FEASIBILITY STUDY FOR DRINKING WATER SUPPLIES THAT MAY BE AFFECTED BY SULFATE IN THE FUTURE

MITIGATION ORDER ON CONSENT DOCKET NO. P-121-07

Prepared for:

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May 28, 2014

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Prepared by:

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May 28, 2014

EXECUTIVE SUMMARY

This Feasibility Study (FS) identifies and evaluates potential mitigation actions for sulfate in drinking water supplies in the Naco area south of Bisbee and recommends a future course of action that is protective of those drinking water supplies. The FS was conducted under Mitigation Order on Consent Docket No. P-121-07 (Mitigation Order) between Freeport-McMoRan Corporation Copper Queen Branch (CQB) and the Arizona Department of Environmental Quality (ADEQ) to address water supplies that may be affected in the future by sulfate in excess of 250 milligrams per liter (mg/L). Currently, drinking water supplies in the Naco area do not exceed 250 mg/L, which is considered to be the concentration at which taste effects may become noticeable. There is no health-based drinking water standard for sulfate, although the U.S. Environmental Protection Agency has issued an advisory for sulfate when present in drinking water at 500 mg/L or above due to possible laxative effects for those unaccustomed to drinking water containing sulfate at that level.

The Mitigation Order set a sulfate concentration limit of 250 mg/L in drinking water supplies as the level at which CQB would need to conduct a mitigation action of providing an affected supply with a drinking water supply meeting the sulfate limit. To date, CQB has mitigated 13 private water supplies and one public water supply at a cost of approximately $2.5 million. To conduct these mitigations, CQB worked with ADEQ and the owners and operators of affected water supplies to identify and implement suitable mitigation actions. The mitigation actions at private supplies included connection to public supply, well replacement, water treatment, and bottled water. The mitigation action at the public water supply consisted of working with the operator to develop an alternate supply by connecting to supply wells unaffected by sulfate.

Groundwater monitoring is ongoing and used to determine the sulfate concentrations of drinking water supplies and groundwater. CQB communicates information on its Mitigation Order activities by posting all reports and submittals to ADEQ at the Bisbee Library and on a project website. CQB also conducts regular meetings with a Community Advisory Group attended by Naco area residents, ADEQ, and representatives of the City of Bisbee, Cochise County, and Arizona Water Company (AWC).

Nature and Extent of Sulfate

A groundwater plume of sulfate exceeding 250 mg/L extends southwest and south from the vicinity of a former evaporation pond on CQB property to the areas of Naco and Bisbee Junction. The sulfate plume was caused by the historical infiltration of sulfate-bearing water

discharged to a former evaporation pond between 1905 and 1987. Water infiltrated from the pond to the water table, mixed with ambient groundwater, and flowed downgradient over time under the prevailing hydraulic gradient. The source of sulfate terminated in 1987 with the end of water discharge to the former evaporation pond. There are no ongoing sources of sulfate.

Feasibility Study Process

Because no drinking water supplies currently exceed 250 mg/L sulfate, the FS prospectively considers drinking water supplies that may be affected in the future due to migration of the sulfate plume. The FS identified potential mitigation actions that could be used to mitigate potential future affects. The mitigation actions included those identified by Arizona Revised Statue § 49-286: alternate water supply, blending, and water treatment. Also included were mitigation actions such as groundwater pumping to control the movement of the plume.

The mitigation actions were combined into the four mitigation alternatives capable of meeting the 250 mg/L sulfate limit at an affected drinking water supply. The mitigation alternatives considered two basic strategies: (1) allowing the plume to migrate over time, while using a monitoring program and contingent mitigation actions to address potential affects at water supplies, and (2) conducting additional groundwater pumping to prevent the future movement of the plume.

Analysis of Mitigation Alternatives

A numerical model of groundwater flow and sulfate transport was used to predict future plume migration under the mitigation alternatives and to develop conceptual designs for evaluating the alternatives. Constructed and calibrated using hydrogeologic data collected for the Mitigation Order, the model accounts for key factors that would influence future plume movement, such as aquifer geometry, groundwater pumping and recharge, and local hydraulic properties.

Simulation of the mitigation alternatives indicates that if the plume were allowed to migrate it would move westward approximately 6,500 feet over 100 years and have the potential to affect three private drinking water wells. The sulfate plume is not predicted to migrate to public water supplies, particularly the AWC wellfield. The AWC and Naco Water Company (NWC) public supplies are not expected to exceed 250 mg/L sulfate if the plume is allowed to migrate.

The mitigation alternatives that would use groundwater pumping considered two plume control strategies: plume stabilization and plume reduction. Plume stabilization would pump

enough groundwater to prevent the advancement of the sulfate plume. Plume reduction would pump enough water to reduce the boundary of the sulfate plume so that over the course of approximately 30 years, it is entirely confined to CQB property. Simulations of these alternatives indicate that groundwater pumping rates on the order of 840 to 900 gallons per minute (gpm) are needed for plume stabilization, while a rate of 2,950 gpm was needed to reduce the plume extent in 30 years. The alternatives that would use groundwater pumping have negligible potential for additional affects to drinking water supplies because the plume would not be allowed to migrate to unaffected areas.

The groundwater pumping alternatives require use of the extracted water. The extracted water would be either treated to 250 mg/L using reverse osmosis (RO) water treatment or used as irrigation supply for a land application system to grow crops. RO treated water could be used as drinking water supply or as aquifer recharge by releasing it to Greenbush Draw. RO treatment consumes about 15 percent of the water treated, which goes into a brine waste that requires disposal and management. Land application consumes water through evapotranspiration.

The alternative allowing plume migration would install additional monitor wells for detailed monitoring of public water supplies, but would not require other infrastructure. The groundwater pumping alternatives would require the development and operation of significant pumping, pipeline, and water treatment or land application facilities. The analysis of mitigation alternatives shows that the groundwater pumping alternatives have significant environmental consequences in that they result in the consumptive use of water, water table declines, and the consumption of a large amount of energy. The brine waste from RO water treatment also requires the consumptive use of land for disposal and long-term isolation of the waste.

Recommended Alternative

CQB recommends the alternative that would allow continued plume migration under an expanded groundwater monitoring program. This is called Alternative 1C in the FS. Alternative 1C would meet the mitigation objective of providing a supply meeting 250 mg/L at private wells by using the mitigation actions identified in the FS and already employed by CQB. A long-term plume monitoring program would be used to monitor sulfate concentrations at drinking water supplies and to track the large scale movement of the plume. Long-term protection of public drinking water supplies in the Naco area would be provided by an expanded groundwater monitoring program which would use detailed monitoring of the plume at wells upgradient of public water supplies to verify that public supplies are unlikely to exceed 250 mg/L sulfate.

The numerical model results indicate that sulfate at the AWC and NWC wellfields would not increase above 250 mg/L under Alternative 1C. However, CQB recognizes that conditions can change and that model predictions require verification. For that reason, the expanded groundwater monitoring under Alternative 1C would incorporate sulfate action levels for the implementation of a contingent mitigation action of an alternative water supply in the event monitoring indicates a likely affect to a public supply. The alternate water supply could be used to blend with or replace the affected supply. Alternative 1C, if accepted, would have the benefit of quickly initiating steps to identify and test potential alternate water supplies which would be implemented upon ADEQ's approval of the Mitigation Plan due 60 days after ADEQ's approval of the FS.

Table ES.1 summarizes the analysis of FS alternatives. Alternative 1C is among the lowest cost of the alternatives. Of the alternatives that would use groundwater pumping, Alternative 3, which would use plume stabilization pumping and land application for agriculture is the least cost alternative meeting the mitigation action objective.

TABLE ES.1
Comparison of Mitigation Alternatives

ALTERNATIVE	ACTIONS	EFFECTIVENESS	IMPLEMENTABILITY			50-YEAR COST				ENVIRONMENTAL FACTORS				
		Meets Mitigation Objective?	Technically Implementable	Administratively Implementable	Implementation Timeframe after Mitigation Plan Accepted	Non-Discounted Capital (millions)	Non-Discounted O&M (millions)	Non-Discounted Total (millions)	NPV(50) (millions)	Reduces Plume Extent?	Net Groundwater Extraction from Aquifer Over 50 Years (millions of gallons)	Potential Water Level Decline Due to Mitigation Action	Electricity Use Over 50 Years (millions of kilowatt hours)	Generates Waste Requiring Consumptive Use of Land?
1A	Long Term Plume Monitoring, Expanded Groundwater Monitoring, Annual ADWR Well Registry Review, Drinking Water Supply Mitigation of 3 Private DWS Wells	Yes. Would mitigate private DWS with proven method and use expanded monitoring and contingent mitigation for public supplies, if needed	Yes	Yes	Immediate	1.8	17.3	19.1	7.3	No. Plume migrates into 1.5 mile area of aquifer	0	0	0	No
1B	Long Term Plume Monitoring, Expanded Groundwater Monitoring, Annual ADWR Well Registry Review, Drinking Water Supply Mitigation of 3 Private DWS Wells, and Contingent Mitigation of Public DWS with RO Treatment	Yes. Would mitigate private DWS with proven method and use expanded monitoring and contingent mitigation by RO for public DWS, if needed	Yes	Yes	Immediate	1.8*	17.3*	19.1*	7.3*	No. Plume migrates into 1.5 mile area of aquifer	0***	0***	0***	No***
1C	Long Term Plume Monitoring, Expanded Groundwater Monitoring, Annual ADWR Well Registry Review, Water Supply Study, Drinking Water Supply Mitigation of 3 Private DWS Wells, and Contingent Mitigation of Public DWS with Alternate Water Supply	Yes. Would mitigate private DWS with proven method and use expanded monitoring and contingent mitigation by alternate water supply for public DWS, if feasible and needed	Yes	Yes	Immediate	3.6**	17.3**	20.9**	9.0**	No. Plume migrates into 1.5 mile area of aquifer	0	0	0	No
2	Plume Stabilization, Water Treatment for Release to Greenbush Draw, Groundwater Monitoring, Annual ADWR Well Registry Review	Yes. Would use groundwater pumping to prevent plume migration to DWS wells	Yes	Yes	36 Months	51.7	118	169	64.6	Yes. Western plume edge remains the same, but the southern edge recedes northward	3,300	30 Years: 15 to 25 feet in vicinity of wellfield; 3 to 5 feet at AWC and NWC wells 50 Years: 15 to 30 feet in vicinity of wellfield; 4 to 6 feet at AWC and NWC wells	153	Yes
3	Plume Stabilization, Land Application, Groundwater Monitoring, Annual ADWR Well Registry Review	Yes. Would use groundwater pumping to prevent plume migration to DWS wells	Yes	Yes	24 Months	6.4	32.1	38.5	16.8	Yes. Western plume edge remains the same, but the southern edge recedes northward	20,000	30 Years: 15 to 25 feet in vicinity of wellfield; 7 to 9 feet at AWC and NWC wells 50 Years: 18 to 24 feet in vicinity of wellfield; 8 to 10 feet at AWC and NWC wells	56	No
4	Plume Reduction and Stabilization, RO Treatment for Release to Greenbush Draw, Land Application, Groundwater Monitoring, Annual ADWR Well Registry Review	Yes. Would use groundwater pumping to prevent plume migration to DWS wells	Yes	Yes	36 Months	69.4	106	175	92.2	Yes. Groundwater pumping reduces plume footprint to CQB property over time	29,000	30 Years: 58 to 80 feet in vicinity of wellfield; 14 to 24 feet at AWC and NWC wells; 50 Years: 24 to 32 feet in vicinity of wellfield; 14 to 16 feet at AWC and NWC wells	254	Yes

Notes:
LTPM = Long Term Plume Monitoring
RO = Reverse Osmosis
DWS = Drinking Water Supply
O&M = Operating and Maintenance
NPV (50) = 50-Year Net Present Value
AWC = Arizona Water Company
NWC = Naco Water Company
CQB = Copper Queen Branch

* Contingent costs for RO water treatment not calculated due to their uncertain need. For illustration purposes, the nondiscounted and net present value total costs could be approximately are $89 million and $26 million if treatment were triggered in 2023, whereas nondiscounted and net present value total costs could be approximately $55 million and $12 if treatment were triggered in 2043.
** Contingent costs for development of an alternate water source not calculated due to their uncertain need.
***If contingent mitigation action were triggered, the environmental factors for Alternative 1B would develop similar to Alternative 2.

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1. INTRODUCTION

1.1. Overview of the Feasibility Study

This Feasibility Study (FS) identifies and evaluates mitigation actions for sulfate in drinking water supplies in the Naco area south of Bisbee (Figure 1) and recommends a future course of action that is protective of drinking water supplies. The FS was conducted under Mitigation Order on Consent Docket No. P-121-07 (Mitigation Order) between Freeport-McMoRan Corporation Copper Queen Branch (CQB) and the Arizona Department of Environmental Quality (ADEQ) to address water supplies that may be affected in the future by sulfate in excess of 250 milligrams per liter (mg/L). Currently, drinking water supplies in the Naco area do not exceed 250 mg/L, which is considered to be the concentration at which taste effects may become noticeable. There is no health-based drinking water standard for sulfate, although the U.S. Environmental Protection Agency (EPA) (EPA, 2003) has issued an advisory for sulfate when present in drinking water at 500 mg/L or above due to possible acute laxative effects for those unaccustomed to drinking water containing sulfate at that level.

A groundwater plume containing sulfate, an inorganic salt that in high enough concentrations can influence the taste of water, occurs in groundwater in the Naco area (Figure 1) (Clear Creek Associates [CCA], 2010). The Mitigation Order set a sulfate concentration limit of 250 mg/L in drinking water supplies as the level at which CQB would need to conduct a mitigation action of providing an affected supply with a drinking water supply meeting the sulfate limit. For the purpose of this FS, the terms "*sulfate plume*" and "*plume*" are defined to mean groundwater with an average sulfate concentration exceeding 250 mg/L. The term "*affected*" (e.g., affected well, affected water supply) is used to refer to a drinking water supply with an average sulfate concentration greater than 250 mg/L.

In July, 2013, CQB submitted to ADEQ a draft of the FS for drinking water supplies that may be affected by sulfate in the future (CCA, 2013). ADEQ reviewed the draft FS and provided comments on it in January 2014 (ADEQ, 2014a). ADEQ agreed with the recommended mitigation alternative, but requested that CQB respond to ADEQ's comments before revising the FS for final submittal. CQB's responses to ADEQ comments were submitted in February 2014 (CQB, 2014). CQB and ADEQ met on March 19, 2014 to discuss the FS comments. ADEQ approved the FS on April 2, 2014 (ADEQ, 2014b), and requested that a revised FS and a Mitigation Plan be submitted within 60 days. This FS has been finalized by revising the draft FS to address ADEQ's January 2014 comments.

In March 2012, CQB submitted to ADEQ a Feasibility Study and Mitigation Plan (FS/MP) (CCA, 2012) that focused on identifying mitigation actions for existing drinking water supplies that were affected by sulfate at that time. CQB voluntarily initiated the planning and implementation of mitigation actions in the FS/MP concurrent with ADEQ's review and approval of the FS/MP (ADEQ, 2012b). To date, CQB has mitigated 13 private water supplies and one public water supply at a cost of approximately $2.5 million. CQB worked with ADEQ and the owners and operators of affected water supplies to identify and implement suitable mitigation actions, including holding a public meeting in July 2011 to describe potential actions. The mitigation actions at private supplies included connection to public supply, well replacement, water treatment, and bottled water. The mitigation action at the public water supply consisted of working with the operator to develop an alternate supply by connecting to supply wells outside the plume.

1.2. Previous Mitigation Order Work

The Mitigation Order requires CQB (formerly Phelps Dodge Corporation [PD] CQB) to characterize the hydrogeology in the vicinity of the sulfate plume and to develop a Mitigation Plan to practically and cost effectively provide a drinking water supply at the point of use to the owner/operator of an existing drinking water supply affected by sulfate attributable to the Concentrator Tailing Storage Area (CTSA) (Figure 2A). The hydrogeologic characterization was conducted in accordance with the ADEQ-approved *Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Concentrator Tailing Storage Area* (Work Plan) (Hydro Geo Chem, Inc. [HGC], 2008). Work completed for the Work Plan was initially documented in an Aquifer Characterization Report (ACR) that was submitted to ADEQ in April 2009 (HGC, 2009). In March 2010, ADEQ provided comments on the ACR (ADEQ, 2010a) and CQB voluntarily proposed additional work to address ADEQ's comments (CQB, 2010b). The final results of investigations completed to characterize the hydrogeology and water quality of the sulfate plume are reported in the *Revision 1 Aquifer Characterization Report* (ACR) (CCA, 2010). The 2010 ACR was approved by ADEQ in October 2011 under the condition that the FS include a discussion of the tailing impoundment reclamation voluntarily undertaken by CQB (ADEQ, 2011). The voluntary reclamation is discussed in Section 2.1.

The Work Plan specifies that a FS would be conducted to identify and evaluate potential mitigation actions for affected drinking water supplies. The Work Plan describes the following FS components:

- Identification and screening of potentially applicable mitigation actions, control technologies, and process options.
- Development and screening of mitigation alternatives.
- Detailed analysis of mitigation alternatives.
- Recommendation of a preferred mitigation alternative.

The preferred mitigation alternative, if approved by ADEQ, would be implemented under a Mitigation Plan to be submitted to ADEQ.

The Work Plan originally envisioned a single FS and Mitigation Plan to address both affected supplies and supplies that might be affected in the future. However, to accelerate implementation of mitigation actions for existing affected drinking water supplies, CQB undertook work to identify and evaluate potential mitigation actions while additional hydrogeologic characterization work was being completed and the revised ACR was being reviewed by ADEQ. As a result of this work, and with notice to ADEQ, implementation of the mitigation actions was initiated in February 2012.

Progress on the identification and evaluation of mitigation alternatives was reviewed with ADEQ at meetings on April 27, 2011, September 28, 2011, and November 29, 2011. CQB met with ADEQ to present and discuss CQB's evaluation of potential mitigation actions for the affected drinking water supplies, CQB's intention to work with the well owners to provide a final mitigation action for their wells, and the selection of the preferred actions by affected well owners. A technical memorandum on well replacement (Appendix A) was submitted to ADEQ in November 2011 to explain the rationale for selecting this mitigation action for some private wells. In September 2011, a technical memorandum on the estimated plume migration rate (Appendix B) was submitted to ADEQ to support discussions on the timing of the FS.

In January 2012, CQB proposed that ADEQ allow CQB to document the steps taken to develop mitigation actions for affected wells in a combined FS and Mitigation Plan (i.e., the FS/MP) that would be submitted in March 2012 (CQB, 2012). CQB also proposed a separate FS (i.e., this document) to be submitted in July 2013 to address drinking water supplies that might be affected in the future, such as unaffected supplies in the path of or proximal to the sulfate plume. The Mitigation Plan for water supplies that may be affected in the future would be submitted 60 days after ADEQ approval of the second FS. The two-track FS process was proposed so that the Mitigation Plan for currently affected drinking water supplies could be submitted to ADEQ without waiting for the completion of additional studies needed for the

analysis of mitigation alternatives for drinking water supplies potentially affected in the future. ADEQ approved the two-track approach in July 2012 (ADEQ 2012a).

1.3. Feasibility Study Approach

Section III.E of the Mitigation Order stipulates:

"PD shall submit a Mitigation Plan to ADEQ for review and approval, which identifies and evaluates alternatives (e.g., containment, collection and discharge with or without treatment, institutional controls, alternative water supplies (including, but not limited to a new supply well, use of an existing drinking water supply well, modifying the screened interval of an existing drinking water supply well, connection to an existing public drinking water supply system, and bottled water), mixing or blending, technically practicable treatment, and no action) to practically and cost effectively provide a drinking water supply that meets applicable drinking water quality standards and with sulfate concentrations less than 250 mg/L to the owner(s)/operator(s) of existing drinking water supplies determined from the characterization described in Section III.C of this Order and verified by sampling and analysis to have an average sulfate concentration in excess of 250 mg/L (or other legally enforceable numeric concentration for sulfate which is enacted by statue or rule after the effective date of this Consent Order) as a result of the sulfate plume originating from the PDCTSA".

Based on Section III.E, drinking water supply mitigation actions are measures that can be taken to provide an existing affected drinking water supply with a source of drinking water with less than 250 mg/L sulfate at the point of use. To accomplish the requirements of Section III.E, the FS identifies potential mitigation actions that are consistent with Arizona Revised Statue (ARS) § 49-286 pertaining to mitigation of non-hazardous releases such as sulfate.

ARS § 49-286.A states that a party may be ordered "*to perform one or more of the following mitigation measures:*

1. *Providing an alternative water supply.*
2. *Mixing or blending if economically practicable.*
3. *Economically and technically practicable treatment before ingesting water.*
4. *Such other mutually agreeable mitigation measures as are necessary to achieve the purposes of this section*."

The mitigation measures of ARS § 49-286.A are included as potential mitigation actions in this FS.

ARS § 49-286.B states "*The director's selection of mitigation measures shall balance the short-term and long-term public benefits of mitigation with the cost of each alternative measure. The director may only require the least costly alternative if more than one alternative may render water usable as a drinking water source*."

Four mitigation alternatives were evaluated for the FS to provide a range of potential actions that could be taken to mitigate drinking water supplies that may be affected in the future. Mitigation alternatives were developed based on site specific data including groundwater chemistry; hydrogeologic conditions; and CQB's operations infrastructure and land position. Alternative development followed a phased process that started with the identification and screening of various potentially applicable mitigation actions identified in ARS§ 49-286.A, followed by development of alternatives consisting of the mitigation actions, control technologies, and process options retained by the screening. The mitigation alternatives were evaluated based on their effectiveness, implementability, and cost to identify a recommended alternative. The environmental effects of each mitigation alternative were also evaluated to illustrate the tradeoffs that need to be considered when selecting a recommended mitigation action that balances short- and long-term public benefits.

An important difference between this FS and the FS/MP for affected drinking water supplies is that it addresses potential future affects. Because it is prospective, the FS relies on predictions of plume movement using a calibrated groundwater flow and transport model to assess the movement of the sulfate plume over time. Hydrologic simulation always has an element of uncertainty which is resolved through ongoing groundwater monitoring and comparison of monitoring results to model predictions. The principal of adaptive management is included in the Mitigation Order to allow the flexibility to respond to future conditions that can only be predicted or assumed at this time.

1.4. Adaptive Management

The mitigation alternatives included in the FS are all long-term actions (i.e., will involve implementation and monitoring for many years) and require making assumptions about future conditions for technical, administrative, and business variables based on current information which can change. For instance, there may be advancements in water treatment that develop new technologies that are less costly and waste less water, or other sources of drinking water or changes to the selection of contingent actions that may be identified in the future. For these reasons, CQB incorporated adaptive management concepts into the FS to allow variables to be periodically reviewed.

As stated in Section III.D of the Mitigation Order, "*The Mitigation Plan may use an adaptive management approach that allows for the adjustment of mitigation measures from time to time based upon information obtained concerning the performance of implemented mitigation measures*." Adaptive management relies on an iterative process of data gathering and analysis to improve decision making by allowing variables to be periodically reviewed. For purposes of environmental remediation or mitigation, the process is one of implementing a selected remedial action or actions, evaluating the performance of the action or actions over time while having contingent measures available to improve performance if warranted, followed by further evaluating the performance of the system, followed by other contingent measures if warranted, and so on.

The adaptive management approach will allow the project to remain flexible to respond to new technical information (i.e., water treatment technology improvements, alternate water supplies, aquifer characteristics, groundwater monitoring results, or engineering data), administrative constraints (e.g., new laws, evolving water supply conditions and regulations, etc.), or business conditions (e.g., changes in mine operating status, etc.) because mitigation measures may be modified as appropriate in response to performance monitoring.

1.5. Report Organization

The remainder of the FS is organized as follows:

- Section 2 provides the site background including descriptions of the hydrogeology and the sulfate plume.
- Section 3 presents the identification and screening of potentially applicable mitigation actions, technologies, and process options.
- Section 4 identifies and screens mitigation alternatives.
- Section 5 is a detailed analysis of the mitigation alternatives.
- Section 6 identifies the preferred mitigation alternative.

2. SITE BACKGROUND

This section summarizes the site history, hydrologic setting, and sulfate plume. Comprehensive reviews of the site history, hydrogeology, and water quality in the vicinity of the plume are provided in the Work Plan (HGC, 2008) and ACR (CCA, 2010).

The CTSA is approximately 3.5 miles southeast of Bisbee, four miles northeast of Naco, and one mile south of Warren (Figures 1 and 2A). As defined in the Mitigation Order, the CTSA consists of two inactive tailing impoundments (the North Tailing Impoundment and the South Tailing Impoundment), a former evaporation pond, and a stormwater impoundment known as Horseshoe Pond and located in a portion of the former evaporation pond (Figure 2A). The North and South Tailing Impoundments and former evaporation pond cover an area of approximately 1,000 acres in Sections 27, 33, and 34, Range 24 East, Township 23 South, and Sections 3 and 4 in Range 24 East, Township 24 South. Comprehensive reviews of the site history, hydrogeology, and water quality in the vicinity of the plume are provided in the Work Plan and ACR, which are the sources of the following summary.

2.1. Site History

Mining and ore processing in the Warren Mining District were active from the late 1800s through 1975. The CTSA facilities were used variably from 1905 through 1987 for the storage and evaporation of excess mine water, the placement of tailing and mine materials, and containment of stormwater. The CTSA facilities are now reclaimed and receive no process solids or liquids.

The North and South Tailing Impoundments are inactive facilities that last received tailing in 1974. The impoundments are unlined and were voluntarily reclaimed by CQB by regrading, capping with local soil, and installation of engineered surface water management facilities. CQB's reclamation objectives were to minimize net infiltration to the tailing, to control erosion and sedimentation, and to attenuate and control stormwater discharge from the impoundment surface. The North and South Tailing Impoundments were graded to shed unimpacted stormwater from the top surfaces and outslopes. The impoundments were covered by an engineered evapotransporative soil cover to minimize net infiltration. The cover consisted of approximately 2 million cubic yards of material with a minimum thickness of 2 feet. Surface water from the top of the impoundments is routed to a series of lined attenuation basins that are used to reduce the peak flow in the channels that convey stormwater away from the impoundments. The stormwater is conveyed to stormwater ponds south of the impoundments for

recharge (Figure 2A). The soil cover was revegetated with a seed mix of self-sustaining native plant species. Figures 2B and 2C show the stormwater management plan and cover and revegetation plan, respectively, for the North and South Tailing Impoundments.

The former evaporation pond was an unlined pond of approximately 350 acres that received excess mine water from 1908 to 1987. The surface sediment from the bottom of the former evaporation pond was excavated and placed on the south slope of the South Tailing Impoundment between 1989 and 1990. The evaporation pond sediment was subsequently covered by soil and revegetated as part of the tailing impoundment reclamation. The former evaporation pond area is graded so that it no longer impounds water.

The former Horseshoe Pond was an unlined stormwater impoundment of approximately six acres, constructed in 1990 in a small portion of the footprint of the former evaporation pond. The former Horseshoe Pond periodically collected incidental rainfall and stormwater runoff from the North and South Tailing Impoundments and areas north of the CTSA (PD, 2004). Horseshoe pond was reclaimed as part of the tailing impoundment reclamation by grading to shed surface water to an engineered surface water management facility.

Historically, water was pumped from the various shafts of the Warren Mining District to dewater underground workings during underground mining (PD, 1990 and 2004; Water Management Consultants, 2006). Dewatering ceased in 1987 with the decision to let the underground workings flood. The estimated volume of groundwater pumped from underground workings from 1906 through 1987 is approximately 168.6 billion gallons (Water Management Consultants, 2006). Water from underground workings was used in mining and excess mine water was discharged to the former evaporation pond or used at the former Warren Ranch irrigation area (Figure 2A).

As described in the ACR, the sulfate plume developed over 80 years primarily due to the infiltration of excess mine water historically discharged to the former evaporation pond and, to a lesser degree, mine water used for irrigation of crops at the former Warren Ranch irrigation area (PD, 1990; Savci Environmental Technologies, Inc., 1998b). The potential for the CTSA and former mining facilities in the vicinity of the CTSA (e.g., the SAC logs and Crawford Mill Tailing) (Figure 2A) to be current or future sources of sulfate is considered negligible because the facilities have either been removed or reclaimed. The Crawford Mill and SAC logs areas were voluntarily reclaimed at the same time as the tailing impoundments. Reclamation included demolition and removal of former buildings, grading, and revegetation. Figure 2D shows the Crawford Mill/SAC logs area before and after reclamation.

Although seepage may have occurred from the North and South Tailing Impoundments during their deposition the volume of seepage was probably not significant because of the low permeability of the tailing material and the water decant system which reclaimed tailing water. Tailing slurry deposition ceased nearly 40 years ago in 1974. Infiltration into the tailing impoundments after tailing deposition ceased is considered negligible based on the result of investigations reported by Savci Environmental Technologies (1998a) which found negligible net infiltration into the tailing (less than 0.25 gpm) due to the combination of a high evaporation rate (evaporation exceeds rainfall) and the low hydraulic conductivity of the tailing. Since the work of Savci Environmental Technologies (1998a), the tailing have been covered and graded to drain which should further reduce the potential for infiltration.

Savci Environmental Technologies (1998a) also reported that the water content of shallow tailing samples were in the range of field capacity, indicating limited potential for free-draining liquids. As reported in the ACR, the lack of elevated sulfate concentrations in wells GL-03, BMO-2008-11G, COB WL, and TM-03 in the immediate vicinity of the tailing impoundments also indicates the lack of significant seepage to the subsurface aquifers.

The tailing reclamation covered the south slope of the South Tailing Impoundment on which the bottom sediment of the former evaporation pond was placed, effectively isolating the bottom sediment. The tailing reclamation also applied a graded soil cover to the surface of the former mining facilities north of the North Tailing Impoundment. Based on the data available, there are no significant ongoing sources of sulfate to the plume.

2.2. Hydrogeologic Setting

The CTSA is in the northeastern portion of the Bisbee-Naco physiographic basin south of the Mule Mountains (Figures 1 and 2A). The Mule Mountains, Cerro La Muela, and Sierra San Jose, form the northern, eastern, and southern margins of the basin, respectively. Approximately one-half of the physiographic basin lies in Mexico. The mountains surrounding the basin are composed of bedrock materials, and the basin area consists of clastic sediment, called basin fill, which is underlain by bedrock. Surface runoff from the Bisbee-Naco watershed flows into Greenbush Draw, which drains to the west to the Upper San Pedro River (Figure 1).

Groundwater occurs in two hydrostratigraphic units in the vicinity of the sulfate plume: basin fill and bedrock of the Bisbee Group. Figure 3 is a map showing the surface geology of the area in the vicinity of the sulfate plume. Basin fill is relatively permeable and consists of poorly to moderately cemented sand and gravel deposits that form alluvial fans emanating from the mountains. The thickness of the basin fill increases from zero at the mountain fronts to

approximately 635 feet in the central portion of the basin north of Naco. The Bisbee Group underlies the basin fill and consists of (from younger to older) the Cintura Formation, Mural Limestone, Morita Formation, and Glance Conglomerate. As described in the ACR, the Cintura Formation, Mural Limestone, and Morita Formation are called the "*Undifferentiated Bisbee Group*" because the shale, siltstone, and sandstone beds of the Cintura and Morita Formations are difficult to tell apart in drill cuttings unless contacts with the Mural Limestone or Glance Conglomerate are present. The undifferentiated Bisbee Group has a low to moderate permeability compared to the basin fill, although massively bedded portions of the Mural Limestone may be relatively impermeable. The Glance Conglomerate has a sandy to silty matrix and a low permeability compared to basin fill.

The structural geology in the vicinity of the CTSA is complex and can have a significant influence on groundwater flow. Major fault zones in the CTSA area are the Bisbee West-Gold Hill fault, the Abrigo fault, the Ninety-One Hills fault, the Black Gap fault, the Mexican Canyon fault, and the La Bellota fault (Figure 3). Most of the fault zones are projected beneath the basin fill based on mapping in areas of outcropping bedrock (e.g., Hayes and Landis, 1964). The La Bellota fault is inferred based on regional geologic mapping and structural analysis (Anderson and Nourse, 2005).

The Bisbee West-Gold Hill and Abrigo fault zones are west-northwest trending, south-dipping high angle faults with normal offset. The Ninety-One Hills fault zone is a west-northwest and west trending, north dipping complex of normal faults paralleling the Abrigo and Bisbee West faults. The Black Gap and Mexican Canyon fault zones trend north-northeast, dip steeply to the west, and show apparent normal offset. The La Bellota fault is north-northwest trending fault in the western part of the study area that is interpreted to have had strike slip motion in the Mesozoic Era.

Information presented in the ACR shows that the thickness of the basin fill and the elevation of the basin fill-bedrock contact differ across the trace of the Black Gap fault, indicating some Quarternary-Tertiary activity along it. The ACR also presents information indicating that bedrock water levels and water quality can vary significantly across the trace of the Abrigo fault zone. Data presented in Section 5.1 show significant water level differences in basin fill across the projected trace of the La Bellota fault.

The basin fill is saturated south of the Abrigo fault and west of the Black Gap fault, and is the primary drinking water supply in the area due to its shallow depth, high permeability, and reliable productivity compared to bedrock. Public drinking water supply wells that draw supply from the basin fill are operated by Arizona Water Company (AWC) and Naco Water Company

(NWC) to supply water to Bisbee and Naco, respectively. Domestic wells completed in the basin fill supply water to rural properties in San Jose and around Naco; although there is only a thin saturated zone in the basin fill at San Jose. The undifferentiated Bisbee Group underlying basin fill west of the Black Gap fault is also water-bearing and provides supply to some domestic wells. North of the Abrigo fault and east of the Black Gap fault the basin fill is typically unsaturated. East of the Black Gap fault the Morita Formation and Glance Conglomerate are the primary water-bearing formations for wells in the Bisbee Junction and near the airport east of the former evaporation pond.

Wells in the undifferentiated Bisbee Group and Glance Conglomerate are not as productive as wells in the basin fill due to the lower permeability of bedrock as compared to basin fill. However, the productivity of bedrock wells is sufficient for domestic supply at private properties, although bedrock wells east of the Black Gap Fault are susceptible to drying out in response to prolonged pumping. NWC operates a public supply well (NWC-04) in bedrock at Bisbee Junction.

Groundwater elevations in the first quarter of 2013 are shown on Figure 4. Groundwater elevations in bedrock wells east of the Black Gap fault and in basin fill and bedrock west of the Black Gap fault decrease from east to west, indicating westerly groundwater flow. Groundwater elevation data collected by CQB since 2008 indicate the water levels in the basin fill and bedrock in the vicinity of the plume are decreasing at approximately 1 to 2 feet per year. The water level decline is likely due to existing groundwater extraction and low groundwater recharge due to climatic conditions.

2.3. Distribution of Sulfate in Groundwater

Sulfate concentration data in the vicinity of the plume have been collected quarterly since January 2008 for groundwater quality monitoring to define the lateral and vertical extent of the sulfate plume. Figure 5 is a contour map showing the areal distribution of the sulfate plume in the first quarter of 2013. The sulfate concentration contours are inferred based on the maximum sulfate concentration at locations where closely spaced wells have different concentrations because they are completed at different depths. The distribution of sulfate can appear complex on plan maps because the sulfate plume is three dimensional and plume water can be underlain or overlain by groundwater with less than 250 mg/L sulfate, depending on location.

The sulfate plume extends southwest and south from the vicinity of the former evaporation pond to the vicinity of Naco and Bisbee Junction. West of the Black Gap fault, the sulfate plume is contained primarily within the basin fill, although elevated sulfate

concentrations do extend into the underlying undifferentiated Bisbee Group in the central and northern portions of the plume (e.g., BMO-2008-8M and BMO-2008-13M on Figure 5). East of the Black Gap fault the sulfate plume is entirely within bedrock of the Morita Formation and Glance Conglomerate. On an area-wide basis, approximately half of the plume is contained in bedrock.

The sulfate plume extends from the water table to varying depths depending on location. Groundwater monitoring data presented and discussed in the ACR indicate that sulfate in excess of 250 mg/L extends to approximately 400 feet below the water table in monitoring wells in Glance Conglomerate and undifferentiated Bisbee Group east of the Black Gap fault, although deeper levels of penetration (at least 500 feet below the water table) are observed at BMO-2008-10GL in the footprint of the former evaporation pond. In the central to northern portions of the plume west of the Black Gap fault sulfate in excess of 250 mg/L occurs throughout the basin fill and into undifferentiated Bisbee Group to approximately 600 feet below the water table. In the southwestern portion of the plume west of the Black Gap fault, sulfate exceeding 250 mg/L is restricted to the basin fill and extends less than 300 feet below the water table such that elevated sulfate concentrations do not extend into the lowermost portion of the basin fill or the underlying bedrock.

As described in the ACR, the sulfate plume was caused by the historical infiltration of sulfate-bearing water from the former evaporation pond. The sulfate-bearing infiltration water migrated down to the water table and mixed with ambient groundwater in the basin fill and bedrock, creating a groundwater mound below the pond. The sulfate-affected groundwater then flowed away from the CTSA under the prevailing hydraulic gradients caused by the groundwater mound, which has dissipated since discharge to the pond was discontinued in 1987. The current hydraulic gradient and direction of groundwater movement is westerly in the vicinity of the former evaporation pond and throughout the area of the sulfate plume.

The bedrock aquifer is heterogeneous east of the Black Gap Fault, as discussed in the ACR. The aquifer heterogeneity is manifested as large differences in hydraulic conductivity over short distances and widely varying water levels indicating perched or multiple aquifers in the bedrock east of the Black Gap Fault. Although heterogeneous, the lateral extent of sulfate-affected groundwater is adequately defined for the purposes of conceptual model development and mitigation alternative development. The evidence for this is that sulfate measurements from monitoring and private wells in the bedrock since 2007 in the vicinity of the plume demonstrates that wells outside and proximal to the north, east and south sides of the plume have not shown evidence of increasing concentrations over time. These observations support the interpretation that expansion of the plume is halted in the upgradient eastern portion of the plume near the

Bisbee Junction/Airport area and in the northern and southern margins of the plume. West of the Black Gap fault the plume is primarily within basin fill with westerly groundwater flow, although bedrock beneath the basin fill is affected by sulfate in the central and northern portion of the plume. Under current conditions, the sulfate plume in the basin fill will continue to migrate to the west. The water-bearing characteristics of the aquifer and spatial distribution of sulfate are important factors constraining the implementability of potential mitigation actions. The sulfate plume in bedrock will continue migrating westerly and is expected to be a long-term feature because the low permeability and heterogeneous hydraulic properties of the bedrock make active plume management impracticable.

2.4. Drinking Water Supplies Potentially Affected in the Future

Drinking water supplies that may potentially be affected in the future are primarily those served by wells that are downgradient to the west of, and thus in the general direction of projected movement of, the sulfate plume (Figure 6). Drinking water supply wells that are peripheral to the sulfate plume on the north, south, and east are not on the current path of the sulfate plume, but could potentially be affected by sulfate in excess of 250 mg/L if there is an unexpected change in plume movement.

Affected drinking water supplies have been identified by the well inventory and groundwater monitoring programs implemented for the Mitigation Order and reported in the ACR. In April 2013, CQB completed mitigation actions at all the affected drinking water supplies at a cost of approximately $2.5 million. As described in the FS/MP, a combination of mitigation actions was used, including well replacement, alternate drinking water supply, and point of use water treatment.

Groundwater monitoring is the primary tool that would be used to determine the sulfate concentration of drinking water supplies in the future. CQB's ongoing well inventory, quarterly groundwater monitoring, and community outreach activities are continuing means of determining the sulfate concentration in drinking water supply wells, identifying concentration trends at individual wells, and documenting the extent and rate of migration of the plume.

The FS uses a numerical model of groundwater flow and sulfate transport to predict future plume migration. Groundwater flow and transport models are constructed and calibrated using measurement data for groundwater elevation, hydraulic conductivity, aquifer geometry, sulfate concentration, groundwater pumping and recharge, and sulfate plume migration. For this reason, groundwater models account for the key factors that influence plume movement, such as the effects of aquifer geometry, groundwater pumping and recharge, and local hydraulic

properties. The calibrated model is used to simulate future conditions by specifying future pumping and recharge conditions. The results of groundwater flow and sulfate transport modeling of future plume movement are presented in Section 5.

All predictions of future plume movement have a validation process to account for the fact that the characteristics of the subsurface hydrogeology that control groundwater flow and plume migration are not perfectly known. The process of model validation consists of ongoing groundwater monitoring and comparison of actual and predicted conditions. The validation process checks model predictions and allows for model modification if needed to better match observed conditions.

3. IDENTIFICATION AND SCREENING OF POTENTIALLY APPLICABLE MITIGATION ACTIONS, CONTROL TECHNOLOGIES, AND PROCESS OPTIONS

This section describes the mitigation action objective and presents the identification and screening of potentially applicable mitigation actions for drinking water supplies that may be affected in the future. The potential mitigation actions evaluated are organized under the two basic approaches of drinking water supply mitigation and plume management.

The approach of drinking water supply mitigation refers to actions that can be taken at an affected water supply to meet the mitigation action objective. In general, drinking water supply mitigation consists of actions that replace, blend, or treat the affected supply to meet the mitigation objective, consistent with ARS § 49-286. The same actions that were used to mitigate currently affected supplies, namely alternate water supply and water treatment, can be used to mitigate drinking water supplies that may be affected in the future; although with appropriate modifications for site specific conditions. The mitigation actions used for affected supplies were described in the FS/MP and are incorporated into this FS.

The approach of plume management would manage or control the rate and direction of plume migration and potentially reduce the extent of the plume. Plume management actions could include groundwater monitoring to track the migration of the plume and quality of drinking water supplies so that mitigation actions can be taken if needed, or the operation of an engineered wellfield to control the plume and reduce its extent by extracting groundwater.

Potential actions that could be taken to mitigate any future affected drinking water supplies were identified and screened using the following hierarchy: mitigation actions, technologies, and process options. Mitigation actions are general categories of actions that can be taken to accomplish the mitigation action objective. Consistent with ARS § 49-286.A, alternate water supply, blending, and water treatment are general categories of mitigation actions for drinking water supplies. Mitigation actions can include a range of technologies. In the case of water treatment, technologies that could be applied for sulfate removal include biological treatment, chemical precipitation, ion exchange or membrane treatment. A single technology can also include a range of process options. For example, membrane water treatment consists of different process options such as reverse osmosis, nanofiltration, and electrodialysis reversal. The purpose of screening the mitigation actions, technologies, and process options is to identify effective and implementable actions that can be used to develop mitigation alternatives.

Mitigation alternatives consist of combinations of mitigation actions, technologies, and process options that could be implemented to meet the mitigation action objective.

Mitigation actions, technologies, and process options are screened for effectiveness, implementability, and cost. Effectiveness refers to the ability and reliability of the mitigation action to meet the mitigation objective over both short- and long-term time horizons, and whether the measure is proven and reliable with respect to site conditions. Implementability is defined in terms of technical and administrative factors. Technical implementability is an assessment of the ability to construct, operate, and maintain a mitigation action given site conditions. Administrative implementability refers to the ability to meet regulatory permitting requirements and project timelines given the general site conditions. Cost consists of the capital cost of goods or services and the ongoing operating and maintenance (O&M) cost over the duration of the action.

3.1. Mitigation Action Objective

The mitigation action objective is a statement of the mitigation goal. The following mitigation action objective is adopted per Section III.E of the Mitigation Order.

Provide the owner(s)/operator(s) of an existing drinking water supply affected by the sulfate plume from the CTSA with a drinking water supply having sulfate concentrations less than 250 mg/L at the point of use.

There is no Arizona numeric aquifer water quality standard for sulfate to use as a quantitative mitigation objective. The Mitigation Order adopted a sulfate limit of 250 mg/L for drinking water supplies. Thus, potential mitigation actions will use the Mitigation Order sulfate limit of 250 mg/L as a numeric upper limit for the acceptable sulfate concentration at the point of use in an existing drinking water supply.

3.2. Mitigation Actions

Mitigation actions are general categories of actions that can provide an affected drinking water supply with a drinking water source meeting the 250 mg/L mitigation action objective consistent with ARS § 49-286. Mitigation actions evaluated for drinking water supply mitigation are listed below.

- **Alternative water supply** – measures that would modify an affected supply well to meet the mitigation objective or replace an affected supply well with a new supply that meets the 250 mg/L sulfate limit at the point of use.

- **Blending** – measures that would mix sulfate-bearing water from an affected water supply with a source of dilute water such that the concentration of the mixture meets the 250 mg/L sulfate limit at the point of use.
- **Water treatment** – measures that would treat water from the affected water supply to reduce the sulfate concentration to meet the 250 mg/L sulfate limit at the point of use.

Mitigation actions for plume management include groundwater and drinking water supply monitoring, and actions that would control future concentration or movement of the plume. The following mitigation actions are evaluated for plume management.

- **Institutional actions** – institutional actions generally refer to groundwater monitoring and other activities that can be used to measure and predict plume migration or manage exposure to an affected medium. Groundwater monitoring and periodically checking for new drinking water supply wells are the institutional actions considered.
- **In situ treatment –** in situ treatment would treat sulfate in place in the subsurface by adding reagents to the plume to create chemical conditions favoring conversion of sulfate to an immobile chemical precipitate such as iron sulfide; thus reducing the concentration of sulfate in the plume.
- **Groundwater control** – measures that would control the movement, extent, or concentration of the plume using groundwater pumping or recharge to remove sulfate from the aquifer and/or alter hydraulic conditions in the aquifer.
- **Management of water produced by groundwater control** – measures that would be a consequence of groundwater control and would consist of the use or recharge of water produced by groundwater control actions.

Table 1 lists mitigation actions considered for drinking water supply mitigation and plume management.

3.3. Technologies and Process Options for Drinking Water Supply Mitigation

The technologies and process options for drinking water supply mitigation actions are described below along with a summary of their screening on the basis of effectiveness, implementability, and relative cost. The rationale for retaining or eliminating technologies and process options is also described. The results of the screening are summarized in Table 1.

3.3.1. Alternate Water Supply

A.R.S. § 49-286 identifies providing an alternate water supply as an acceptable mitigation action for meeting the mitigation action objective. Alternate water supply refers to different ways of developing or providing a new source of drinking water for an affected supply. The alternate water supply mitigation action contains five technologies: well modification, well replacement, connection to public water supply, identification and development of an alternate water supply, and bottled water.

3.3.1.1. Well Modification

Well modification would retrofit an affected drinking water supply well to exclude zones that produce sulfate-bearing water. Well modification could consist of the following process options: sealing off sections of a well screen to exclude sulfate-bearing water, deepening a well by drilling through the existing casing to access deep water-bearing zones, or both, depending on site specific hydrogeology, water quality, and well construction.

Sealing off Sulfate-Bearing Water – The objective of this process option would be to seal off portions of a well that contribute sulfate in excess of 250 mg/L and allow portions with low sulfate content to remain open for water production. Sealing off sulfate-bearing water from an existing drinking water supply well would require determining the vertical distribution of sulfate in the well to establish whether there is a section that contributes low sulfate water. If a low sulfate zone exists, a casing liner or some other method might be capable of sealing off the portion of the well screen in the sulfate affected zone so that it no longer contributes flow to the well. The well annulus between the sulfate affected and the unaffected zones would also need to be sealed to prevent flow between the zones.

Sealing off sulfate-bearing water would be potentially effective at meeting the mitigation action objective if it could be reliably implemented. However, sealing off sulfate-bearing water is not expected to have a good effectiveness or technical implementability for a variety of reasons. First, potentially affected private wells are unlikely to intersect a low-sulfate portion of the aquifer because they tend to be relatively shallow and screened in the basin fill aquifer. Even if a low sulfate zone were identified in a basin fill well, it would be uncertain how long the zone would remain unaffected. Second, there is only limited technical certainty in the long-term reliability of a well modification to effectively seal off a sulfate-bearing zone and prevent sulfate-bearing water from migrating along the annulus of a well. Finally, there is high potential to damage a well during modification due to the age, materials, and relatively small diameter of

most private wells. Large diameter wells may have a greater potential of successfully sealing off specific zones than small diameter wells because there is more open hole available for tooling. Sealing off sulfate-bearing inflow is judged to have poor to moderate effectiveness and technical implementability.

Sealing off sulfate-bearing water is administratively implementable in that there are no regulatory restrictions against trying to modify a well. An Arizona Department of Water Resources (ADWR) permit would be required. The cost of sealing off sulfate-bearing water would be highly site specific, but would probably be less than drilling a new well because less equipment and crew are required. Sealing off sulfate-bearing water was rejected from further consideration in the FS because of its poor to moderate effectiveness and technical implementability.

Well Deepening –Well deepening would require drilling through the bottom of an existing well to access a part of the aquifer below the sulfate plume. If low sulfate water is found at depth, a new screen and casing of a smaller diameter than the existing well could potentially be installed. The new well screen and annulus would need to be sealed off from the overlying existing screen and annulus to prevent the incursion of sulfate-bearing water.

There are technical difficulties associated with implementing well deepening. Well deepening always has a risk that drilling may damage the existing well; a risk that increases with well age. The casing diameter of most private domestic wells is 6 inches or less, making them difficult to drill in. Small casing diameters require that even smaller drill bits and casing be used for the deepened well. The small diameter of the new casing would make placing a seal between the old and new casings a challenging and potentially infeasible task. The small diameter of the new casing may also limit the production of the modified well or make equipping with a small diameter submersible pump difficult or infeasible. Large diameter (greater than 6 inches) wells may have a greater potential for successful implementation because there is more open hole for tooling. Finally, well deepening has the potential to create a vertical pathway for sulfate-affected water to impact the deeper aquifer if the annular space is poorly sealed or a there is a faulty seal between the casings.

Well deepening may also not be implementable for site specific hydrogeologic reasons. It is sometimes uncertain whether drilling deeper would encounter a water-bearing zone of sufficient quantity to supply domestic needs. As discussed in Section 2.2, groundwater with sulfate concentrations greater than 250 mg/L does not extend into the bedrock at the southwest end of the plume near Naco. Thus, the bedrock aquifer could be a target for water supply development where conditions are expected to be similar to those near Naco. However,

replacement of affected drinking water supplies near Naco to date found that the productivity of bedrock is highly variable because of its stratigraphy and faulting. For this reason, deepening a well in the area always contains a risk that drilling may not intersect material with sufficient permeability to produce adequate water for even a domestic drinking water supply.

Well deepening may be possible with some wells, but is not expected to be a generally effective or implementable means of obtaining a supply meeting the mitigation objective due to the technical and hydrogeologic factors described above. Well deepening is judged to have poor to moderate effectiveness and technical implementability. Well deepening is administratively implementable in that there are no regulatory restrictions against it. An ADWR permit would be required. The cost of well deepening would depend on site specific conditions, but might equal or exceed the cost of drilling a new well because the equipment, crew, and work effort would be of a similar scale. Well deepening is rejected from further consideration in the FS because of poor to moderate effectiveness and technical implementability, and a cost comparable to or greater than well replacement.

3.3.1.2. Well Replacement

Well replacement would consist of replacing an affected well with a new well in an unaffected portion of the basin fill or bedrock aquifers. Well replacement can be implemented in different ways depending on whether the water supply is a private or a public supply.

Private Drinking Water Supply

Private drinking water wells may be mitigated by well replacement if the property containing the well is in an area where an unaffected aquifer occurs at depth. As discussed in Section 2.2, the Naco area at the southwestern portion of the plume is known to be underlain by basin fill and bedrock with groundwater sulfate concentrations less than 250 mg/L. For this reason, CQB was able to successfully install six replacement wells into the unaffected bedrock aquifer in the Naco area. The replacement wells were connected to the existing water distribution systems and the affected wells were disconnected, but could still be used for non-potable purposes. CQB worked cooperatively with private property owners to implement the well replacements, including site preparation, drilling and well installation, pump installation, and site restoration.

Although low-sulfate water is documented in basin fill in the Naco area, it is recommended that any future replacement well at the western leading edge of the plume be constructed in the bedrock to provide a safety factor separating the perforated interval of the

replacement well from the plume. The hydrogeologic conditions at the leading (western) edge of the plume are permissive for developing a domestic drinking water supply in the deep bedrock. For most cases of replacement wells drilled in the Naco area, bedrock productivity and water quality were sufficient to supply domestic water needs. Although bedrock conditions at the leading edge of the plume are expected to be similar to those in the Naco area, well replacement always contains a risk that drilling may not intersect material with sufficient permeability to produce an adequate water supply. Well replacement in bedrock is not recommended in the area east of the Black Gap fault because the low permeability and spatial variability of water bearing zone makes water supply development unpredictable.

Well replacement for a private drinking water supply is judged to have good effectiveness and technical implementability depending on site specific hydrogeologic conditions. An ADWR drilling permit would be required for well installation. The drilling and construction of a replacement well in bedrock has an estimated cost in the range of $180,000 per well for a domestic well (including electrical and plumbing) based on prior experience. Well replacement for private water supplies was retained for use in alternatives development because it has a demonstrated effectiveness and implementability given appropriate hydrogeological conditions.

Public Drinking Water Supply

Well replacement for a public water supply can consist of development of new wells or connection to existing wells outside the plume. Public supplies generally need to produce more water than domestic supply wells. For this reason, well replacement in the low-yielding bedrock is unlikely to meet the production need of a public supply.

A replacement well for a public supply could potentially be located in the basin fill aquifer outside the plume to develop the production capacity needed by a public supply. The replacement well would need to be constructed far enough from the plume (vertically and/or horizontally) that the new well minimizes the potential to pull in sulfate-affected groundwater. Installation of a replacement well outside the plume and its future migration would likely require developing a land position and infrastructure to distribute the water.

CQB used a well replacement approach to mitigate the NWC-03 well. CQB worked cooperatively with NWC to evaluate different alternate supplies before deciding on well replacement through connection of NWC-03 to two existing wells located away from the plume. The replacement wells were connected to NWC-03 by developing the conveyances, pumping capabilities, and water storage facilities needed.

NWC drilled a deeper well at NWC-04 at Bisbee Junction. The current supply well NWC-04 (55-551849) was installed to a depth of 462 feet in 1995 and deepened to a depth of 795 feet by NWC in 2008. Based on water quality sampling conducted for the Mitigation Order (e.g., CCA, 2014) and historical sampling results (CCA, 2010), groundwater monitoring at NWC-04 has not detected sulfate in excess of 250 mg/L, although concentrations in 2013 were between 200 and 230 mg/L. There is a capped well within 100 feet of NWC-04, NWC-04 CAP (55-627685), that was previously used for water supply. Compared to NWC-04, NWC-04 CAP was installed in 1925 to a more shallow depth of 379 feet. Historical water quality data for samples collected from 1996 through 2002 indicate that the sulfate concentration at NWC-04 CAP ranged from 248 to 314 mg/L.

Potential replacement well sites in basin fill outside the plume are in the Naco area. CQB also has potential water sources on its property that may be appropriate for developing a replacement well that could provide sufficient quantity for a public water supply. The well replacement process option would require that CQB work with the operator of public water supply to evaluate the development of a new water source. A water supply study would likely be needed to identify, rank, and test potential water sources for consideration prior to its development.

The effectiveness of well replacement for a public supply at meeting the mitigation action objective would be good provided the quantity and quality of the water developed by a replacement well can be demonstrated. CQB has demonstrated the effectiveness of well replacement for mitigating the NWC-03 well. The technical implementability would be dependent on the location of the replacement well relative to the location and needs of the public water supply system. The administrative implementability of well replacement is probably good, but would require the agreement of the public supply and compliance with Cochise County, ADEQ, ADWR, Arizona Corporation Commission (ACC), and any other applicable regulations pertaining to the construction and operation of a public water supply. The cost of well replacement is difficult to assess without more information, such as the results of a water supply study identifying potential water sources. Well replacement for a public water supply was retained for alternatives development because it has a proven effectiveness and implementability.

3.3.1.3. Connection to Public Water Supply

Connection to public water supply would provide an affected private domestic supply service from a public water supply and discontinue use of the affected well for drinking water purposes. The affected well could still be used for non-drinking water purposes. The

practicability of connection to a public water supply depends on the proximity of an affected water supply to the public water system.

AWC and NWC are existing public water supplies with distribution systems in the vicinity of the sulfate plume. Figure 7 shows extent of the AWC and NWC service areas and the locations of public water supply distribution lines. The AWC and NWC service areas encompass several square miles outside of the plume. Should a private drinking water supply well within the AWC or NWC service areas become affected in the future, it may be possible to extend public water supply service to the affected property. The feasibility of extending public water supply service depends on the distance of the affected supply from the distribution system of the public supply as well as other system criteria, such as sufficiency of supply for the additional service and system pressure. Additionally, the number of parties to be connected to a pipeline extension also influences the ability to connect to public supply because a larger number of new service connections would lower the cost per connection.

CQB has effectively used connection to a public supply in both the Naco and San Jose areas to address affected private water supply wells. Connection of a private drinking water supply to public supply has good effectiveness and is technically implementable. The primary constraints on technical implementability are proximity of the affected supply to existing distribution lines, supply availability, and distribution system design. Although connection to public supply is technically implementable for an affected supply far from an existing distribution line, the cost of a line extension could be more than another action such as well replacement (if applicable).

Connection of a private drinking water supply to a public water supply has good administrative implementability. In the past, CQB entered into agreements with AWC and NWC to fund line extensions and connection of the new service. An application for service needs to be submitted to the utility by the new service connection. A line extension to connect to a public water supply would need to comply with Cochise County, ADEQ, ACC, and any other applicable regulations pertaining to the construction and operation of a public water supply. In the future, if an affected supply is outside the service area of a public water supply, but close enough to a distribution line to make connection feasible, it may be possible to expand the service area by application to the ACC. The cost of connection to a public water supply is expected to be greater than the cost of drilling a new well because of the need for engineering, materials purchase, and construction.

Connection to a public water supply would effectively provide the owner/operator of an affected drinking water supply with a long-term, reliable supply meeting the mitigation action

objective. Connection to a public water supply is potentially implementable in the area of the plume depending on the proximity of an affected well to existing AWC and NWC infrastructure and proximity to their service area. Connection to a public water supply was retained as an effective and implementable technology for drinking water supply mitigation.

3.3.1.4. Bottled Water

Bottled water would provide affected water supplies with bottled water for drinking water purposes. A commercial service in Sierra Vista has been used to deliver water to the affected parties to date as an interim action during implementation of mitigation actions. CQB has used bottled water as a final mitigation action when the owners of affected private wells preferred it to other potential actions. Bottled water has been effective and implementable in meeting the mitigation action objective. It has also been successful in meeting the needs of affected water supplies based on the general satisfaction of affected owners receiving bottled water.

Bottled water is an effective way to provide the owner/operator of an affected private water supply with a drinking water meeting the mitigation action objective. The implementability of bottled water is good because commercial services are available to provide service and the number of affected private water supplies is small enough to make bottled water practical. In the short-term the cost of bottled water is low compared to well replacement, but over time the cost of bottled water can be significant. Bottled water was retained because of its good effectiveness and implementability for mitigation of affected private water supplies.

3.3.2. Blending

A.R.S. § 49-286 identifies blending as an acceptable mitigation action for meeting the mitigation action objective. Blending would mix waters of high and low sulfate concentrations to produce a mixed water meeting the mitigation action objective prior to the point of use. In addition to a source of low sulfate water, blending also requires storage tanks, valves, piping, and pumps to build and operate a mixing system given the design constraints of the particular water supply. Blending also requires knowledge of the sulfate concentrations in the waters being mixed so their proportions could be specified to reliably produce a blended water meeting the mitigation action objective.

Opportunities for blending at future affected water supplies would be highly site specific depending on the availability of low sulfate water, infrastructure for conveying and blending water, and the experience needed for operation. Because of the needed infrastructure and

experience, there is likely little opportunity to use blending for a single private well. Blending is more likely to be applicable for a public water system with multiple supply wells feeding a common storage tank and trained operators.

Brown & Caldwell (Appendix C) evaluated the use of blending at the AWC wellfield should sulfate reach 250 mg/L in the future. The Brown & Caldwell evaluation concluded that it may be possible to blend water from the different AWC wells to meet the mitigation action objective, although the exact configuration of blending would depend on the sulfate concentrations at each of the wells supplying the AWC system. It would also be possible to blend water from an alternate water source, if available. A benefit of blending would be that it could be implemented relatively quickly as the design and construction of facilities do not require significant lead time.

Blending would be effective at meeting the mitigation action objective assuming the availability of a source of low sulfate water for mixing. The equipment and knowledge needed to implement blending are readily available. The technical implementability of blending would be primarily dependent on the availability of a low sulfate water source. With respect to affected domestic wells, the level of knowledge needed to reliably operate a blending system is outside the experience of most owners and there are no commercial services available for a system such as a domestic well. Blending was rejected for use on domestic water supplies because of poor implementability. Blending could be effective and technically implementable for a public drinking water supply affected by sulfate in excess of 250 mg/L. The administrative implementability is expected to be good given the concurrence of the water system operator. Implementation of blending would require compliance with Cochise County, ADEQ, ACC, and any other applicable regulations pertaining to construction and operation of a public water supply. Blending was retained as a potential action for a public drinking water supply. The cost of blending water is difficult to assess, but would probably be less than well replacement, an alternate private water supply, or water treatment.

3.3.3. Water Treatment

A.R.S. § 49-286 identifies economically and technically practicable water treatment prior to ingestion as an acceptable mitigation action. The water treatment mitigation action would consist of treating affected groundwater to meet the sulfate mitigation action objective at the point of use. Water treatment would use above-ground facilities engineered and constructed to remove sulfate from affected water. Water treatment would need to be capable of producing water for potential potable use or for other potential beneficial uses such as aquifer recharge.

Water treatment would potentially need to be applied at either a large scale capable of treating hundreds to thousands of gallons per minute (gpm), such as would be needed for mitigation of a public water supply, or a small scale for mitigation of a private drinking water supply well.

Water treatment technologies are capable of removing sulfate from water by biological, chemical, or physical methods. Biological treatment removes sulfate from water using microbial processes for the biological transformation of sulfate to sulfide, with subsequent removal of sulfide by precipitation of a sulfide mineral or as elemental sulfur. Chemical treatment would use reagents to adjust the chemistry of water to remove sulfate by precipitation of sulfate-bearing minerals or would employ resins for exchange of ionic species. Physical treatment process options would remove sulfate from water by distillation or the use of semi-permeable membranes as ionic filters.

Process options for sulfate water treatment consist of biological treatment, chemical precipitation, ion exchange, distillation, and the membrane separation processes electrodialysis (ED), electrodialysis reversal (EDR), and reverse osmosis (RO) (Lorax Environmental, 2003). Of these process options, sulfate removal by membrane separation is the predominant sulfate treatment methodology used in practice.

MWH reviewed the potentially applicable technologies for large scale treatment of sulfate at concentrations and flow rates similar to those that would be needed to treat water from the plume. MWH's review of treatment technologies is provided in Appendix D. The findings of the review are summarized below.

- **Biological Treatment** – Biological treatment would use sulfate reducing bacteria to convert sulfur to sulfide and precipitate the sulfide as a metal complex or elemental sulfur. Biological treatment systems have been developed for organics in water, but the technology is not widely used to treat sulfate only, and would require significant research and pilot testing to develop a large scale treatment system. Biological treatment was not recommended for additional consideration because of the additional technology development needed for implementation. Freeport-McMoRan Corporation is conducting pilot scale testing of biological treatment systems for sulfate treatment. Biological treatment could become a more viable technology in the future.
- **Chemical Precipitation** – Chemical precipitation requires adding reagents to water to precipitate a sulfur-bearing mineral to remove sulfate from solution. Different chemicals might be used, but the degree of sulfate removal that can be attained is based on the aqueous solubility of the precipitate. In general chemical precipitation does not remove sulfate to concentrations significantly lower than the mitigation action objective. For example, barium chloride is only able to remove sulfate to a concentration of approximately 200 mg/L. Chemical precipitation was not

considered further because it is ineffective compared to other available technologies for sulfate removal.

- **Ion Exchange** – Ion exchange would use selective sulfate exchange resins to remove sulfate by absorption. Ion exchange would likely require water pretreatment steps to optimize sulfate removal. Because ion exchange would replace sulfate in solution by another ion, it is not the most desirable technology for large scale production of potable water. Ion exchange was not considered optimal for sulfate treatment because it would require additional technology development and not as effective for large scale treatment as a membrane treatment process such as RO. Freeport-McMoRan Corporation is conducting pilot scale testing of ion exchange systems for sulfate treatment. Ion exchange could become a viable technology in the future.
- **Distillation and Thermal Evaporation** – Distillation and thermal evaporation would evaporate some or all of the water to be treated. During evaporation, ions such as sulfate are partitioned into residual brine while the steam is condensed to produce relatively pure water. The brine requires management and disposal. Although effective at producing high quality product water, distillation and thermal evaporation are highly energy intensive. This technology was not considered as favorable for implementation as membrane separation processes for large scale water treatment due to its high energy demand and cost.
- **Electrodialysis and Electrodialysis Reversal** – ED and EDR use electrical current and semipermeable membranes to separate ions from water. The electrical charge draws the opposite charge ions through the membrane to produce a low sulfate product water, leaving a concentrated brine. The brine requires management and disposal. Although ED and EDR are commonly used and commercially accepted technologies, they are not used for large scale treatment as often as RO. ED and EDR are sometimes used in conjunction with RO as part of a designed treatment system. ED and EDR are technically effective and implementable, but are not considered as technically implementable and cost effective as RO. ED and EDR were not selected for further consideration unless needed to support RO treatment.
- **Reverse Osmosis –** RO uses pressure and semipermeable membranes to separate ions from water to produce a high quality permeate of low ionic content and a concentrated brine residual. The brine requires management and disposal. RO is a well understood and commercially accepted technology used to provide high quality industrial and potable water. RO was identified as the best available sulfate treatment technology.

MWH identified RO as the most effective, implementable, and lowest cost effective treatment technology for sulfate removal. However, water treatment technologies are always evolving and a better technology may be developed in the future. For this reason, although RO water treatment is retained for purposes of developing and evaluating potential mitigation alternatives, any future consideration of water treatment should review the current status of technologies before a mitigation alternative is implemented.

RO treatment produces two streams: a low dissolved solids permeate and a high dissolved solids brine residual. The permeate is suitable for drinking water and other uses, while the brine requires disposal. The amount of brine production typically varies based on the size and design of the treatment system. RO can be implemented for either large or small scale treatment applications. A large scale RO water treatment plant would require engineering design, a major construction effort, and trained operators. Sulfate reduction in small scale flows (less than 1 gpm) is almost exclusively conducted with RO treatment. Commercial service providers such as Culligan or Ecowater sell and maintain RO systems suitable for treating a domestic water supply and capable of either full house treatment (all water uses) or point of use treatment (drinking water only).

3.3.3.1. Large Scale RO Water Treatment Plant

A large scale water treatment plant is one designed for treating hundreds to thousands of gpm of water for potable or other uses. A large scale water treatment facility would be capable of mitigating an affected public water supply.

Conceptual designs for large scale RO water treatment plants were developed by MWH (Appendix D) and Brown & Caldwell (Appendix C). The MWH design is generalized for application anywhere in the study area. The Brown & Caldwell design was provided to AWC in 2012 to show how RO treatment could be applied to the AWC system as an interim action, if needed, and to identify factors that would need to be considered for implementation. The Brown & Caldwell evaluation was specific to AWC and didn't consider cost. The MWH evaluation was performed to provide a more generally applicable conceptual design and costs.

Although the MWH and Brown & Caldwell designs vary in detail, each would utilize a filtration step to remove fine solids that can foul RO membranes, a water conditioning step that would add anti-scalant or disinfectant chemicals to the feed water, and an RO step for sulfate removal. RO backwash and brine wastes would be pumped to lined evaporation ponds. The brine reject from RO treatment is estimated to be approximately 15 to 20 percent of the total influent flow (i.e., 1,000 gpm of influent will produce approximately 800 to 850 gpm of permeate and 150 to 200 gpm of brine reject). MWH identified enhanced brine evaporation as the most effective way to manage the brine reject. The size of the evaporation ponds would depend on the rates of treatment and brine production.

RO treatment would be effective at reliably producing water that meets the mitigation action objective for use as either drinking water supply or water for blending. RO and the

technologies that would be used in a large scale RO treatment plant are reliable technologies in wide use for water purification. The technical implementability of RO treatment is good. Equipment and skilled services are readily available for design, construction, and operation of a large scale RO treatment plant. For example, Brown & Caldwell (Appendix C) estimated that a 24-month lead time would be needed for design, procurement, and construction of an RO plant capable of treating water from the AWC wellfield.

The administrative implementability of RO water treatment is good. RO water treatment would be developed in coordination with the owner/operator of a public supply that would need to provide specifications for the treatment system so that the features of the supply are fully considered. Design, construction, and operation of the treatment system would need to meet applicable requirements, such as Arizona Aquifer Protection Permit (APP) and Cochise County construction requirements. ADEQ and ACC requirements would need to be met if treated water is used for a public water system. Development of a large scale water treatment plant may also require acquisition of land as right of way for pipelines or evaporation ponds. Permitting and land acquisition can add to the implementation time of a treatment facility. The cost of RO treatment would be high. The capital cost of a plant that can treat 1,000 gpm would likely exceed $10,000,000. Ongoing O&M costs for treatment would also be high; with electric power and operating staff being significant components. Large scale RO treatment was retained as a potentially applicable control technology for a public water supply, such as AWC or NWC.

3.3.3.2. Full House RO

Full house RO would be applicable to a private domestic water supply to treat water to meet the mitigation action objective prior to distribution for residential use. Full house RO would treat water from an affected supply to meet all indoor household demands. The RO system would be sized to treat the supply used for all indoor household uses including shower, toilet, and laundry.

A full house RO system would likely need to be installed in a garage or shed between the well and the point where the water supply enters the residence. A water softener may also need to be installed to remove calcium to extend the life of the RO system. A full house RO treatment system would be installed by a trained technician from a commercial water treatment company. Water softeners and RO systems require regular maintenance. A service contract with the water treatment company such as Culligan or Ecowater would be established for this purpose. A full house RO system could have a capacity of producing up to 500 gallons per day of treated water.

Household RO treatment systems are relatively inefficient compared to large scale systems in that they waste more water as brine. Full house RO systems are only 50 to 60 percent efficient, which means that approximately 830 to 1,000 gallons per day would need to be pumped and treated to produce 500 gallons per day of treated water. This volume of treatment would generate 330 to 500 gallons per day of brine, which would require disposal. Because full house RO would treat all water uses in a home, it requires a larger volume of water than point of use RO, which treats water only for potable use. The additional water requirement could limit the application of full house RO in cases for which the existing well has limited productivity. Septic systems would also need to be evaluated for their ability to handle the additional volume of brine. If feasible given the plumbing configuration of the existing water supply, full house RO would be configured so that untreated water is used for exterior applications such as landscape irrigation.

Full house RO would be effective at providing an affected drinking water supply a source of drinking water meeting the mitigation action objective of 250 mg/L sulfate. Full house RO would exceed the mitigation action objective because it would also treat household water that is not used as potable supply. A potential problem associated with full house RO is that a relatively large volume of brine waste discharged to a septic system could potentially migrate to the aquifer.

The technical implementability of full house RO is good in that the RO treatment is reliable if properly maintained and commercial services are available for installation and ongoing maintenance. Some affected water supplies may not be suitable for full house RO if a well is unable to produce adequate supply or the septic system is unable to receive the relatively large volume of brine waste. There are no special regulatory requirements for installation of a full house RO treatment system. The purchase and installation of a full house RO system would cost approximately $12,000 per home. Annual maintenance costs are estimated to be about $1,000 per home for supplies and service fees.

Although full house RO has disadvantages in terms of water conservation and brine management, full house RO was judged to have good effectiveness and implementability for providing reliable, long-term drinking water supply mitigation. Full house RO treatment was retained as a control technology.

3.3.3.3. Point of Use RO

Point of use RO systems are designed to provide treated water for potable use only. Point of use RO systems are typically installed beneath the kitchen sink with a second faucet mounted on the sink to provide treated water for drinking and cooking purposes. Untreated water would remain in use for toilets, bathing, laundry, irrigation, and other non-potable uses. Depending on source water chemistry, a water softener may also need to be installed to remove calcium to extend the life of the RO system. A point of use RO treatment system would be installed by a trained technician from a commercial water treatment company. Water softeners and RO systems require periodic maintenance. A service contract with the water treatment company, such as Culligan or Ecowater, would be established for this purpose. A typical system will produce 10 gallons per day of drinking water.

Point of use RO systems recover only 50 to 60 percent treated water. Thus, for every 10 gallons of drinking water, 17 to 20 gallons of water must be pumped and treated while 7 to 10 gallons of brine would be discharged as waste. However, the amount of additional well water that would need to be pumped to make up for the brine wastage of a point of use RO system would be minimal given the low volume of water treated. The additional discharge of brine to a septic system would also be minimal.

Point of use RO would be effective at providing an affected drinking water supply with a source of drinking water meeting the mitigation action objective of 250 mg/L sulfate. The technical implementability of point of use RO treatment is good in that it is a reliable technology if properly maintained, and commercial services are available for installation and ongoing maintenance. Point of use RO would not cause a significant increase in pumping or septic flow. There are no special regulatory requirements for installation of a point of use RO treatment system. A water softener and point of use RO system can be purchased and installed for approximately $3,400 per unit based on information from Culligan of Tucson. The annual service fee and materials for system maintenance is estimated to be $730 per unit. CQB would pay for the purchase and installation of the treatment system and a 10-year service contract.

Point of use RO was judged to have good effectiveness and implementability for providing reliable, long-term drinking water supply mitigation; especially in instances of low yielding wells or owner preference for a more water conservative mitigation. Point of use RO treatment was retained as a control technology.

3.4. Technologies and Process Options for Plume Management

Technologies and process options for plume management are described below along with a summary of effectiveness, implementability, and relative cost, and the rationale for eliminating some of them from further consideration. The results of the identification and screening are summarized in Table 1.

3.4.1. Institutional Actions

Institutional actions are actions that could be used to reduce or manage the risk of potential exposure to plume water in drinking water supplies. Groundwater monitoring and ADWR well registry review are the institutional controls considered.

3.4.1.1. Groundwater Monitoring

Groundwater monitoring consists of water quality sampling and analysis for sulfate, and water level measurement. Groundwater monitoring would collect measurements of sulfate concentrations and water levels over time at monitor and drinking water supply wells in the vicinity of the plume. Groundwater monitoring data would be used to document the location of the plume, hydrologic conditions that influence plume migration, and changes in sulfate concentrations over time. Drinking water supply monitoring would be used to determine whether a supply is affected or likely to be affected by the sulfate plume. Groundwater monitoring can be conducted at different spatial scales and frequencies depending on the monitoring objectives, such as determining sulfate concentrations at drinking water supplies, measuring plume edge migration, or documenting the large scale geometry of the plume.

Groundwater monitoring would be an effective means of documenting the location and movement of the plume. Water quality sampling would document the concentration of sulfate in groundwater and changes in concentration over time. Water sampling results would be used to develop sulfate concentration maps showing the location of the plume. Groundwater level measurements would be used to calculate the magnitude of hydraulic gradients and to prepare water table maps used to assess the direction of plume migration. The results of groundwater monitoring would be used to verify and validate the conceptual and numerical models for sulfate fate and transport.

The technical and administrative implementability of groundwater monitoring is good as it is already implemented pursuant to a monitoring plan approved by ADEQ (ADEQ, 2010b).

Groundwater monitoring for sulfate has low to moderate cost depending on the quantity of samples and the frequency of sampling. Groundwater monitoring was retained for use in mitigation alternatives development because it is a necessary data gathering and exposure management activity applicable for any mitigation alternative developed for the FS.

3.4.1.2. ADWR Well Registry Review

Groundwater wells installed in Arizona are required to register with ADWR. The ADWR well registry records identify the ownership, location, construction, and, sometimes, water use of registered wells. The purpose of the ADWR well registry review would be to periodically check for new drinking water supply wells in the vicinity of the plume.

A review of the ADWR well registry would be conducted annually to identify new wells installed within a mile of the plume. The water use at new wells identified would be established from the ADWR records or by interviewing the well owner. With the owner's approval, CQB would sample any new drinking water supplies identified.

The ADWR well registry review would be an effective and implementable means of identifying new drinking wells for inclusion in the groundwater monitoring program. The well registry review was retained for use in mitigation alternatives development because it is applicable for any mitigation alternative developed for the FS.

3.4.2. In Situ Treatment

In situ treatment would reduce the concentration of sulfate in the plume by treating it in place within the aquifer. Reagents would be injected or infiltrated into the subsurface to change the groundwater chemistry and precipitate sulfate in the groundwater flow system containing the plume. Sulfate would be sequestered in a precipitate mineral. The sulfate precipitate would need to have a low solubility in the aquifer to ensure long-term stability and sequestration in the aquifer. In situ treatment would use similar processes as ex situ chemical and biological treatment strategies, but sulfate removal would occur in the subsurface aquifer rather than an above-ground plant.

In situ treatment could be accomplished by the addition of reagents to chemically precipitate sulfate minerals or to create reducing conditions for the precipitation of sulfide minerals. In situ reduction would introduce a carbon source such as ethanol, methanol, or molasses to act as a reducing agent and electron donor to stimulate the activity of naturally

occurring sulfate reducing bacteria in the aquifer. The biological activity of the sulfate reducing bacteria is capable of reducing sulfate to sulfide and its subsequent precipitation as a sulfide mineral.

In situ treatment of groundwater is frequently used to treat organic chemicals, although there are also examples of in situ treatment of metals. The size of typical applications of in situ treatment in terms of groundwater flow rates and areal extent is small (i.e., tens of gpm or less and tens of acres or less) compared to the size of the groundwater flow system containing the sulfate plume (i.e., hundreds of gpm or more and an aerial extent of more than a thousand acres). In situ treatment would require equipment, infrastructure, and a reagent supply for uniform and ongoing delivery of chemicals to the subsurface. Pilot testing of in situ treatment would be required for selection of reagents, determination of application and reaction rates, and geochemical and hydrologic characterization of the subsurface.

In situ treatment of sulfate is theoretically possible, but is not a widely used technology. There are few, if any, field demonstrations of in situ treatment for sulfate only, although there are examples of sulfate reduction associated with chemical and biological in situ treatment of metal-bearing water. In situ chemical precipitation of sulfate as gypsum (calcium sulfate) and/or barium sulfate would not be practical because their relatively high solubilities (1,500 mg/L in the case of gypsum, 200 mg/L in the case of barium sulfate) and would not result in sufficient (gypsum) or efficient (barium sulfate) sulfate removal. The use of reducing agents for in situ reduction of sulfate could be effective given the presence of sufficient bioavailable iron in the subsurface to precipitate iron sulfide. In the absence of sufficient iron, aqueous sulfide could either remain in solution as an undesirable constituent, such as hydrogen sulfide, or re-oxidize to sulfate if oxidizing conditions were to occur. In situ chemical precipitation was not recommended for further consideration because of its low removal efficiency, high cost of reagents, the large extent of the plume, the limited areal extent of treatment, and complexity of the sub-surface hydrogeology.

In situ bioreduction of sulfate would use reducing agents, such as ethanol, methanol, or molasses that are relatively inexpensive compared to reagents for chemical precipitation. The conceptual model for in situ bioreduction of sulfate is based on experience with ex situ bioreactors. The process for in situ biological treatment requires mixing a carbon source electron donor into groundwater to stimulate the growth of resident anaerobic bacteria, including sulfur reducing bacteria that utilize iron, manganese, and sulfate as electron acceptors. The continued introduction of electron donor into sulfate bearing water would create reducing conditions, stimulate sulfate reducing bacteria, and create a reaction zone in which iron, manganese, and sulfate are chemically reduced. If there is a sufficient mass of iron from oxide and silicate

minerals, reduced iron and sulfide in the reaction zone will precipitate as iron sulfide (pyrite). Pyrite is expected to be relatively insoluble in a non-aerated subaqueous condition such as exists below the water table. As iron in the reaction zone is depleted, sulfide would migrate downgradient out of the reaction zone to where the aquifer retains its bioavailable iron and the sulfide would again be able to precipitate as pyrite. As bioavailable iron in the aquifer is depleted over time sulfide-bearing water would continue to migrate further downgradient from the injection site to zones with bioavailable iron for precipitation of pyrite.

A requirement for in situ biological reduction of sulfate is sufficient bioavailable iron in the aquifer to remove the sulfide. Another requirement is that the electron donor be well-mixed within the volume to be treated so that reactants are used efficiently and there are few or no remnant untreated zones. There must also be sufficient time for reactions to occur in the subsurface. Mixing can be accomplished ex situ or in situ. Ex situ mixing would pump water to a mix tank where the electron donor would be added at a rate dependent on the sulfate concentration and the mixture would be injected into the aquifer. In situ mixing would inject the electron donor as a solution with a minimal amount of water and would rely on either advective flow and hydrodynamic dispersion or creation of circulation cells with wells to disperse the electron donor. In situ mixing is not expected to be a very efficient mixing mechanism given the depth and permeability of the aquifer. Systems of extraction wells with or without injection wells could be developed for in situ mixing of the sulfate-bearing groundwater with the electron donor. Such wellfield schemes would likely be expensive to construct and operate because of the large number of wells needed and the need to obtain a high degree of control over the groundwater flow pattern in the mixing zone.

Given the lack of prior examples of in situ biological methods being used to treat sulfate at the concentration and extent of the plume, the effectiveness of in situ treatment is uncertain. In theory, the in situ bioreduction of sulfate is potentially effective and technically implementable. In practice, pilot testing would be needed to address uncertainties and data gaps associated with bioreduction, to verify performance, and to develop an engineering design. Uncertainties and data gaps include the amount of bioavailable iron and manganese in the basin fill, the degree to which undesirable reduced species such as manganese and arsenic might be mobilized from aquifer sediment, the degree of sulfate removal attainable, sustainable injection rates, and well rehabilitation requirements for injection wells.

The administrative implementability of in situ bioreduction is potentially good in that treatment would be carried out in the context of a large scale mitigation action. A U.S. Environmental Protection Agency Underground Injection Control (UIC) permit and an APP would be required for in situ treatment. In situ bioreduction would have a high capital cost for

wells, pumps, and other facilities. Annual O&M are expected to be high based on a high operating, well maintenance, and reagent costs.

3.4.3. Groundwater Control

The groundwater control mitigation action includes technologies that would control plume movement or the plume extent by manipulating hydraulic conditions in the aquifer in the vicinity of the plume. Two categories of groundwater control technologies were considered: 1) groundwater pumping and 2) groundwater barriers.

3.4.3.1. Groundwater Pumping

Groundwater pumping would use wells placed at strategic locations to extract groundwater at rates sufficient to control the migration of the plume. Groundwater pumping is a commonly used technology for groundwater plume capture and management. The plume management approach assumes the aquifer is permeable and relatively homogeneous so that appropriate hydraulic capture zones can be established. The basin fill has sufficient permeability and lateral continuity for a plume management strategy. The low permeability and heterogeneity of the bedrock aquifer makes plume management impracticable because pumping rates would be so low that they would not establish areally extensive capture zones. Further, the continuity of capture could not be assured given the spatial variability of bedrock hydraulic properties. Two general plume management approaches were considered for groundwater pumping: plume stabilization and plume reduction.

Plume stabilization would be achieved by pumping wells near the western leading edge of the plume or other locations at a total rate sufficient to minimize or prevent future downgradient migration of the plume. Plume stabilization requires pumping of the sulfate-impacted groundwater at approximately the same rate at which it flows to the leading edge of the plume. Although plume stabilization can control the downgradient migration of the plume, it would not result in a significant decrease in sulfate concentrations within the plume for many years because of the relatively small amount of recharge that occurs in the footprint of or upgradient of the plume. A wellfield designed for plume stabilization would likely have an operational life of many decades and pumping could not be stopped until concentrations in the plume met the mitigation action objective or project objectives changed to another mitigation approach.

Plume reduction would reduce the extent of the plume over time by pumping sulfate-impacted water at higher rates than those needed for plume stabilization alone. Plume reduction would consist of wells at locations near the leading edge of the plume and within the plume. Pumping rates would need to be sufficient to reduce the lateral extent of the plume over time. The degree and rate of plume reduction would be proportional to the amount of pumping. Plume reduction would be a long-term undertaking, likely requiring decades to reduce the plume to a point at which either plume stabilization or monitored attenuation could be implemented.

Factors that must be known to design wellfields for plume stabilization or reduction include: 1) the extent of the sulfate bearing zone to be managed, 2) the minimum pumping rate, 3) the number of wells required, and 4) the management of the pumped groundwater. The number and configuration of wells required for a plume control wellfield are a function of aquifer conditions and the groundwater control objective. Conceptual designs for plume control wellfields are typically developed using a numerical model for groundwater flow and transport to simulate the response of the aquifer and plume to various pumping rate schemes and well configurations. A groundwater right would not be required for pumping because the sulfate plume is not within an Active Management Area. Groundwater pumping would produce a sulfate-impacted water requiring management by storage or use. Water management actions are described in Section 3.4.4.

Groundwater pumping process options considered for this screening are:

- Vertical wells.
- Horizontal wells.

Potentially applicable process options such as Ranney Wells, shafts, and drifts were not considered because these technologies are inappropriate for plume management given the depth to water (approximately 150 feet to 200 feet below ground surface), and saturated thickness (up to 400 feet) in the vicinity of the plume. These process options are screened out because depth limitations make them impracticable.

Vertical Wells

This process option would use vertical wells to pump from locations at the leading edge of the plume or from within the plume for the purposes of plume stabilization or plume reduction. Wells would be installed to extract water from the basin fill.

The effectiveness of vertical wells should be good. The basin fill has adequate permeability and saturated thickness to allow groundwater pumping in the area of the plume. Wellfields for plume management can be designed and optimized using standard methods such as numerical modeling of groundwater flow and analysis of drawdown with analytical equations. The installation and operation of vertical wells is a standard technology with good technical and administrative implementability. Installation of vertical wells would require permitting with ADWR and may require leasing well sites and easements for the infrastructure needed to establish a wellfield (e.g., pipeline corridor, electrical service, access roads), although much of the needed infrastructure can probably be established on CQB property. Construction and operation of wellfield infrastructure would require appropriate permits and the use of available skilled trades. While large capacity vertical extraction wells are expensive to install and operate, they would be less costly than horizontal wells because they are a readily available standard technology. Vertical wells were retained for alternative development because they are effective and have good technical and administrative implementability, although there may be a lead time of 24 to 36 months for permitting, land access negotiation, well installation, and the engineering and construction of conveyance and pumping facilities.

Horizontal Wells

This process option would pump groundwater from one or more horizontal wells for the purpose of plume stabilization or plume reduction. The potential advantages of horizontal wells over vertical wells are screen length and efficiency. A horizontal well aligned along the axis of the plume can have a larger wetted screen length than a vertical well. A horizontal well installed at depth in the basin fill may be more efficient than a vertical well because it would not be as susceptible to drawdown that lowers the saturated thickness and well productivity over time. A horizontal well could also be drilled to target a specific depth horizon in the aquifer, if that capability were needed. Potential disadvantages of horizontal wells are that they are more difficult and expensive to install than vertical wells because they require specialized equipment, crews, and well construction materials; are more expensive to maintain than vertical wells because they are a non-standard technology; and may have water production limitations if pumped with standard submersible pumps (i.e., may not be able to be pumped at their full capacity). The surface wellhead of a horizontal well would need to be large distance (thousands of feet) from the zone being pumped because of the slope required between the surface penetration and its target depth. This factor can be an advantage or a disadvantage depending on land access constraints.

Horizontal wells are a specialized technology typically applied in the oil and gas industry. Outside of the oil and gas industry, most horizontal wells are installed to shallow depths for

remediation purposes rather than water production (Miller, 1996 and Fournier, 2005). Horizontal well technology has been incorporated into environmental remediation applications at some sites with relatively shallow soil and/or groundwater contamination or sites that have unique hydrologic conditions or access restrictions that limit the use of vertical wells. Horizontal wells are not typically used for plume management in hydrologic settings such as the sulfate plume in the basin fill aquifer because conditions generally do not favor selection of the horizontal well technology over vertical wells due to their more difficult implementation and higher cost.

Horizontal wells would likely be effective for plume control, but they have poor technical implementability and high cost compared to vertical wells. Horizontal wells would not provide a significant advantage over vertical wells in terms of effectiveness of plume management under the site conditions. The administrative implementability of horizontal wells is equivalent to that of vertical wells. Horizontal wells were eliminated from further consideration in the FS because they are less implementable and more costly than vertical wells and provide no special benefit for plume management in the existing aquifer conditions.

3.4.3.2. Groundwater Barriers

Groundwater barriers are typically used to impede or prevent subsurface flow for the purposes of channeling flow around an area to be isolated, routing flow into a subsurface zone for in situ treatment, or enhancing the performance of groundwater pumping systems. Groundwater barriers are a mature remedial technology effective at controlling groundwater flow. Barriers alone cannot be used for plume management because the sulfate plume is too large and deep to isolate within a barrier system. Groundwater barriers were evaluated because they can be used in conjunction with extraction wells to increase the effectiveness of wellfields, although there does not appear to be a need for a groundwater barrier given the current saturated thickness in basin fill. When used to enhance wellfield performance, barriers are typically placed on the downgradient side of the wellfield where they limit the hydraulic communication between the upgradient and downgradient sides of the barrier.

Groundwater barriers may be either engineered low permeability structures physically emplaced in the subsurface or hydraulic barriers that recharge water to create hydraulic pressure fields that alter groundwater flow patterns. The term hydraulic barrier is used in this FS to denote a process that recharges groundwater to raise the hydraulic head for the purpose of controlling the direction of groundwater flow and enhancing wellfield capture. This process differs from groundwater pumping which depresses the hydraulic head around a wellfield to

create a capture zone, although pumping can also be characterized as a type of hydraulic barrier. In conventional settings, groundwater recharge may be incorporated into an extraction wellfield for several reasons: 1) to create hydraulic head conditions allowing capture of affected groundwater, 2) to sustain the saturated thickness for pumping efficiency, or 3) to recharge treated water pumped from extraction wells. A hydraulic barrier may be implementable in cases where installation of a physical barrier is not. Also, hydraulic barriers are not permanent because the hydraulic head field dissipates when recharge is stopped.

The three process options considered for groundwater barriers are:

- Physical barriers.
- Hydraulic barrier using injection wells.
- Hydraulic barrier using infiltration ponds.

Physical Barriers

A physical barrier would consist of a wall of low permeability material installed in the aquifer downgradient of a wellfield to build up groundwater levels for efficient pumping or to channel flow to a point of pumping. Several physical barrier process options are available. Physical barriers, such as slurry walls or funnel and gate systems typically consist of a trench excavated with a trackhoe or crane and filled with low permeability material. Barrier materials can be low permeability mixtures of fine-grained soil, clay, and/or cement. Materials such as polyethylene geomembrane sheeting can also be added to barriers to reduce their permeability. Sheet piling can be used at shallow depths to create a continuous physical barrier of interlocking steel or plastic panels. Soil mixing and permeation grouting, or jet grouting (grout injection), are additional methods of constructing a physical barrier.

Physical barriers have depth limitations for installation. The practically achievable depth of construction of a physical barrier using excavation is generally less than 150 feet. The depth to the bottom of the basin fill where a physical barrier might be advantageous is much greater than 150 feet. The depth limitation of sheet piling is shallower than that of excavation. In theory, chemical reagents could be injected at depth into an aquifer to solidify and create a zone of reduced permeability around the injection point, but this is a seldom-used technology with significant uncertainty of effectiveness and cost in the hydrologic setting of the downgradient plume. For these reasons, physical barriers are considered technically infeasible for application at the depths of basin fill in the area of the plume and were not considered further.

Hydraulic Barrier Using Injection Wells

Injection wells are a commonly used technology for groundwater recharge projects, underground injection of waste, and management of saltwater intrusion. Injection wells could be used to inject water downgradient of an extraction wellfield in order to enhance its effectiveness or attain a larger area of capture. Over time, injection would result in a groundwater mound that increases the local hydraulic head downgradient of the extraction wellfield such that it flattens or reverses the local hydraulic gradient thereby enhancing the capture of the extraction wells. Using injection wells to create a hydraulic barrier would require a source of injection water that is low in sulfate, meets aquifer water quality standards, and would not plug the injection wells. Such a water supply could be obtained from wells outside the plume or by treating water pumped for plume management.

Although injection wells are a common technology, they can be associated with high initial cost for well installation and pilot testing, and high O&M costs because well clogging reduces injection efficiency and necessitates frequent rehabilitation. Clogging can result from chemical precipitates that form when injected water aerates or mixes with subsurface water of a different chemistry, entrainment of air bubbles that reduce the hydraulic conductivity of the aquifer near the well, biological growth (biofouling) that occurs around the well, or particulates in the injected water that can clog the well screen, filter pack, and aquifer formation. These potential problems can be minimized by careful design and operation, chemical treatment of water prior to injection to reduce formation of precipitates, and filtration of injected water (Pyne, 2005).

A hydraulic barrier with injection wells has the potential to be effective, although problems with well clogging and injection efficiency can limit effectiveness if it results in excessive down time or insufficient pressure buildup. Injection wells can be used to enhance the performance of a plume management wellfield, but there is no expectation that such enhancement would be needed given the aquifer conditions in the vicinity of the plume. A hydraulic barrier with injection wells is technically implementable because the technology is readily available, but design studies and pilot testing would be needed to evaluate clogging issues and injection efficiency. Operation of injection wells would require obtaining a UIC permit and an APP. The cost of an injection wellfield would be high compared to an extraction wellfield alone because of the additional cost of obtaining water of a quality suitable for recharge, building pipelines to deliver water to the injection wells, drilling and constructing injection wells, and the high level of O&M required. Injection wells for hydraulic barriers were not considered further in the FS because conditions in the basin fill aquifer are such that a hydraulic barrier is unnecessary and would not provide a unique benefit for the additional cost.

If a hydraulic barrier were deemed to be needed in the future, pilot testing would be needed to evaluate effectiveness and cost concerns.

Hydraulic Barrier Using Infiltration Ponds

Infiltration ponds are a commonly used technology for groundwater recharge. Use of infiltration ponds for creating a hydraulic barrier would consist of infiltrating water from the surface downgradient of an extraction wellfield to create a groundwater mound in a similar manner as injection wells to enhance the effectiveness of an extraction wellfield. Creation of a hydraulic barrier with infiltration ponds would use surface ponds or an infiltration gallery to infiltrate water to the water table by gravity flow through the vadose zone. A groundwater mound would grow once a continuous zone of recharge is established between the surface and the water table. The groundwater mound would increase the local hydraulic head field to flatten or reverse the local hydraulic gradient, and thereby enhance the effectiveness of the extraction wells.

The effectiveness of infiltration ponds as a hydraulic barrier is dependent on the infiltration capacity at potential recharge sites, the character of subsurface materials, and the hydraulic loading required. The vertical permeability of subsurface materials would strongly influence the timing and geometry of a groundwater mound created by infiltration. Caliche layers in the vadose zone, as observed in the vicinity of the plume (Clear Creek Associates, 2010), could impede the vertical migration of infiltration or lead to perched water zones and lateral spreading of recharge. Compared to well injection, the placement of recharge water by infiltration is expected to be less exact due to spreading caused by geologic conditions. To be effective for plume management, a hydraulic barrier would need to be designed to deliver water to the subsurface in a specific location and at specific rates. Infiltration ponds may not deliver recharge to the water table precisely enough to allow their use as an efficient and effective hydraulic barrier for plume management.

Infiltration ponds are technically and administratively implementable, but would require land access in the area of the leading edge of the plume and favorable subsurface materials. Pilot testing would be required to fully evaluate the applicability of infiltration ponds as a hydraulic barrier. Construction and operation of infiltration ponds would require an APP permit. A source of low-sulfate water meeting aquifer water quality standards would be required for recharge. Infiltration ponds would require costs for land access, pipelines, water supply development and operation and O&M, but may be lower cost than injection wells.

Infiltration ponds for a hydraulic barrier were rejected as a process option because of likely poor effectiveness at precisely placing recharge compared to injection wells. There is also a lack of need for any barrier to effectively operate a plume management wellfield. Infiltration ponds would also have poor technical implementability due to the need of a water supply for infiltration.

3.4.4. Management of Plume Control Water

A mitigation measure that uses groundwater pumping for plume management would also have to use or release the water produced. The following eight water management control technologies were screened for potential application.

- Use in mining.
- In-pit evaporation.
- Land application.
- Treatment for use as drinking water supply or recharge water.
- Evaporation of untreated water.
- Recharge of untreated water.
- Blending.
- Conveyance, treatment, or use by others.

3.4.4.1. Use in Mining

There are no current uses for water in mining operations because the CQB is an inactive facility. There could be a potential use for water in mining should mining operations restart in the future. However, there are no plans for restarting the mine at this time. Therefore, the use of water in mining operations for water management was rejected.

3.4.4.2. In-Pit Evaporation

Water management by in-pit storage would place water produced by the mitigation measures in the Lavender pit to create a pit lake for evaporation of water. CQB evaluated the potential use of the Lavender pit for in-pit storage and determined that the relatively small surface area and depth of the pit lake would not provide sufficient evaporative loss to manage

inflows for plume management. Therefore, in-pit storage as a water management process option was rejected.

3.4.4.3. Land Application

Land application would use water produced by mitigation measures as a water supply for agricultural use. Untreated water from plume management actions would be conveyed to the point of application for use as an irrigation water and nutrient supply for crops such as alfalfa hay, wheat, feed corn, sorghum, and native grasses. Appendix E contains an analysis of the feasibility of land application conducted by Cascade Earth Sciences (CES).

The use of untreated water with elevated sulfate for agricultural use is technically feasible because sulfur is an essential nutrient for plant growth that is absorbed in the sulfate form (California Fertilizer Association, 1995). Sulfur is one of the more important elements for plant growth and is an essential component of proteins, enzymes, chlorophyll, and chloroplasts in plants. Thus, the sulfate in water used for land application would partly be incorporated into the crops, although the sulfate uptake by crops would be substantially less than the entire sulfate load applied. The amount of sulfate that would percolate to the subsurface and remain in the soil column compared to that draining back into the aquifer depends on the soil chemistry, subsurface geology, and the irrigation water balance. Sulfate added to soil has multiple potential fates: precipitation as calcium sulfate or barium sulfate, immobilization by microorganisms, sorption on organic matter by formation of sulfate esters, sorption to clay minerals by displacement of hydroxyl groups, co-precipitation with calcium carbonate, loss by conversion to hydrogen sulfide, and leaching to groundwater. CES' analysis indicates that approximately 34% of the applied sulfate can be precipitated as gypsum in the soil. This is not expected to cause a soil permeability reduction based on experience at other land application systems for sulfate. Theoretically, sulfate migrating into the subsurface with infiltration could be held in the soil column by controlling the application rate and the hydraulic balance in the soil. In practice, however, some portion of the applied sulfate could eventually migrate to the water table if infiltration occurs.

The analysis by CES (Appendix E) indicates that land application of sulfate-bearing water would be effective for crop production. Land application is technically and administratively implementable. An agricultural general use APP would be required for operation. CQB owns several square miles of land in the former Warren Ranch irrigation area (Figure 2A) that is over the footprint of the plume and could be used for land application. Land application would provide a beneficial use of water produced by groundwater control activities

and may provide a means of attenuating sulfate by sequestration through plant uptake in harvested materials and in the vadose zone soil column if water application rates can be managed appropriately. Costs associated with land application include costs for land preparation, purchase and installation of irrigation equipment, water storage and conveyance facilities, and O&M. Land application is likely to be significantly less expensive than water management with water treatment because land application would have low infrastructure requirements relative to treatment, no significant residuals management requirement, and would potentially yield a revenue stream from product sales. The land application process option was retained as potentially technically feasible and effective, implementable, and cost effective.

3.4.4.4. Treatment for Use

Water generated by mitigation measures could be treated for use. As discussed in Section 3.3, RO is considered the best water treatment process option that could meet water quality needs for different potential water uses. The most likely potential uses of treated water are aquifer recharge and drinking water supply.

Use of treated water for aquifer recharge would require water treatment to meet the mitigation action objective. Treated water could be recharged to the aquifer by release to the surface of Greenbush Draw where it would infiltrate to the subsurface aquifer or by use of engineered facilities such as injection wells or infiltration ponds either inside or outside the plume.

Treated water could be released to Greenbush Draw by building a conveyance from a treatment plant to Greenbush Draw where the water would be released directly to the stream bed for infiltration outside the plume. The release of treated water to Greenbush Draw would need to comply with applicable environmental and groundwater regulations, most likely including an Arizona Pollutant Discharge Elimination System (AZPDES) permit. At a minimum, extracted water would be treated to a level such that the infiltration of effluent would not cause sulfate concentrations in groundwater to be in excess of the mitigation action objective. In the event of temporary, rainfall related surface flow in Greenbush Draw, the treated effluent would mix with the surface flow and would either infiltrate or flow downstream along Greenbush Draw.

The recharge of treated water through engineered facilities such as infiltration ponds or injection wells would require an APP permit. A UIC permit likely would be required if injection wells were used for recharge. Recharge could be implemented either inside or outside the plume. Recharge of treated water inside the plume could be implemented in the basin fill at an

upgradient location so that over time the treated water would flush the aquifer with low sulfate water. Recharge of treated water in basin fill outside of the plume could be implemented for water management only or to create a hydraulic barrier (Section 3.4.3.2).

Recharge of treated water in the plume would have to be of a limited flow rate because of the groundwater pumping scheme for plume control. Preliminary calculations indicate that less than 25 percent of the groundwater pumped to stabilize the plume could be recharged at an upgradient site without losing containment. The potential benefit of recharging treated water at an upgradient location in the plume would be that sulfate concentrations in the basin fill aquifer would gradually decrease over time as treated water flushes through the plume area. However, the location and rate of recharge would need to be carefully controlled to create a low-sulfate cleanup front rather than simply mixing additional water in the plume and increasing its volume. Preliminary calculations indicate that it would be 80 years or more before water recharged at an upgradient location in basin fill would migrate to the current front of the plume and cause any significant reduction of sulfate concentrations in the basin fill. The low permeability and spatially variable hydraulic properties of the bedrock prohibit the use of recharge to address its water quality condition.

Recharge of treated water outside the plume would have the benefits of recharging the aquifer and offsetting groundwater extraction for plume management. Recharge by injection wells or infiltration ponds would be more expensive than release to Greenbush Draw due to the need for significantly more infrastructure (i.e., injection wells, storage facilities and pump stations) and O&M. Recharge to the aquifer through engineered facilities was not considered cost effective compared to release to Greenbush Draw and was not considered further given that there is no apparent need for a hydraulic barrier (Section 3.4.3.2). Recharge by release to Greenbush Draw was retained for alternatives development.

Use of treated water as drinking water supply would require water treatment to meet the mitigation action objective and applicable drinking water standards. Treated water could also be used for blending. The water treatment facility and conveyance system needed to implement this option would need to comply with Arizona regulations regarding public water systems (Arizona Administrative Code R18-4-201 through R18-4-290) depending on the exact circumstances and Cochise County construction requirements. Potential users of treated water could be AWC, NWC, water providers in the Sierra Vista area, or other entities not yet identified.

Treating water for recharge or drinking water use would be an effective means of water management to meet the mitigation action objective. Water treatment for recharge to Greenbush Draw is technically and administratively implementable, but would require appropriate permits.

Water treatment for drinking water supply is technically and administratively implementable, but would require the cooperation and agreement of the water company taking the supply. Treatment for either use would have a high cost due to the need to construct and operate water treatment facilities (Section 3.3.3) and conveyances to bring water the point of use. Water treatment for drinking water and recharge uses was retained as a process option.

3.4.4.5. Evaporation of Untreated Water

Water generated by mitigation measures could be evaporated. MWH evaluated the potential solar evaporation of impacted groundwater in detail (Appendix D). Passive evaporation could be conducted in solar evaporation ponds. Large evaporation ponds would be required to evaporate any sizable flows of impacted groundwater. For example, MWH estimated that a pond of approximately 645 acres would be needed for passive evaporation of 2,000 gpm of impacted water. Spray or enhanced evaporation facilities could be used to add solar or other heat sources to the water to increase the evaporation rate and reduce the pond size required at a given flow rate of water. Spray or enhanced evaporation methods have large energy and maintenance requirements that make them costly to operate.

Passive or enhanced evaporation of impacted water can be effective at managing flows of several thousand gpm if sufficient land is available for ponds. Evaporation is technically implementable. The process option would use lined ponds and possibly, other equipment such as spray systems to enhance solar heating. CQB owns several square miles of undeveloped property in the former Warren Ranch irrigation area east of Naco Highway and north of Purdy Lane (Figure 2A) that could be used for evaporation ponds. Evaporation is administratively implementable, but would require an APP and Cochise County building permits. Evaporation has a high cost. The capital cost to build evaporation ponds for 1,000 gpm is estimated at approximately $75 million compared to $18 million to construct an RO treatment and brine evaporation facility to produce treated water at 250 mg/L sulfate (Appendix D). However, the annual operating cost of evaporating 1,000 gpm of untreated water is estimated to be approximately $375,000 compared to more than $1.8 million per year for RO treatment and brine evaporation (not considering the value of the treated water). Based on these estimates, the non-discounted cost of 30 years of evaporation would exceed the cost of RO treatment by approximately $34 million. There is also a significant difference in water conservation between evaporation and treatment for use in that evaporation would not produce usable water. Evaporation is a potentially applicable process option for water management because it is effective and implementable. However, evaporation was not retained for alternative

development because it does not produce usable water and is more expensive than RO treatment which does produce usable water.

3.4.4.6. Use of Untreated Water by Others

Untreated water produced by groundwater extraction for plume management could be used by an outside party. Potential water uses by others include recharge in the San Pedro basin, drinking water supply augmentation, or industrial use. This process option would require an outside party capable of using the water and conveying it to the point of use.

Untreated water produced by groundwater extraction could be used by an outside entity for aquifer recharge. The subsurface recharge and storage of water with a lower water quality than the naturally occurring aquifer water is common in Arizona aquifer recharge and storage projects, but the lower quality of the resulting mixture is accepted given the augmentation of supply that occurs. It may also be possible that a means could be developed to augment surface water resources by the release of untreated water extracted for plume management. An industrial water user might consider blending with untreated mitigation water to reduce the amount of unaffected water supply that is needed by an operation. Thus, blending for use for water management may produce water for use as aquifer recharge, surface water replenishment, or industrial purposes.

The use of untreated waters by others would require a water user or resource manager with a water use plan consistent with local conditions and resource management objectives. Definite opportunities for blending are not identified at this time, but opportunities may arise in the future as water supply conditions change. Future opportunities may be present among the San Pedro River communities where ground and surface water supplies are scarce and new sources of water supply are being sought. The potential benefits of this process option are the increase in local water supply and a low cost relative to water treatment.

The use of untreated water by others could have good effectiveness for water management by using the water extracted for groundwater control to augment local water resources, although this process option would be contingent on identification of an entity to acquire the water on a long-term basis. The technical implementability of this option would be good in that the infrastructure needed to implement the action would consist of readily available technology - pipelines, pumping facilities, and other engineered facilities depending on water use. The administrative implementability of this option is uncertain in that no outside party has been identified to acquire the water. Any project that would use the untreated water would need

to comply with applicable state and/or county requirements depending on water use. The cost of this option would depend on the intended use and the final agreement between the participating parties. This process option was retained as potentially effective and implementable, but was not used for alternative development because no specific opportunity exists at this time.

3.5. Summary of Identification and Screening of Mitigation Actions, Technologies, and Process Options

The identification and screening of mitigation actions, technologies, and process options for drinking water supply mitigation and plume management considered a range of potentially applicable actions for possible incorporation into mitigation alternatives. The screening process narrowed the range of options on the basis of effectiveness and implementability (Table 1).

3.5.1. Summary of Drinking Water Supply Mitigation Process Options

The evaluation considered 17 process options for drinking water supply mitigation. The eight process options retained for drinking water supply mitigation are:

- Alternate Water Supply:
  - Well Replacement on property with affected well.
  - Well Replacement on alternate property outside the plume.
  - Connection to Public Water Supply.
  - Bottled Water.
- Blending.
- Water Treatment:
  - Large Scale RO Water Treatment Plant.
  - Full House RO.
  - Point of Use RO.

The drinking water supply mitigation process options retained for alternatives development can be used to provide a drinking water supply meeting the mitigation action objective at the point of use as required by Section III.E of the Mitigation Order. Most of the process options have already been used successfully for mitigation by CQB. However, the applicability of the process options in any specific case depends on site specific factors such as existing infrastructure and hydrogeologic conditions that constrain the use of some options. For

this reason, CQB would work with the owner or operator of a drinking water supply that is affected or could likely be affected in the future to determine the most appropriate mitigation action based on site specific conditions as was done for the mitigation of affected wells.

Mitigation of a large public water supply would be more complex than mitigation of a private water supply due to the large volume of water pumped by the public supply wells and the need to comply with regulations related to drinking water supplies. Process options potentially applicable to large public water supplies include well replacement, blending, and water treatment.

3.5.2. Summary of Plume Management Process Options

Plume management process options include institutional actions, groundwater control, and water management actions that can be incorporated into mitigation alternatives consistent with Section III.D of the Mitigation Order. Plume management considered 17 process options. The six process options retained for plume management are listed below:

- Institutional Actions:
  - Groundwater Monitoring.
  - ADWR Well Registry Review.
- Groundwater Control:
  - Vertical Wells.
- Water Management:
  - Land Application.
  - Treatment for use.
  - Use of Untreated Water by Others.

Not all of the process options retained will be used for alternative development. The water management option of Use of Untreated Water by Others will not be included in an alternative because uncertainties associated with identifying future sources and users makes it difficult to develop opinions of probable cost needed to evaluate and compare alternatives.

The process options retained for drinking water supply mitigation and plume management provide an array of process options that can be used to develop mitigation alternatives to accomplish the mitigation action objective. The potentially applicable process

options will allow a range of mitigation alternatives to be developed in the context of site specific conditions consistent with Section III.D of the Mitigation Order and includes the mitigation measures identified in ARS § 49-286. Section 4 of the FS describes the application of the retained process options in development of mitigation alternatives. The results of a detailed analysis of mitigation alternatives, including conceptual design studies, numerical simulation of mitigation alternative effectiveness, and costs, are discussed in Section 5.

4. DEVELOPMENT AND SCREENING OF MITIGATION ALTERNATIVES

Mitigation alternatives are combinations of mitigation actions, control technologies, and process options that can be used to meet the mitigation action objective. This section formulates and describes how mitigation alternatives were developed based on the screening evaluations described in Section 3.

4.1. Development of Mitigation Alternatives

Mitigation actions, technologies, and process options retained by the screening evaluation (Table 1) were combined to develop four mitigation alternatives. The mitigation alternatives were formulated to provide a range of potential measures that could meet the mitigation objective and the requirements of ARS § 49-286.

It is important to understand that the mitigation action objective of providing a practical and cost effective drinking water supply with sulfate concentrations less than 250 mg/L at the point of use of an existing drinking water supply (Section 3.1) could be met by only using drinking water supply mitigation actions. That is, one or more of the measures in ARS § 49-286.A could be taken to mitigate an existing drinking water supply at the point of use if it were to become affected. However, this FS developed mitigation alternatives spanning a range of possible mitigation measures, including different plume management actions such as pump and treat approaches. These plume management actions fall in the category of measures that may be required only by "*mutual agreement*" under ARS § 49-286.A.

The mitigation alternatives evaluated by the FS can all achieve the mitigation objective, but do so in different ways consistent with Section III.D of the Mitigation Order. The range of mitigation alternatives is responsive to the need to meet the Mitigation Order requirements in the future if a water supply becomes affected, while also providing a range of potential mitigation actions for comparison in respect to the magnitude of actions considered, cost, and other factors. Once a mitigation alternative is selected for Mitigation Plan development and implementation, the adaptive management provision in Section III.E of the Mitigation Order would allow for the adjustment of the mitigation alternative, if warranted, based on information obtained during its implementation and operation.

The mitigation alternatives are summarized in Table 2 and generally described in Sections 4.1.1 through 4.1.4. The purpose of the alternative descriptions in this section is to introduce the objective and approach of the alternatives. More detailed descriptions of the

mitigation alternatives are provided in Section 5; including the results of numerical simulations of plume migration under each alternative.

4.1.1. Alternative 1 – Long Term Plume Monitoring and Expanded Groundwater Monitoring with Contingent Drinking Water Supply Mitigation

Alternative 1 would not control the plume, but would monitor drinking water supplies and plume migration over time. An annual review of the ADWR well registry would be conducted to identify new drinking water supply wells within a mile of the plume for sampling. Alternative 1 would include two groundwater monitoring programs: long term plume monitoring and expanded groundwater monitoring. Long term plume monitoring would be used to measure sulfate at drinking water supplies and track large scale plume features. Expanded groundwater monitoring would monitor plume migration near public water supplies in the path of the plume near Naco. Expanded groundwater monitoring would install new monitoring wells for detailed characterization of plume movements near the public supplies. Based on monitoring results, sentinel wells with sulfate action levels would be established between the supplies and the plume. Contingent mitigation would be used if sulfate concentrations were to exceed an action level at a private or public drinking water supply. Alternative 1 would consist of the following actions.

- Long term plume monitoring.
- Expanded groundwater monitoring.
- Annual review of ADWR well registry records.

Alternative 1 would not pump groundwater or require the development of water management facilities. Under Alternative 1 the sulfate plume would migrate downgradient and slowly attenuate over time by advective and dispersive mixing with unimpacted regional groundwater along the margin of the plume and dilution by unimpacted recharge in the footprint of the plume. As discussed in Section 5.3.1, the current understanding of plume movement is that public water supplies would not be affected by sulfate in excess of 250 mg/L, although three private wells may be affected.

The objective of Alternative 1 is to provide an alternative relying on groundwater monitoring to determine sulfate concentrations and, if needed, contingent drinking water supply mitigation to meet the mitigation objective. Long term plume monitoring would determine sulfate concentrations in private and public drinking water supplies. Expanded groundwater monitoring would establish sentinel wells and action levels for the AWC and NWC public water

supplies near Naco. The NWC water supply well NWC-04 near Bisbee Junction is not included in the expanded groundwater monitoring because it is not in the projected direction of plume movement and will be monitored under the groundwater monitoring program.

Expanded groundwater monitoring focused on public water supplies near Naco is a key component of Alternative 1. Expanded groundwater monitoring would conduct detailed monitoring of plume movement upgradient of Naco area public supplies such that the potential for affects to those public supplies would be determined based on observational data. This would be accomplished by increasing the number of monitoring wells upgradient of the public supply wells so that water quality and water level measurements would be collected at a frequency and spatial resolution sufficient to determine the rate of plume migration and the potential for sulfate to increase above 250 mg/L at a public supply. Analysis of sulfate concentration trend and water level data would be used to establish sulfate action levels for the implementation of a contingent mitigation at a public drinking water supply, if needed. The sentinel well locations and action level concentrations would be specified such that they would trigger initiation of contingent actions in a timeframe sufficient to allow for design and construction of the mitigation action before the public supply exceeds 250 mg/L sulfate. A plan for the development of the expanded groundwater monitoring network, including sampling frequency, action levels, and contingent mitigation, would be provided in the Mitigation Plan to be submitted to ADEQ 60 days after approval of the FS.

Under Alternative 1, sulfate sampling and analysis at private and public water supplies would be conducted under the long term plume monitoring program. The drinking water supply mitigation actions identified in Section 3.3 (e.g., connection to public supply, well deepening, RO treatment, or bottled water) would be used for contingent actions at an affected private drinking water supply or at the NWC Bisbee Junction supply. The drinking water supply mitigation actions of RO water treatment and alternate water supply by well replacement outside the plume are proposed as contingent actions for the AWC and NWC public supplies near Naco, if monitoring results indicate they are likely to be affected.

Contingent actions are included in this alternative to account for uncertainty in the predicted future migration of the plume and affects to drinking water supplies. For this reason, Alternative 1 is separated into three subalternatives, Alternatives 1A, 1B, and 1C. Under Alternative 1A the only contingent mitigation action is for private drinking water supplies. Alternative 1B assumes the installation of wellhead treatment using RO as a contingent mitigation action for the AWC supply. Development of an alternate water supply is assumed as the contingent mitigation action for the AWC supply under Alternative 1C. Other contingent actions also could be evaluated and utilized in the future under the adaptive management

approach. For example, if mitigation is needed, development of an alternate water supply is determined to be infeasible, and the future cost of implementing wellhead RO treatment is determined to be greater than the cost of Alternative 3 (plume stabilization and land application), the new information would indicate that Alternative 3 is the most cost effective action. In this hypothetical case, the adaptive management provision of the Mitigation Order could be used to modify the mitigation action if Alternative 3 or another option (e.g. technology or water management option) would still allow implementation prior to sulfate affecting the water supply. Otherwise, in this hypothetical case RO treatment would be implemented.

Groundwater monitoring would be used to evaluate the quality of drinking water supplies, track the location and magnitude of the sulfate plume, and evaluate the effectiveness of Alternative 1. The current Mitigation Order groundwater monitoring plan would be revised to focus monitoring on drinking water supplies, the location of the plume edge, and the regional geometry of the plume. The revised monitoring plan would be included in the Mitigation Plan submitted to ADEQ 60 days after the FS is approved.

4.1.2. Alternative 2 – Plume Stabilization and Water Treatment for Release to Greenbush Draw

Alternative 2 would use groundwater pumping for plume stabilization, RO water treatment and water management through recharge to Greenbush Draw, and groundwater monitoring as plume management actions. Drinking water supply mitigation would not be needed as this alternative would prevent future plume migration to currently unaffected drinking water supplies. An annual review of ADWR well registry records would be conducted to identify new drinking water supply wells within a mile of the plume for sampling. Alternative 2 would consist of the following actions.

- Plume stabilization by groundwater pumping.
- RO water treatment and brine evaporation.
- Release of treated water to Greenbush Draw for recharge.
- Groundwater and drinking water monitoring.
- Annual review of ADWR well registry records.

The objective of Alternative 2 is to maintain the plume to its current approximate extent. The current extent of the plume would be maintained by groundwater pumping within the plume at a sufficient rate to prevent downgradient migration of the plume. It is expected that pumping

on the order of 600 to 1,000 gpm for a number of decades would be required for plume stabilization. A wellfield would be designed and constructed for the purpose of establishing plume stabilization. The sulfate-bearing water pumped for Alternative 2 would be treated by RO at a facility that would be constructed and operated on CQB property. Water discharged from the treatment facility would meet the 250 mg/L mitigation action objective and be released to Greenbush Draw to recharge to the aquifer. A brine evaporation facility would be constructed and operated on CQB property to manage the RO residual. A pipeline and booster pump system would be constructed, as needed, to convey extracted water to the treatment plant and treated water to Greenbush Draw.

Groundwater monitoring would be used to evaluate the quality of drinking water supplies, track the location and magnitude of the sulfate plume, and evaluate the effectiveness of the Alternative 2. An expanded groundwater monitoring program would not be required for Alternative 2 because plume migration would be controlled. The current Mitigation Order groundwater monitoring plan would be revised to focus on monitoring the plume and drinking water supplies. The revised monitoring plan would be included in the Mitigation Plan submitted to ADEQ 60 days after the FS is approved. Because groundwater pumping for Alternative 2 would prevent the downgradient migration of the plume and gradually reduce its extent over time, there would be negligible risk of exceeding 250 mg/L sulfate at currently unaffected drinking water supply wells outside the plume.

4.1.3. Alternative 3 – Plume Stabilization with Land Application

Alternative 3 would use groundwater pumping for plume stabilization, land application, and groundwater monitoring as plume management actions. Drinking water supply mitigation would not be needed as this alternative would prevent future plume migration to currently unaffected drinking water supplies. An annual review of ADWR well registry records would be conducted to identify new drinking water supply wells within a mile of the plume for sampling. Alternative 3 would consist of the following actions.

- Plume stabilization by groundwater pumping.
- Land application for agriculture.
- Groundwater and drinking water monitoring.
- Annual review of ADWR well registry records.

The objective of Alternative 3 is to maintain the plume to its current approximate extent. The current extent of the plume would be maintained by groundwater pumping within the plume at a sufficient rate to prevent the downgradient migration of the plume. It is expected that pumping on the order of 600 to 1,000 gpm would be required for plume stabilization. A wellfield would be designed and constructed for the purpose of establishing plume stabilization. The sulfate-bearing water pumped for Alternative 3 would be used for agricultural land application at facilities that would be developed on CQB property to grow native grasses, alfalfa, or other crops. The land application facilities would consist of a water distribution system, irrigation pivots, and equipment for harvesting and processing crops. Water applied by land application would be managed to optimize crop production. To the extent that water irrigation percolates into the subsurface beneath the agricultural fields and migrates to the groundwater table, it would be captured by the downgradient groundwater pumping system. A pipeline and booster pump system would be constructed, as needed, to convey untreated well water to the land application facilities.

Groundwater monitoring would be used to evaluate the quality of drinking water supplies, track the location and magnitude of the sulfate plume, and evaluate the effectiveness of the Alternative 3. An expanded groundwater monitoring program would not be required for Alternative 3 because plume migration would be controlled. The current Mitigation Order groundwater monitoring plan would be revised to focus on monitoring the plume and drinking water supplies. The revised monitoring plan would be included in the Mitigation Plan submitted to ADEQ 60 days after the FS is approved. Because groundwater pumping for Alternative 3 would prevent the downgradient migration of the plume and gradually reduce its extent over time, there would be negligible risk of exceeding 250 mg/L sulfate at currently unaffected drinking water supply wells outside the plume.

4.1.4. Alternative 4 – Plume Reduction and Stabilization with Land Application and Water Treatment for Release to Greenbush Draw

Alternative 4 would use groundwater pumping for plume reduction and stabilization, land application, RO water treatment and release to Greenbush Draw, and groundwater monitoring as plume management actions. Drinking water supply mitigation would not be needed as this alternative would prevent future plume migration to currently unaffected supplies. An annual review of ADWR well registry records would be conducted to identify new drinking water supply wells within a mile of the plume for sampling. Alternative 4 would consist of the following actions.

- Plume reduction by groundwater pumping.
- Land application for agriculture.
- RO Water treatment and brine evaporation.
- Groundwater and drinking water monitoring.
- Annual review of ADWR well registry records.

The objective of Alternative 4 would be to reduce the extent of the plume to the CQB property boundary during the first 30 to 50 years of groundwater extraction and then to stabilize the extent of the plume thereafter. Plume reduction would require the operation of more pumping wells and the extraction of a larger volume of water than groundwater pumping for plume stabilization alone. It is expected that groundwater pumping rates of several thousand gpm could be required for plume reduction. Once plume reduction is attained, groundwater pumping rates would be reduced to a level needed for plume stabilization. The sulfate-bearing water pumped for Alternative 4 would be managed by land application and RO water treatment. A portion of the water would be used for agricultural land application at facilities that would be constructed on CQB property. The remainder of the water would be treated by RO at a facility that would be constructed and operated on CQB property and then released to Greenbush Draw.

A wellfield would be designed and constructed for the purpose of plume reduction and eventual stabilization. Land application facilities would consist of a water distribution system, irrigation pivots, and equipment for harvesting and processing crops. Untreated water applied by land application would be managed to optimize crop production. To the extent that irrigation water percolates into the subsurface beneath the agricultural fields and migrates to the groundwater table, it would be captured by the downgradient groundwater pumping system.

The RO water treatment facility would be constructed and operated by CQB. The RO facility would treat water to a sulfate concentration of 250 mg/L for release to Greenbush Draw to recharge to the aquifer. A brine evaporation facility would be constructed and operated to manage the RO residual. A pipeline and booster pump system would be constructed, as needed, to convey extracted water to the land application facilities and RO treatment plant, and treated water to Greenbush Draw.

Groundwater monitoring would be used to evaluate the quality of drinking water supplies, track the location and magnitude of the sulfate plume, and evaluate the effectiveness of the Alternative 4. An expanded groundwater monitoring program would not be required for Alternative 4 because plume migration would be controlled. The current Mitigation Order

groundwater monitoring plan would be revised to focus on monitoring the plume and drinking water supplies. The revised monitoring plan would be included in the Mitigation Plan submitted to ADEQ 60 days after the FS is approved. Because groundwater pumping for Alternative 4 would gradually reduce the plume extent over time and prevent its downgradient migration of the plume, there would be negligible risk of exceeding 250 mg/L sulfate at existing drinking water supply wells outside the plume.

5. DETAILED ANALYSIS OF MITIGATION ALTERNATIVES

The detailed analysis of mitigation alternatives evaluates the effectiveness, implementability, and cost of the four proposed mitigation alternatives (effectiveness and implementability are defined in Section 3). The detailed analysis also includes an evaluation of environmental factors that illustrate the tradeoffs posed by the alternatives. The mitigation alternatives are individually evaluated and also evaluated in comparison to one another to identify the relative short- and long-term benefits of the alternatives in accordance with ARS § 49-286.

The mitigation alternatives were evaluated by a three-step process of numerical modeling, preliminary design, and costing. First, the groundwater flow and sulfate transport model reported in the ACR (Clear Creek Associates, 2010) was updated and used to simulate future plume migration under Alternatives 1 through 4. The numerical model was used to identify well locations and pumping specifications based on the predicted plume movement and water levels over time for each alternative. The results of plume migration modeling were used to evaluate alternative effectiveness. The numerical model is discussed in Section 5.1 and Appendix G.

Second, preliminary conceptual designs were developed for the engineered facilities that would be required for each alternative (e.g., pipelines, pumping system, treatment plant, irrigation system, etc.). The conceptual designs identify the infrastructure that would need to be designed, constructed, and operated to implement the pumping, water routing, water management, and monitoring specifications of the alternatives.

Third, the cost of each alternative was estimated based on their pumping specifications and conceptual designs. Cost estimates included the capital cost for the design, procurement, and construction of facilities, and O&M expenditures needed for 50 years. The results of the evaluation process provided information used to assess the effectiveness, implementability, and cost of the mitigation alternatives. Section 5.2 describes the cost analysis methodology.

Section 5.3 provides an analysis of each mitigation alternative; including descriptions of their conceptual design, future plume migration, effectiveness, implementability and cost. Section 5.4 contains a comparison of the mitigation alternatives; including environmental factors that were considered in evaluating the tradeoffs posed by the alternatives.

5.1. Numerical Modeling of Mitigation Alternatives

The numerical model of groundwater flow and sulfate transport developed for the ACR was used to simulate future conditions for the mitigation alternatives. The numerical simulations were used to predict future sulfate concentrations under each mitigation alternative, to develop preliminary conceptual designs for wellfields and related infrastructure, and to predict hydraulic and mass loads for water management. Predictive modeling for the FS included simulation of future pumping for public water supply and agricultural uses in the vicinity of the plume and groundwater pumping for plume management.

The numerical model, called the RSET Model in the ACR because it is a revision of an earlier model developed by SET (1998), covers an area of nearly 60 square miles and encompasses the sulfate plume (Figure 8). HGC adapted the SET model to simulate development of the sulfate plume from 1905 through 2008, as reported in the initial version of the ACR (HGC, 2009). Clear Creek added water level and sulfate targets to the model, and conducted additional calibration, as reported in the final version of the ACR (Clear Creek Associates, 2010). The numerical model has been updated through 2012 for this FS. The updated model was recalibrated through 2012, with updated pumping and recharge stresses, and some structural adjustments, including modification of boundary conditions on the west side of the model.

The construction of the numerical model for groundwater flow and sulfate transport is described in detail by Clear Creek Associates (2010) and will not be repeated here. The numerical model was constructed using MODFLOW (McDonald and Harbaugh, 1988) for groundwater flow and MT3D (Zheng, 1993) for sulfate transport. Groundwater Vistas, Version 6 (Environmental Simulations, Inc., 2007) was used for pre- and post-processing of modeling files.

The model extends in the north-south direction from approximately the location of the North Tailing Impoundment on the north to the southern edge of the current footprint of the El Oasis irrigation area, which lies approximately two miles south of the United States-Mexico border. The model extends in the east-west direction from approximately two miles west of the Naco Sanitary District Wastewater Treatment Facility on the west to approximately two miles east of the South Tailing Impoundment on the east (Figures 2 and 8). The model domain extends several miles beyond the current extent of the sulfate plume and is sufficiently large to simulate long-term plume migration under the mitigation alternatives. Sections 5.1.1 to 5.1.3 document the update and further details are also presented in Appendix G.1.

5.1.1. Groundwater Flow and Transport Model Update

This groundwater model update included the addition of water level and sulfate targets for calibration, updates to pumpage for large pumping wells, changes in hydraulic properties, evaluation of model-wide recharge, and updates to boundary conditions. The changes that were implemented are discussed in the following sections.

5.1.1.1. New Model Targets

The water level database used for this model update now contains 4,837 water levels. The majority of the water level data were collected between 1989 and October 2012. However, approximately 200 pre-1989 water level measurements were available, with some dating back to 1905. These data include water levels from driller's reports from ADWR records, ADWR Groundwater Site Inventory (GWSI) database, water levels collected during the investigation and other data collected historically by CQB. Of these data, 2,512 measurements are within the model domain and have non-zero depth to water measurements. Figure 9 shows the locations of water level targets used for the update and recalibration. Ultimately, water levels outside of the model domain were also considered in the model to constrain water levels in the model area. Water level data from outside the model domain were also used in setting boundary head values and adjusting the conceptual model. A complete set of water level data is included (electronically) as Appendix G.2.

Water level data for the Naco, Sonora side of the model were also updated based on a site visit conducted during 2008 by HGC.[1] Additional depth to water information was available for wells UN-1 and UN-5, which had previously been included as targets in the groundwater flow model (Border Environmental Cooperation Council [BECC], 1996). Figure 8 shows the well locations in Naco, Sonora.

Additional water quality sample results for sulfate collected since 2008 have been added to the water quality database, which now includes 2,610 values. Most sulfate data were collected between 1989 and October 2012, although 24 measurements were available between 1954 and 1986. Of these, 1,789 are non-duplicate samples within the model domain and were integrated into the model as targets. Figure 10 illustrates the location of sulfate targets for the model. These data have been integrated from data contained in quarterly groundwater monitoring reports

[1] Additional estimated water levels were provided by Naco, Sonora water utility staff during the visit and interview which were not included in the groundwater flow model as targets. Due to the limited information available, these data were added to the model for use as targets.

and the environmental database maintained by CQB. A complete set of sulfate data is included (electronically) in Appendix G.2.

5.1.1.2. Model Pumping Update

Well pumpage was updated through the 2011 period based upon the available reported pumpage data. Data were identified to update pumpage from AWC wells, NWC wells, Turquoise Valley golf course wells and Naco (Sonora) municipal pumping. Other wells, which are private domestic or stock watering wells, have been continued at previously estimated rates for 2008. Figure 11 illustrates the wells with updated pumpage. The basis of the updates is as follows:

- AWC: Updated from ACC Annual Reports from 2008 to 2011 (ACC, 2012).
- NWC: Updated from ACC reports from 2008 to 2011 (ACC, 2012).
- Turquoise Valley Golf Course: Updated from 2008 to 2010 using information provided from operator of the course[2].
- Naco, Sonora Municipal Water: Updated for 1998 to 2010 based upon interviews with staff and other published data (EPA, 2010 and BECC, 1996).
- Ejido Naco Agricultural Irrigation: Aerial photographic history was reviewed for possible update, but no changes were implemented.

Tables and other details regarding the update of pumpage are in Appendix G.3.

5.1.2. Modifications to the Groundwater Model

The update and recalibration of the model included an evaluation of the simulation of water levels in the western portion of the model domain and changes in boundary conditions. The following sections discuss the implementation of the changes. Additional detail on the basis for the modification is included in the technical memorandum in Appendix G.1.

5.1.2.1. Water Levels at the Western Model Boundary

There are several wells near and beyond the western model boundary that provided additional information with which to constrain boundary conditions. LADD 976 and LADD 538

[2] Email communication to Jim Norris from Pete Campbell on February 7, 2012.

are located within the model domain to the northwest of Naco, Arizona (Figure 12) and have been measured historically for water levels. LADD 976 is a shallow well with a depth of 150 feet, which had a reported depth to water of 97 feet in 1950 when it was drilled. The depth to water in this well increased from 103.7 feet in 1969 to 108 feet by November 1985, when it was last measured (both measurements by the United States Geological Survey [USGS]). In 1990, LADD 976 was listed as obstructed and it has not been measured since. The approximate land surface elevation is 4,535 feet above mean sea level (feet AMSL), based on Google Earth location. This implies that the water level elevations are 4,438 and 4,427 feet AMSL for the two measurements listed.

Well LADD 538 was drilled in July 1982, and is screened from 177 to 277 feet. When completed, this well had a depth to water of 177 feet. The wellhead measuring point has been surveyed by CQB, and is listed as 4,527.05 feet AMSL. The depth to water was measured as 276.58 feet in September 2011. This implies that the water level elevation in LADD 538 has declined from 4,350 feet AMSL to 4,250 feet AMSL from 1982 to 2011. This suggests that the LADD 538 well has historically had a water level elevation of 88 to 188 feet lower than LADD 976 although these wells are estimated to be only 300 feet apart.

Although the 88 to 188 foot vertical difference in water levels between LADD 976 and LADD 538 could be explained by a local hydrologic factor such as a perched water table, regional water level measurements suggest a regional factor may be the cause. Water levels at LADD 837 (Figure 13) west of LADD 976 and LADD 538 and outside the model boundary have ranged from 4,230 feet AMSL in 1988 to 4,162 feet AMSL in 1999. The water level elevation for September 2011 was measured as 4,207 feet AMSL. A review of data in the ADWR GWSI database indicates that this value (approximately 4,200 feet) is consistent with water levels further to the west of the LADD 837. In contrast to the water levels to the west, water levels to the east of LADD 976 and LADD 538 are higher than 4,420 feet, and do not increase significantly to the east at wells in the vicinity of Naco Highway. Figure 13 illustrates these water level relationships. The water level elevations, indicate an approximately 200-foot difference in water levels in the areas east and west of LADD 976 and LADD 538, and shallow hydraulic gradients in the aquifer both upgradient and downgradient of the wells.

These observed water level relationships were not included in previous versions of the numerical model because the reliability of the data was uncertain. Since 2010, additional measurements have been made and verified, and additional wells monitored to corroborate the water level data. The conceptual model for the basin fill aquifer on the west boundary of the model was modified to improve the simulation of water levels by matching observations in the western portion of the model domain. If water levels in the basin fill are assumed to be

continuous from the CQB groundwater model area into the San Pedro Valley to the west, consistent with the regional groundwater model for the Upper San Pedro Valley prepared by the USGS (Pool and Dickinson, 2007), a discontinuity would need to be added to account for the hydraulic jump represented by the 200-foot offset in water elevations in the vicinity of LADD 976 and LADD 538. Two possible explanations for the observed water levels are faulting and bedrock topography.

A fault extending into the basin fill sediments and causing a narrow zone of low hydraulic conductivity that disrupts the horizontal continuity of permeability is one explanation. Essentially, the fault acts as a dam that creates the hydraulic jump and controls the hydraulic gradient to the east while groundwater flow over the dam maintains the water levels and hydraulic gradient in the basin fill to the west. This phenomenon has been observed in alluvial sediments that are disturbed by faulting[3].

A zone of shallow bedrock with a concomitant thinning of basin fill on the east side of the hydraulic jump and a transition to deep bedrock and thick basin fill on the west side of the jump could also cause the observed water level distribution. In this scenario, the thickness or permeability of basin fill would need to increase to the west to sustain the lower observed heads. Such a bedrock high could be due to geomorphologic processes or faulting. As discussed below, faulting is hypothesized to have caused the subsurface conditions observed on the west side of the model.

5.1.2.2. La Bellota Fault

A fault inferred to be the La Bellota fault (Anderson and Nourse, 2005 and McKee, McKee, and Anderson 2005) has previously been projected to the area west of the sulfate plume (Clear Creek Associates, 2010). The La Bellota fault has not been physically identified in the subsurface, but is a logical inference based upon the structural and water level conditions in the area. Figure 14 illustrates the proposed location of this fault, assuming it represents the basin-bounding fault separating the Mule Mountains from the San Pedro Valley. The presence of a fault is interpreted to be the cause of the water level difference observed between the plume area and the San Pedro River area on the west side of the model domain.

[3] An example of fault-controlled water levels is the Algodones Fault in the Yuma, Arizona area (Hill, 1993) which disrupts the alluvial sediments causing a steep hydraulic gradient of up to 50 feet over the narrow zone. Another example is along Pantano Wash on the eastern side of the Tucson Basin, where a fault causes 200 feet of head change in less than one mile (Davidson, 1973 and ADWR GWSI, 2013).

Figure 13 illustrates the model cross section showing the approximate location of the Black Gap Fault and La Bellota Fault. Figure 13 also shows the measured data at BMO-2008-6B and LADD 837. These data clearly show the significant difference in water levels that occur in the short distance between these wells.

5.1.2.3. Implementation of the Fault Zone in the Model

The implementation of this fault in the groundwater flow model required creating a long and narrow, steep-dipping (assumed to be vertical) zone of low hydraulic conductivity in the basin fill model layer (Layer 1) and extending into Layers 2 through 4 (Figure 15). For Layer 1, the hydraulic conductivity of the fault zone was set at 0.0098 feet per day (ft/d), based on model calibration. For Layers 2 through 4, the implementation is similar to the approach for the Black Gap Fault (Figure 16). The hydraulic conductivity value for Layers 2 through 4 along the fault zone is 0.0492 ft/d and is identical to the value used on the Black Gap Fault (same zone number). A lower hydraulic conductivity zone was not implemented in Layer 1 for the Black Gap Fault because Layer 1 is unsaturated to the east of the fault zone. The low permeability of the fault zone is what causes it to act as a dam in the model.

5.1.3. Transient Model Calibration

5.1.3.1. Flow Model Results

Calibration of the hydraulic conductivity values focused on Layer 1, since groundwater flow through the basin fill layer is the primary transport mechanism for sulfate, and the basin fill is the source of the majority of drinking water for the area. The transient phase of the groundwater model was the focus of this recalibration effort, but the steady state model was ultimately modified to address low starting water levels identified during the calibration process. A combination of Parameter ESTimation (PEST, Doherty, 2010) automated calibration (using flow and transport targets) and manual calibration techniques were implemented. Changes were made to both specific yield and porosity to improve the model calibration. This update addressed the high porosity for model Layer 1. In the prior version of the model, portions of Layer 1 had porosity values of up to 0.55 for the zone around the plume area. This value is higher than the typical range of porosity for material such as the basin fill. The new calibrated specific yield for Layer 1 ranges from 0.22 to 0.23 (formerly 0.19 to 0.20) in the plume area, and the porosity ranges from 0.24 to 0.28 in the plume area (formerly 0.21 to 0.55). The new calibrated values are more typical of basin fill.

Hydraulic conductivity changes during the recalibration were focused on Layer 1, and a slight anisotropy was introduced to address observed southward transport of sulfate. Figure 15 illustrates the hydraulic conductivity for Layer 1, and Figure 16 illustrates Layer 2 hydraulic conductivity used for the calibration.

Generally the model-simulated recharge rates remained the same as previously used. No change in the concentration of recharged water was implemented. A full listing of recharge rates for the calibrated model is included in Appendix G.4.

An observation noted during the calibration process was that the model had Layer 1 heads that were consistently 5 to 20 meters too low in the Purdy Lane and Naco area. This problem was traced back to the original steady state model, which also has heads that are too low in this area. Starting heads were raised in the steady state model by 10 meters uniformly, and the implementation of the western fault zone improved the simulated heads. Figure 17 illustrates the comparison of 2011 measured water levels with the model simulated levels for Layer 1 and Layer 2. The residuals for 2011 are also posted, and generally the plume area heads are within 10 feet of measured values, with the model lower than the measured values. The table below shows the model statistics for the updated transient flow model.

Statistical Parameter	Updated Model	ACR Model[4]
Residual Mean (m)	-2.28	1.68
Absolute Residual Mean (m)	9.75	11.79
Residual Standard Deviation (m).	20.21	22.36
Number of Observations	2,417	252
Range Observations (m)	291	197
Scaled Root Mean Square Error	6.95%	11.34%

The overall scaled root-mean-square (RMS) error was 6.95%[5]. The scaled RMS for the model reported in the ACR was 11.34%. Based on the statistics presented, the updated groundwater flow model had a better overall statistical match with observed data. The standard deviation and the absolute residual mean values were lower than the previous calibration, indicating less average error. Only the residual mean value was higher than previous results. The number of targets was significantly greater for this calibration. It should be noted that while

[4] Statistics presented here are for All Targets used in the ACR model.
[5] Water levels for the TM-08 Swan well (55-522817) were not included, since they are not representative of regional conditions simulated in the flow model.

2,512 water level targets were loaded into the model, 2,417 were used for the final calibration. This is due to the fact that pumping water levels are identified in hydrographs and manually removed from the target dataset after import. Table G.6.1 in Appendix G documents the water level target statistics from the flow model calibration.

5.1.3.2. Transport Model Results

Because the purpose of the groundwater model is to evaluate the transport of sulfate in the basin fill sediments, the sulfate concentration targets were also used to calibrate the model. PEST and manual calibration techniques were used with the sulfate targets to improve calibration. The table presented below illustrates the model statistics for the updated transport model.

Statistical Parameter	Updated Model	ACR Model
Residual Mean (mg/l)	18.79	7.5
Absolute Residual Mean (mg/l)	168.63	200.1
Residual Standard Deviation (mg/l)	345.48	442.1
Number of Observations	1,771	241
Range in Observations (mg/l)	2,960	2,747
Scaled Root Mean Square Error	11.69%	16.09%

The scaled RMS error was improved from 16.1% for the mode reported in the ACR to 11.7% for this calibration. Based on the statistics presented, the updated groundwater flow model had better overall statistical match with measured sulfate data. The average of the residuals was greater, and thus not as good, but the average of the absolute values of the residuals was better. Standard deviation was slightly higher for this calibration. The scaled RMS error was slightly better indicating an improved overall match. The number of targets was significantly greater for this calibration. Table G.6.2 lists the sulfate target statistics for the calibrated model.

Figure 18 illustrates the comparison of 2011 measured and simulated sulfate concentration for the sulfate plume area. Generally the contours have a good match with measured values. The simulation results differ from the 2011 measured sulfate data at the western edge of the plume and east of the Black Gap fault.

The western edge of the plume is its leading edge of migration. The model overestimates the western extent of the plume by as much as 2,000 feet. The cause of the overestimation is believed to be uncertainty in the recharge rate and concentration values used to represent the source of sulfate in the model, the former evaporation pond and the former Warren Ranch irrigation area. The sources were active from 1905 through 1987 and are only generally characterized by historical data. The overestimation of the western plume migration should be conservative for predictive simulation of the mitigation alternatives in the sense that they will also tend to overestimate the western extent of the plume.

The southeastern extent of the plume is underestimated in bedrock east of the Black Gap fault. The underestimation in bedrock east of the fault is likely because the heterogeneous hydraulic properties of the bedrock make it difficult to simulate using a numerical model, especially during the part of the simulation when the sources were active and groundwater mounding would have caused southerly transport of sulfate against the regional hydraulic gradient. The underestimation of sulfate transport east of the Black Gap fault should not have a negative influence simulation of the plume in basin fill which is the focus of the predictive simulations. Sulfate within the bedrock aquifer will be a long-term condition because natural attenuation in the bedrock is expected to be slow and active plume management is impracticable in the low permeability bedrock

5.1.4. Groundwater Flow and Transport Model Predictive Simulations

Numerical modeling for the FS consisted of predictive simulations of conditions from 2012 to 2015 prior to the assumed implementation of the mitigation alternatives. The pumping and recharge elements of the alternatives are assumed to start in 2015 for the purpose of the FS. A 100 year simulation of each alternative was conducted. Annual model stress periods are simulated through 2015, and then 5 year periods are simulated through 2115.

Pumping stresses for wells not associated with the mitigation pumping remain constant for the 100 year projection period. This assumption is based on the general decline over time in the area population and industrial activity. Census data presented by The Planning Center (2004) indicate that between 1980 and 2000 the population of Bisbee declined from 7,154 to 6,090, a 15 percent decline in 20 years. The decline in population likely reflects the closure of mining operations in the 1980s which reduced employment opportunities. Liden (2003) summarized employment in Bisbee as follows “Employment in Bisbee today is almost exclusively in the retail trade, public administration and educational, health and social services sectors.” Arizona Department of Administration (2014) population projections for Bisbee indicate an increase from

5,441 people in 2014 to 6258 people in 2050. Thus in 2050, Bisbee's projected population would be similar to its population of the 1990s. Inasmuch as mining is not expected to resume, and population is not expected to increase significantly over the next several decades, the domestic and commercial water use is expected to remain at current or historical levels of usage.

Groundwater pumping in Naco, Sonora is also considered in the model. "*The majority of groundwater in the Municipality of Naco is directed for residential and commercial use; a small portion of groundwater is allocated for industrial use*" (EPA, 2010). The population of Naco, Sonora experienced growth at a rate of 1.57 percent annually from 1950 to 1990 (BECC, 1996). Using this growth rate and the 1996 population of 5733 persons, the population of Naco, Sonora was projected to be 7130 persons in 2010 (Science Application International Corporation [SAIC], 1997). However, "*land use in the Naco, Arizona border region is characterized as slowly developing*" which can be seen in the 2010 estimated population of 6016 persons (EPA, 2010) which is 15 percent less than the SAIC projection. Thus, municipal water use in Naco, Sonora is not expected to change significantly over the next several decades.

Agricultural water use in the Naco, Sonora area is also not expected to expand greatly. Aerial photographs discussed in Appendix G indicate that amount of land used for agricultural irrigation in Naco, Sonora did not change significantly between 1992 and 2011, suggesting that agricultural water use is not growing.

Based on these data, it was assumed for the numerical model that groundwater pumping would be static for the next 100 years. This assumption would be reviewed and modified as necessary for periodic updates of the numerical model assumed for the mitigation alternatives.

Future pumping rates and locations were assumed to remain at the values and locations specified for 2012 in the calibrated model because no significant growth in the residential, industrial, or agricultural water demand is expected for the Bisbee-Naco area. The model domain includes 67 pumping wells. The most significant pumping wells down gradient of the sulfate plume are operated by AWC and have specified pumping rates between 64 and 303 gpm. Most other wells are domestic or stock wells, with assumed withdrawal rates of 0.3 and 1.8 gpm, respectively.

In the case of Alternative 1, which would not use groundwater pumping for mitigation, the predictive simulation consisted of running the model forward from 2012 to 2115 under the groundwater pumping assumed to occur in the future. Pumping for wells considered as part of Alternative 2, 3, and 4, which would use groundwater pumping for mitigation, were adjusted through successive approximation to identify the well locations and pumping rates that

accomplished the groundwater control objective of the alternative while minimizing the total groundwater extraction and the number of wells. Wellfield design considerations for Alternatives 2, 3, and 4 were to minimize the total mitigation pumping rate, minimize the number of wells, and maintain wells on CQB property.

Recharge stresses in the predictive simulations that are unrelated to the mitigation were maintained constant over time, except for discharge rates from the San Jose Wastewater Treatment Plant to Greenbush Draw which increases after 2024[6]. Also included in the recharge stresses are the projected agricultural recharge in Mexico, recharge from the Turquoise Valley golf course, and recharge from stormwater infiltration basins on CQB property.

The simulation of Alternative 1 did not change the recharge assumptions from the current recharge projections for existing rechargers. Recharge rates for Alternatives 2, 3, and 4 were adjusted in each simulation to reflect the alternative's assumed use of irrigation for land application and/or the discharge of treated water proposed for Greenbush Draw. The recharge values for Alternatives 2, 3, and 4 were adjusted through successive approximation as the recharge rates varied as groundwater pumping assumptions were varied until a final wellfield design was identified. Tables of pumping and recharge stress rates are presented in Appendix G.5 for the final designs of each of the simulated alternatives.

The results of predictive simulations are discussed in the context of the analysis of individual mitigation alternatives in Section 5.3 and the comparative analysis of alternatives in Section 5.4. Effort was made in the FS to use the best available water extraction and recharge projections for the area so that the predictions of future conditions could be as accurate as possible based on current knowledge. Nonetheless, quantifying long-term, future projections of the location, timing, and magnitude of future pumping and recharge is subject to the limitations of reliance on existing information. Significant differences between the actual future pumping and recharge and the assumptions in the model may result in differences between the model predictions and actual conditions. Validation of the model and adaptive management are used to address these limitations.

5.2. Cost Analysis Methodology

A feasibility study level cost analysis was made for each mitigation alternative based on the expected land access/acquisition, permitting, engineering design, procurement, construction,

[6] The San Jose WWTP currently discharges water to Greenbush Draw near the Naco Highway bridge. The plant has reported that it expects to discharge an average of 0.104 MGD from 2012 to 2024, and 0.398 MGD after 2024 (fax communication from SJWWTP, August 12, 2012).

and O&M activities required to implement and operate the alternative. The cost estimates were developed using a consistent basis to provide comparability between the alternatives.

Capital and O&M costs are calculated over a 50-year period to determine the total non-discounted cost (the sum of expenditures over time without discounting the time value of money) and the net present value (NPV) of each alternative. At the direction of CQB, a discount rate of 7.8 percent and an escalation rate of 2.4 percent were used to calculate the present values.

The cost model of each alternative includes the plume management action required for the alternative. Drinking water supply mitigation costs are accounted for only in Alternative 1 which allows the sulfate plume to migrate as it attenuates over time. Capital costs included both direct costs (procurement, equipment, and labor for construction of wells, pumping and pipeline systems, electrical service, treatment facilities, and/or land application facilities) and indirect costs (engineering design, permitting, legal and administrative costs, construction management, and transportation and freight) needed to implement the alternative. Initial capital expenditures are assumed to occur in year one after approval of a Mitigation Plan and O&M is assumed to start in year two with the exception of groundwater monitoring, which is assumed throughout the 50-year cost period. Capital expenditures for design and construction were assumed to occur in 2014 for consistency with the timing assumed for predictive numerical modeling. Although it is unlikely that implementation of a mitigation alternative requiring design and construction of new facilities could be completed at the timetable assumed, the costs would remain approximately the same if the project were started a year or two later.

Capital costs were based as much as possible on vendor quotes developed for the FS, but also relied on current information for similar projects. The placement, sizing, and quantity of capital items, such as electrical service, wells, pumps, and pipelines, were based on the preliminary conceptual designs described in Section 5.3, CQB property boundaries, and likely right of way corridors. WestLand Resources, Inc. (WestLand) provided preliminary designs and costs for the civil, mechanical, and electrical systems for Alternatives 2, 3, and 4 (Appendix F). The cost of water treatment was based on MWH's estimate for RO treatment (Appendix D). The cost of land application was taken from CES's preliminary designs for Alternatives 3 and 4 (Appendix E).

Mitigation O&M costs include labor, power, and equipment repair and replacement. Wellfield and pipeline O&M costs were based on equipment size and usage estimates by WestLand (Appendix F). The water treatment O&M is based on MWH's RO system and brine evaporation pond design (Appendix D). The land application system O&M and revenue are based on CES' designs (Appendix E). All estimates assumed a power cost of $0.08 per Kilowatt

hour based on CQB's current electrical service from Arizona Public Service and assuming CQB would continue being responsible for maintenance of the system after the meter.

The FS cost estimates are scoping level opinions of probable cost developed from preliminary engineering calculations, industry experience, current professional rates, and cost data from similar projects. The level of accuracy of the water extraction and conveyance systems (capital/O&M) reported by WestLand are on the order of plus 50 percent and minus 35 percent. Water treatment/residual management costs (capital/O&M) are reported by MWH to be plus or minus 40 percent. CES indicates its cost estimates of land application were developed assuming an accuracy of plus 30 percent to minus 50 percent. The cost analyses for Alternatives 1 through 4 are discussed in Sections 5.3.1 through 5.3.4, respectively.

5.3. Analysis of Individual Mitigation Alternatives

The mitigation alternatives generally described in Section 4 and Table 2 are described more fully in this section. Each alternative is described at a level of detail sufficient to understand the preliminary conceptual design, the predicted future plume migration, and the cost. The wellfield, pipeline, and water management facility layouts for Alternatives 2 through 4 are presented along with a schedule of groundwater pumping rates over time. The results of numerical simulations of the mitigation alternative specifications are used to illustrate the effectiveness of the alternatives by showing the predicted location of the 250 mg/L sulfate concentration contour over time. The location of the plume over time is used to assess the potential for sulfate to increase above 250 mg/L in drinking water supplies under the alternatives. The implementability of the mitigation alternatives is described based on expected permitting requirements and implementation timeframes for the design and construction of project components. The cost of the alternatives is provided as non-discounted and discounted capital and O&M estimated as described in Section 5.2.

5.3.1. Alternative 1 – Long Term Plume Monitoring and Expanded Groundwater Monitoring with Contingent Drinking Water Supply Mitigation

Alternative 1 would use groundwater and drinking water supply monitoring for plume management. Groundwater pumping would not occur under Alternative 1 and the plume would migrate downgradient over time. Alternative 1 consists of expanded groundwater monitoring upgradient of the AWC and NWC public supplies near Naco and long term plume monitoring of drinking water supplies and the plume.

5.3.1.1. Alternative 1 Simulated Plume Migration

The numerical model was used to simulate the future migration of the plume under Alternative 1. Figure 19 shows the predicted extent of the sulfate plume after 30, 50, 75, and 100 years based on the highest predicted sulfate concentration in any of the four layers of the model. Appendix H.1 contains the results of a particle tracking simulation that illustrates the predicted movement of the plume over time. Graphs of the predicted future groundwater elevation and sulfate concentrations at the public drinking water supplies are also in Appendix H.1. The simulated leading edge of the plume is predicted to migrate as much as 1,550 feet west during the first 30 years of Alternative 1 in addition to the 2,000-foot overestimation of the western extent of the plume (Section 5.1.3).

The plume is predicted to remain north of Greenbush Draw and to migrate approximately 6,500 feet to the west over 100 years of Alternative 1. The southern boundary of the plume is predicted to remain north of Greenbush Draw and the AWC wellfield. The reason the plume remains north of Greenbush Draw and approximately 1,000 feet north of the AWC wellfield is likely because westerly groundwater flow from the CTSA and northerly groundwater flow from Mexico converge in the vicinity of Greenbush Draw and the component of flow from the south maintains the plume north of that convergence. The sulfate concentrations at the AWC wellfield are predicted to remain below 250 mg/L because plume water that migrates to the AWC wells is diluted by mixing with groundwater that originates from outside of and south of the plume. The plume is predicted to remain approximately 2,500 feet north of the NWC wells NWC-02 and NWC-06.

The plume is not predicted to cause sulfate concentrations to exceed 250 mg/L at the AWC wellfield, the water supply wells NWC-02 and NWC-06 in Naco, or NWC-04 in Bisbee Junction. There are three private drinking water supply wells in the region where the plume is predicted to migrate between 2012 and 2115. One of the wells could be affected in the next 30

years and two could be affected in 50 to 100 years. Although the plume is predicted to migrate to the area of private wells, it is not certain that concentrations would increase above 250 mg/L sulfate because some shallow wells pump from a low sulfate layer that sometimes overlies the plume.

5.3.1.2. Expanded Groundwater Monitoring for Alternative 1

Expanded groundwater monitoring would install new monitoring wells and conduct detailed monitoring of plume movement between the plume edge and Naco area public water supplies. Expanded groundwater monitoring data would be used identify sentinel wells and sulfate action levels which, if exceeded, could trigger a contingent mitigation at the AWC or NWC supplies. The goals of expanded groundwater monitoring are to establish a monitoring regime for the Naco area public supplies and to have a systematic response in place to respond to the results of monitoring in a way that prevents a public supply from exceeding 250 mg/L sulfate.

Because the plume continues to migrate under Alternative 1, CQB would conduct expanded groundwater monitoring. Expanded groundwater monitoring would include installation of additional new monitoring wells to measure sulfate at several locations between the plume and the AWC and NWC wellfields. Well locations would be arrayed in a manner to allow direct measurement of plume travel time based on comparison of sulfate concentration and water level data from within the well array and between the array and existing monitor wells. The wells would be installed in the basin fill aquifer. Water sampling and sulfate analysis at the new monitoring wells would be conducted quarterly for the first two years to establish representative concentration data. Subsequent monitoring would depend on the results of the first two years. Water quality and water level measurements for expanded groundwater monitoring would be collected at a frequency and spatial resolution sufficient to determine the rate of plume migration. Additionally, hydraulic testing would be conducted at the new wells to further characterize the hydraulic conductivity of the basin fill near the public water supplies.

The data collected by expanded groundwater monitoring would be used to track plume movement proximal to the Naco area public supplies, provide early detection of sulfate concentration trends, and determine the potential for sulfate to increase above 250 mg/L at the public water supplies. Analysis of sulfate concentration trend and plume migration data would be used to establish sulfate action levels for the implementation of a contingent mitigation at a public drinking water supply, if needed. The sentinel well locations and action level concentrations would be specified such that they would trigger initiation of contingent actions in

a timeframe sufficient to allow for design and construction of the mitigation action before the supply exceeds 250 mg/L sulfate. Different action levels may be used to trigger successive phases of work, such as design versus construction. The requirement for expanded groundwater monitoring and action levels, and a timetable for implementation would be identified in the Mitigation Plan, if Alternative 1 is selected for implementation. The expanded groundwater monitoring program would be developed to work in conjunction with the long term plume monitoring program for drinking water supplies and large scale plume characterization.

5.3.1.3. Long Term Plume Monitoring

Long term plume monitoring would be used to evaluate sulfate in drinking water supplies, track the large scale geometry and concentration of the sulfate plume, and evaluate the effectiveness of Alternative 1. Groundwater monitoring data collected from wells at the leading edge of the plume would also be used for expanded groundwater monitoring.

Groundwater samples would be collected from drinking water supply wells within a mile of the plume. The sulfate analyses would be used to document the sulfate concentration for comparison with the mitigation action objective. An annual review of ADWR well registry records would be conducted to identify new drinking water supply wells within a mile of the plume and CQB would offer to sample any new drinking water wells identified.

Long term plume monitoring would track the large scale migration of the plume edge and define the regional geometry of the plume for ongoing plume characterization. Monitoring the edge of the plume as defined by the 250 mg/L sulfate concentration contour would be a primary goal for groundwater monitoring. Water level measurements to determine the potentiometric conditions throughout the plume would also be prioritized because they are important for assessing the hydraulic gradient and groundwater flow direction for analysis of plume migration. Long term documentation of sulfate concentrations within the plume would be conducted at a lower frequency than monitoring at the plume edge because concentrations within the plume do not change quickly based on monitoring results since 2008.

The current plan for groundwater monitoring under the Mitigation Order would be revised to focus monitoring on drinking water supplies, the location of the plume edge, water level characterization, and the regional geometry of the plume. The revised monitoring plan would be included in the Mitigation Plan submitted to ADEQ 60 days after the FS is approved.

5.3.1.4. Alternative 1 Contingent Drinking Water Supply Mitigation

If an existing private drinking water supply or the NWC supply at Bisbee Junction were to exceed 250 mg/L sulfate based on monitoring, CQB would implement a contingent drinking water supply mitigation. The three private drinking water supply wells predicted to be in the path of the plume are assumed to require mitigation, although groundwater monitoring data would determine the need and timing. Mitigation of the private wells would likely be by one of the methods already used to mitigate private wells affected by the plume (e.g., connection to public supply, well replacement, RO treatment, or bottled water).

The groundwater modeling results for Alternative 1 indicate that AWC and NWC drinking water supplies near Naco are not predicted to exceed 250 mg/L sulfate. The numerical model is the best available tool for predicting the future migration of the plume. However, given that the AWC water supply is 1,000 feet south of the predicted path of the plume and the potential for the hydrogeologic regime to behave differently than predicted, an adaptive management approach is proposed. That approach would include the implementation of contingent drinking water supply mitigation at the AWC wellfield if monitoring data demonstrate that an action level established under expanded groundwater monitoring has been exceeded. Although the NWC wells in the Naco area would also be included in expanded groundwater monitoring and the proposed contingent mitigation actions as a precaution, they are not explicitly considered in the following discussion because they are not considered to be at risk from the plume given their locations approximately 2,000 feet south of the predicted path of the plume.

Alternative 1 is separated into subalternatives, 1A, 1B, and 1C, to incorporate the use of adaptive management and contingent actions under the Mitigation Order. The subalternatives explicitly consider potential outcomes with respect to whether or not the AWC water supply is affected in the future and describe the type of contingent water supply mitigation actions that would be taken. Alternative 1A, 1B, and 1C contain the same base case actions of long term plume monitoring, expanded groundwater monitoring, and ADWR well registry records review, but vary based on the assumed contingent drinking water supply mitigation as described below.

- **Alternative 1A** – Alternative 1A assumes that groundwater monitoring demonstrates that the average sulfate concentration at the AWC water supply will not exceed 250 mg/L. The only contingent drinking water supply mitigation under Alternative 1A would be for private drinking water supplies potentially in the path of the plume. Private drinking water supplies and the NWC Bisbee Junction supply would be mitigated using one of the actions identified in Section 3.3 if monitoring determines that sulfate concentrations exceed 250 mg/L.

- **Alternative 1B** –Alternative 1B considers the case in which monitoring data indicate that the average sulfate concentration of the AWC water supply is likely to exceed 250 mg/L and water treatment would be used for mitigation. Contingent drinking water supply mitigation actions under Alternative 1B would be for the AWC supply and for private drinking water supplies potentially in the path of the plume. Alternative 1B assumes that RO water treatment would be used to mitigate the AWC water supply. At least 24 months would be needed to implement RO water treatment at the AWC water supply based on Brown & Caldwell's preliminary design and implementation timeframe (Appendix C). Should Alternative 1B be selected, the Mitigation Plan would require a plan for initiation of design and construction activities based on analysis of sulfate concentration trends and trigger levels set to allow completion and startup of the treatment plant prior to the average sulfate concentration of the supply exceeding 250 mg/L. Private drinking water supplies and the NWC Bisbee Junction supply would be mitigated using one of the actions identified in Section 3.3, if monitoring determines that sulfate concentrations exceed 250 mg/L.
- **Alternative 1C** –Alternative 1C considers the case in which monitoring data indicate that the average sulfate concentration of the AWC water supply is likely to exceed 250 mg/L and an alternate water supply source would be used for mitigation. Contingent drinking water supply mitigation actions under Alternative 1C would be for the AWC supply and private drinking water supplies potentially in the path of the plume. Alternative 1C assumes that an alternate water supply consisting of one or more new water supply wells outside the plume would be developed for blending with or replacing the AWC supply. The new supply wells would need to be sited, installed, equipped, and plumbed into the existing system. Because of the lead time needed to develop an alternate water supply, CQB would work with AWC to conduct a water supply study to identify and evaluate potential alternate water supply sources. The water supply study would identify and rank prospective sources and drill exploration wells in the most promising targets to determine the quantity and quality of the supply. CQB would commence the water supply study pursuant to an approved Mitigation Plan should Alternative 1C be selected. If an alternate supply is identified, CQB would work with ACW to prepare a conceptual design and implementation schedule. The implementation schedule would be used to set sulfate concentration trigger levels such that the alternate supply would be available for use prior to the average sulfate concentration of the AWC supply exceeding 250 mg/L. In the event that an alternate supply is infeasible or could not be implemented in an appropriate timeframe, Alternative 1B would be implemented. Private drinking water supplies and the NWC Bisbee Junction supply would be mitigated using one of the actions identified in Section 3.3 if monitoring determines that sulfate concentrations exceed 250 mg/L.

Long-term groundwater monitoring data would ultimately be used to confirm the performance of Alternative 1 by tracking groundwater sulfate concentrations, water elevations, and plume migration. The monitoring data would be used to update and validate the conceptual

and numerical models for Alternative 1. An adaptive management approach would be used during Alternative 1 to evaluate new information as it becomes available and determine whether any modification of the alternative is warranted.

5.3.1.5. Alternative 1 Effectiveness

Alternatives 1A, 1B, and 1C would accomplish the mitigation action objective by groundwater and drinking water supply monitoring. There are three private drinking water supply wells potentially in the predicted path of the plume that may require mitigation. Alternatives 1A, 1B, and 1C would implement one of the drinking water supply mitigation actions of Section 3.3 to address private water supplies and the NWC Bisbee Junction supply.

The assumption for Alternative 1A is that the Naco area public drinking water supplies do not exceed 250 mg/L. Alternatives 1B and 1C assume implementation of the contingent mitigation actions of RO water treatment and alternate water supply, respectively, if monitoring determined that the sulfate concentration at an upgradient sentinel well exceeds an action level to be set pursuant to the Mitigation Plan. RO water treatment for Alternative 1B would be effective at meeting the mitigation action objective at a public supply. Although an alternate water supply for Alternative 1C would be effective at meeting the mitigation action objective at a public supply, the availability of an alternate supply is uncertain. For that reason, work for Alternative 1C would conduct a water supply study to determine the availability and lead time for an alternate supply. If Alternative 1C were found to be infeasible as a contingency action, Alternative 1B would be implemented.

Expanded groundwater monitoring upgradient of the Naco area public water supplies would provide the data for evaluating plume migration and sulfate concentrations with respect to action levels. Action levels would be set considering implementation timeframes for mitigation actions so that an action could be completed prior to a water supply exceeding 250 mg/L sulfate. The principles of adaptive management with contingent measures would be used to analyze new data from groundwater monitoring and future hydrologic studies. If the data analysis indicates that the actual hydrogeologic regime behaves differently than expected based on the conceptual and numerical models for Alternative 1, the models would be revised and modifications to the alternative would be made as determined to be necessary by operational experience and/or modeling.

The sulfate plume is predicted to migrate approximately 6,500 feet to the west over the next 100 years under Alternative 1. Mixing between the plume and unimpacted groundwater is

predicted to be insufficient to attenuate the downgradient plume during the 100-year simulation timeframe of Alternative 1. Although there are no ongoing sources of sulfate, the amount of dilution within and at the edges of the plume is insufficient to significantly attenuate the plume. Overall, the western extent of the plume increases over time compared to the current plume extent, while the plume extent to the southeast and east decreases slightly.

5.3.1.6. Alternative 1 Implementability

There are no technical or administrative barriers expected for implementation of long term plume monitoring, expanded groundwater monitoring, the ADWR well registry review, and drinking water supply mitigation for Alternatives 1A, 1B, and 1C. Long term plume monitoring and expanded groundwater monitoring could be implemented immediately after approval of a Mitigation Plan as there are no engineered systems required. Long-term property access would need to be negotiated with landowners for monitoring well sites for the expanded groundwater monitoring program. Drinking water supply mitigation at a private drinking water supply well or the NWC Bisbee Junction supply, when and if needed, could likely be implemented within a year of an agreement executed between the well owner and CQB. Bottled water would be an interim action for an affected private drinking water well or the NWC Bisbee Junction supply. The components of Alternatives 1 A, 1B, and 1C described above are considered technically and administratively implementable.

Contingent RO water treatment for Alternative 1B is technically and administratively implementable. Implementation of RO water treatment would require the agreement of AWC. The treatment plant design would be expected to be similar to the conceptual designs in Appendices C and D, but modified for site-specific conditions. Skilled contractors are available that can provide the expertise and services for the technical design, construction, and operation of an RO water treatment plant. ADEQ and ACC approval of the treatment plant would be needed to build and operate the facility.

Implementation of the water supply study for Alternative 1C is technically and administratively implementable. The installation of exploration wells to confirm water supply and quality would potentially require that land access be negotiated with land owners and that drilling permits be obtained from ADWR. The results of the water supply study would be used to determine the technical and administrative implementability of developing an alternate water supply. If an alternate water supply were implemented, CQB would develop an agreement with AWC for the alternate water supply. ADEQ and ACC approval of the new water source would likely be needed.

5.3.1.7. Alternative 1 Cost

Table 3 summarizes the estimated costs of Alternatives 1A, 1B, and 1C. The cost of contingent public water supply mitigation for Alternative 1B and 1C was not estimated because the AWC wellfield is not predicted to be affected by the plume. Alternatives 1A and 1B have estimated 50-year non-discounted capital and O&M costs of $1.8 million and $17.3 million, respectively, because their non-contingent actions are the same. The 50-year total non-discounted cost of Alternatives 1A and 1B is $19.1 million and the NPV(50) is $7.3 million[7]. Alternative 1C has estimated 50-year non-discounted capital and O&M costs of $3.6 million and $17.3 million, respectively. The 50-year total non-discounted cost of Alternative 1C is $20.9 million and the NPV(50) is $9.0 million. The higher cost of Alternative 1C is for a water supply study. Additional costs may be incurred for development of an alternate water supply, if one is identified. Detailed summaries of estimated costs for Alternative 1A, 1B, and 1C are in Appendix I.1A, I.1B, and I.1B, respectively.

Capital costs common to Alternatives 1A, 1B, and 1C are monitoring well installation for expanded groundwater monitoring and drinking water supply mitigation for the private wells. To estimate the cost of the expanded groundwater monitoring, new monitoring wells were assumed to be installed in the basin fill upgradient of the AWC and NWC wellfields at a cost of $1.3 million. The cost of collecting and analyzing water level and water quality data for long term plume monitoring was attributed to O&M and estimated based on current monitoring expenditures. Drinking water supply mitigation costs for private wells were assumed to be $180,000 per well based on the 2012 mitigation cost of well replacement into the deeper aquifer. The mitigation of one private drinking water supply was assumed to occur in 2018. Mitigation of the two wells that may be affected in 50 to 100 years was assumed to occur in year 50.

If needed, Alternative 1B would have contingent capital costs for design and construction of an RO water treatment facility at the AWC wellfield. Additional O&M costs would be associated with the operation of the RO facility. The potential costs of contingent water treatment were estimated for illustrative purposes only (see footnote 7), assuming that treatment might be triggered at different times. The two different treatment durations were arbitrarily selected to show a range of potential contingent costs. The basis for the treatment cost estimates is the MWH conceptual design for RO treatment (Appendix D) and an estimated annual average flow rate of 840 gpm.

[7] The timing of contingent costs, if triggered, can affect Alternative 1B. Assuming two potential cases, one in which the contingent costs were triggered in 2023 and one with the contingent action triggered in 2043, the total non-discounted cost could range from $89 million to $55 million, respectively, whereas the NPV(50) could range from $26 million to $12 million, respectively.

The Alternative 1C cost for the water supply study would be expended whether or not a contingent mitigation action were triggered. Thus, the water supply study was estimated as a capital expenditure assuming $1.8 million would be spent over two years for professional hydrogeologic consulting services and installation of four exploration boreholes for testing targets for an alternate water supply. The costs for full scale development of an alternate water supply (e.g., well installation, pumps, piping, storage tanks, etc.) were not included as they are contingent costs that would be highly dependent on the specifics of the alternate supply.

5.3.2. Alternative 2 – Plume Stabilization and Water Treatment for Release to Greenbush Draw

Alternative 2 would use the plume management actions of groundwater pumping for plume stabilization, treatment of the extracted water using RO water to meet the 250 mg/L mitigation action objective, release of treated water to Greenbush Draw for aquifer recharge, and groundwater monitoring. Alternative 2 would pump groundwater to maintain the current extent of the plume and prevent plume migration. Drinking water supply mitigation would not be needed because the sulfate plume would not expand under Alternative 2.

Figure 20 shows the preliminary conceptual layout of wells, treatment facilities, and pipelines for Alternative 2. The wellfield design and groundwater pumping specifications were developed using the numerical model. The treatment plant specifications are based on the MWH preliminary design in Appendix D. The piping layout and pump specifications are based on WestLand's preliminary design in Appendix F.1.

5.3.2.1. Alternative 2 Simulated Plume Migration

The numerical model was used to simulate the future migration of the plume under Alternative 2. Figure 21 shows the predicted extent of the sulfate plume after 30, 50, 75, and 100 years of Alternative 2 based on the highest sulfate concentration in any of the four layers of the model. Appendix H.2 contains the results of a particle tracking simulation that illustrates the predicted movement of the plume over time. The numerical simulation results indicate that the western edge of the plume remains stable over time while the southern edge of the plume north of Naco recedes northward. The simulated leading edge of the plume is predicted to migrate less than 1,000 feet west during the first 30 years of Alternative 2 before the westward plume movement stops. As discussed in Section 5.1.3.2, the numerical model conservatively overestimates the western extent of the plume.

5.3.2.2. Alternative 2 Groundwater Pumping and Water Management

Groundwater modeling indicates that Alternative 2 would require that CQB install and operate four wells to extract a total of approximately 840 gpm of sulfate-bearing groundwater. The wells would be located in basin fill on CQB property in the southwestern portion of the plume. The pumping specifications over time for Alternative 2 are noted on Figure 21. Groundwater pumping would be maintained at approximately 840 gpm for about 50 years (until 2066), after which the pumping rate would be reduced to a total of about 740 gpm because the southernmost well (FS-3) is predicted to be outside the plume.

Under Alternative 2, CQB would design, construct and operate an RO water treatment facility capable of treating approximately 840 gpm. Extracted groundwater would be treated to meet the mitigation action objective of 250 mg/L sulfate. Assuming an 85% product water rate for treatment, approximately 715 gpm of treated water would be piped to Greenbush Draw downgradient of the AWC wellfield where it would be released to the surface to infiltrate and recharge the aquifer. Approximately 125 gpm of brine reject from RO treatment would be evaporated in lined ponds near the treatment facility. The treatment facility and brine evaporation pond would be located on CQB property. A new electrical service would be established for the wellfield, treatment plant, brine pond, and pumping system.

Discharge from the treatment facility would be routed to Greenbush Draw via a pipeline running south along Naco Highway and west on Purdy Lane to a location near the Naco Sanitary District ponds downgradient of the AWC wellfield. CQB would have to obtain access to Cochise County right-of-way and, possibly, private land for installation of the discharge pipeline. An APP would be needed for the evaporation ponds and an individual AZPDES permit would be needed to release treated water to Greenbush Draw.

5.3.2.3. Alternative 2 Groundwater Monitoring

Long-term groundwater monitoring would be conducted pursuant to a revised groundwater monitoring plan that would be based on the currently existing monitoring network, and would focus on documenting plume location and the sulfate concentration of drinking water supplies. The plume stabilization pumping is predicted to keep the plume within its current approximate footprint over time. Based on the simulation results, sulfate concentrations at the AWC and NWC wellfields would remain less than 250 mg/L in the future and no private drinking water supply wells are affected by the plume. Therefore, drinking water supply mitigation is not predicted to be needed under Alternative 2. Long-term groundwater monitoring

would be conducted to verify the sulfate concentration of drinking water supplies. An annual review of ADWR well registry records would be conducted to identify new drinking water supply wells within a mile of the plume. CQB would offer to sample any new drinking water wells identified.

Monitoring data would also be used to confirm the performance of Alternative 2 by tracking groundwater sulfate concentrations, water elevations, and plume migration. The monitoring data would be used to update and validate the conceptual and numerical models for Alternative 2 throughout the mitigation. An adaptive management approach would be used during Alternative 2 to evaluate new information as it becomes available and determine whether any modification of the alternative is warranted.

5.3.2.4. Alternative 2 Effectiveness

Alternative 2 would accomplish the mitigation objective using groundwater pumping to stabilize the leading edge of the plume to its current approximate location and prevent plume migration to currently unaffected drinking water supplies. Under Alternative 2, the leading edge of the plume is predicted to remain in its current approximate location over the next 100 years while the southern edge of the plume contracts to the north. Public and private drinking water supplies are not predicted to exceed the mitigation action objective of 250 mg/L sulfate. The principles of adaptive management would be used to collect and analyze new data from groundwater monitoring and future hydrologic studies. If the data analysis indicates that the actual hydrogeologic regime behaves differently than expected based on the conceptual and numerical models for Alternative 2, the models would be revised and modifications to the alternative would be made as determined to be necessary by operational experience and/or modeling.

5.3.2.5. Alternative 2 Implementability

There are no significant technical or administrative barriers expected for implementation of Alternative 2. The technological and commercial resources are available for implementation of the plume management actions of Alternative 2. The groundwater pumping, RO water treatment, brine evaporation, discharge of treated water, and groundwater monitoring specified for Alternative 2 are standard technologies. The design, procurement and construction of wellfield, pipelines, and water treatment facilities can probably be accomplished in 24 to 36 months after project initiation. A groundwater monitoring network is already in place and would be continued. The ADWR well registry review requires no special activities.

Administrative tasks needed to implement Alternative 2 include:

- ADWR permits for well installation.
- Cochise County construction permits for water treatment facilities and pipelines.
- APP for the treatment plant evaporation ponds.
- Land access and right-of-way acquisition for pipelines.
- Individual AZPDES permit for discharge from water treatment to Greenbush Draw.

The APP, land access and right of way acquisition, and AZPDES permit are expected to be the longest lead time administrative tasks. It is assumed that 24 to 36 months should be sufficient to complete these tasks if initiated concurrent with design engineering. If land access and right of way acquisition or permitting were to be protracted, construction and/or startup schedules could be delayed. The total time required to implement Alternative 2 is estimated to be approximately 36 months after approval of a Mitigation Plan.

5.3.2.6. Alternative 2 Cost

Alternative 2 has 50-year non-discounted capital and O&M costs of $51.7 and $118 million, respectively. The 50-year total non-discounted cost of Alternative 2 is $169 million, and the NPV (50) is $64.6 million (Table 3). The Alternative 2 costs include the direct and indirect capital and O&M costs for the facilities required for the alternative. A detailed summary of estimated costs for Alternative 2 is presented in Appendix I.2.

Direct capital costs account for the purchase of materials and equipment, installation, and construction, including: electrical service, site preparation, wells, wellfield pipelines, water treatment plant and brine evaporation pond, pumping systems, discharge pipeline, control and data acquisition systems, and telemetry. The Alternative 2 capital estimate includes replacement of the brine evaporation pond after 20 and 40 years, and replacement of the RO treatment system after 30 years. Indirect capital includes:

- Federal and state permitting that may be required for construction of drilling pads, electrical lines, access roads, and piping runs and operation of treatment and discharge facilities; and elevation, archeological and endangered species surveys that may be required.
- Construction/project management.
- Legal and administrative costs.

- Engineering design and construction drawing/specifications for: electrical installations, well and wellhead instrumentation, control and telemetry, piping and valves, water treatment and brine evaporation facilities, and discharge pipeline.

Annual O&M costs include: labor; electrical power for the wellfield, water treatment plant, and pumping systems; supplies; equipment repair and periodic replacement; groundwater and discharge monitoring; and consulting. Capital and O&M costs for the civil, mechanical and electrical systems of Alternative 2 are described in Appendix F.1. Capital and O&M costs for water treatment and brine evaporation are described in Appendix D.

5.3.3. Alternative 3 – Plume Stabilization with Land Application

Alternative 3 would use the plume management actions of groundwater pumping for plume stabilization, land application of pumped water for agricultural use, and groundwater monitoring. Alternative 3 would pump groundwater to maintain the current extent of the plume and prevent significant plume migration. Drinking water supply mitigation would not be needed because the sulfate plume would not expand under Alternative 3.

Figure 22 shows the preliminary conceptual layout of wells, treatment facilities, and pipelines for Alternative 3. The wellfield design and groundwater pumping specifications were developed using the numerical model. The land application system specifications are based on the CES preliminary design in Appendix E.1. The piping layout and pump specifications are based on WestLand's preliminary design in Appendix F.2.

5.3.3.1. Alternative 3 Simulated Plume Migration

The numerical model was used to simulate the future migration of the plume under Alternative 3. Figure 23 shows the predicted extent of the sulfate plume after 30, 50, 75, and 100 years of Alternative 3 based on the highest sulfate concentration in any of the four layers of the model. Appendix H.3 contains the results of a particle tracking simulation that illustrates the predicted movement of the plume over time. The numerical simulation results indicate that the western edge of the plume remains stable over time while the southern edge of the plume north of Naco recedes northward. The simulated leading edge of the plume is predicted to migrate approximately 1,000 feet west during the first 30 years of Alternative 3 before the westward plume movement stops. As discussed in Section 5.1.3.2, the numerical model conservatively overestimates the western extent of the plume.

5.3.3.2. Alternative 3 Groundwater Pumping and Water Management

Groundwater modeling indicates that Alternative 3 would require that CQB install and operate four wells to extract a total of approximately 900 gpm of groundwater. Three wells would be located in basin fill on CQB property in the southwestern portion of the plume. One well would be located in basin fill on private property just west of CQB. The pumping specifications over time for Alternative 3 are noted on Figure 23. Groundwater pumping would be maintained at approximately 900 gpm for 50 years (from 2015 until 2066) when the pumping rate would be reduced to 850 gpm, which is predicted to be sufficient to maintain plume stabilization.

Under Alternative 3, CQB would design, construct, and operate a land application system for native grasses, alfalfa, and other crops. The land application system would consist of a system of center pivot irrigation units designed to use up to 900 gpm of sulfate-bearing groundwater for application on crops and for soil conditioning. A lined water storage pond, pumping station, and system of water transmission pipelines would be constructed to supply the pivots. CQB would retain a contract farmer to run the operation, including planting, maintenance, harvesting, and crop sales. The land application system would be located on CQB property east of Naco Highway and north of Purdy Lane. CQB would have to obtain access to private land west of Naco Highway for the installation of a well and associated pipelines. County right-of-way would be needed to be obtained for the portion of extracted groundwater pipeline crossing Naco Highway. A new electrical service would be established for the wellfield, land application system, and pumping system.

5.3.3.3. Alternative 3 Groundwater Monitoring

Long-term groundwater monitoring would be conducted pursuant to a revised groundwater monitoring plan that would be based on the currently existing monitoring network and would focus on documenting the plume location and the sulfate concentration of drinking water supplies. The plume stabilization pumping is predicted to keep the plume within its current approximate footprint over time. Based on the simulation results sulfate concentrations at the AWC and NWC wellfields remain less than 250 mg/L in the future. Therefore, drinking water supply mitigation is not predicted to be needed under Alternative 3. Long term monitoring would be conducted to verify the sulfate concentration of drinking water supplies. An annual review of ADWR well registry records would be conducted to identify new drinking supply wells within a mile of the plume. CQB would offer to sample any new drinking water wells identified.

Monitoring data would also be used to confirm the performance of Alternative 3 by tracking groundwater sulfate concentrations, water elevations, and plume migration. The monitoring data would be used to update and validate the conceptual and numerical models for the Alternative 3 throughout the mitigation. An adaptive management approach would be used during Alternative 3 to evaluate new information as it becomes available and determine whether any modification of the alternative is warranted.

5.3.3.4. Alternative 3 Effectiveness

Alternative 3 would accomplish the mitigation objective using groundwater pumping to stabilize the leading edge of the plume at its current approximate location and prevent plume migration to currently unaffected drinking water supplies. Under Alternative 3, the leading edge of the plume is predicted to remain in its current approximate location over the next 100 years while the southern edge of the plume contracts to the north. Public and private drinking water supplies are not predicted to exceed the mitigation action objective of 250 mg/L sulfate. The principles of adaptive management would be used to collect and analyze new data from groundwater monitoring and future hydrologic studies. If the data analysis indicates that the actual hydrogeologic regime behaves differently than expected based on the conceptual and numerical models for Alternative 3, the models would be revised and modifications to the alternative would be made as determined to be necessary by operational experience and/or modeling.

5.3.3.5. Alternative 3 Implementability

There are no significant technical or administrative barriers expected for implementation of Alternative 3. The technological and commercial resources are available for implementation of the plume management actions of Alternative 3.

The groundwater pumping, land application, and groundwater monitoring specified for Alternative 3 are standard technologies. The design, procurement and construction of wellfield, pipeline, and land application facilities can probably be accomplished in 24 months after project initiation. Groundwater monitoring is already in place and would be continued for plume management. The ADWR well registry review requires no special activities.

Administrative tasks needed to implement Alternative 3 include:

- ADWR permits for well installation.

- Cochise County construction permits for water pipelines and pumping facilities.
- APP – agricultural general use permit for land application.

The APP is expected to be the longest lead time administrative task, but is not expected to be a rate limiting factor for implementation of Alternative 3. The total time required to implement Alternative 3 is estimated to be approximately 24 months after approval of a Mitigation Plan.

5.3.3.6. Alternative 3 Cost

Alternative 3 has estimated 50-year non-discounted capital and O&M costs of $6.4 and $32.1 million, respectively. The 50-year total non-discounted cost of Alternative 3 is $38.5 million and the NPV (50) is $16.8 million (Table 3). Alternative 3 costs include direct and indirect capital and O&M costs for the facilities required for the alternative. A detailed summary of estimated costs for Alternative 3 is presented in Appendix I.3.

Direct capital costs account for the purchase and installation of equipment, including: electrical service, site preparation, wells, wellfield pipelines, land application equipment, pumping systems, discharge pipeline, control and data acquisition systems, and telemetry. Indirect capital includes:

- Federal and state permitting that may be required for construction of drilling pads, electrical lines, access roads, and piping runs and operation of treatment and discharge facilities; and elevation, archeological and endangered species surveys that may be required.
- Construction/project management.
- Legal and administrative costs.
- Engineering design and construction drawing/specifications for: electrical installations, well and wellhead instrumentation, control and telemetry, piping and valves, water treatment and brine evaporation facilities, and discharge pipeline.

Annual O&M costs include: labor; electrical power for the wellfield, land application system operation, and pumping systems; supplies; equipment repair and periodic replacement; groundwater monitoring; and consulting. Capital and O&M costs for the civil, mechanical and electrical systems of Alternative 3 are described in Appendix F.2. Capital and O&M costs for land application are described in Appendix E.1.

5.3.4. Alternative 4 - Plume Reduction and Stabilization with Land Application and Water Treatment for Release to Greenbush Draw

Alternative 4 would use the plume management actions of groundwater pumping for plume reduction, RO water treatment to meet the 250 mg/L mitigation action objective, release of treated water to Greenbush Draw for aquifer recharge, land application of water for agricultural use, and groundwater monitoring. Alternative 4 would pump a large amount of groundwater during the first 30 years of the alternative to reduce the extent of the plume to CQB property and thereafter use groundwater pumping to maintain the current extent of the plume and prevent significant plume migration. Drinking water supply mitigation would not be needed because the sulfate plume would not expand under Alternative 4.

Figure 24 shows the preliminary conceptual layout of wells, treatment facilities, and pipelines for Alternative 4. The wellfield design and groundwater pumping specifications were developed using the numerical model. The treatment plant specifications are based on the MWH preliminary design in Appendix D. The land application system specifications are based on the CES preliminary design in Appendix E.2. The piping layout and pump specifications are based on the WestLand preliminary design in Appendix F.3.

5.3.4.1. Alternative 4 Predicted Plume Migration

The numerical model was used to simulate the future migration of the plume under Alternative 4. Figure 25 shows the predicted extent of the sulfate plume after 30, 50, 75, and 100 years of Alternative 4 based on the highest sulfate concentration in any of the four layers of the model. Appendix H.3 contains the results of a particle tracking simulation that illustrates the predicted movement of the plume over time. The numerical simulation results indicate that the western edge of the plume would migrate east and the southern edge would recede north for the first 50 years of Alternative 4 and then remain stable beneath CQB property thereafter.

5.3.4.2. Alternative 4 Groundwater Pumping and Water Management

Groundwater modeling indicates that Alternative 4 would require that CQB install and operate ten wells to extract a total of approximately 2,950 gpm of sulfate-impacted groundwater during the first 30 years of the alternative and 800 gpm from a fewer number of wells thereafter. Nine wells would be located in basin fill on CQB property in the southwestern portion of the plume. One well would be located in basin fill on private property just west of CQB. The pumping specifications over time for Alternative 4 are listed in Figure 25. Groundwater

pumping would be maintained at approximately 2,950 gpm for 30 years (until 2046) when the pumping rate would be reduced to 800 gpm, a rate that is predicted to continue plume reduction and maintain plume stabilization after year 50.

Under Alternative 4, CQB would design, construct and operate both an RO water treatment facility capable of treating approximately 1,600 gpm and a land application system requiring 1,350 gpm of water for native grasses, alfalfa, and other crops. During the first 30 years of Alternative 4 when the flow rate is greatest, sulfate-bearing groundwater would be treated to meet the mitigation action objective of 250 mg/L sulfate. Assuming an 85% product water rate for treatment, approximately 1,360 gpm of treated water would be piped to Greenbush Draw downgradient of the AWC wellfield where it would be released to the surface to infiltrate and recharge the aquifer. Approximately 240 gpm of brine reject from RO treatment would be evaporated in lined ponds near the treatment facility. RO water treatment would end after 30 years when the flow rate is decreased. The treatment facility and brine evaporation pond would be located on CQB property. The land application system would consist of a system of center pivot irrigation units designed to use 1,350 gpm of sulfate-bearing groundwater for application on crops and for soil conditioning. A water storage pond, pumping station, and system of water transmission pipelines would be constructed to supply the pivots. CQB would retain a contract farmer to run the operation, including planting, maintenance, harvesting, and crop sales. The farming operation would be located on CQB property east of Naco Highway and north of Purdy Lane. CQB would have to obtain access to private land west of Naco Highway for the installation of a well and associated pipelines. County right-of-way would be needed for portions of pipelines for extracted groundwater and treated water effluent crossing and routed along Naco Highway. A new electrical service would be established for the wellfield, treatment plant, brine pond, land application system, and pumping system.

5.3.4.3. Alternative 4 Groundwater Monitoring

Long-term groundwater monitoring would be conducted pursuant to a revised groundwater monitoring plan that would use the existing monitoring network and would focus on documenting plume location and the sulfate concentration of drinking water supplies. The plume stabilization pumping is predicted to keep the plume within its current approximate footprint over time. Based on the simulation results sulfate concentrations at the AWC and NWC wellfields remain less than 250 mg/L in the future. Therefore, drinking water supply mitigation is not predicted to be needed under Alternative 4. Long term monitoring would be conducted to verify the sulfate concentration of drinking water supplies. An annual review of ADWR well

registry records would be conducted to identify new drinking water supply wells within a mile of the plume. CQB would offer to sample any new drinking water wells identified.

Monitoring data would also be used to confirm the performance of Alternative 4 by tracking groundwater sulfate concentrations, water elevations, and plume migration. The monitoring data would be used to update and validate the conceptual and numerical models for the Alternative 4 throughout the mitigation. An adaptive management approach would be used during Alternative 4 to evaluate new information as it becomes available and determine whether any modification of the alternative is warranted.

5.3.4.4. Alternative 4 Effectiveness

Alternative 4 would accomplish the mitigation objective using groundwater pumping to reduce the extent of the plume to CQB property over time and prevent plume migration to currently unaffected drinking water supplies. Under Alternative 4, the plume is predicted to decrease significantly in size over the first 50 years of operation. The plume would be localized beneath CQB property after 50 years and stabilized at that location thereafter. Public and private drinking water supplies are not predicted to exceed the mitigation action objective of 250 mg/L sulfate. The principles of adaptive management, including the use of contingent measures, would be used to collect and analyze new data from groundwater monitoring and future hydrologic studies. If the data analysis indicates that the actual hydrogeologic regime behaves differently than expected based on the conceptual and numerical models for Alternative 4, the models would be revised and modifications to the alternative would be made as determined to be necessary by operational experience and/or modeling.

5.3.4.5. Alternative 4 Implementability

There are no significant technical or administrative barriers expected for implementation of Alternative 4. The technological and commercial resources are available for implementation of the plume management actions of Alternative 4.

The groundwater pumping, RO water treatment and brine evaporation, discharge of treated water, land application, and groundwater monitoring specified for Alternative 4 are standard technologies. The design, procurement and construction of wellfield, pipelines, water treatment facilities, and land application facilities can probably be accomplished in 24 to 36 months after project initiation. Groundwater monitoring is already in place and would be

continued for plume management. The ADWR well registry review requires no special activities.

Administrative tasks needed to implement Alternative 4 include:

- ADWR permits for well installation.
- APP – individual permit for the treatment plant evaporation ponds.
- Land access and right-of-way acquisition for pipelines.
- Individual AZPDES permit for discharge from water treatment to Greenbush Draw.
- Cochise County construction permits for water pipelines and pumping facilities.
- APP – agricultural general use permit for land application.

The treatment plant APP, land access and right of way acquisition, and the AZPDES permit are expected to be the longest lead time administrative tasks. The land application APP is not expected to be a rate limiting factor. It is assumed that 24 to 36 months should be sufficient to complete these tasks if initiated concurrent with design engineering. If land access and right of way acquisition or permitting were to be protracted, construction/startup schedules could be delayed. The total time required to implement Alternative 4 is estimated to be approximately 36 months after approval of a Mitigation Plan.

5.3.4.6. Alternative 4 Cost

Alternative 4 has estimated 50-year non-discounted capital and O&M costs of $69.4 and $106 million, respectively. The 50-year total non-discounted cost of Alternative 4 is $175 million and the NPV(50) is $92.2 million (Table 3). Alternative 4 costs include direct and indirect capital and O&M for the facilities required for the alternative. A detailed summary of estimated costs for Alternative 4 is presented in Appendix I.4. The Alternative 4 capital estimate includes one replacement of the brine pond at 20 years. There is not a rebuild of the treatment plant because its use ends at 30 years.

Direct capital costs account for the purchase and installation of equipment, including: electrical service, site preparation, wells, wellfield pipelines, water treatment plant and brine evaporation pond, land application equipment, pumping systems, discharge pipeline, control and data acquisition systems, and telemetry. Indirect capital includes:

- Federal and state permitting that may be required for construction of drilling pads, electrical lines, access roads, and piping runs and operation of treatment and discharge facilities; and elevation, archeological and endangered species surveys that may be required.
- Construction/project management.
- Legal and administrative costs.
- Engineering design and construction drawing/specifications for: electrical installations, well and wellhead instrumentation, control and telemetry, piping and valves, water treatment and brine evaporation facilities, and discharge pipeline.

Annual O&M costs include: labor; electrical power for the wellfield, water treatment plant, land application system operation, and pumping systems; supplies; equipment repair and periodic replacement; groundwater and discharge monitoring; and consulting. The O&M for Alternative 4 reflects the reduction of pumping and transition to land application only at 30 years. Capital and O&M costs for the civil, mechanical and electrical systems of Alternative 4 are described in Appendix F.3. Capital and O&M costs for water treatment and brine evaporation are described in Appendix D. Capital and O&M costs for land application are described in Appendix E.2.

5.4. Comparative Analysis of Mitigation Alternatives

This section compares the mitigation alternatives based on their relative effectiveness, implementability, and cost. Cost is described by the 50-year non-discounted cost and the NPV(50) of the alternatives. Additional environmental factors that need to be considered in terms of the tradeoffs are also considered so that ADEQ can weigh the short- and long-term benefits of the alternatives consistent with ARS § 49-286. Table 4 summarizes the comparison of mitigation alternatives.

5.4.1. Effectiveness, Implementability, and Cost

5.4.1.1. Effectiveness

Consistent with Section III.D of the Mitigation Order, all of the alternatives meet the mitigation action objective. Meeting the mitigation action objective is a prerequisite for satisfying the Mitigation Order. Alternatives 1 through 4 would all be effective at meeting the mitigation action objective, but vary in the means by which they would do so. The mitigation

action objective can be met through direct mitigation of drinking water supplies or by plume management actions that eliminate the need for drinking water supply mitigation actions.

Alternatives 1A, 1B, and 1C would meet the mitigation action objective by long term plume monitoring and expanded groundwater monitoring to track plume migration and drinking water supply quality, and, if needed, contingent drinking water supply mitigation. There are 3 private drinking water supply wells and no public water supplies predicted to be in an area where sulfate concentrations may exceed 250 mg/L over the next 100 years. The mitigation action implemented at an affected private water supply would be selected based on site specific conditions. Drinking water supply mitigation actions at a public supply would be implemented if sulfate concentrations in a water supply are determined through monitoring to be likely to exceed 250 mg/L based on action levels to be established under the Mitigation Plan. If triggered, Alternatives 1B and 1C would implement RO water treatment or alternate water supply, respectively.

Alternatives 2, 3, and 4 would meet the mitigation action objective by preventing plume migration to existing drinking water supplies. Drinking water supplies are not expected to be affected by the plume under these alternatives because there is no additional plume migration.

5.4.1.2. Implementability

Implementability refers to the availability of resources and the ability to meet the technical and administrative requirements needed to permit, design, build, and operate the mitigation alternatives. The implementability of process options used by the mitigation alternatives was assessed generally in Section 3. This section focuses on the implementability of the alternatives.

Technical Implementability

Alternatives 1 through 4 are all technically implementable in that the technologies they would employ are generally reliable and commonly used. Implementation of the alternatives would require activities and technologies that are typical of groundwater pumping and water treatment actions. There are no developing or experimental technologies used by the alternatives.

The alternatives differ in the infrastructure they would need to be designed, procured, and built for implementation. Alternative 1A is the least technically difficult to implement because it would have no engineered facilities. If Alternatives 1B or 1C were triggered they would require

design and construction efforts less extensive than those for Alternatives 2 and 4 which have more components. Alternative 1C could be similar to Alternative 3 in implementation because only groundwater pumping and conveyance would be needed. Alternatives 2 would be more difficult to implement than Alternative 3 because, although it would use the same number of wells, the water treatment and brine evaporation facilities that would be constructed by Alternative 2 require a greater number of trades and greater coordination than Alternative 3 which consists primarily of land preparation, pipeline installation, and land application equipment installation. Additionally, Alternative 2 would need to construct 2.8 miles of pipeline off of CQB property, which adds to the technical challenge of the project. Alternative 4 would be the most technically difficult alternative to implement because it would have the largest number of wells and would use both water treatment, brine evaporation, off site recharge, and land application at a larger scale than either Alternatives 2 or 3. Although the alternatives range in complexity, the design and construction of the various wellfield, pipeline, water treatment, land application, and supporting infrastructure of the alternatives requires engineering and construction skills that are readily available in the marketplace.

The groundwater and drinking water supply monitoring included in all the alternatives is technically implementable for monitoring the effectiveness of the mitigation alternative and assessing water supplies for sulfate. Numerical simulation of Alternative 1 indicates that 3 private drinking water supply wells may be affected by the sulfate plume in 100 years. Simulations of Alternatives 2, 3, and 4 indicate that no existing drinking water supply wells would be affected by the plume.

All the alternatives are capable of being modified in the future. Groundwater monitoring data would be used throughout the mitigation to assess the performance of the mitigation and to determine whether additional actions are warranted to meet the mitigation action objective. As described in Section III.D of the Mitigation Order, CQB would implement the mitigation using an adaptive management approach, including the use of contingent measures, that can remain flexible to respond to scientific (i.e., groundwater monitoring data, water treatment technology developments, or engineering factors), administrative (e.g., new laws or evolving water resource constraints), or business (e.g., changes in mine water supply) conditions. An example of an instance for which adaptive management could be used is to modify pumping if the aquifer response to pumping differs significantly from predictions.

Administrative Implementability

Administrative implementability refers to the level of regulatory agency or private party interactions needed for land purchases, permitting, and gaining access or right-of-way for construction and operation of the alternative.

Alternative 1A would require land access to private property if drinking water supply mitigation were required at the private wells in the path of the plume. CQB has implemented previous mitigation actions by negotiating access agreements with affected property owners. An ADWR well installation permit would be required if drinking water supply mitigation were to be well replacement. Alternative 1B, if triggered, would require an agreement between CQB and AWC for the design, construction, permitting, and operation of water treatment. ADEQ and ACC approval would also be required. Alternative 1C, if triggered, would likely require land access negotiations for well sites and conveyances. An agreement between CQB and AWC would be needed for the water supply. ADEQ and ACC approval would also be required.

Alternatives 2, 3, and 4 would install wells, pipelines, and water management facilities on CQB property. The ADWR permits that would be required for well installation are standard permits that typically have a permitting timeframe less than 30 days. Alternatives 3 and 4 would also install one well and an associated pipeline on private property west of CQB. The access to private property for the well and pipeline should be implementable through negotiation of an access agreement with the property owner. Alternatives 3 and 4 would require Cochise County right of way for pipeline crossings Naco Highway to convey extracted water from the west to CQB property. Obtaining the county right of way should not present a difficulty provided that CQB submits construction plans in a timely manner. Alternatives 2 and 4 would require construction of 14,800 feet of pipeline on county right of way and private property to convey treated water to Greenbush Draw. The administrative implementability of the effluent pipeline should be straight forward but will require access negotiations and timely submittal of construction plans. Although there are no apparent obstacles to gaining access, there is a potential for delays in gaining access, which might also delay the construction schedule.

Alternatives 2 and 4 would construct an RO water treatment plant, brine evaporation ponds, associated pumping stations, and an effluent discharge line on CQB property. Construction permits would be secured as needed by Cochise County regulations. The treatment plant and pond would require an APP. The APP process would require time for ADEQ technical and administrative review and approval. CQB would prepare an APP application and meet with ADEQ as needed to schedule the permit submittal and review. The timeframe for an APP permit varies depending on the complexity and completeness of the application and the degree of public

interest (AAC R18-1-501 to 525). It is expected that it would take one year to two years to obtain an APP.

Alternatives 3 and 4 would construct land application facilities on CQB property. Construction permits would be secured as needed by Cochise County regulations. An APP agricultural general permit would be required, but is not expected to require a significant submittal and review process.

Alternatives 2 and 4 would require an individual AZPDES permit to discharge treated water to Greenbush Draw. CQB would prepare an AZPDES application and meet with ADEQ as needed to schedule the permit application submittal and review. The timeframe for an AZPDES permit varies depending on the complexity and completeness of the application and the degree of public interest (AAC R18-1-501 to 525). It is expected that it would take two years to obtain an AZPDES permit, although the licensing timeframe for an AZPDES permit can be more than 5 years.

In summary, the alternatives would not be comparable in implementability because the different mitigation approaches they would take would require different degrees of planning and permitting. Alternative 1A is the simplest alternative to implement because it would not require construction of wellfields, conveyances, or water management facilities. Alternatives 2 and 3 would construct wellfields, conveyances, and water management facilities, making them more complicated to implement than Alternative 1A. Alternative 3 would be less complicated to implement than Alternative 2 because it would have less significant construction and permitting activities. Alternative 4 is the most complicated alternative to implement because it would construct a larger number of wells than Alternatives 2 and 3 while using the water management facilities of both Alternatives 2 and 3. If Alternatives 1B and 1C were triggered, they would likely have a level of complication similar to Alternative 3. The APP and AZPDES permit requirements of Alternatives 2 and 4 have the potential to rate limiting steps in implementation.

Implementation Timeframes

The different levels of land access, construction planning, and permitting that would be needed for the mitigation alternatives result in different implementation timeframes once a Mitigation Plan is approved. The implementation timeframes estimated for the engineering, access negotiation, permitting, and construction activities of the mitigation alternatives are:

- Alternative 1A - can be implemented immediately on approval of Mitigation Plan.
- Alternative 1B – can be implemented immediately on approval of Mitigation Plan.

- Alternative 1C – can be implemented immediately on approval of Mitigation Plan.
- Alternative 2 - 36 months after approval of Mitigation Plan.
- Alternative 3 - 24 months after approval of Mitigation Plan.
- Alternative 4 - 36 months after approval of Mitigation Plan.

5.4.1.3. Cost

Tables 3 and 4 summarize costs for the mitigation alternatives. A discussion of the costs is provided below.

The 50-year total non-discounted cost of Alternatives 1A, 1B, 1C, 2, 3, and 4 is estimated to be $19.1, $19.1, $20.9 $169, $ 38.5, and $175 million, respectively. The lowest total non-discounted project cost is estimated for Alternatives 1A and 1B at $19.1 million. Alternative 1C has a higher 50-year non-discounted cost of $20.9 million due to the addition of a water supply study. The highest 50-year non-discounted total project cost is estimated for Alternative 2 and 4 at $169 and $175 million, respectively. Alternative 3 would have a 50-year net present value of $38.5 million, making it the lowest cost alternative using groundwater pumping to meet the mitigation objective. The highest cost Alternatives 2 and 4 are about three times the cost of Alternative 3, whereas Alternative 3 is about twice the cost of the lowest cost Alternatives 1A, 1B, and 1C.

The NPV(50) of Alternatives 1A, 1B, 1C, 2, 3, and 4 is estimated at $7.3, $7.3, $9.0, $64.6, $16.8, and $92.2 million, respectively. The lowest NPV(50) of $7.3 million is estimated for Alternatives 1A and 1B, which also have the lowest total non-discounted cost. The highest NPV(50) of $92.2 million is estimated for Alternative 4, which also has the highest total non-discounted cost.

In Alternatives 1A, 1B, and 1C the primary cost driver is expanded groundwater monitoring. Alternative 1C has both expanded groundwater monitoring and the cost of a water supply study. In Alternatives 2 and 4 groundwater pumping and treatment are the primary cost drivers. Groundwater monitoring and groundwater pumping are the cost drivers of Alternative 3.

The total non-discounted cost provides a better estimate of the absolute level of expenditure for the mitigation alternatives than the NPV(50) because the NPV(50) is subject to uncertainty in the timing of expenditures and the effective interest rate, whereas the non-discounted cost is not. Alternatives 1A, 1B, and 1C are the lowest cost mitigation alternatives based on the total non-discounted cost and the NPV(50).

5.4.2. Additional Environmental Factors Associated with Mitigation Alternatives

Beyond the threshold requirement of meeting the mitigation action objective, the mitigation alternatives vary in the degree to which they reduce the extent of the plume over time, conserve groundwater resources, conserve energy, minimize waste generation and maximize land use. These factors describe the environmental footprint of each alternative and define tradeoffs that need to be considered in the selection of the recommended alternative.

5.4.2.1. Reduction of Plume Extent

The degree to which the alternatives reduce the plume extent is dependent on the amount and location of groundwater pumping and recharge they would use. Reduction of plume extent is not a prerequisite for meeting the mitigation action objective.

Alternatives 1A, 1B, and 1C use long term plume monitoring, expanded groundwater monitoring, and contingent mitigation rather than groundwater pumping, so the extent of the plume increases over time (Figure 19). Under Alternative 1 the area of the plume footprint would increase over the next 100 years by approximately 1.5 square miles. Alternatives 2 and 3 would maintain the current western extent of the plume and slightly reduce the southern extent over time by groundwater pumping at 840 and 900 gpm, respectively (Figure 21 and 23). Alternative 4 would pump groundwater at a maximum rate of 2,950 gpm in order to reduce the extent of the plume to the CQB property boundary over 50 years and then stabilize the plume thereafter (Figure 25). Alternative 4 significantly reduces both the western and southern extent of the plume.

None of the alternatives would reduce the extent of sulfate in the bedrock aquifer, such as east of the Black Gap fault and below the control portion of the plume (Section 2.3). The low permeability and heterogeneity of the bedrock make groundwater control actions impracticable. Sulfate in the bedrock is not expected to have a detrimental effect on the proposed alternatives.

5.4.2.2. Conservation of Groundwater Resource

Groundwater conservation is important to CQB and the region. Groundwater conservation is not a prerequisite for meeting the mitigation action objective, but alternatives that minimize pumping or reduce losses associated with water management while accomplishing the mitigation action objective would provide the benefit of conserving the groundwater resource. Groundwater conservation can be considered in terms of the quantity of water removed from the

aquifer and the potential water level changes in the aquifer due to long-term groundwater extraction.

Groundwater Extraction

Alternatives 1A, 1B, and 1C would not increase the amount of future groundwater extraction in the area. Even if contingent mitigation were triggered under Alternatives 1B and 1C, their groundwater extraction would replace that of the AWC wellfield, although Alternative 1B would pump an additional 15 percent due to treatment efficiency. The groundwater budget in the plume area would be unaffected by actions under Alternative 1 given the current understanding of future plume migration. Figures 26, 27, and 28 show annual groundwater extraction, recharge, and net groundwater extraction rates for Alternatives 2, 3, and 4, respectively. The net groundwater extraction rate is the annual extraction rate minus the recharge rate for the alternative. Alternative 2 would pump 840 gpm while recharging 715 gpm for a net groundwater loss of 125 gpm. Alternative 3 would pump 900 gpm while recharging 125 gpm of irrigation return for a net groundwater loss of 775 gpm. Alternative 4 would pump 2,950 gpm initially while recharging 1,360 gpm of treated water and 210 gpm of irrigation return for a net loss of 1,380 gpm in the first 30 years. After 30 years, Alternative 4 would pump 800 gpm and recharge 125 as irrigation return for a net loss of 675 gpm.

The annual net groundwater extraction of the alternatives is compared on Figure 29. Alternatives 1A, 1B, and 1C would have no net extraction unless Alternative 1B is triggered. The initial annual net extraction rates of Alternatives 2, 3, and 4 are 66, 408, and 726 million gallons per year, respectively. The annual extraction rates of Alternatives 2 and 3 are constant over the first 50 years of the alternatives while the rate of Alternative 4 drops to 355 million gallons per year after 30 years of operation. Figure 30 shows the cumulative net groundwater extraction after 50 years of the mitigation alternatives. The net groundwater extraction from the aquifer after 50 years of Alternatives 1, 2, 3, and 4 would be approximately 0, 3.3, 20, and 29 billion gallons, respectively.

Potential Water Level Declines Due to the Mitigation Alternatives

An aspect of water conservation is the degree to which the alternatives would potentially lower groundwater elevations. The numerical model was used to predict future water levels for each alternative. Alternative 1 would not change water levels in the aquifer because it would not involve additional groundwater pumping unless Alternative 1B were triggered. Alternative 1B would require a slight increase in the amount of water pumped from the AWC wellfield to make up for water lost through RO treatment. Figure 31 shows simulated groundwater elevations after

30 and 50 years of Alternative 1. The potential water level changes associated with Alternatives 2, 3, and 4 were determined by comparing the predicted future water levels for the alternatives to the predicted future water levels for Alternative 1. The comparison was conducted by subtracting the predicted future water level of Alternative 1 from the predicted future water level of the groundwater pumping alternative. In this comparison, a negative number is obtained when the future water level of an alternative is lower than for Alternative 1, indicating a decline in the water table. A positive value is obtained if the future water level of an alternative is higher than for Alternative 1, indicating an increase in the water table. The comparison shows the net change in predicted water levels attributable to the mitigation alternatives relative to Alternative 1 which represents a base case of no mitigation pumping or recharge. The net predicted water level change would be independent of changes due to non-mitigation pumping and recharge in the area.

Figures 32, 33, and 34 show the predicted water level changes in the basin fill aquifer due to Alternatives 2, 3, and 4, respectively. The water level changes are predicted after 30 and 50 years of the alternative, or approximately 2045 and 2065. The simulation results predict that mitigation pumping would cause a net decrease in groundwater levels in the vicinity of the plume with respect to the Alternative 1. This is expected because groundwater pumping for plume management is designed to depress the water table in order to capture affected water, especially in the vicinity of the mitigation extraction wells. The predicted water level declines generally decrease with distance from the mitigation extraction wells. The groundwater elevation in basin fill and bedrock is declining at approximately 1 to 2 feet per year as discussed in Section 2.2. The water level declines associated with mitigation pumping would be superimposed on the background declines already occurring.

Alternatives 2 and 3 are predicted to cause similar declines in the vicinity of the mitigation wellfield because they have a similar well array and total pumping rate (Figures 32 and 33). Water level declines around the mitigation wellfields of Alternatives 2 and 3 are on the order of 15 to 25 feet. Alternatives 2 and 3 are predicted to reduce the water level at the AWC wellfield by approximately 3 to 5 feet and 7 to 9 feet, respectively, in 30 years. Similar declines are predicted for the NWC-02 and NWC-06 water supply wells near Naco. A greater water level decline is predicted for Alternative 3 because it would not use groundwater recharge as would Alternative 2. Recharge under Alternative 2 would cause a groundwater mound beneath Greenbush Draw west of the AWC wellfield. If Alternative 1B were triggered, the 15 percent additional pumping at the AWC wellfield would be similar to the net extraction under Alternative 2 and would result in similar water table affects over time.

Alternative 4 would be associated with larger water level declines than Alternatives 2 and 3. Declines within the mitigation wellfield of Alternative 4 are predicted to be on the order of 58 to 80 feet (Figure 34). Water level declines at the AWC wellfield and at the NWC-02 and NWC-06 wells are predicted to be approximately 14 to 18 feet and 18 to 22 feet, respectively. Recharge under Alternative 4 would cause a groundwater mound beneath Greenbush Draw west of the AWC wellfield. The recharge mound would dissipate after water treatment ceases in 30 years of Alternative 4.

Interpretation of the significance of the predicted water level declines requires evaluation of the difference in future saturated thickness at pumping wells and the possible reduction in well efficiency due to the declines. The predicted declines of less than 10 feet in 30 years at the AWC and NWC-02 and NWC-06 wells for Alternatives 2 and 3 is less than 10 percent of the current estimated saturated thickness at the wells. The predicted declines of less than 22 feet in 30 years at the AWC and NWC-02 and NWC-06 wells for Alternative 4 is about 10 percent of the current saturated thickness at the wells. As a general approximation, a 10 percent reduction in saturated thickness could result in a 10 percent reduction in a well's pumping capacity if the well were highly efficient and pumping at its maximum sustainable rate.

5.4.2.3. Energy Conservation

Energy efficiency is important to CQB and the larger, state-wide community. Energy conservation is not a prerequisite for meeting the mitigation action objective, but alternatives that minimize energy use, while accomplishing the mitigation action objective would provide the benefit of reducing the carbon footprint of complying with the Mitigation Order.

Alternative 1 would use less energy than Alternatives 2, 3, and 4 because there are no engineered systems to operate unless contingent mitigation were triggered. If Alternative 1B were triggered, its annual energy use for water treatment would be similar to treatment for Alternative 2. The energy use for Alternative 1C would probably be similar to the current use of the AWC wellfield, meaning there would be no net increase. Energy is the largest component of the O&M cost of Alternatives 2, 3, and 4, which use power for wellfield pumping, water treatment and brine disposal, or irrigation systems. The projected electrical usage of the mitigation alternatives is shown on Figure 35. Alternatives 1, 2, 3, and 4 would use 0, 156, 56, and 254 million kilowatt hours of electricity, respectively, over the first 50 years of operation. Alternative 1 would have the lowest energy footprint. Alternative 4 would have the highest energy footprint. Alternatives 2 and 4 would use two to three times the energy of Alternative 3 because they would use RO treatment and brine evaporation, which are energy intensive.

5.4.2.4. Waste Generation and Land Use

Alternatives that do not generate waste requiring disposal provide the benefit of not producing a second environmental medium that can cause additional affects to soil and water, and of not consuming land for long-term waste storage. Alternatives 1A, 1C, and 3 would not generate brine wastes requiring land storage. Alternatives 1B, 2, and 4 that include RO water treatment would generate brine waste requiring long-term management. The lined evaporation ponds receiving reject brine from RO treatment for Alternatives 2 and 4 are estimated to be about 30 and 50 acres, respectively, and to have a service life of 20 years. Because the waste salts would be water soluble, closure of the ponds would entail encapsulating the residual salts with the liner, installation of a soil cover, and surface contouring to shed water. Future land use at the former pond site would be restricted to avoid disturbing the brine waste. This disposal method is land consumptive because a new 30- to 50-acre pond site would need to be developed every 20 years and the closed sites would be restricted from use to avoid disturbance. The land storage of treatment wastes also presents a risk of cross-media contamination (groundwater to brine to soil) if the brine repository were to be compromised.

5.4.2.5. Summary of Additional Environmental Factors

The performance of the mitigation alternatives with respect to the additional environmental factors is as follows.

- Alternative 4 would provide the greatest reduction of plume extent. However, even after extensive, long-term pumping, the plume would remain in a portion of the basin fill aquifer and there would be little change in the extent of the plume in the bedrock. Alternatives 2 and 3 would maintain the current western extent of the plume and reduce the southern extent of the plume. Alternatives 2 and 3 are approximately equivalent in controlling the plume extent although Alternative 2 is predicted to reduce the southern extent more than Alternative 3. Alternative 1 would provide the least control over the plume extent as the plume would migrate under the natural hydraulic gradient. An additional 1.5 square mile portion of the aquifer would increase above 250 mg/L sulfate under Alternative 1.
- Alternative 1 would conserve water compared to Alternatives 2, 3, and 4 because there would be no groundwater pumping. The extractive loss of groundwater pumped from the aquifer would occur due to water losses in brine evaporation or evapotranspiration from agricultural fields. Of the alternatives that would pump groundwater, Alternative 2 would remove the least groundwater over 50 years (cumulative net extraction of 3.3 billion gallons). Alternative 3 and 4 would extract approximately 6 to 9 times the volume of Alternative 2, respectively.

- Alternative 1 would have no effect on water levels in the basin fill aquifer. Alternatives 2, 3, and 4 would all reduce water levels in the vicinity of the sulfate plume. Water level decreases in the vicinity of the plume are a necessary effect for any mitigation strategy using groundwater pumping to control the plume. Alternative 1 would provide a benefit in terms of maximizing future water levels in the aquifer compared to Alternatives 2, 3, and 4.
- Alternative 1 would conserve energy compared to Alternatives 2, 3, and 4 because there would be no motorized equipment used. Alternative 3 would use more energy than Alternative 1, but less energy than Alternatives 2 and 4 which would operate treatment, brine evaporation, and recharge facilities. Alternative 4 is the most energy intensive alternative because it pumps, treats, recharges, and irrigates the largest volume of groundwater.
- Evaporation of RO brines by Alternatives 1B, 2, and 4 make them highly land consumptive and presents a long-term waste management requirement. Alternatives 1A, 1C, and 3 would not produce significant amounts of waste requiring land disposal and would maximize land availability for future use.

6. RECOMMENDED MITIGATION ALTERNATIVE

Table 4 compares the effectiveness, implementability, and cost of the four mitigation alternatives. The mitigation alternatives would all meet the mitigation action objective of providing an affected drinking water supply with a supply having sulfate concentrations less than 250 mg/L, but do so using different levels of groundwater monitoring, plume management, water management, and contingent drinking water supply mitigation actions. The mitigation alternatives all meet the threshold requirement of being effective and implementable. Alternatives 1A, 1B, and 1C would be the least expensive with 50-year non-discounted costs of $19.1 million, $19.1 million, and $20.9 million, respectively. Alternatives 2 and 4 would be the most expensive alternatives, with 50-year non-discounted costs of $169 and $175 million, respectively. Alternative 3, with a 50-year non-discounted cost of $38.5 million, would be significantly less expensive than Alternatives 2 and 4.

CQB's identification of a recommended mitigation alternative considered guidance at ARS § 49-286 pertaining to mitigation of non-hazardous releases. ARS § 49-286.A identifies possible mitigation measures as:

"*1. Providing an alternative water supply.*

2. Mixing or blending if economically practicable.

3. Economically and technically practicable treatment before ingesting water.

4. Such other mutually agreeable mitigation measures as are necessary to achieve the purposes of this section."

ARS § 49-286.B states "*The director's selection of mitigation measures shall balance the short-term and long-term public benefits of mitigation with the cost of each alternative measure. The director may only require the least costly alternative if more than one alternative may render water usable as a drinking water source*."

As discussed in Section 5.4, there are environmental tradeoffs and different short- and long-term public benefits that need to be weighed when selecting a recommended alternative. The tradeoffs are illustrated by the following factors:

- Reduction of plume extent.
- Conservation of water resources.

- Conservation of energy resources.
- Waste Generation and Land Use.

Protection of Drinking Water Supplies

Alternatives 1A, 1B, and 1C would not control the plume or reduce its extent the way that Alternatives 2, 3, and 4 would. However, although Alternatives 1A, 1B, and 1C allow plume migration, numerical modeling predicts that there are only three existing private drinking water supplies the path of the plume in the next 100 years and that sulfate remains less than 250 mg/L at the AWC and NWC wellfields. As an alternate to a groundwater pumping approach and to be protective of drinking water supplies in case conditions change, Alternatives 1A, 1B, and 1C would mitigate a private well by one of the methods used to date (connection to public supply, well replacement, water treatment or bottled water) and would implement an expanded groundwater monitoring program focused on public supplies. The expanded monitoring program would install additional monitoring wells upgradient of public supplies and carefully document the extent and movement of the plume. The results would be used to validate and update the predictive model of plume migration. The program would develop sulfate action levels that would trigger a contingent mitigation action to ensure that sulfate levels in drinking water remain below 250 mg/L, if monitoring data demonstrate a public supply is likely to be affected. The contingent action could be construction and operation of a RO treatment plant to reduce sulfate to 250 mg/L (Alternative 1B) or development of an alternate water source that could replace or blend with the water supply from impacted wells (Alternative 1C).

Environmental Tradeoffs

Alternatives 1A, 1B, and 1C provide societal benefits by avoiding the consumptive use of groundwater, water table declines, and large energy demands associated with Alternatives 2, 3, and 4. Alternatives 2, 3, and 4 would reduce the plume extent, but because of the water treatment and water management methods they use, they consume more groundwater, result in water table declines in excess of the declines already occurring, and consume more electricity which generates more greenhouse gas than the other alternatives (Section 5.4). If the contingent measures in Alternative 1B are implemented, this alternative would not only result in a larger plume, but would have similar environmental impacts as Alternative 2. Alternatives 1B, if triggered, 2, and 4 would also generate brine waste as a byproduct of RO treatment. The disposal of the brine waste would require the consumptive use of land for long-term storage and containment of the waste.

Recommended Alternative

On consideration of the benefits and costs of the mitigation alternatives, and consistent with ARS § 49-286, CQB recommends Alternative 1C as the preferred alternative because it would meet the mitigation objective and provide long-term protection of drinking water supplies, is among the lowest cost alternatives that meet the mitigation action objective, and has the greatest level of groundwater, energy, land, and waste conservation compared to the other alternatives. In addition to the expanded groundwater monitoring it would implement for public water supplies, Alternative 1C has the benefit of initiating steps to identify an alternate water supply that could be used for blending or replacement of the AWC wellfield, if a contingent action is needed based on monitoring results. If the water supply study determines it is infeasible to develop a new water source, then a contingent action of RO water treatment would be implemented under Alternative 1B, if needed. If approved, a Mitigation Plan describing the actions to be implemented for Alternative 1C, including descriptions and timetables for expanded groundwater monitoring and the alternate water supply study would be submitted to ADEQ.

ADEQ will review and comment on the FS. The FS may need to be revised to address ADEQ comments before it is approved. ADEQ could consider another alternatives than the one recommended by ADEQ. Alternative 3, although not recommended by CQB, would be the lowest cost alternative using groundwater pumping to control future plume movement and accomplish the mitigation action objective. On approval of the FS, CQB will prepare a Mitigation Plan for submittal to ADEQ. The Mitigation Plan would provide additional detail on how the approved FS alternative would be implemented.

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TABLES

TABLE 1
Mitigation Actions, Control Technologies, and Process Options Evaluated for Development of Mitigation Alternatives

Mitigation Action	Control Technology	Process Option	Effectiveness	Implementability	Cost	Evaluation
DRINKING WATER SUPPLY MITIGATION						
Alternate Water Supply	Well Modification to Eliminate Pumping from Sulfate Zone	Casing liner to seal out sulfate-bearing inflow	Uncertain effectiveness; effectiveness would depend on site-specific well and hydrogeologic conditions; requires good seal and a low sulfate zone with adequate supply.	Poor to moderate technical implementability due to difficulty of retrofitting existing wells, risk of damage to well during modification, difficulty of ensuring and maintaining adequate seal, and low probability of low sulfate zone in the screened interval of most affected wells. Good administrative implementability; requires ADWR permit.	Medium	Reject due to uncertain effectiveness and poor to moderate implementability
		Well deepening to seal out sulfate-bearing inflow and draw from low sulfate aquifer at depth	Uncertain effectiveness; effectiveness would depend on site-specific well and hydrogeologic conditions; requires good seal and site to be underlain by unaffected aquifer with adequate supply.	Poor to moderate technical implementability due to difficulty of retrofitting existing wells, risk of damage to well during deepening, and difficulty of ensuring and maintaining adequate seal. Good administrative implementability; requires ADWR permit.	Medium	Reject due to uncertain effectiveness and poor to moderate implementability
	Well Replacement	Well replacement on property with affected well	Potentially effective depending on site-specific hydrogeologic conditions; would require site to be underlain by unaffected aquifer with adequate supply. Option potentially applicable to both domestic and public water supplies.	Moderate to good technical implementability in areas with hydrogeology allowing development of low sulfate water supply of adequate quantity. Primary risk is inability to develop new water supply if the unaffected aquifer has inadequate water quality and quantity. Good administrative implementability; requires ADWR permit.	High	Retain as potentially applicable based on site-specific conditions
		Well replacement on an alternate property outside path of sulfate plume	Potentially effective depending on site-specific hydrogeologic conditions; would require an alternate well site underlain by unaffected aquifer with adequate supply, and right of way and construction of conveyances to point of use. Option limited to large public water supply	Moderate to good technical implementability; would require alternate well site in area with favorable hydrogeology for low sulfate water supply of adequate quantity, well installation, and water supply line engineering design, permitting, procurement, and construction services that are commercially available. Risks are inability to acquire property, right of way for conveyances, and aquifer with inadequate water quality and quantity. Moderate to good administrative implementability; requires ADWR permit for drilling and approvals/permits for public water supplies by ADEQ, Cochise County, and ACC.	High	Retain as potentially applicable for a public water supply based on site-specific conditions
	Connection to Public Water Supply		Effective; has been used to meet mitigation objective for final mitigation actions at sites within public water supply service areas and proximal to water supply distribution lines.	Good technical implementability; would require line extension engineering design, permitting, procurement and construction services that are commercially available. Good administrative implementability; requires approvals/permits for public water supplies by ADEQ, Cochise County, and ACC.	High	Retain as potentially applicable for domestic water supplies based on site-specific conditions
	Identification and development of an Alternate Water Supply		Effective; would require identification of an alternate water meeting water quality and quantity guidelines and proximal to point of need. Option limited to large public water supply	Moderate to good technical implementability if alternate source available; would require construction of conveyance infrastructure between the alternate source and point of need. Uncertain administrative implementability; identification of alternate source uncertain, would require development of agreements for water use, land access, and rights of way, and approval of ADEQ and ACC; certain uses may be limited by rights and permits in effect.	High	Retain as potentially applicable for a public water supply based on site-specific conditions
	Bottled Water		Effective; has been used to meet mitigation objective for interim and final mitigation actions.	Good technical implementability; commercial drinking water providers service the area and have a reliable performance record. Good administrative implementability; no special permits required.	Low to Medium	Retain as potentially applicable for domestic water supplies based on site-specific conditions
Blending	Mix affected water supply with water from other sources to meet mitigation objective		Potentially effective at meeting the mitigation objective; option limited to large-scale public drinking water supply such as AWC.	Good technical implementability for large-scale public water system if a source of water for blending can be identified; short lead time for design and construction. Poor technical implementability for small scale domestic water supplies due to lack of water for blending and the high degree of operating oversight required. Good to moderate administrative implementability; requires public water supply approvals/permits by ADEQ, Cochise County, and ACC.	High	Retain as potentially applicable for a public water supply based on site-specific conditions

Shading indicates process option retained for alternative development

Abbreviations: ACC = Arizona Corporation Commission, ADEQ = Arizona Department of Environmental Quality, ADWR = Arizona Department of Water Resources, APP = Aquifer Protection Permit, AWC = Arizona Water Company, AZPDES = Arizona Pollutant Discharge Elimination System; CQB = Copper Queen Branch, gpm = gallons per minute, CWA = Clean Water Act, mg/L = milligrams per liter, O & M = operation and maintenance, UIC = Underground Injection Control, RO = reverse osmosis, WWTF = wastewater treatment facility

TABLE 1
Mitigation Actions, Control Technologies, and Process Options Evaluated for Development of Mitigation Alternatives

Mitigation Action	Control Technology	Process Option	Effectiveness	Implementability	Cost	Evaluation
DRINKING WATER SUPPLY MITIGATION (continued)						
Water Treatment	Biological Treatment	Anaerobic bioreactor to reduce sulfate to hydrogen sulfide and precipitate as metal sulfide or native sulfur	Uncertain effectiveness; technology not yet reliable for sulfate treatment at flow rates greater than 50 to 100 gpm.	Poor technical implementability; treatment process is still in development for large flow rates; pilot testing at larger flow rates being conducted by Freeport-McMoRan, but technology still unavailable for implementation. Good administrative implementability; may require APP and Cochise County permits for construction and other permits for use of product water.	High	Reject due to uncertain effectiveness compared to other technologies
	Chemical Precipitation	Chemical mixing, precipitation, clarification, and filtration plant using barium salt	Poor effectiveness; sulfate has poor removal efficiency by chemical precipitation, produces a high total dissolved solids product water.	Good technical implementability; uses water treatment process that is well understood. Good administrative implementability; may require APP and Cochise County permits for construction and other permits for use of product water.	High	Reject due to poor effectiveness compared to other technologies
	Ion Exchange with Conventional Resin/Process	Selective sulfate exchange resin to absorb sulfate	Poor effectiveness; high calcium in water interferes with sulfate removal, produces a high total dissolved solids product water.	Good technical implementability; uses water treatment process that is well understood. Good administrative implementability; may require APP and Cochise County permits for construction and other permits for use of product water.	High	Reject due to poor effectiveness compared to other technologies
	Ion Exchange with Experimental Resin/Process	Experimental sulfate exchange resin to adsorb sulfate	Poor effectiveness; technology not yet reliable for sulfate treatment at flow rates greater than 50 to 100 gpm.	Poor technical implementability; treatment process is still in development for large flow rates; pilot testing at larger flow rates being conducted by Freeport-McMoRan, but technology still unavailable for implementation. Good administrative implementability; may require APP and Cochise County permits for construction and other permits for use of product water.	High	Reject due to poor effectiveness compared to other technologies
	Distillation and Thermal Evaporation	Distillation and thermal evaporation units convert water to demineralized condensate and collect residual brine	Potentially effective; produces a high quality product water, but very energy intensive.	Good technical implementability; uses water treatment process that is well understood, but that has large electrical requirement; design and operation services commercially available. Good administrative implementability; may require APP and Cochise County permits for construction and other permits for use of product water.	High	Reject due high cost and high energy consumption compared to other technologies
	Electrodialysis and Electrodialysis Reversal	Electromotive force used to filter water through semi permeable membranes	Potentially effective; reported success in removing sulfate to 250 mg/L, but process is not capable of the lower sulfate removal efficiency of reverse osmosis.	Good technical implementability; uses water treatment process that is well understood, but that is not as commonly used for water treatment for sulfate as is reverse osmosis; design and operation services commercially available. Good administrative implementability; may require APP and Cochise County permits for construction and other permits for use of product water.	High	Reject due to less effective sulfate removal compared to reverse osmosis
	Reverse Osmosis (Pressure used to filter water through semi permeable membranes)	Large Scale Water Treatment Plant for Public Water Supply	Potentially effective; capable of reliably producing water meeting the 250 mg/L sulfate limit; reverse osmosis has ability to remove 85% of influent sulfate and is the most common means of treating sulfate and high total dissolved solids; option limited to treatment of large scale (tens to thousands of gpm) flows.	Good technical implementability for large scale water treatment; uses water treatment process that is well understood; design and operation services commercially available; produces a brine concentrate that requires management. Good to moderate administrative implementability; may require APP and Cochise County permits for construction and ADEQ and ACC permits for use as public supply.	High	Retain as potentially applicable for AWC wells based on site-specific conditions
		Full-House Reverse Osmosis Treatment for Domestic Drinking Water Supply	Potentially effective; capable of reliably producing water meeting the 250 mg/L sulfate limit; reverse osmosis is the most common means of treating sulfate and high total dissolved solids; option limited to domestic drinking water supplies.	Moderate to good technically implementability; full-house treatment systems are an existing and reliable technology with local commercial service providers. Full house RO brine production is about 50% of water treated. Implementability may be limited by site-specific factors such as limited well production or septic system capacity to accept brine. Good administrative implementability; no special permit required.	Medium	Retain as potentially applicable for domestic drinking water supplies; option has high water and sewage demand
		Point of Use Reverse Osmosis Treatment for Domestic Drinking Water Supply	Potentially effective; capable of reliably producing water meeting the 250 mg/L sulfate limit; reverse osmosis is the most common means of treating sulfate and high total dissolved solids; option limited to domestic drinking water supplies.	Good technical implementability; point-of-use treatment systems are an existing and reliable technology with local commercial service providers. Point of use RO brine production is about 50% of water treated. Implementability should not be limited by well production or septic capacity because of low water volume for point of use treatment, but risk of limited septic capacity does exist. Good administrative implementability; no special permit required.	Medium	Retain as potentially applicable for domestic drinking water supplies

Shading indicates process option retained for alternative development

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TABLE 1
Mitigation Actions, Control Technologies, and Process Options Evaluated for Development of Mitigation Alternatives

Mitigation Action	Control Technology	Process Option	Effectiveness	Implementability	Cost	Evaluation
PLUME MANAGEMENT						
Institutional Actions	Groundwater Monitoring	Ongoing groundwater monitoring at monitor and drinking water supply wells	Effective for identifying affects to drinking water supplies and determining the magnitude, extent, movement, and attenuation of the plume.	Good technical implementability; groundwater monitoring plan already in place. Good administrative implementability; may require obtaining land access agreements to conduct monitoring activities on private property.	Medium	Retain as potentially applicable
	ADWR Well Registry Reviews	Annual review of ADWR well registry to identify new wells within one mile of the plume and sampling of new drinking water supply wells	Effective for identifying new registered wells, water use to be determined by ADWR record or interview with well owner, CQB would offer to sample for sulfate new drinking water supply wells within one mile of the plume.	Good technical implementability; ability to sample new drinking water wells depends on approval of well owner.	Low	Retain as potentially applicable
In Situ Treatment	Use injection wells to introduce reagents to the subsurface to create in-place chemical precipitation or biological reduction of sulfate to lower plume concentrations over time		Uncertain effectiveness; non-standard technology for sulfate, ability to meet mitigation objective in aquifer may be limited due to complexity of treatment process, incomplete sulfate reduction in aquifer, and potential well and aquifer clogging. Technology may have potential to mobilize unwanted constituents.	Moderate to good technical implementability; although a conceptual design can be developed and likely built and operated, this is an experimental approach to sulfate mitigation that has no proven application at similar scales. Technology could be associated with a high levels of O&M that can impact effectiveness through frequent shut downs for well rehabilitation. Good to moderate administrative implementability; would require ADWR permit for wells and UIC permit and APP for operation.	High	Reject because effectiveness is uncertain and technology is unproven at scale of application
Groundwater Control	Groundwater Pumping from Basin Fill Aquifer to Control Plume Movement	Vertical wells to establish capture zone by pumping	Effective; vertical wells can be used to limit plume migration; mitigation objective met by preventing future affects to water supplies; requires wellfield design to meet plume management objectives.	Good technical implementability; vertical wells are standard technology for plume management; would require acquisition of land access and right of way for wells and pipelines. Good administrative implementability; would require ADWR permit for wells and Cochise County construction permit.	High	Retain as potentially applicable
		Horizontal wells to establish capture zone by pumping	Effective; horizontal wells can be used to limit plume migration; mitigation objective met by preventing future affects to water supplies; requires wellfield design to meet plume management objectives. Potential uncertainty regarding effectiveness of vertical capture.	Moderate technical implementability; horizontal drilling at the depths required is a non-standard technology for groundwater plume control and would require specialized equipment, personnel, and well construction materials. Good administrative implementability; would require ADWR permit for wells and Cochise County construction permit.	High	Reject because horizontal wells are a non-standard technology that is more costly than vertical wells and provides no additional benefit
	Groundwater Barrier in Basin Fill Aquifer to Enhance Plume Capture	Physical barrier emplaced in subsurface to the bottom of the basin fill aquifer	Ineffective at the required depth (150 to 400 feet below surface) of application; physical barriers are difficult to install to depths greater than 150 feet.	Poor technical implementability due to infeasibility given site-specific conditions. Good administrative implementability; no special permit required.	High	Reject because physical barriers are ineffective and infeasible for site conditions
		Hydraulic barrier created with vertical injection wells	Potentially effective; a hydraulic barrier to enhance plume capture can be created by injecting water to the aquifer through vertical wells; would require wellfield design to meet plume management objectives; long-term effectiveness is uncertain due to potential operational issues such as well clogging and need of frequent rehabilitation; requires pilot testing.	Moderate to good technical implementability; but injection wells are associated with a high levels of O&M that can impact effectiveness through frequent shut downs for well rehabilitation. Good to moderate administrative implementability; would require ADWR permit for wells and UIC permit and APP for operation.	High	Reject because hydraulic barrier using injection wells has uncertain long-term effectiveness and no currently identified need; option could have a future role in optimizing a plume capture
		Hydraulic barrier created by surface recharge with infiltration ponds or trenches	Poor effectiveness; a hydraulic barrier can be created by infiltration ponds or trenches, but hydraulic control would be uncertain due to lag time for recharge to reach water table, lack of precise application due to spreading in subsurface, lack of flow control, and difficulty monitoring.	Good technical implementability; vadose zone perching may limit effectiveness. Moderate administrative implementability; would require UIC permit APP.	High	Reject because a hydraulic barrier using surface recharge has poor effectiveness compared to a hydraulic barrier using injection wells

Shading indicates process option retained for alternative development

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TABLE 1
Mitigation Actions, Control Technologies, and Process Options Evaluated for Development of Mitigation Alternatives

Mitigation Action	Control Technology	Process Option	Effectiveness	Implementability	Cost	Evaluation
PLUME MANAGEMENT (continued)						
Water Management for Groundwater Control	Use in Mining	Pump untreated water to mine for use	Ineffective; there is no current water need at the Copper Queen Branch	Not technically implementable; no water use is identified; if a water use were identified would require engineering and construction of conveyance. Good administrative implementability; ARS 49-544 allows use; would need to comply with applicable regulations; no permit need identified.	Medium to High	Reject because there is no current mine demand for water
	In-Pit Storage	Store and evaporate water in the Lavender pit	Ineffective; long-term storage is infeasible due to insufficient evaporation capacity, short-term storage and evaporation may be effective	Good technical implementability; requires engineering and construction of conveyance. Good administrative implementability; ARS 49-544 allows use; would need to comply with applicable regulations; no permit need identified.	Medium to High	Reject for long-term water management because of infeasibility; option could be used for short-term storage
	Land Application	Use untreated water for irrigation of crops (e.g., alfalfa and grass hay)	Effective; untreated water is usable for agriculture; land application would consume limited amounts of sulfate; irrigation return would be potential source of sulfate bearing recharge to the aquifer that would need to be considered by sulfate fate and transport modeling; some sulfate removal expected by gypsum precipitation in soil column.	Good technical Implementability; requires construction of irrigation conveyances and facilities; design, construction and operation services are commercially available; crops can be sold in existing markets. Potential for soil clogging by mineral precipitates is an uncertainty. Good administrative implementability; requires an agricultural general use APP.	Medium to High	Retain as potentially applicable beneficial use of water with potential for revenue from crop sales
	Treatment for Use (see Water Treatment)	Treat to meet drinking water standards and identify a consumer market	Potentially effective; reverse osmosis water treatment and disinfection can reliably meet standards for drinking water.	Moderate to good technical implementability; requires construction of treatment, conveyance, and distribution facilities. Uncertain administrative implementability; identification of a consumer market uncertain, potential service areas: Bisbee, Naco, or Sierra Vista; would require development of agreements for use, land access and rights of way, and approval of ADEQ and ACC, depending on location of use may require ADWR and CWA permitting; certain uses may be limited by rights and permits in effect.	High	Retain as potentially applicable; option has potential to minimize net groundwater withdrawal by substituting treated water for groundwater pumped for drinking water supply
		Treat to meet standards for surface water release or aquifer recharge, and develop release/recharge facilities	Potentially effective; reverse osmosis water treatment can reliably meet standards for beneficial use as surface water or groundwater recharge; release/recharge could be implemented outside the sulfate plume or inside the plume for flushing.	Good technical implementability; would require construction of treatment, conveyance, and release/injection facilities. Good to moderate administrative implementability; potential surface water release segments/groundwater recharge areas could include Greenbush Draw and San Pedro River; would require development of agreements for land access and rights of way, and AZPDES, APP, and/or UIC permits; certain end uses may be limited by rights and permits in effect.	High	Retain as potentially applicable; option has potential to augment surface water resources and/or minimize net groundwater withdrawal
	Evaporation of Untreated Water	Evaporate water in constructed ponds or impoundments	Potentially effective; evaporation can dispose of untreated water; evaporation rate would be dependent on evaporation facility area. Option would be highly water consumptive as it would not produce a usable water.	Good technical implementability; would require large pond area for large flow rate; residual brine requires long-term management. Good administrative implementability; would require an APP.	High	Reject due to high water consumption and cost
	Recharge of Untreated Water	Recharge untreated water through ponds or injection wells inside the plume	Poor effectiveness; only low recharge rates possible without increasing groundwater control pumping; recirculates sulfate indefinitely.	Good technical implementability; would require water conveyances and infiltration ponds or injection wells for recharge. Moderate to good administrative implementability; would require ADWR and UIC permit for wells, if used, and APP for operation.	Medium to High	Reject due to poor effectiveness
		Recharge untreated water through ponds or injection wells outside the plume	Poor effectiveness; only low recharge rates possible if the sulfate concentration in the aquifer is to be maintained at 250 mg/L sulfate or less.	Good technical implementability; would require water conveyances and infiltration ponds or injection wells for recharge. Moderate to good administrative implementability; would require ADWR and UIC permit for wells, if used, and APP for operation.	Medium to High	Reject due to poor effectiveness
	Use of Untreated Water by Others	Untreated water could be used by an outside party	Potentially effective; potential uses include recharge in the San Pedro basin, drinking water supply augmentation, or industrial use	Moderate to good technical implementability if a party can be identified for long-term acquisition of the water; could require construction of conveyances. Uncertain administrative implementability; identification of a party to acquire the water is uncertain; project would need to comply with applicable regulations for water use; certain uses may be limited by rights and permits in effect.	High	Retain as potentially applicable; option has potential to conserve or augment water resources

Shading indicates process option retained for alternative development

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TABLE 2
Mitigation Alternatives

ALTERNATIVE	PLUME MANAGEMENT			WATER MANAGEMENT		DRINKING WATER SUPPLY MITIGATION	
	LONG TERM PLUME MONITORING AND EXPANDED GROUNDWATER MONITORING	GROUNDWATER PUMPING TO STABILIZE THE PLUME LOCATION	GROUNDWATER PUMPING TO REDUCE AND THEN STABILIZE THE EXTENT OF THE PLUME	LAND APPLICATION FOR AGRICULTURE	TREATMENT FOR USE AS RECHARGE OR DRINKING WATER	PUBLIC SUPPLIES	PRIVATE WELLS
1A	X					Not needed	Contingency actions if needed: connection to municipal supply, well replacement, RO treatment, or bottled water depending on site conditions
1B	X					Contingency action if needed: RO water treatment	
1C	X					Water supply study to identify alternate water sources. Contingency action if needed: alternative water supply, if feasible	
2		X (840 gpm)			X (840 gpm)	Not needed	Not needed
3		X (900 gpm)		X (900 gpm)		Not needed	Not needed
4			X (2950 gpm for 30 years, 800 gpm thereafter)	X (1350 gpm for 30 years, 800 gpm thereafter)	X (1600 gpm for 30 years, no treatment thereafter)	Not needed	Not needed

Notes:
gpm = gallons per minute
RO = reverse osmosis

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TABLE 3
50-Year Cost Estimates for Mitigation Alternatives

Facilities	Alternative 1A	Alternative 1B*	Alternative 1C**	Alternative 2	Alternative 3	Alternative 4
Wellfield and Pipeline Mechanical, Civil, and Electrical						
Total Capital	$0	$0	$0	$4,681,994	$3,794,679	$12,088,793
Total O&M	$0	$0	$0	$13,062,512	$15,154,420	$20,732,678
Water Treatment and Brine Evaporation						
Total Capital	$0	$0	$0	$47,010,685	$0	$53,002,872
Total O&M	$0	$0	$0	$92,051,726	$0	$70,327,092
Land Application						
Total Capital	$0	$0	$0	$0	$2,621,800	$4,270,500
Total O&M	$0	$0	$0	$0	$4,405,100	$2,146,100
Groundwater Monitoring						
Total Capital	$1,300,000	$1,300,000	$1,300,000	$0	$0	$0
Total O&M	$17,250,000	$17,250,000	$17,250,000	$12,500,000	$12,500,000	$12,500,000
Drinking Water Supply Mitigation						
Total Capital	$540,000	$540,000	$2,340,000	$0	$0	$0
Total O&M	$0	$0	$0	$0	$0	$0
Nondiscounted Capital	**$1,840,000**	**$1,840,000**	**$3,640,000**	**$51,692,679**	**$6,416,479**	**$69,362,165**
Nondiscounted O&M	**$17,250,000**	**$17,250,000**	**$17,250,000**	**$117,614,238**	**$32,059,520**	**$105,705,870**
Nondiscounted Total Cost	**$19,090,000**	**$19,090,000**	**$20,890,000**	**$169,306,917**	**$38,475,999**	**$175,068,035**
Net Present Value of Total Cost	**$7,325,947**	**$7,325,947**	**$8,989,979**	**$64,623,423**	**$16,790,760**	**$92,209,908**

* Contingent costs for RO water treatment not calculated due to their uncertain need. For illustration purposes only, nondiscounted and net present value total costs could be approximately $140 million and $39 million if treatment were triggered in 2023, whereas nondiscounted and net present value total costs could be approximately $82 million and $16 if treatment were triggered in 2043.

** Contingent costs for development of an alternate water source not calculated due to their uncertain need.

Notes:
O&M = Operating and Maintenance

TABLE 4
Comparison of Mitigation Alternatives

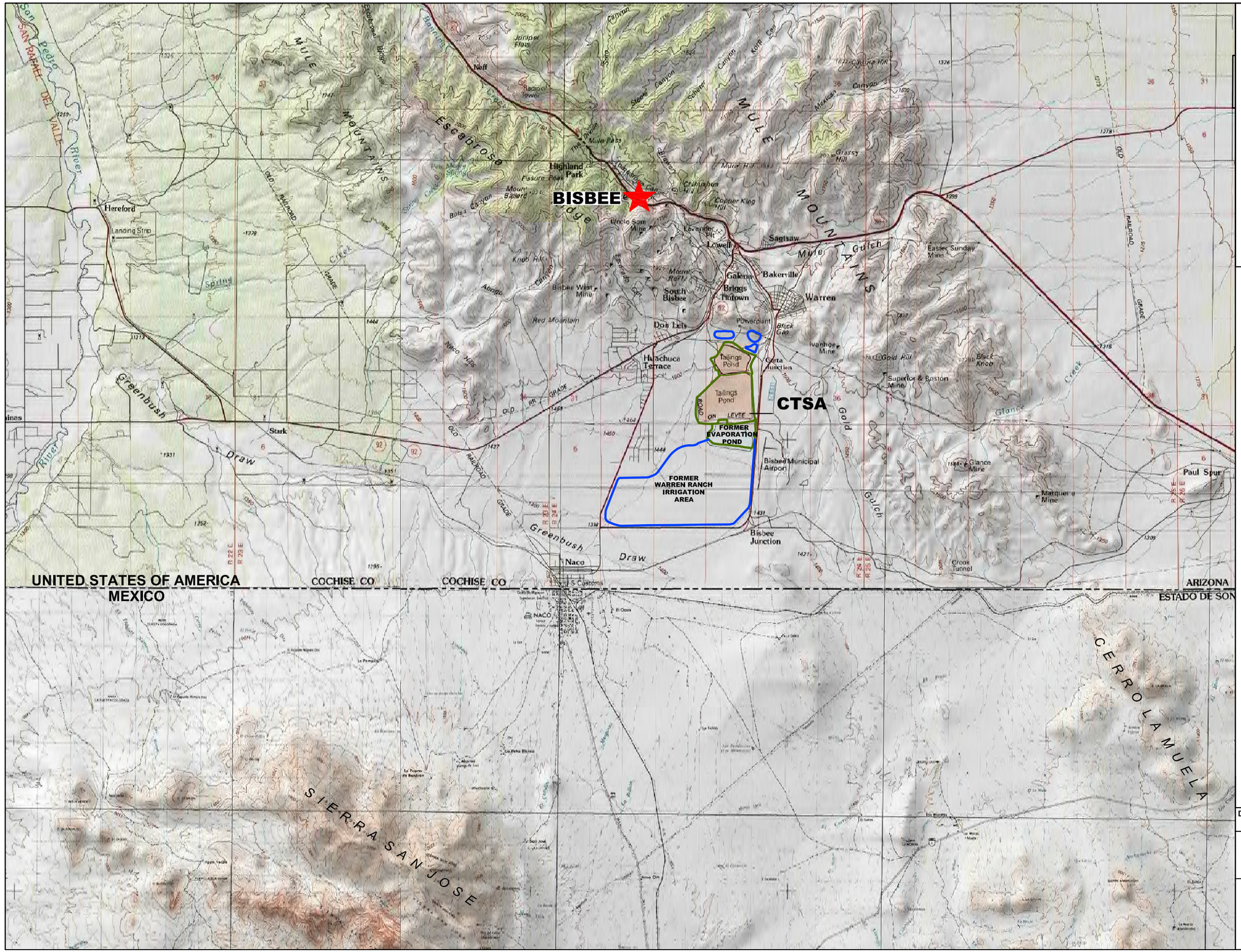
ALTERNATIVE	ACTIONS	EFFECTIVENESS	IMPLEMENTABILITY			50-YEAR COST				ENVIRONMENTAL FACTORS				
		Meets Mitigation Objective?	Technically Implementable	Administratively Implementable	Implementation Timeframe after Mitigation Plan Accepted	Non-Discounted Capital (millions)	Non-Discounted O&M (millions)	Non-Discounted Total (millions)	NPV(50) (millions)	Reduces Plume Extent?	Net Groundwater Extraction from Aquifer Over 50 Years (millions of gallons)	Potential Water Level Decline Due to Mitigation Action	Electricity Use Over 50 Years (millions of kilowatt hours)	Generates Waste Requiring Consumptive Use of Land?
1A	Long Term Plume Monitoring, Expanded Groundwater Monitoring, Annual ADWR Well Registry Review, Drinking Water Supply Mitigation of 3 Private DWS Wells	Yes. Would mitigate private DWS with proven method and use expanded monitoring and contingent mitigation for public DWS, if needed	Yes	Yes	Immediate	1.8	17.3	19.1	7.3	No. Plume migrates into 1.5 mile area of aquifer	0	0	0	No
1B	Long Term Plume Monitoring, Expanded Groundwater Monitoring, Annual ADWR Well Registry Review, Drinking Water Supply Mitigation of 3 Private DWS Wells, and Contingent Mitigation of Public DWS with RO Treatment	Yes. Would mitigate private DWS with proven method and use expanded monitoring and contingent mitigation by RO for public DWS, if needed	Yes	Yes	Immediate	1.8*	17.3*	19.1*	7.3*	No. Plume migrates into 1.5 mile area of aquifer	0***	0***	0***	No***
1C	Long Term Plume Monitoring, Expanded Groundwater Monitoring, Annual ADWR Well Registry Review, Water Supply Study, Drinking Water Supply Mitigation of 3 Private DWS Wells, and Contingent Mitigation of Public DWS with Alternate Water Supply	Yes. Would mitigate private DWS with proven method and use expanded monitoring and contingent mitigation by alternate water supply for public DWS, if feasible and needed	Yes	Yes	Immediate	3.6**	17.3**	20.9**	9.0**	No. Plume migrates into 1.5 mile area of aquifer	0	0	0	No
2	Plume Stabilization, Water Treatment for Release to Greenbush Draw, Groundwater Monitoring, Annual ADWR Well Registry Review	Yes. Would use groundwater pumping to prevent plume migration to DWS wells	Yes	Yes	36 Months	51.7	118	169	64.6	Yes. Western plume edge remains the same, but the southern edge recedes northward	3,300	30 Years: 15 to 25 feet in vicinity of wellfield; 3 to 5 feet at AWC and NWC wells 50 Years: 15 to 30 feet in vicinity of wellfield; 4 to 6 feet at AWC and NWC wells	153	Yes
3	Plume Stabilization, Land Application, Groundwater Monitoring, Annual ADWR Well Registry Review	Yes. Would use groundwater pumping to prevent plume migration to DWS wells	Yes	Yes	24 Months	6.4	32.1	38.5	16.8	Yes. Western plume edge remains the same, but the southern edge recedes northward	20,000	30 Years: 15 to 25 feet in vicinity of wellfield; 7 to 9 feet at AWC and NWC wells 50 Years: 18 to 24 feet in vicinity of wellfield; 8 to 10 feet at AWC and NWC wells	56	No
4	Plume Reduction and Stabilization, RO Treatment for Release to Greenbush Draw, Land Application, Groundwater Monitoring, Annual ADWR Well Registry Review	Yes. Would use groundwater pumping to prevent plume migration to DWS wells	Yes	Yes	36 Months	69.4	106	175	92.2	Yes. Groundwater pumping reduces plume footprint to CQB property over time	29,000	30 Years: 58 to 80 feet in vicinity of wellfield; 14 to 24 feet at AWC and NWC wells; 50 Years: 24 to 32 feet in vicinity of wellfield; 14 to 16 feet at AWC and NWC wells	254	Yes

Notes:
LTPM = Long Term Plume Monitoring
RO = Reverse Osmosis
DWS = Drinking Water Supply
O&M = Operating and Maintenance
NPV (50) = 50-Year Net Present Value
AWC = Arizona Water Company
NWC = Naco Water Company
CQB = Copper Queen Branch

* Contingent costs for RO water treatment not calculated due to their uncertain need. For illustration purposes, the nondiscounted and net present value total costs could be approximately are $89 million and $26 million if treatment were triggered in 2023, whereas nondiscounted and net present value total costs could be approximately $55 million and $12 if treatment were triggered in 2043.
** Contingent costs for development of an alternate water source not calculated due to their uncertain need.
***If contingent mitigation action were triggered, the environmental factors for Alternative 1B would develop similar to Alternative 2.

CLEAR CREEK ASSOCIATES

FIGURES



LEGEND

CTSA FACILITY

FACILITY DISCUSSED IN TEXT

SCALE

0 1 2 MILES

0 6000 12000 FEET

Date	File ID
07/29/2013	055038-106

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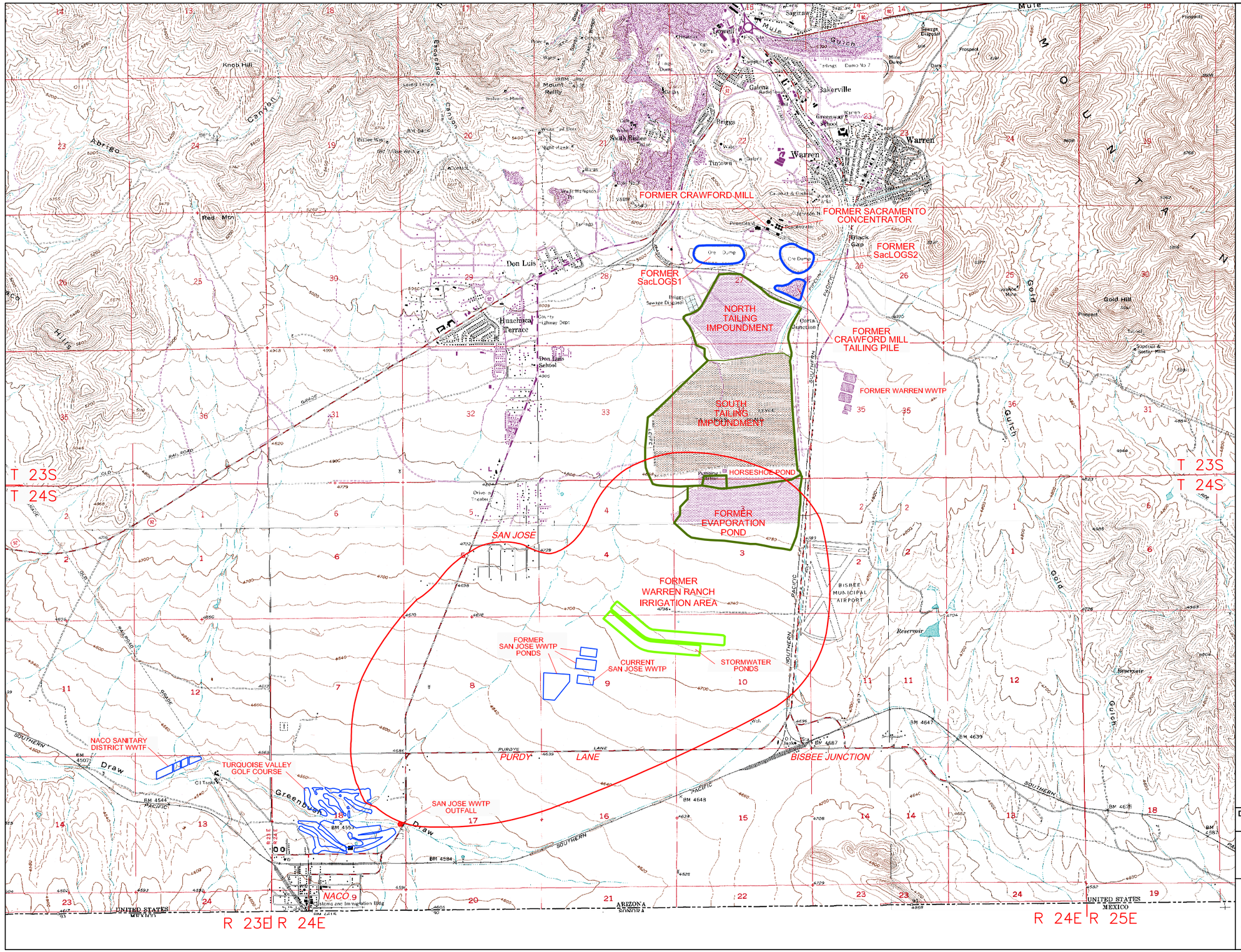
FIGURE 1
LOCATION MAP
BISBEE - NACO AREA



LEGEND

- CTSA FACILITY
- FACILITY DISCUSSED IN TEXT
- ESTIMATED 250 mg/L SULFATE CONCENTRATION CONTOUR, Q1 2013
- STORMWATER POND

SCALE (FEET)

0 4000 8000

MAP SOURCE: USGS 7.5 MIN QUADS: BISBEE, BISBEE NE, BISBEE SE, AND NACO, ARIZONA. NAD 27 ZONE 12 CENTRAL, METERS

Date	File ID
05/01/2014	055038-107

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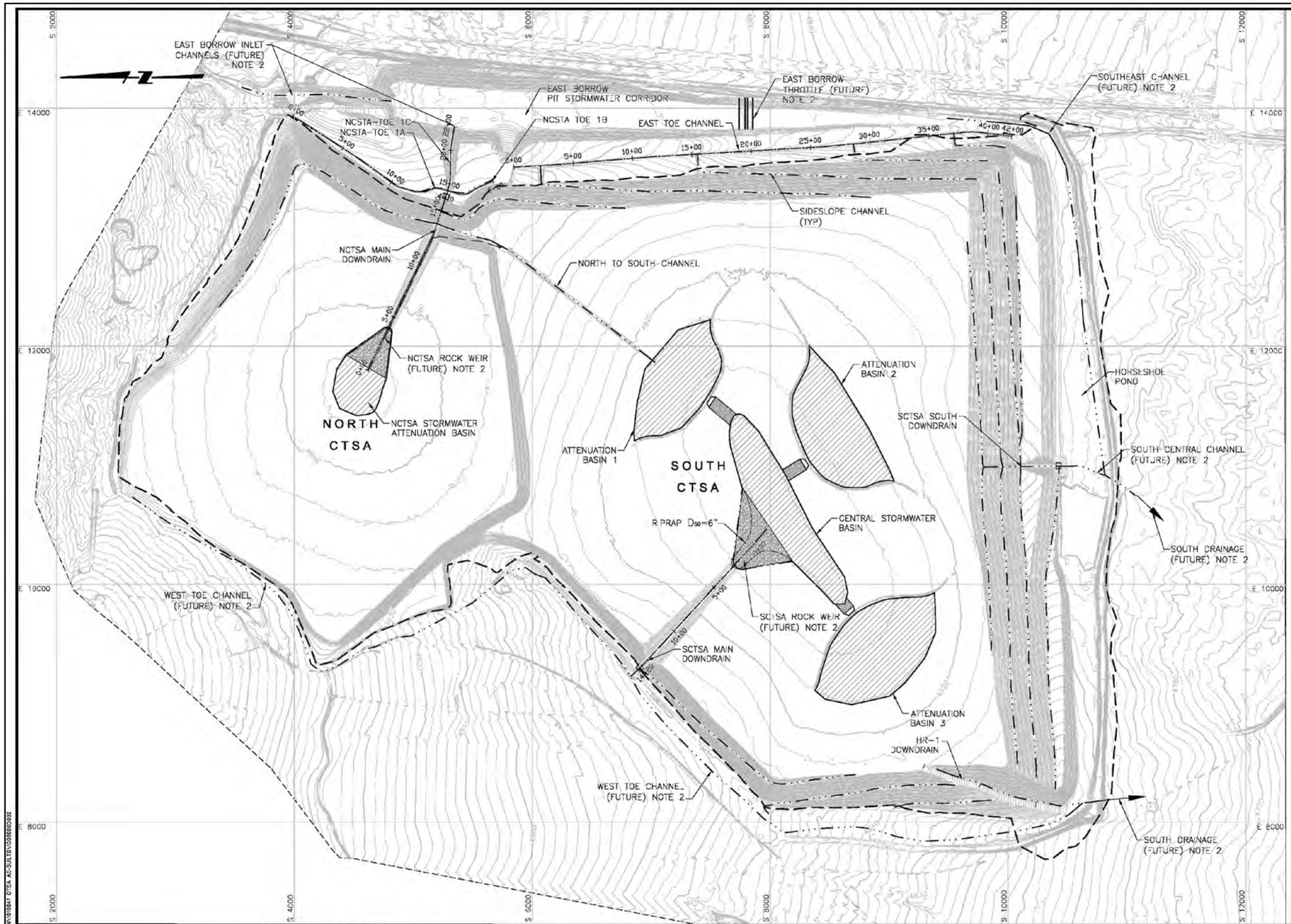
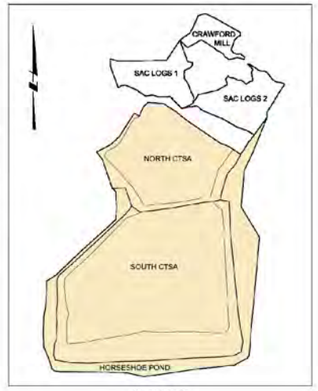
FIGURE 2A
FACILITIES IN THE VICINITY OF THE CONCENTRATOR TAILING STORAGE AREA





KEY MAP
N.T.S.

LEGEND:

- RECORD FINAL GRADE CONTOUR AND ELEVATION, FEET
- FACILITY BOUNDARY
- 40+00 — CHANNEL ALIGNMENT AND STATION, FEET
- LINED AREA
- 1/20 — DETAIL NUMBER / SHEET REFERENCED

NOTES:

1. THE CTSA RECORD DRAWINGS WERE PREPARED USING RECORD TOPOGRAPHY PROVIDED BY FCX ON 03/22/2013. THE RECORD DRAWINGS CONSIDER OBSERVATIONS MADE IN THE FIELD, REQUESTS FOR INFORMATION, SUBMITTALS ISSUED, AND DESIGN CHANGES DURING CONSTRUCTION.
2. REFERENCE CTSA AREA STORMWATER MANAGEMENT DESIGN DRAWINGS FOR DETAILS REGARDING FUTURE FACILITIES.

PLAN
SCALE
400 0 400 800 FEET
CONTOUR INTERVAL = 2 FEET

REV	DESCRIPTION	TECH	ENG	DATE
R0	RECORD DRAWING	RNW	PJH	11/08/13

DISCLAIMER
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DRAWING REFERENCE:

Stephen J. Taylor 20810 Registered Professional Engineer 5-8-13
Expires 3-31-16

DESIGNED BY	P. HOHVAITH	11/08/13
DRAWN BY	R. WOOLSEY	11/08/13
CHECKED BY	S. TAYLOR	11/08/13
APPROVED BY	S. TAYLOR	11/08/13
PROJECT MANAGER	S. TAYLOR	11/08/13
CLIENT APPROVAL		
CLIENT REFERENCE NO.		

FREEPORT-McMoRAN COPPER & GOLD INC.

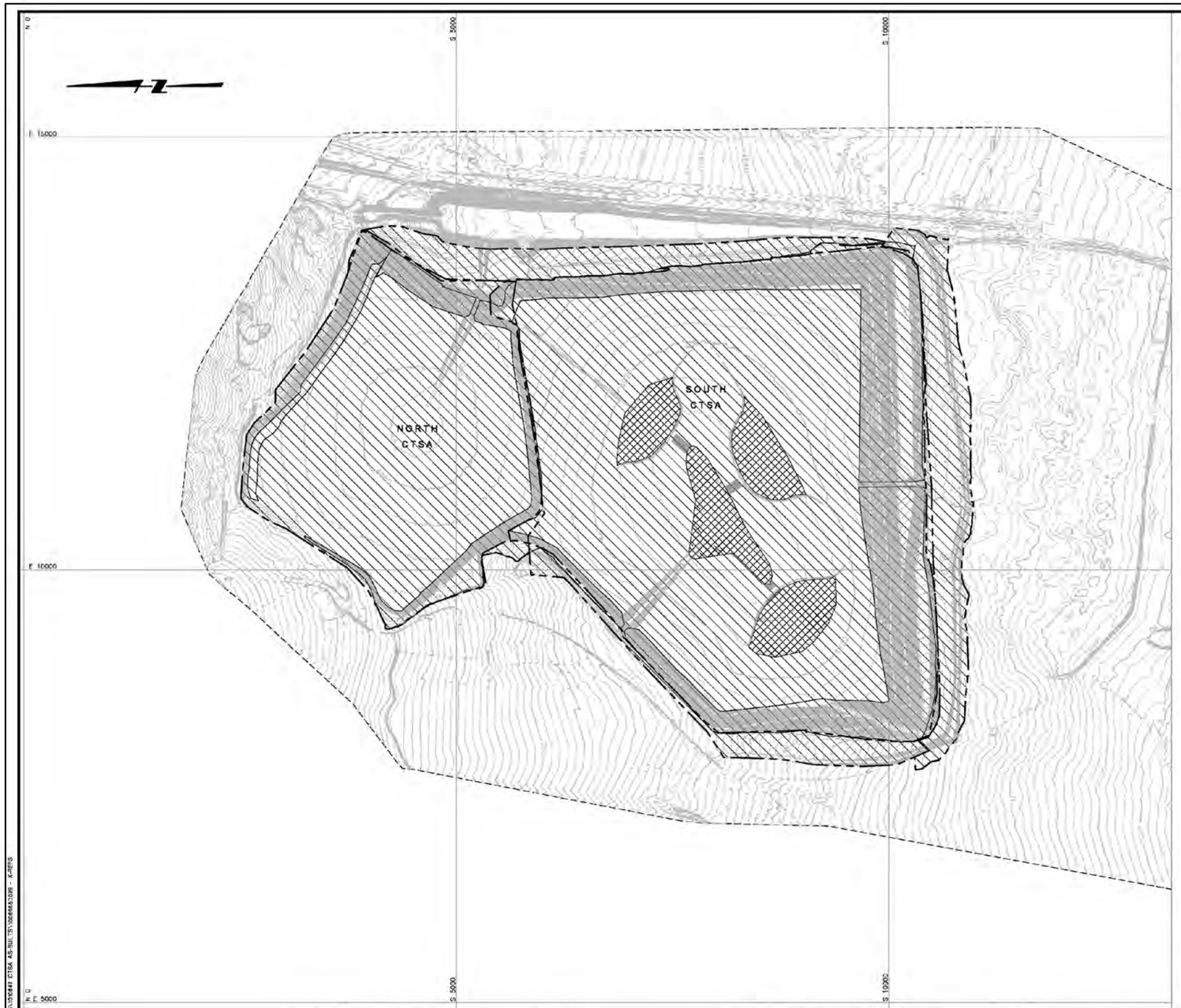
PROJECT LOCATION: COPPER QUEEN MINE
PROJECT: COPPER QUEEN CTSA TEST RECLAMATION PLAN
TITLE: OVERALL STORM WATER MANAGEMENT PLAN
SHEET: 3 of 26
REVISION: R0
FILE NAME: 1006666D032

MWH

Date: 5/12/14
File ID: 055038-363

FIGURE 2B
STORMWATER MANAGEMENT PLAN
NORTH & SOUTH TAILING IMPOUNDMENTS

Y:\Data\FREEPORT McMORAN\1006647 CTSA AS-BUILTS\1006666D032



LEGEND:

- RECORD FINAL GRADE SURFACE CONTOUR AND ELEVATION, FEET
- FACILITY BOUNDARY
- TYPE I SEED
- TYPE II SEED (+DTUR)

NOTES:

1. THE CTSA RECORD DRAWINGS WERE PREPARED USING RECORD TOPOGRAPHY PROVIDED BY FOX ON 03/22/2013. THE RECORD DRAWINGS CONSIDER OBSERVATIONS MADE IN THE FIELD, REQUESTS FOR INFORMATION SUBMITTALS ISSUED, AND DESIGN CHANGES DURING CONSTRUCTION.

Type II Seed Mix

Common Name	Scientific name	Pure Live Seeding Rate (lb/ac)
Yellow sweet clover	*Melilotus officinalis*	0.25
White sweet clover	*Melilotus alba*	0.75
Deergrass	*Muhlenbergia rigen*	0.01
Inland salt grass	*Distichlis spicata*	0.01
Indian rice grass	*Oryzopsis hymenoides*	0.5
Hooker evening primrose	*Oenothera elata*	0.05
Sand dropseed	*Sporobolus cryptandrus*	0.01
White clover	*Trifolium repens*	0.05
White prairie clover	*Dalea candida*	0.1
Firecracker penstemon	*Penstemon eatonii*	0.05
Palmer penstemon	*Penstemon palmeri*	0.05
Arroyo lupine	*Lupinus succulentus*	1
Curly mesquite	*Hilaria belangeri*	0.1
Tobosa grass	*Pleuraphis mutica*	0.5
Alkali sacaton	*Sporobolus airoides*	0.05
Indian paintbrush	*Castilleja spp.*	0.01
Gilamonth	*Ellenbergia spp.*	0.05
Broadleaf cattails	*Typha latifolia*	0.005
Sixweeks	*Sporobolus wrightii*	0.05
Arizona Cottontop	*Trichachne californica*	0.1
Wintertitis	*Krascheninnikovia lanata*	0.5
Lime Beardgrass	*Andropogon barbinodis*	0.1
Purple Threeawn	*Aristida purpurea*	0.1
Sideoats grama	*Bouteloua curtipendula*	0.2
Buffalo grass	*Bouteloua dactyloides*	0.3
Plains Bristle grass	*Setaria macrostachya*	0.2
Alkalibull nush	*Scirpus californicus*	0.5
Baltic rush	*Juncus balticus*	0.05
Tufted hairgrass	*Deschampsia cespitosa*	0.05
Bentgrass	*Calamagrostis spp.*	0.01
Slough grass	*Beckmannia syzigachne*	0.1
Arizona rosewood	*Vauquelinia californica*	0.5
Fourwing saltbush	*Atriplex canescens*	0.5
Quail bush	*Atriplex lentiformis*	0.1
Alkali grass	*Puccinellia spp.*	0.1
Totals		6.5

KEY MAP
N.T.S.

Type I Seed Mix

Common Name	Scientific Name	Percent of Total Mixture (%)
James' Galleta	*Pleuraphis jamesii*	3.5
Sweet acacia	*Acacia smallii*	10.0
Sideoats grama, Vaughn	*Bouteloua curtipendula* (Vaughn)	10.0
Blue grama, alma	*Bouteloua gracilis* (alma)	2.5
Fourwing salt bush	*Atriplex canescens*	10.0
Velvet mesquite	*Prosopis velutina*	1.0
White Doon acacia	*Acacia constricta*	2.5
Purple threeawn	*Aristida purpurea*	2.5
rothrock grama	*Bouteloua barbata* var. *rothrockii*	1.0
green sprangletop	*leptochloa dubia*	2.5
Sand dropseed	*Sporobolus cryptandrus*	0.5
Bottle brush	*Emorella frankwoodii* A. Gray.	20.0
Quail bush	*Atriplex lentiformis*	2.0
Curly-mesquite	*Hilaria belangeri*	0.5
Desert abdominalis	*Sphaeralcea ambigua*	2.0
Plains bristlegrass	*Setaria macrostachya*	1.0
Needle grama	*Bouteloua aristidoides*	5.0
Desert senna	*Senna covesii*	2.5
Catclaw acacia	*Acacia gregii*	2.0
Cattle saltbush	*Atriplex polycarpa*	1.0
Triangle leaf bursage	*Ambrosia deltoidea*	2.0
Desert marigold	*Baileya multiradiata*	1.0
Bottle brush Squirreltail	*Elymus elymoides*	10.0
Alkali Sacaton	*Sporobolus airoides*	4.0

PLAN
SCALE
500 0 600 1200 FEET
CONTOUR INTERVAL = 2 FEET

REV	DESCRIPTION	RNW	PJH	DATE
R0	RECORD DRAWING	RNW	PJH	11/08/13

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DRAWING REFERENCE:

DESIGNED BY	P. HORVATH	11/08/13
DRAWN BY	R. WOOLSEY	11/08/13
CHECKED BY	S. TAYLOR	11/08/13
APPROVED BY	S. TAYLOR	11/08/13
PROJECT MANAGER	S. TAYLOR	11/08/13
CLIENT APPROVAL		
CLIENT REFERENCE NO		

FREEPORT-McMoRAN COPPER & GOLD INC.

PROJECT LOCATION: COPPER QUEEN MINE
PROJECT: COPPER QUEEN CTSA TEST RECLAMATION PLAN
TITLE: NORTH AND SOUTH CTSA - COVER AND REVEGETATION PLAN

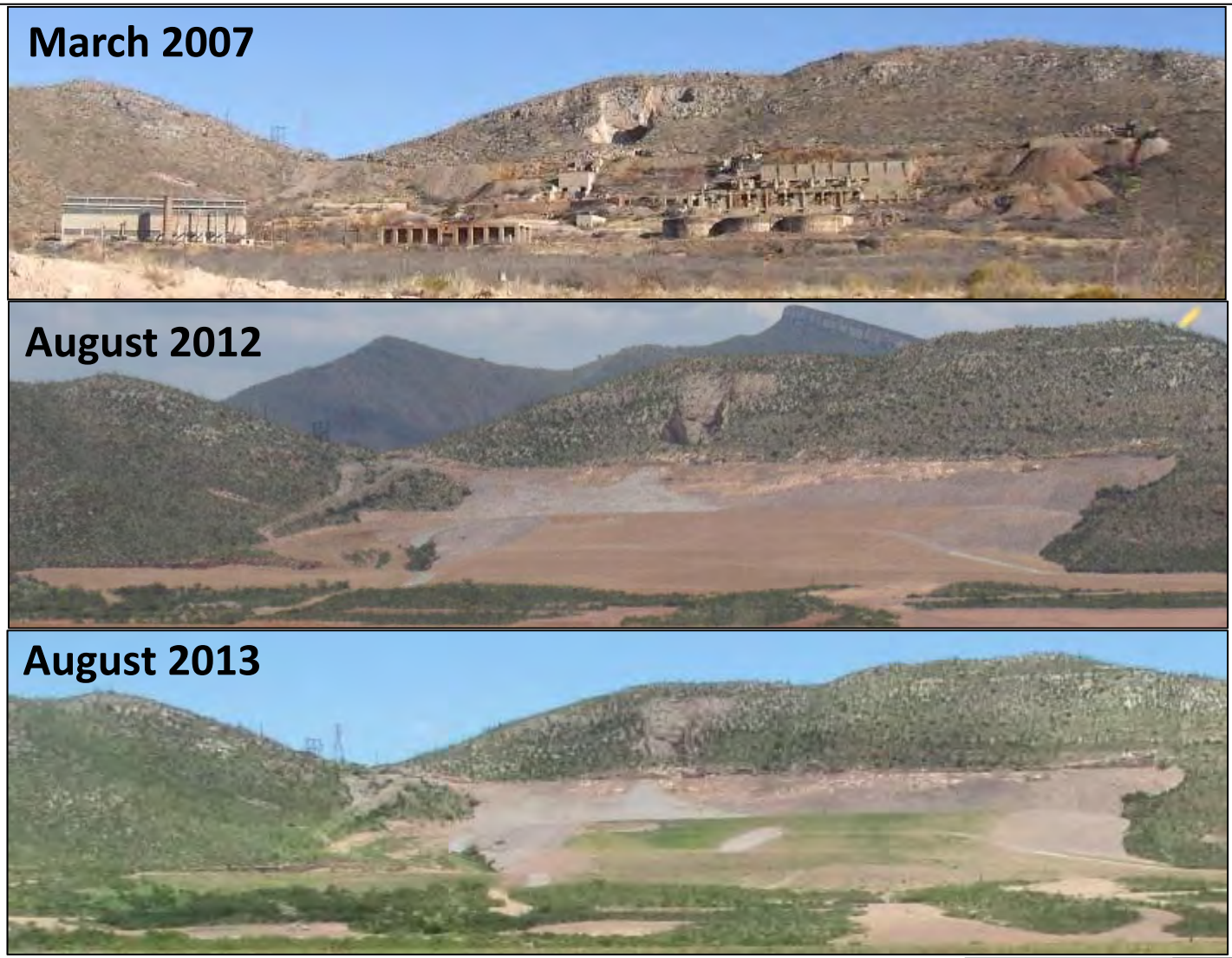
MWH

SHEET: 24 of 26
REVISION: R0
FILE NAME: 1006666D029

Date: 5/12/14
File ID: 055038-363B

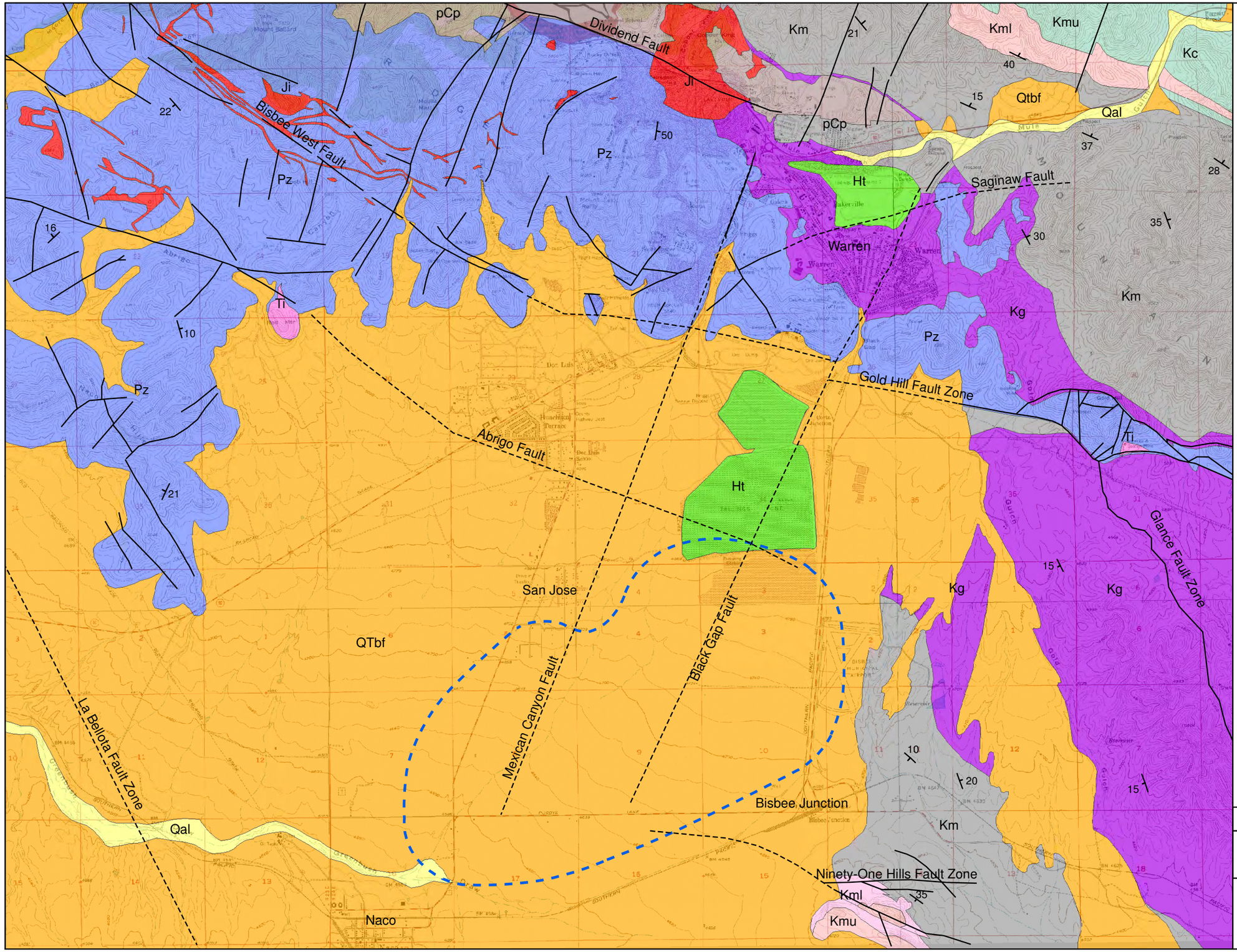
FIGURE 2C
COVER AND REVEGETATION PLAN
NORTH & SOUTH TAILING IMPOUNDMENTS

Y:\Data\V\FREEPORT MAPDATA\1006640 CTSA AS-BUILT\1006640-1026 - X-REFS



CLEAR CREEK ASSOCIATES	File ID
	Date 5/2/14

FIGURE 2D
PHOTOGRAPHS OF
CRAWFORD MILL AREA



LEGEND

RECENT ALLUVIUM

- Ht — HOLOCENE MINE MATERIAL AND TAILINGS
- Qal — QUATERNARY ALLUVIUM

BASIN FILL

- QTbf — QUATERNARY - TERTIARY BASIN FILL

BEDROCK COMPLEX

- Ti — TERTIARY INTRUSIVE

CRETACEOUS BISBEE GROUP

- Kc — CINTURA FORMATION
- Kmu — UPPER MURAL LIMESTONE
- Kml — LOWER MURAL LIMESTONE
- Km — MORITA FORMATION
- Kg — GLANCE CONGLOMERATE

- Ji — JURASSIC INTRUSIVE COMPLEX
- Pz — PALEOZOIC SEDIMENTARY FORMATIONS, UNDIFFERENTIATED
- pCp — PRECAMBRIAN PINAL SCHIST

FAULT (DASHED WHERE INFERRED)

250 mg/L SULFATE CONCENTRATION CONTOUR Q1 2013

37 — STRIKE AND DIP OF BEDDING

SOURCES:
GEOLOGY FROM HAYES AND LANDIS (1964)
FAULT PROJECTIONS FROM SET (1998c)
GLANCE AND LA BELLOTA FAULTS FROM ANDERSON AND NOURSE (2005)

Scale (Feet)

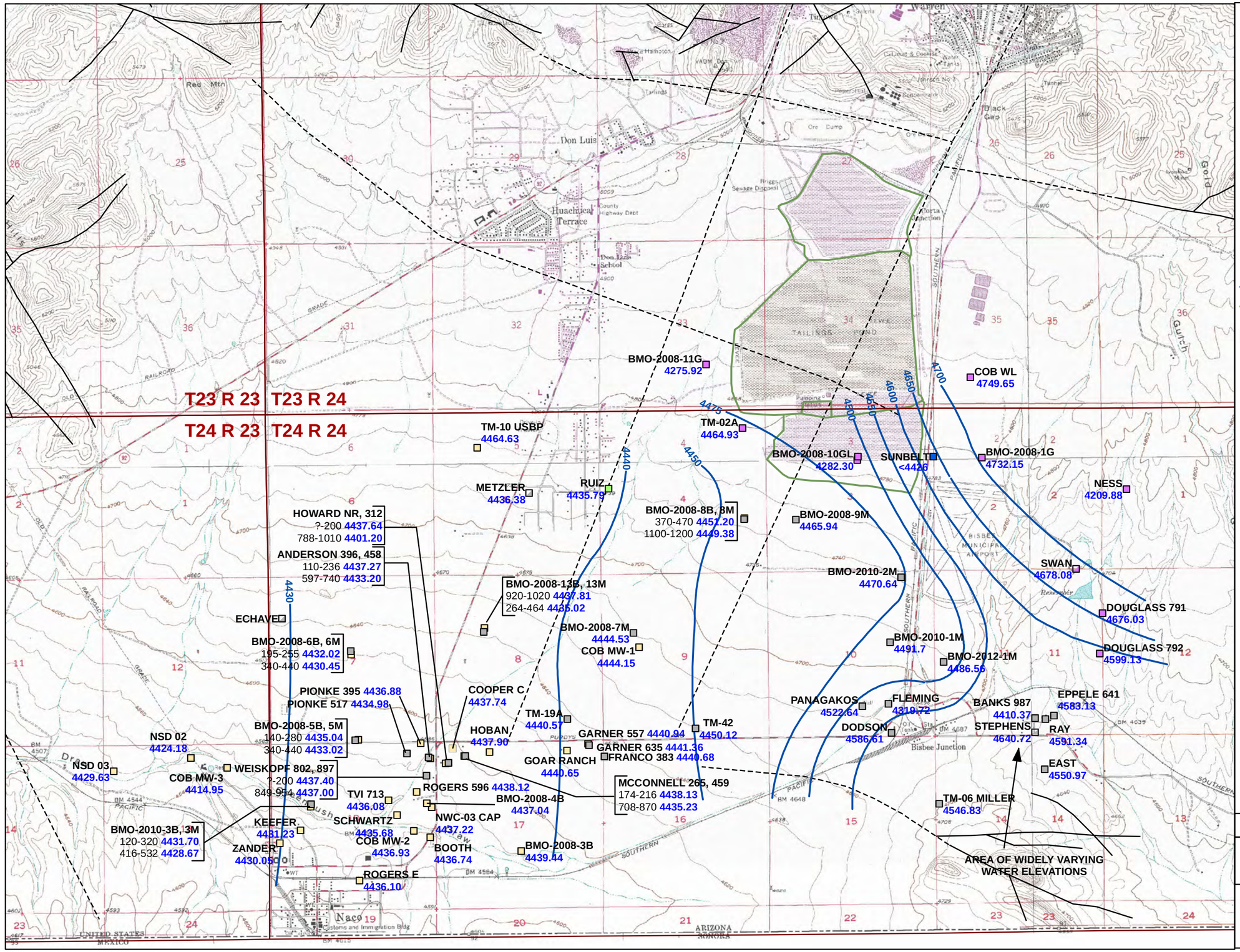
0 — 4,000 — 8,000

Notes:
Projection: UTM Zone 12N NAD83

Date	File ID
07/29/2013	055038-108

CLEAR CREEK ASSOCIATES

FIGURE 3
GEOLOGICAL MAP OF THE CTSA AND VICINITY

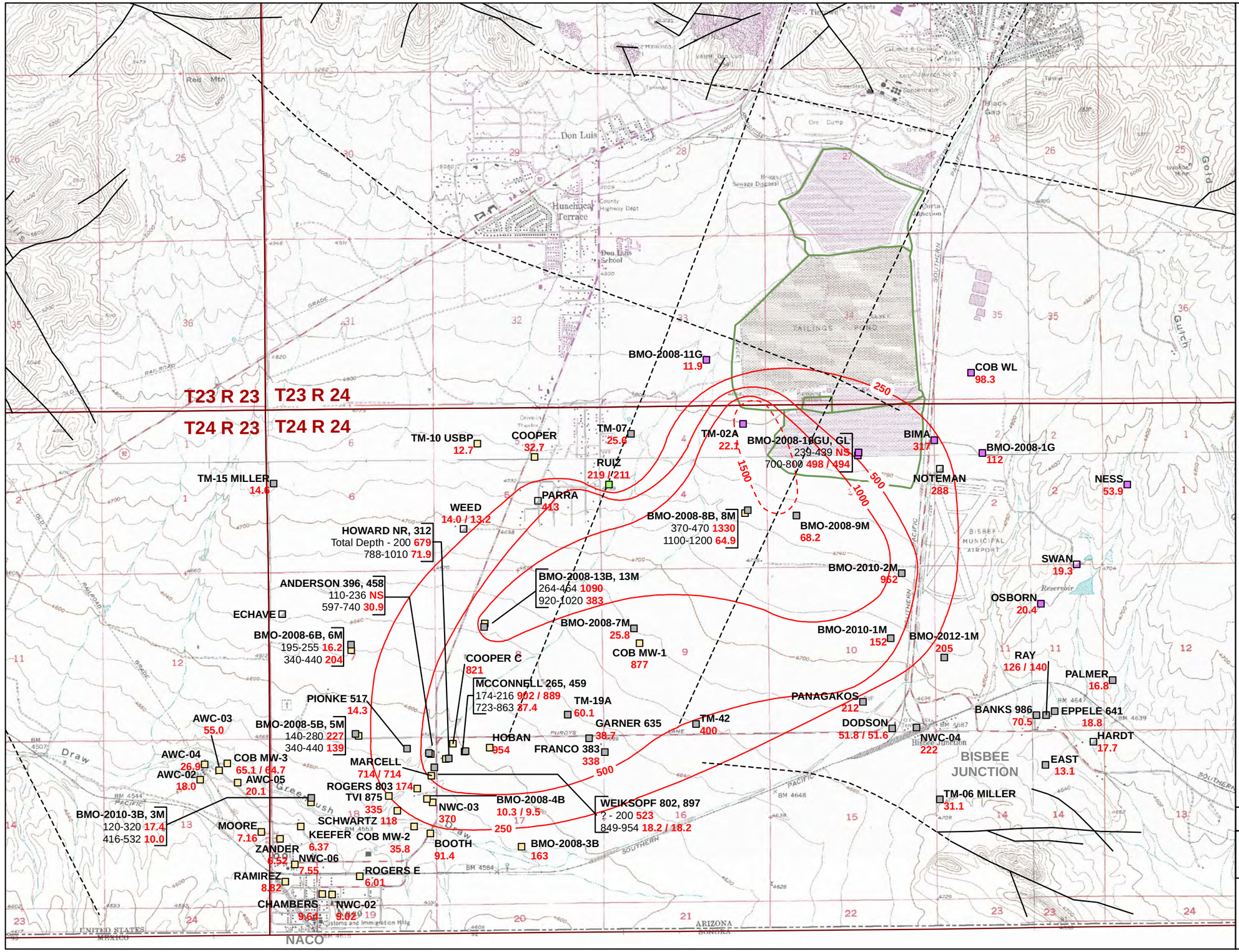


Notes:

Projection: UTM Zone
12N NAD83
amsl = above mean sea level
bls = below land surface
Groundwater elevation contour intervals are irregular. The intervals were chosen to show hydraulic gradient across the study area while maintaining the legibility of the data.

Date	File ID
4/16/13	055038-237B

FIGURE 4
GROUNDWATER ELEVATIONS
FOR FIRST QUARTER 2013



Legend

- RAY — Well ID
- 126 / 140 — SO4 Concentration (mg/L)

Co-located Wells
- Well ID
- Screen (ft bgs): Sulfate Levels (mg/L)

Screened Formation
- Basin Fill
- Basin Fill and Undifferentiated Bisbee Group
- Undifferentiated Bisbee Group
- Undifferentiated Bisbee Group - Estimated
- Undifferentiated Bisbee Group and Glance Conglomerate
- Glance Conglomerate
- Glance Conglomerate-Estimated

Undifferentiated Bisbee Group: Cintura, Mural Limestone, and Morita Formations

- Estimated Sulfate Concentration Contours Q1 2013 (mg/L)
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

0 — 3,000 — 6,000

Notes:

Projection: UTM Zone 12N NAD83
NS = Not Sampled
mg/L = milligrams per liter
In areas where no data were collected in the first quarter, contours are based on third quarter 2012 data.

Date	File ID
4/17/13	055038-252B

FIGURE 5
SULFATE CONCENTRATIONS IN GROUNDWATER FOR FIRST QUARTER 2013

T23 R 23 T23 R 24

T24 R 23 T24 R 24

GROUNDWATER FLOW DIRECTION

Legend

Well

- Drinking Water Supply Well
- Drinking Water Well Installed Below Plume
- Treated Drinking Water Supply Well
- Water Supply Well With Bottled Water

Estimated 250 mg/L Sulfate Concentration Contour Q1 2013

Well Inventory Area

CQB Property Boundary

CTSA Facility

Township and Range

Fault (Dashed Where Inferred)

Scale (Feet)

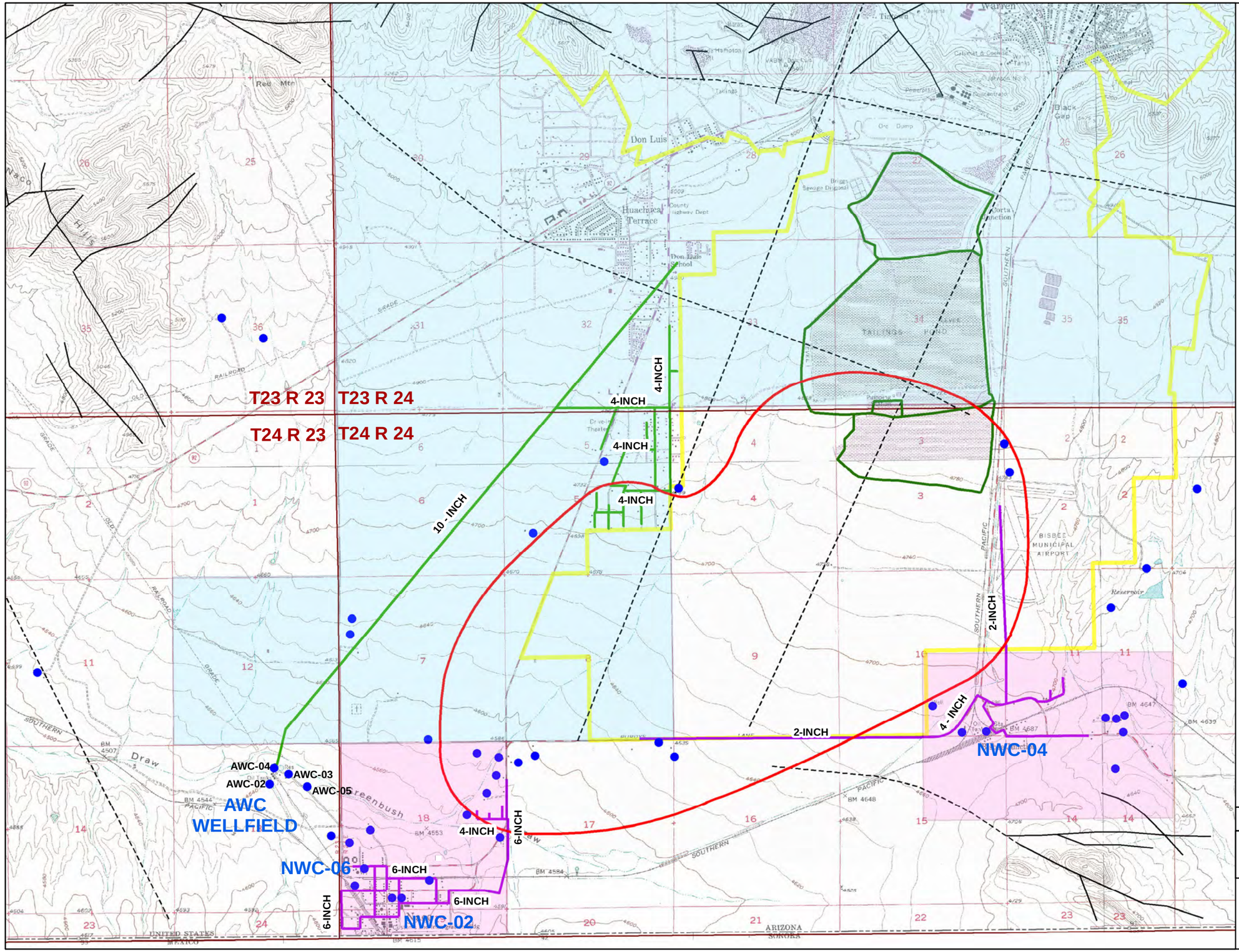
0 3,000 6,000

Notes:

Drinking water supply wells show include wells within and to the west of the Well Inventory Area
Projection: UTM Zone 12N NAD83

Date	File ID
7/21/13	055038-288

FIGURE 6
DRINKING WATER SUPPLY WELLS IN THE VICINITY OF THE SULFATE PLUME



Legend

- Arizona Water Company Service Area
- Naco Water Company Service Area
- NWC Pipeline
- AWC Pipeline
- Drinking Water Supply Well
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

0 3,000 6,000

Notes:

Projection: UTM Zone 12N NAD83

Date	File ID
4/29/2014	055038-178C

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FIGURE 7
SERVICE AREA MAP
FOR AWC AND NWC

T23 R 23 T23 R 24

T24 R 23 T24 R 24

Former San Jose WWTP

Stormwater Ponds

San Jose WWTP Discharge to Greenbush Draw

Warren Ranch Irrigation District

TVI Golf Course

Ejido Naco Agricultural Area

Legend

- Numerical Model Domain
- Selected Numerical Model Recharge Areas
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- Model Pumping Wells
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

0 4,000 8,000

NOTES:
Projection: UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-306A

CLEAR CREEK ASSOCIATES

FIGURE 8
NUMERICAL MODEL DOMAIN

T23 R 23 T23 R 24

T24 R 23 T24 R 24

Legend

Current Model Head Targets

Number of Values

- 1 - 5
- 6 - 10
- 11 - 20
- 21 - 50
- 51 - 103

- Inactive Cells
- Numerical Model Domain
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

0 4,000 8,000

NOTES:
Projection: UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-308

CLEAR CREEK ASSOCIATES

FIGURE 9
WATER LEVEL TARGET LOCATIONS

T23 R 23 T23 R 24

T24 R 23 T24 R 24

Legend

Count of Sulfate Targets

- 1 - 5
- 6 - 10
- 11 - 20
- 21 - 30
- 31 - 82

- Inactive Cells
- Numerical Model Domain
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

0 4,000 8,000

NOTES:
Projection: UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-298

CLEAR CREEK ASSOCIATES

FIGURE 10
SULFATE CONCENTRATION TARGET LOCATIONS

T23 R 23 T23 R 24

T24 R 23 T24 R 24

AWC-03
AWC-04
AWC-02
AWC-05
TVI 875
TVI 236
NWC-06
NWC-02
NWC-04
UN-1
UN-4
UN-3
UN-2
UN-5
EN-06
EN-05
EN-02
EN-03
EN-01

SONORA
ESTADOS UNIDOS MEXICANOS
ARIZONA

Legend

Updated Pumping Rates for Model

- Rates Same as 2008 (Private, Domestic, and Stock Wells)
- Values Updated for 1998 to 2010
- Values Updated for 2008 to 2011
- Rates Re-Evaluated with No Changes
- Inactive Cells
- Numerical Model Domain
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

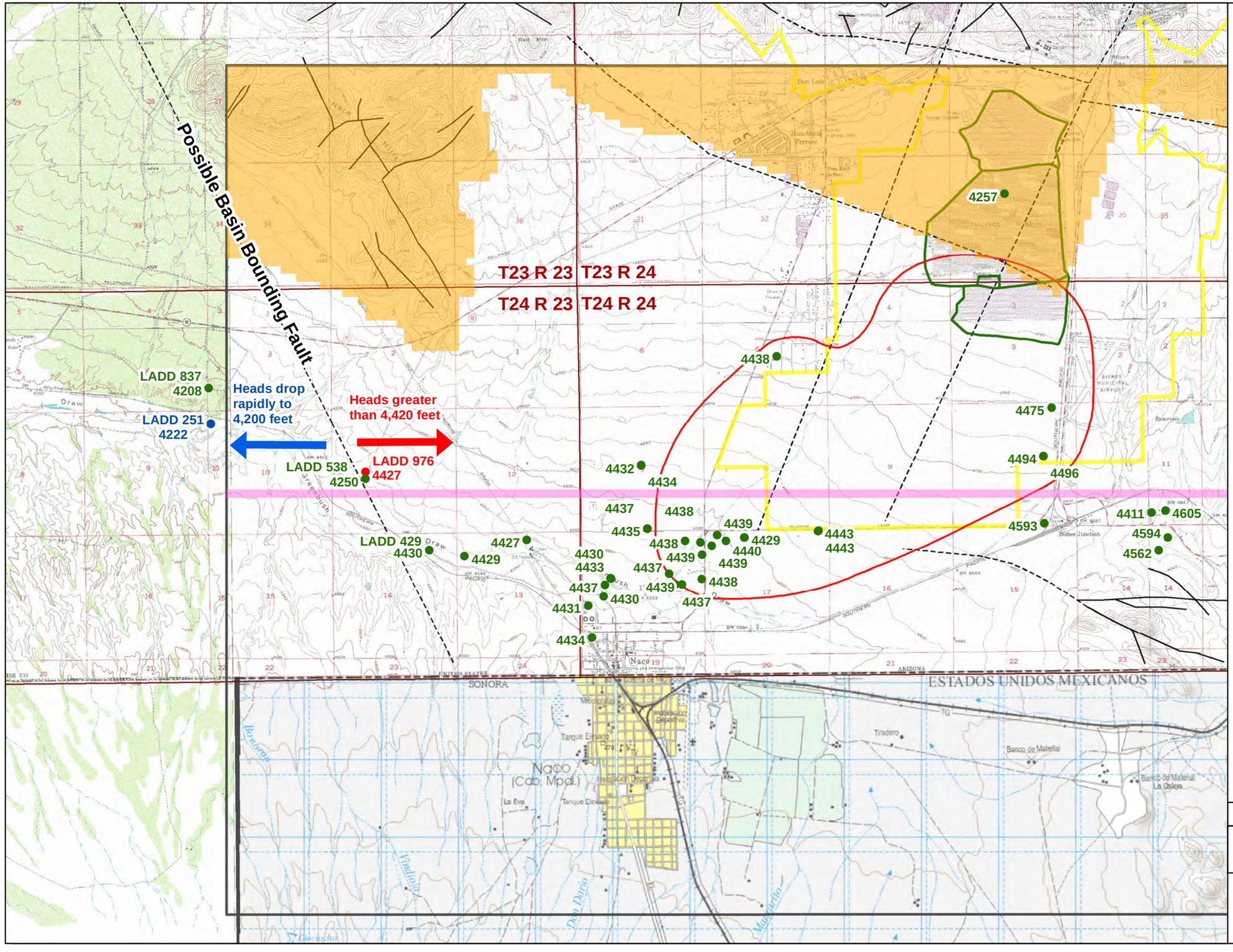
0 4,000 8,000

NOTES:
Projection: UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-299

CLEAR CREEK ASSOCIATES

FIGURE 11
WELLS WITH UPDATED PUMPING RATES



Legend

- Water Level Measurement from 1985 (ft amsl)
- September 2011 Water Levels (ft amsl)
- June 2013 Water Levels (ft amsl)
- Cross Section Shown on Figure 13
- Inactive Cells
- Numerical Model Domain
- Estimated 250 mg/L Sulfate Concentration Contour for Q1 2013
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

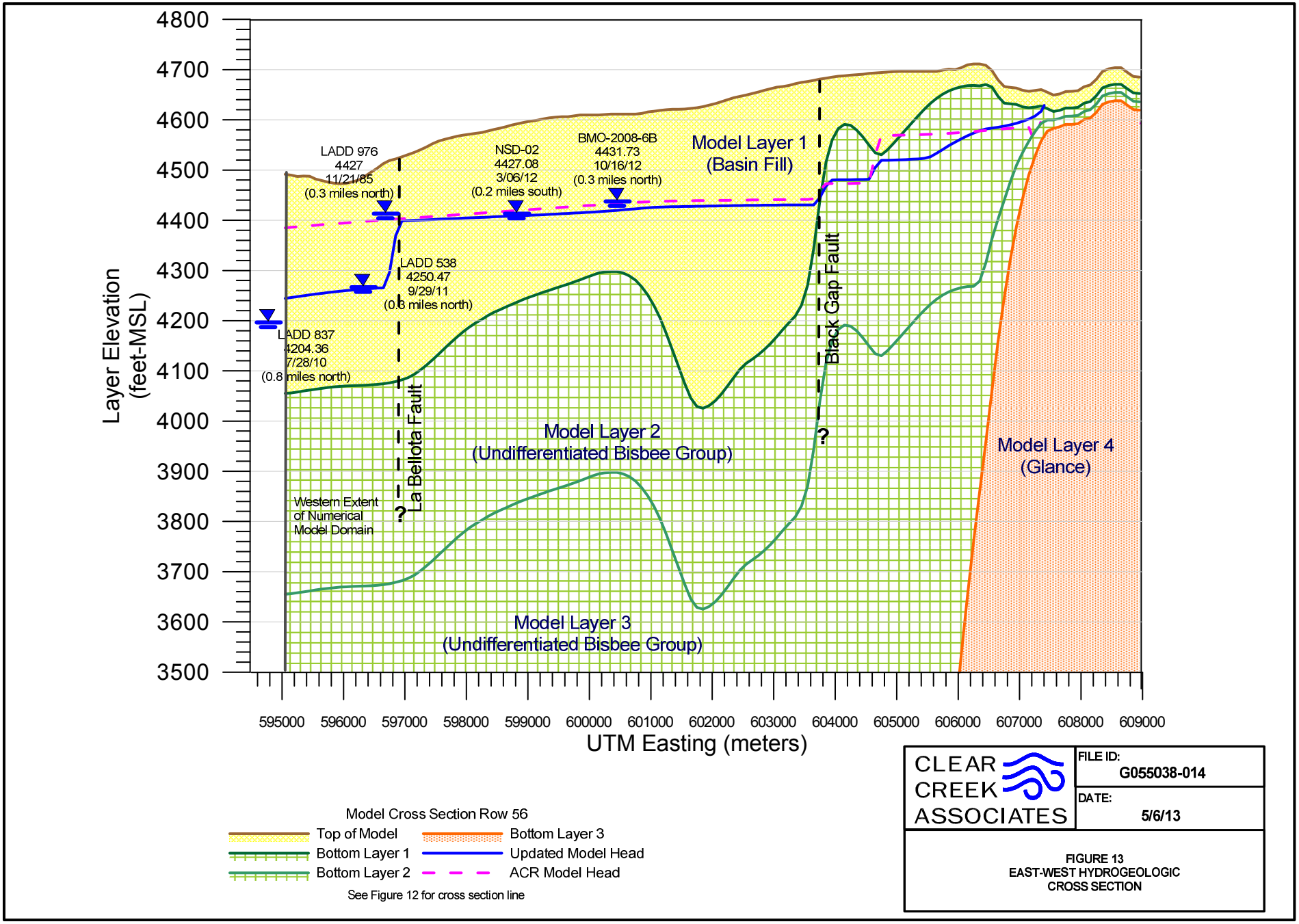
0 4,000 8,000

NOTES:
Projection: UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-301

CLEAR CREEK ASSOCIATES

FIGURE 12
WATER LEVEL RELATIONSHIPS AT WESTERN MODEL BOUNDARY

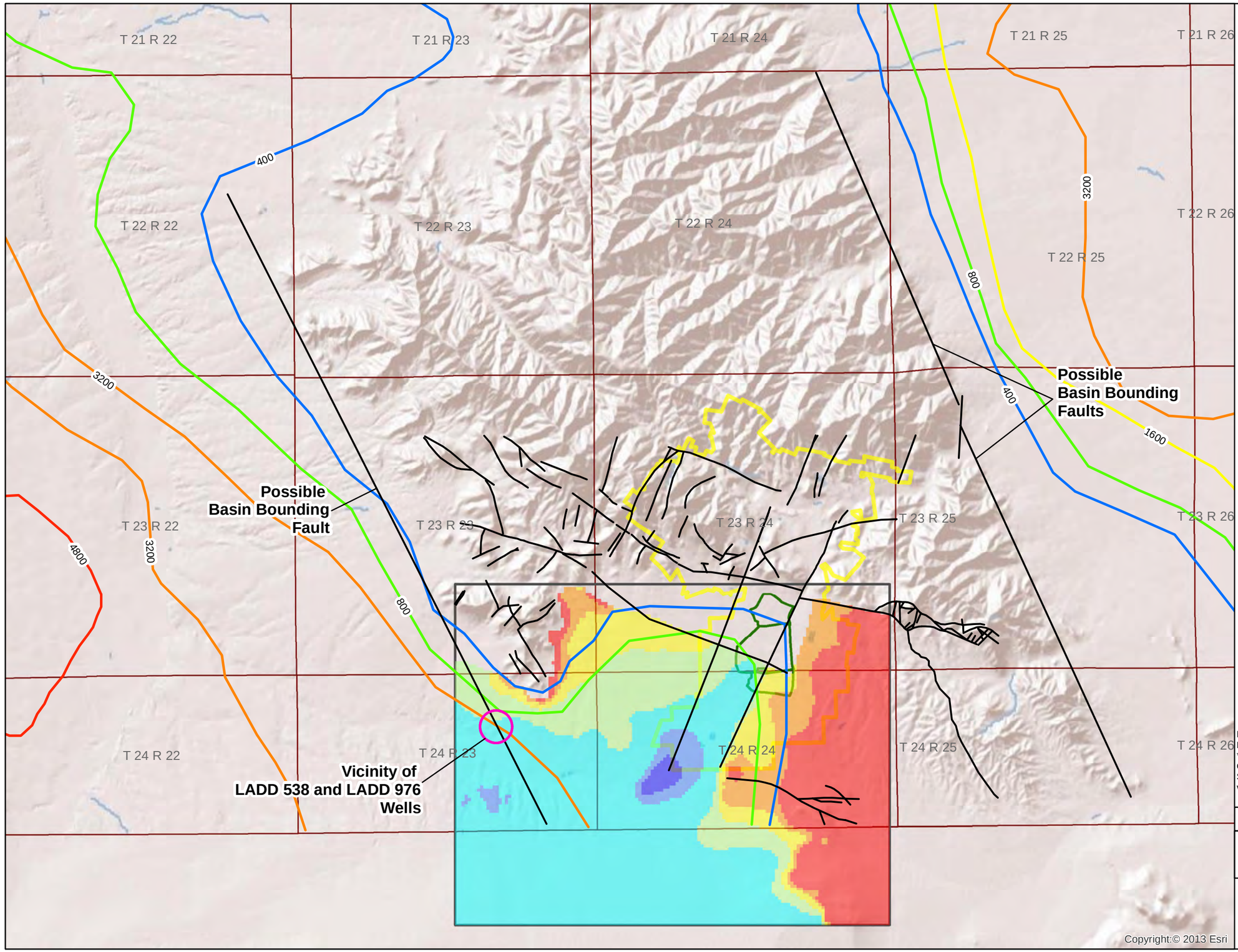


CLEAR CREEK ASSOCIATES

FILE ID: G055038-014

DATE: 5/6/13

FIGURE 13
EAST-WEST HYDROGEOLOGIC
CROSS SECTION



Legend

Regional Depth to Bedrock*

Depth (feet)

- 400
- 800
- 1600
- 3200
- 4800

Layer 1 - Basin Fill Thickness (feet)

- 33 - 50
- 51 - 100
- 101 - 200
- 201 - 300
- 301 - 500
- 501 - 600
- 601 - 656
- Model Domain
- CQB Property Boundary
- CTSA Facility
- Fault
- Township and Range

Scale (Feet)

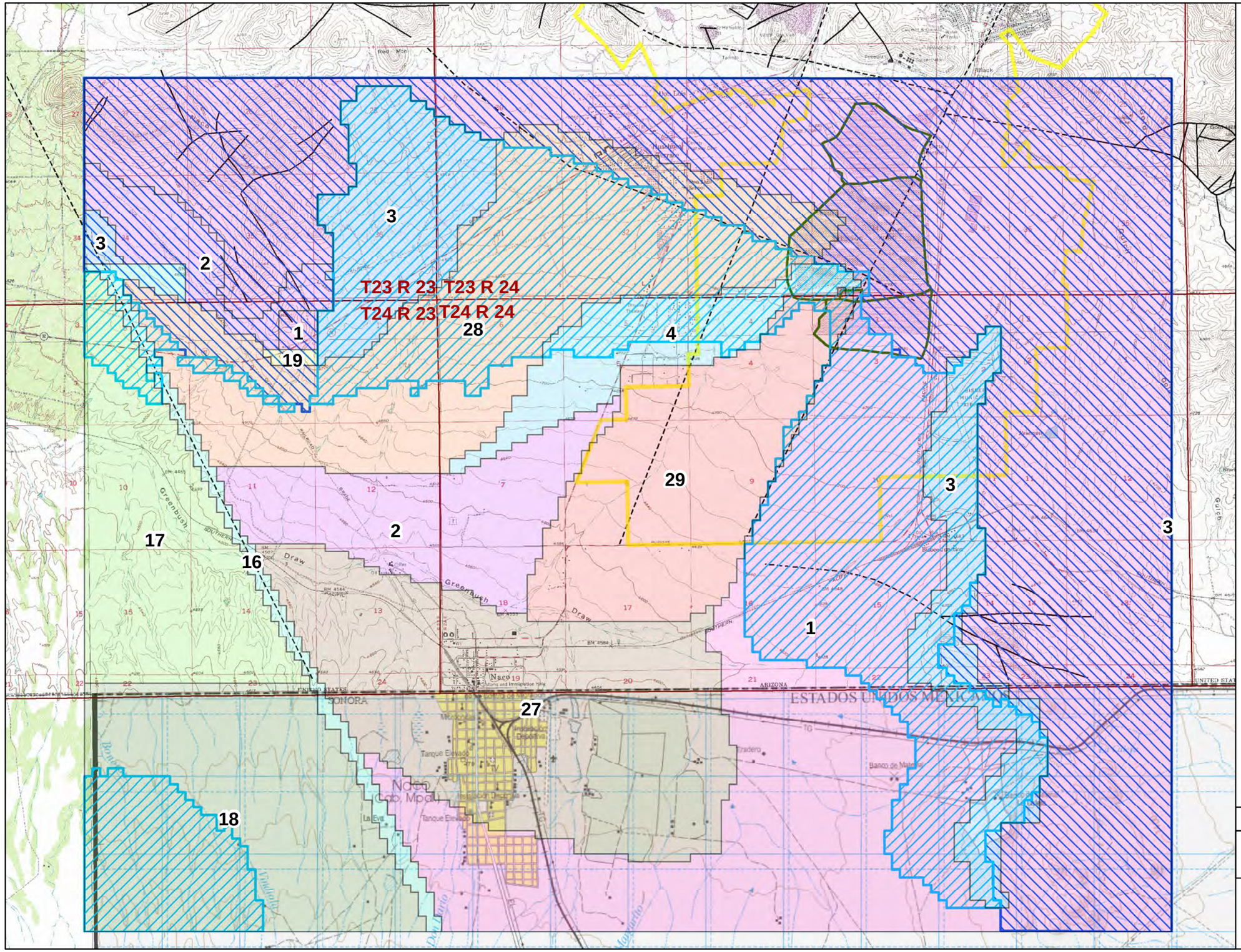
0 10,000 20,000

NOTES:
Projection: UTM Zone 12 NAD 83
* Depth to bedrock from: Richard, Shipman, Greene and Harris, 2007. Arizona Geological Survey Digital Geologic Map 52 (DGM-52), version 1.0. April, 2007

Date	File ID
7/21/13	055038-300A

CLEAR CREEK ASSOCIATES

FIGURE 14
INTERPRETED BASIN BOUNDING FAULTS



Legend

- Basin Fill Unsaturated
- Basin Fill Inactive in Bedrock Area
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Zone	Hydraulic Conductivity (ft/day)	
	Horizontal	Vertical
1	38.38	0.03
2	14.76	1.64
3	67.24	2.30
4	4.92	0.33
16	0.01	0.01
17	27.62	3.28
18	18.14	0.03
19	1.01	0.03
27	32.80	3.28
28	5.58	0.33
29	29.52	3.28

Scale (Feet)

0 4,000 8,000

NOTES:
Projection is UTM Zone 12 NAD 83.

Date	File ID
7/21/13	055038-302

CLEAR CREEK ASSOCIATES

FIGURE 15
CALIBRATED HYDRAULIC CONDUCTIVITY IN LAYER 1

Legend

- Inactive Cells (Layer 2)
- Unsaturated Cells (Layer 2)
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Zone	Hydraulic Conductivity (ft/day)
1	38.38
5	4.92
6	1.31
7	0.16
8	0.02
9	0.79
10	0.05
11	0.07
22	0.83
23	0.004
24	1.05
25	0.22

Scale (Feet)

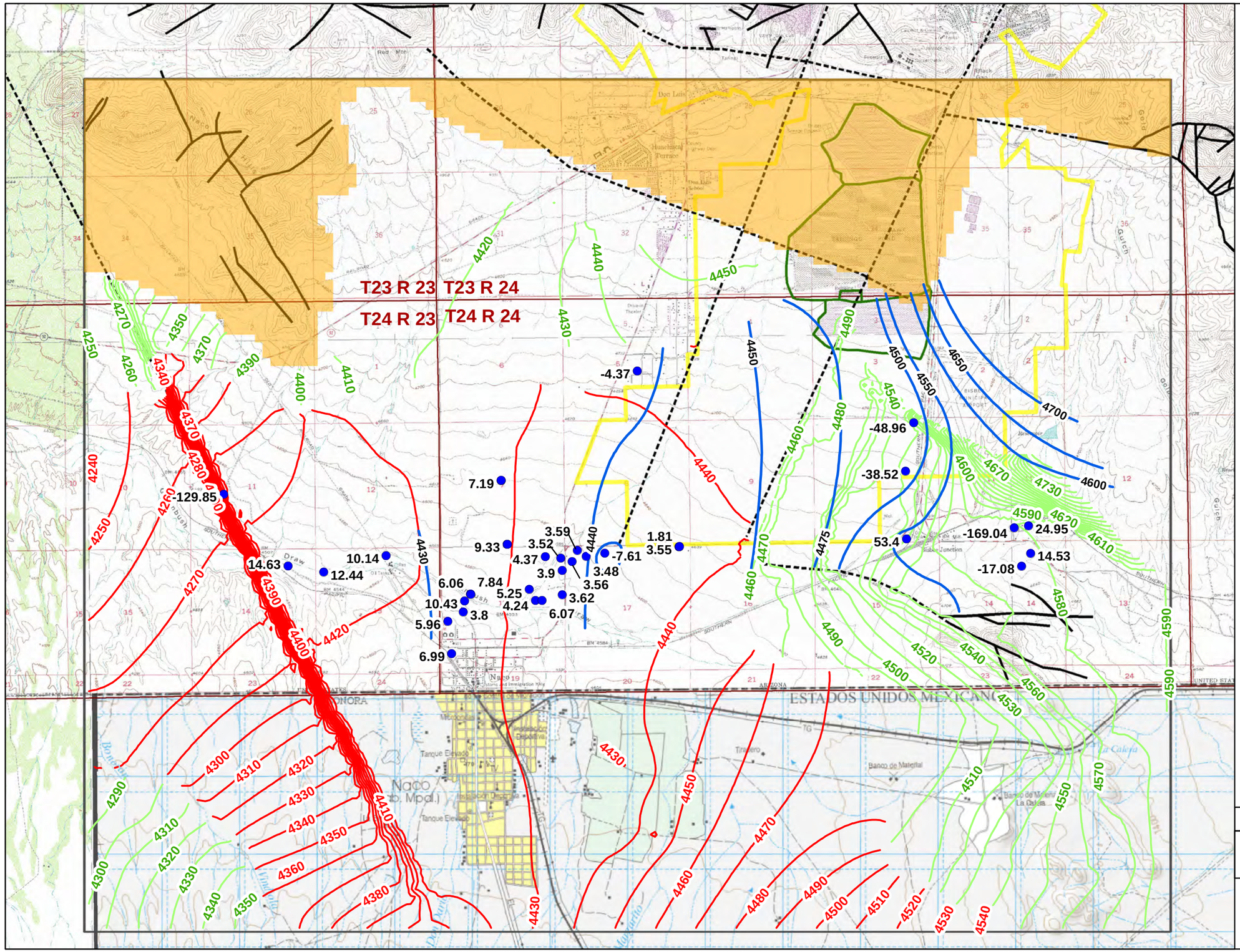
0 4,000 8,000

NOTES:
Projection is UTM Zone 12 NAD 83.

Date	File ID
7/21/13	055038-303

CLEAR CREEK ASSOCIATES

FIGURE 16
CALIBRATED HYDRAULIC CONDUCTIVITY IN LAYER 2



Legend

- Residuals (feet)
- Simulated Layer 1 Groundwater Elevation Contours Q4 2011(feet-AMSL)
- Simulated Layer 2 and 3 Groundwater Elevation Contours Q4 2011(feet-AMSL)
- Estimated Groundwater Elevation Contours Q4 2011 (feet-AMSL)
- Inactive Cells
- Numerical Model Domain
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

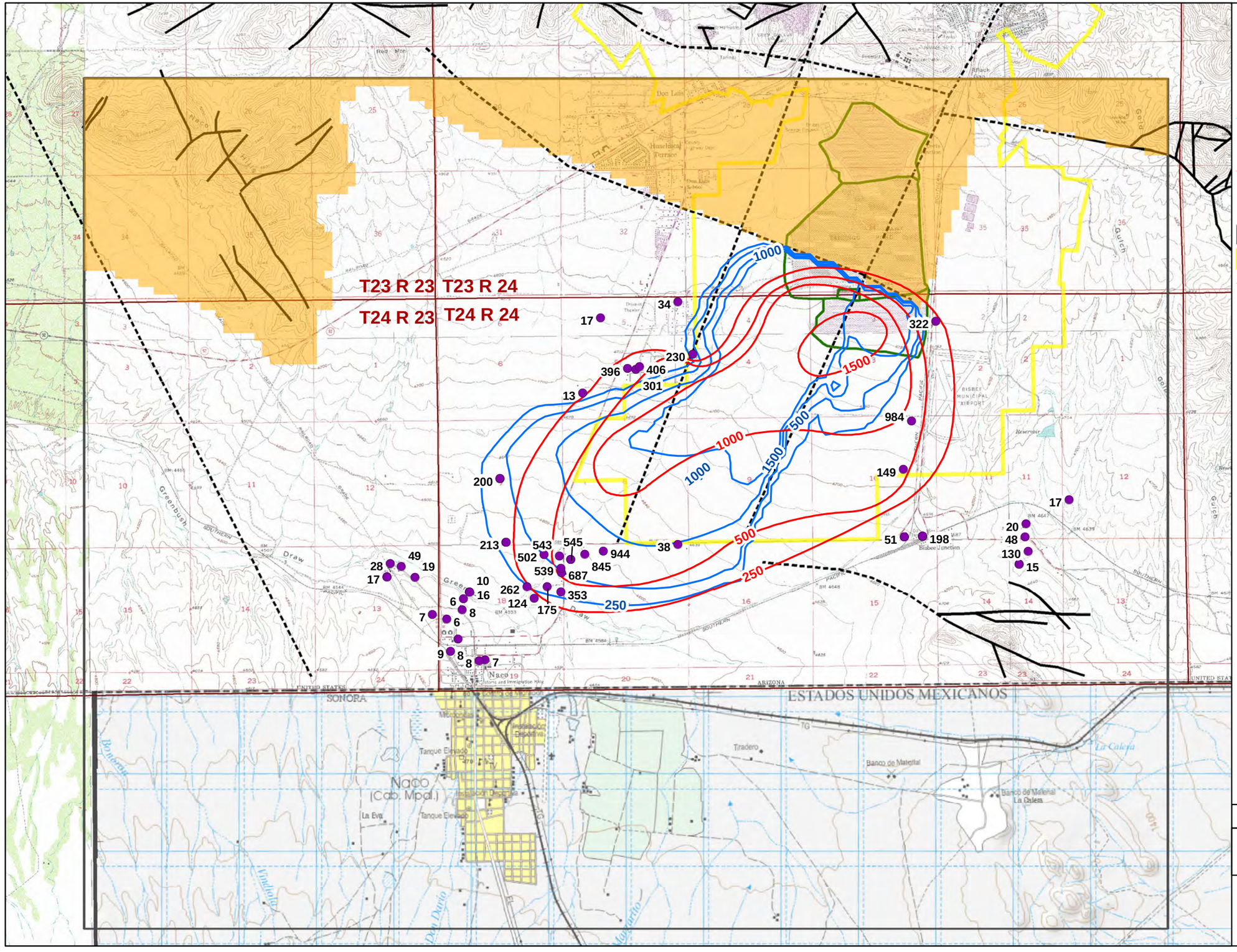
0 4,000 8,000

NOTES:
Projection is UTM Zone 12 NAD 83.

Date	File ID
7/21/13	055038-304A

CLEAR CREEK ASSOCIATES

FIGURE 17
SIMULATED WATER LEVELS AND RESIDUALS FOR FOURTH QUARTER 2011



Legend

- Measured Sulfate Concentrations Q4 2011 (mg/L)
- Simulated Sulfate Concentration Contours Q4 2011 (mg/L)
- Estimated Sulfate Concentration Contours Q4 2011 (mg/L)
- Inactive Cells
- Numerical Model Domain
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

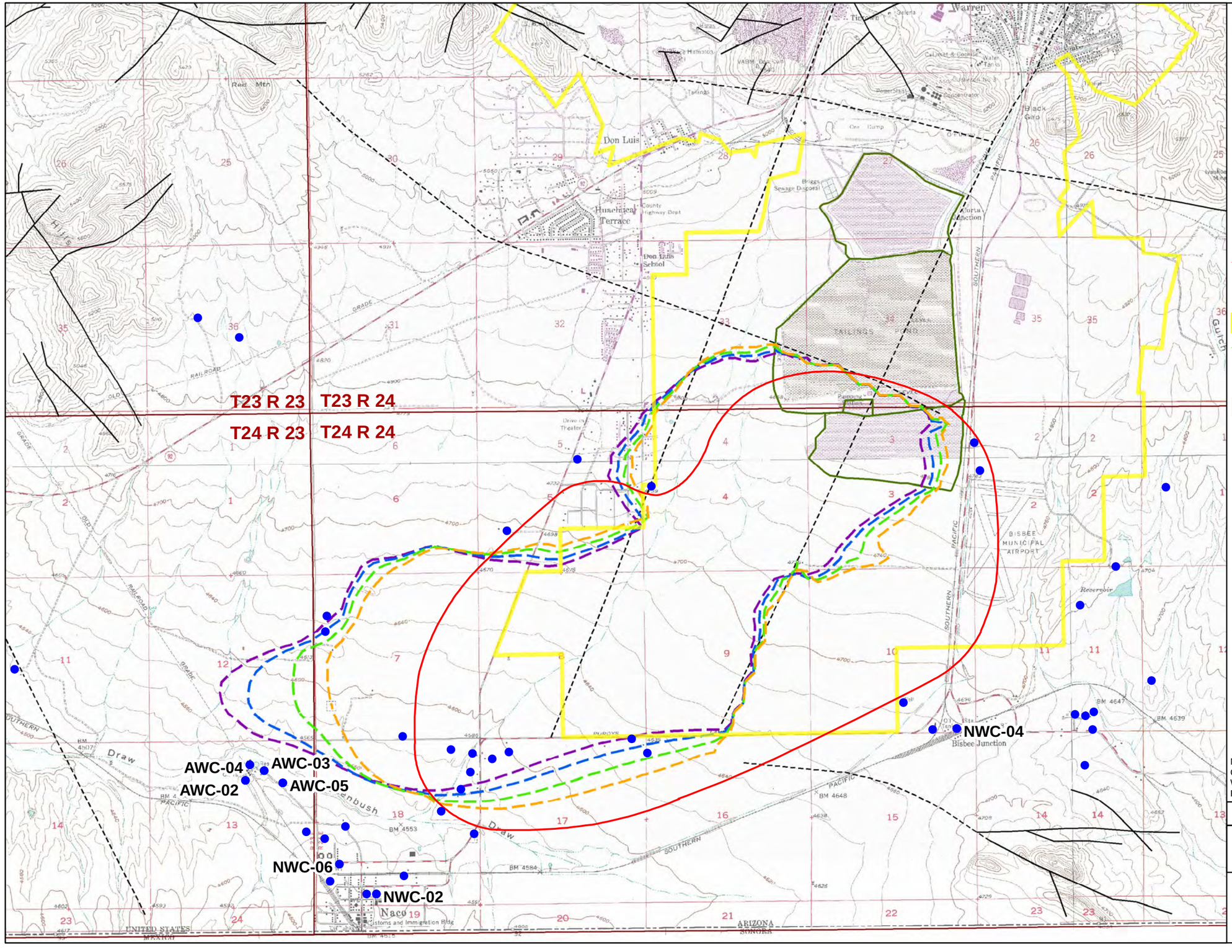
0 4,000 8,000

NOTES:
Projection is UTM Zone 12 NAD 83.

Date	File ID
7/21/13	055038-305

CLEAR CREEK ASSOCIATES

FIGURE 18
SIMULATED SULFATE CONCENTRATIONS FOR FOURTH QUARTER 2011



Legend

- Simulated 250 mg/L Sulfate Concentration Contour in 2045 (30 Years)
- Simulated 250 mg/L Sulfate Concentration Contour in 2065 (50 Years)
- Simulated 250 mg/L Sulfate Concentration Contour in 2090 (75 Years)
- Simulated 250 mg/L Sulfate Concentration Contour in 2115 (100 Years)
- Estimated 250 mg/L Sulfate Concentration Contour for Q1 2013
- Drinking Water Supply Well
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

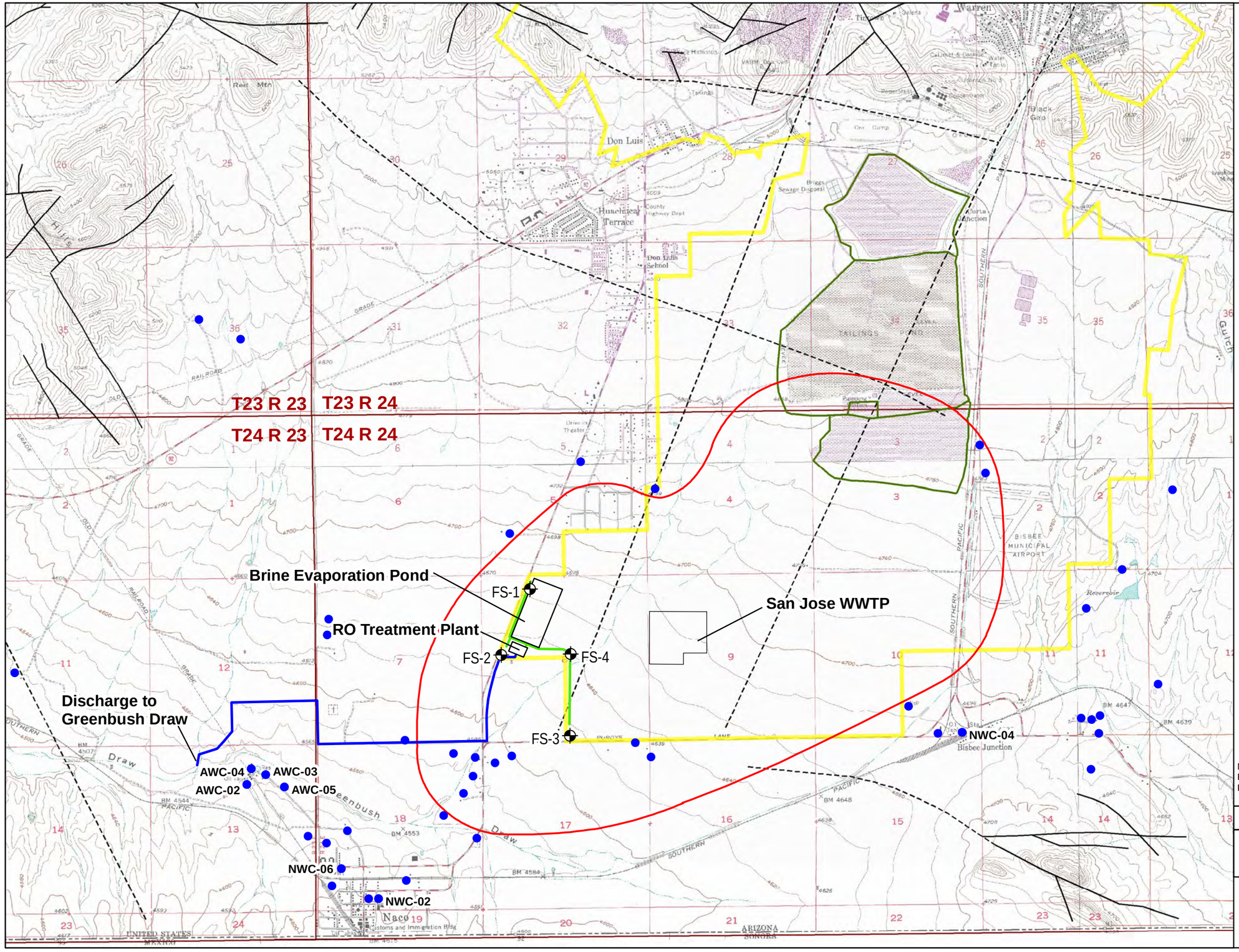
0 3,000 6,000

NOTES:
Concentrations are highest value regardless of layer.
Well locations based on survey data where available.
Projection is UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-281

CLEAR CREEK ASSOCIATES

FIGURE 19
ALTERNATIVE 1
SIMULATED 250 MG/L SULFATE CONTOUR AT 30, 50, 75, AND 100 YEARS



Legend

- Treated Water Discharge Piping
- Wellfield Piping
- Alternative 2 Extraction Well
- Estimated 250 mg/L Sulfate Concentration Contour for Q1 2013
- Drinking Water Supply Well
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

0 3,000 6,000

NOTES:
Facilities layout provided by Westland Resources
Projection is UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-314

CLEAR CREEK ASSOCIATES

FIGURE 20
ALTERNATIVE 2
FACILITIES

Well Name	Pumping Rate 2015-2065 (gpm)	Pumping Rate 2066-2115 (gpm)
FS-1	240	240
FS-2	400	400
FS-3	100	0
FS-4	100	100
TOTAL	840	740

T23 R 23 T23 R 24

T24 R 23 T24 R 24

FS-1

FS-2 FS-4

FS-3

AWC-04 AWC-03

AWC-02 AWC-05

NWC-06

NWC-02

NWC-04

Legend

- Alternative 2 Extraction Well
- Simulated 250 mg/L Sulfate Concentration Contour in 2045 (30 Years)
- Simulated 250 mg/L Sulfate Concentration Contour in 2065 (50 Years)
- Simulated 250 mg/L Sulfate Concentration Contour in 2090 (75 Years)
- Simulated 250 mg/L Sulfate Concentration Contour in 2115 (100 Years)
- Estimated 250 mg/L Sulfate Concentration Contour for Q1 2013
- Drinking Water Supply Well
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

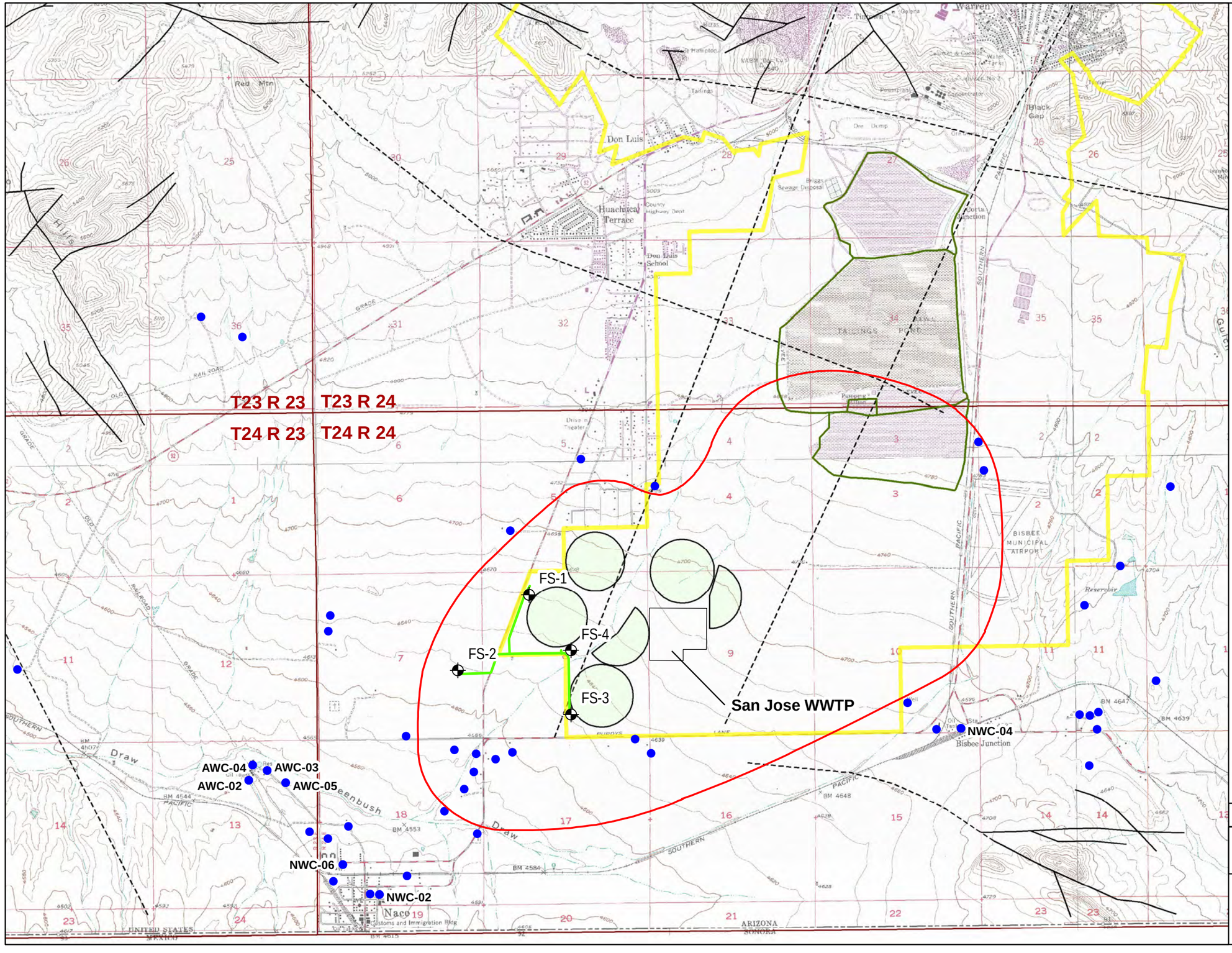
0 3,000 6,000

NOTES:
Concentrations are highest value regardless of layer.
Well locations based on survey data where available.
Projection is UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-282

CLEAR CREEK ASSOCIATES

FIGURE 21
ALTERNATIVE 2
SIMULATED 250 MG/L SULFATE CONTOUR
AT 30, 50, 75, AND 100 YEARS



Legend

- Irrigation Pivot
- Wellfield Piping
- Alternative 3 Extraction Well
- Estimated 250 mg/L Sulfate Concentration Contour for Q1 2013
- Drinking Water Supply Well
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

0 3,000 6,000

NOTES:
Facilities layout provided by Westland Resources
Projection is UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-316

CLEAR CREEK ASSOCIATES

FIGURE 22
ALTERNATIVE 3
FACILITIES

Well Name	Pumping Rate 2015-2065 (gpm)	Pumping Rate 2066-2115 (gpm)
FS-1	300	300
FS-2	400	400
FS-3	100	50
FS-4	100	100
TOTAL	900	850

T23 R 23 T23 R 24

T24 R 23 T24 R 24

FS-1

FS-2

FS-3

FS-4

NWC-04

NWC-06

NWC-02

AWC-04

AWC-03

AWC-02

AWC-05

Legend

- Alternative 3 Extraction Well
- Simulated 250 mg/L Sulfate Concentration Contour in 2045 (30 YEARS)
- Simulated 250 mg/L Sulfate Concentration Contour in 2065 (50 YEARS)
- Simulated 250 mg/L Sulfate Concentration Contour in 2090 (75 YEARS)
- Simulated 250 mg/L Sulfate Concentration Contour in 2115 (100 YEARS)
- Estimated 250 mg/L Sulfate Concentration Contour for Q1 2013
- Drinking Water Supply Well
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

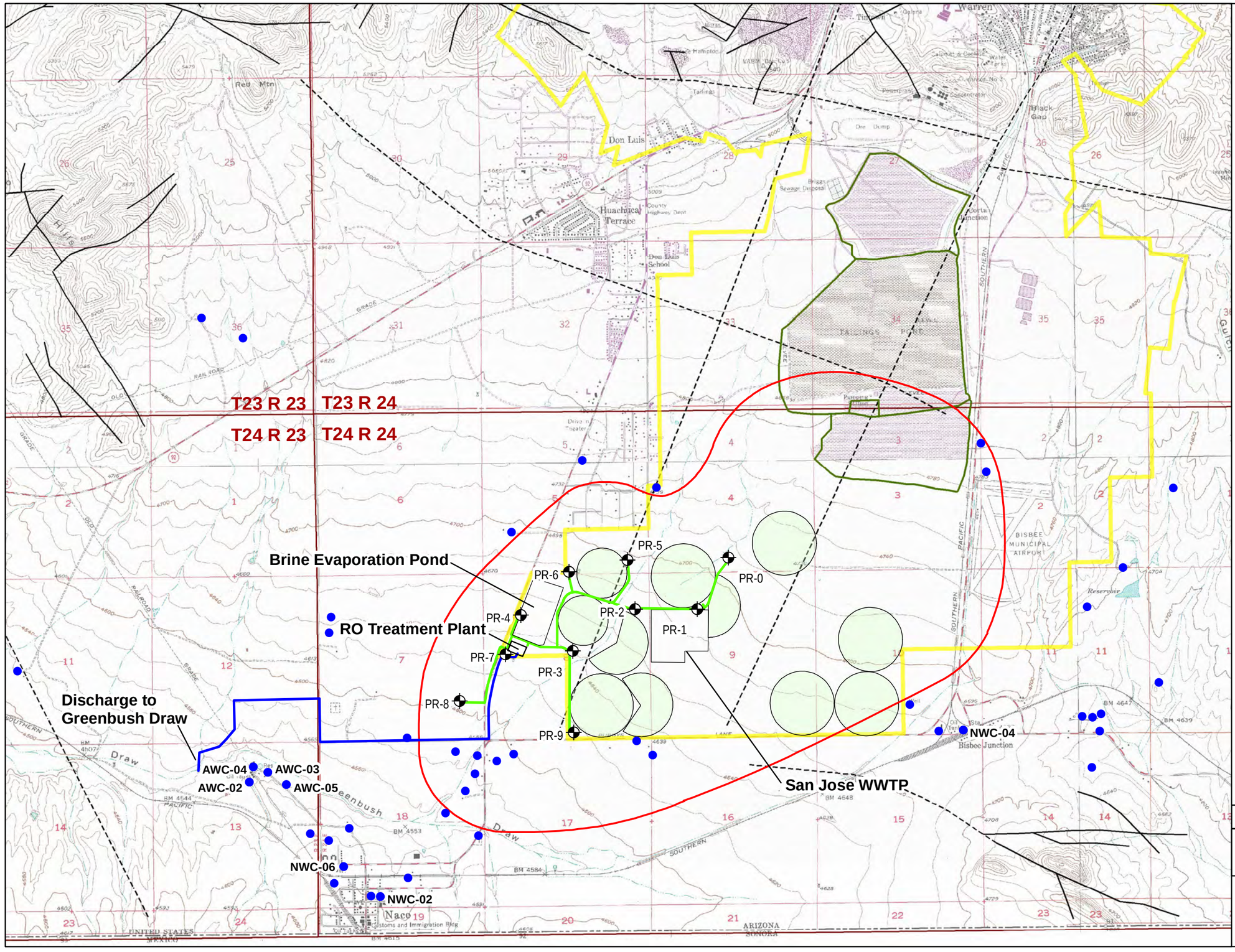
0 3,000 6,000

NOTES:
Concentrations are highest value regardless of layer.
Well locations based on survey data where available.
Projection is UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-285

CLEAR CREEK ASSOCIATES

FIGURE 23
ALTERNATIVE 3
SIMULATED 250 MG/L SULFATE CONTOUR AT 30, 50, 75, AND 100 YEARS



Legend

- Irrigation Pivot
- Treated Water Discharge
- Wellfield Piping
- Alternative 4 Extraction Well
- Estimated 250 mg/L Sulfate Concentration Contour for Q1 2013
- Drinking Water Supply Well
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

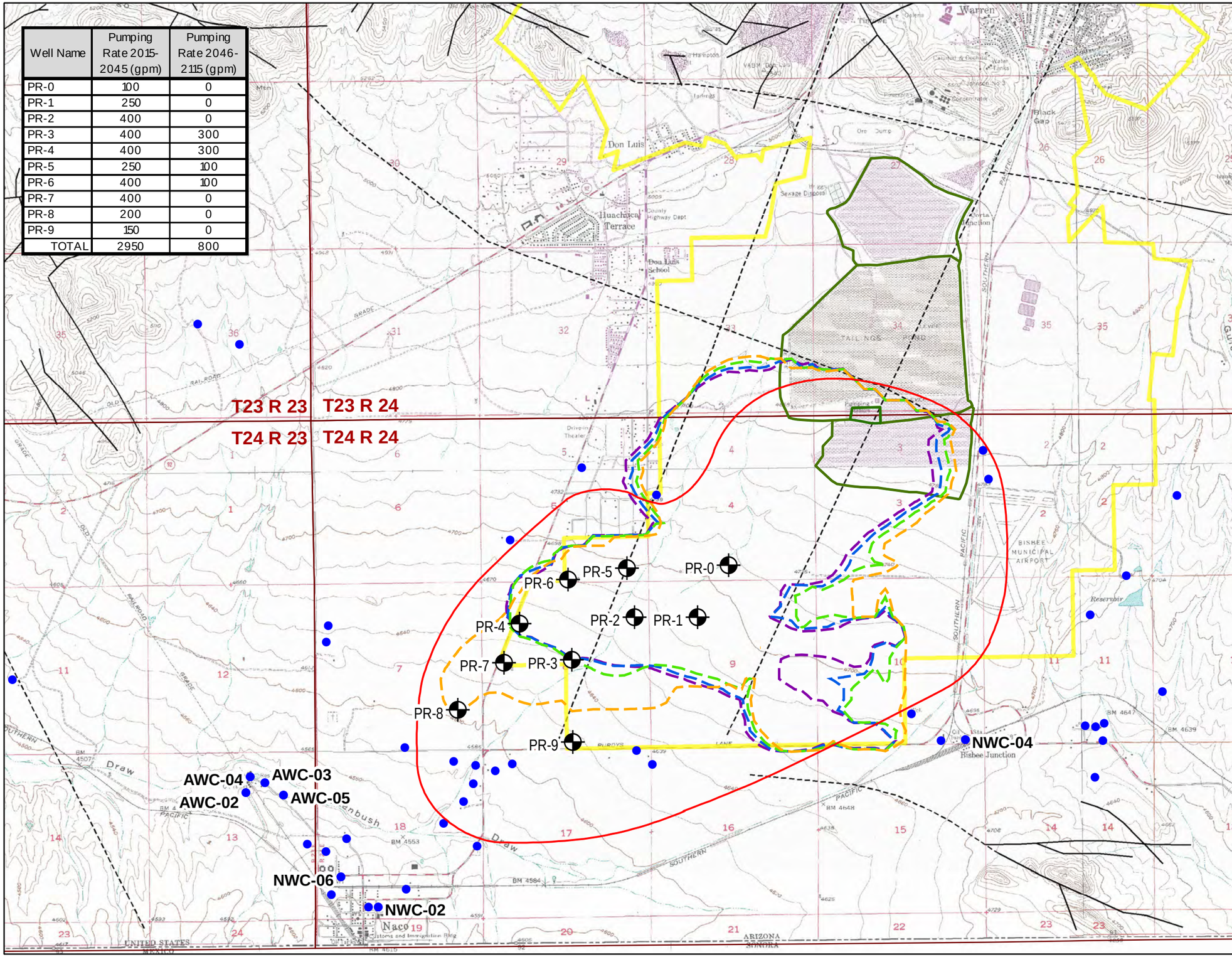
0 3,000 6,000

NOTES:
Facilities layout provided by Westland Resources
Projection is UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-317

CLEAR CREEK ASSOCIATES

FIGURE 24
ALTERNATIVE 4
FACILITIES



Well Name	Pumping Rate 2015-2045 (gpm)	Pumping Rate 2046-2115 (gpm)
PR-0	100	0
PR-1	250	0
PR-2	400	0
PR-3	400	300
PR-4	400	300
PR-5	250	100
PR-6	400	100
PR-7	400	0
PR-8	200	0
PR-9	150	0
TOTAL	2950	800

Legend

- Alternative 4 Extraction Well
- Simulated 250 mg/L Sulfate Concentration Contour in 2045 (30 Years)
- Simulated 250 mg/L Sulfate Concentration Contour in 2065 (50 Years)
- Simulated 250 mg/L Sulfate Concentration Contour in 2090 (75 Years)
- Simulated 250 mg/L Sulfate Concentration Contour in 2115 (100 Years)
- Estimated 250 mg/L Sulfate Concentration Contour for Q1 2013
- Drinking Water Supply Well
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

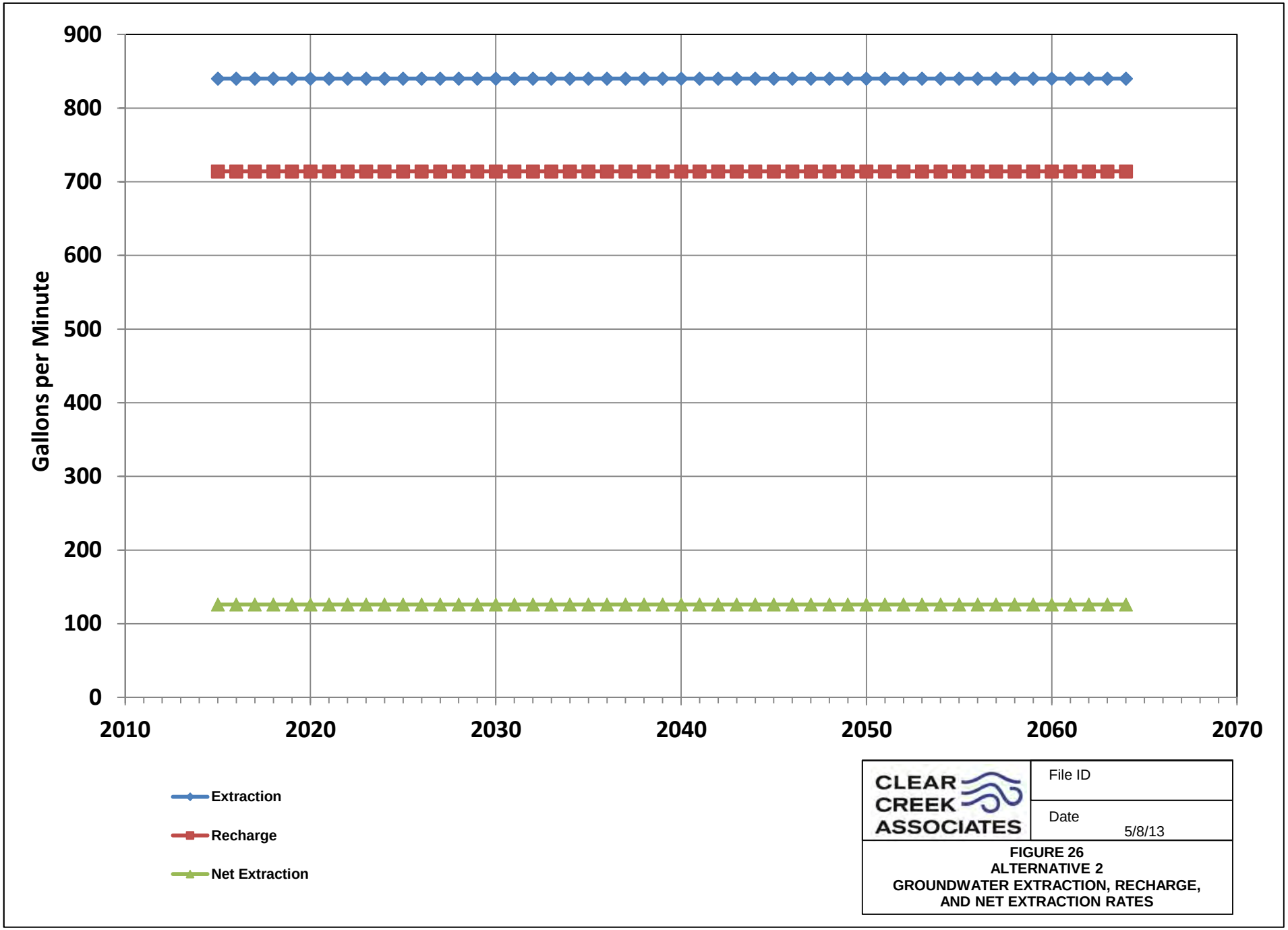
0 3,000 6,000

NOTES:
Concentrations are highest value regardless of layer.
Well locations based on survey data where available.
Projection is UTM Zone 12 NAD 83

Date	File ID
7/21/13	055038-293

CLEAR CREEK ASSOCIATES

FIGURE 25
ALTERNATIVE 4
SIMULATED 250 mg/L SULFATE CONTOUR
AT 30, 50, 75, AND 100 YEARS

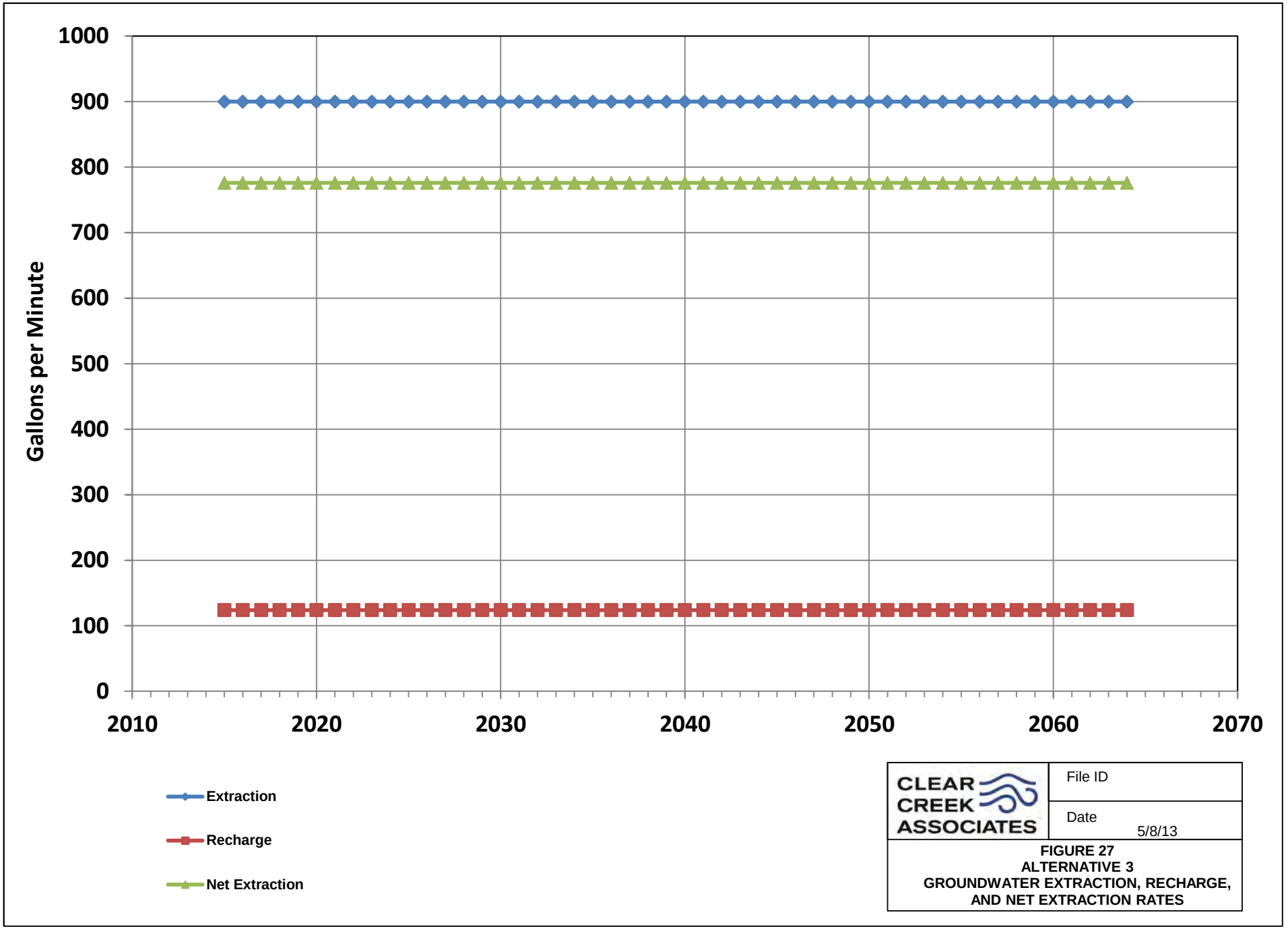


CLEAR CREEK ASSOCIATES

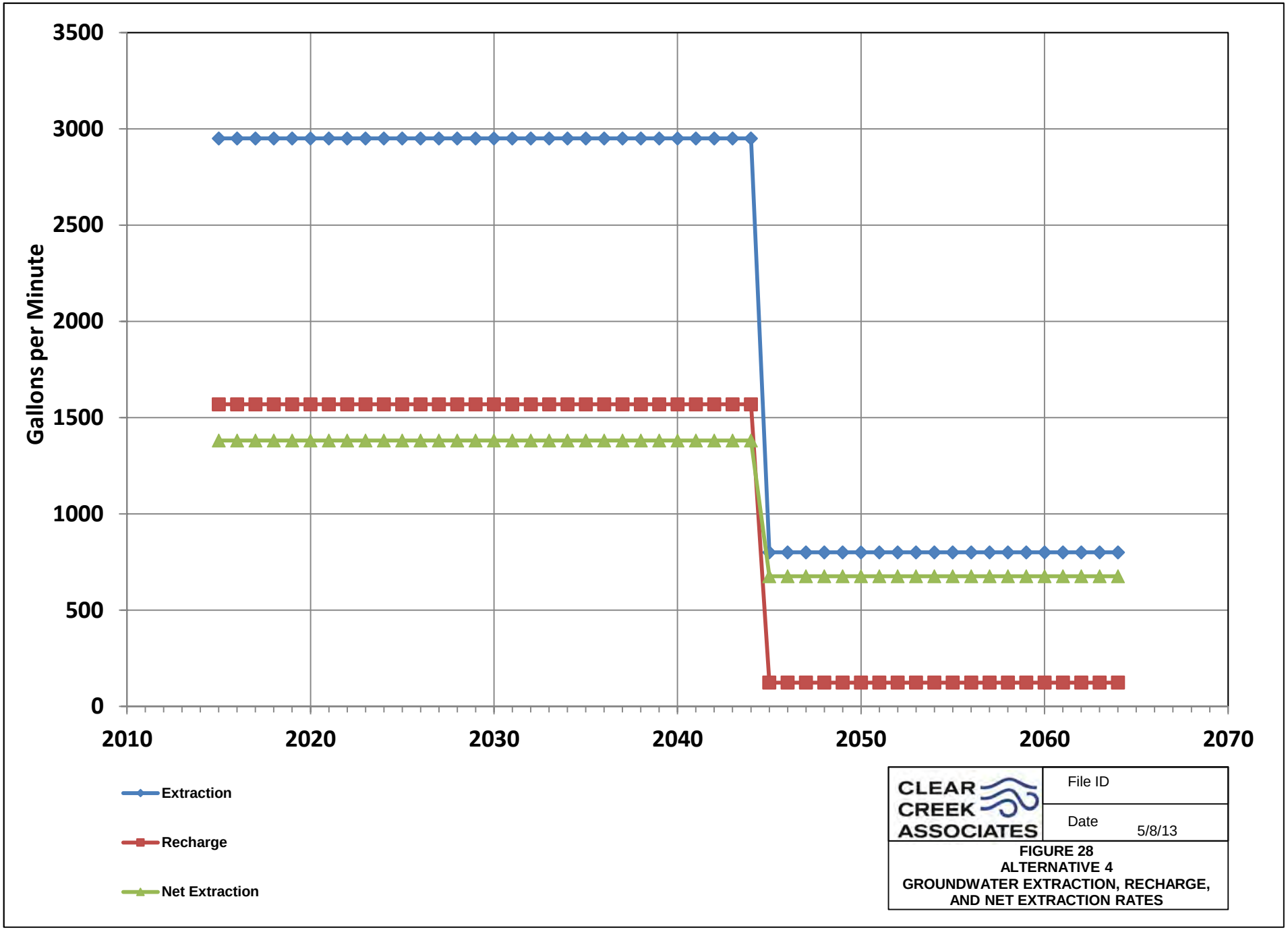
File ID

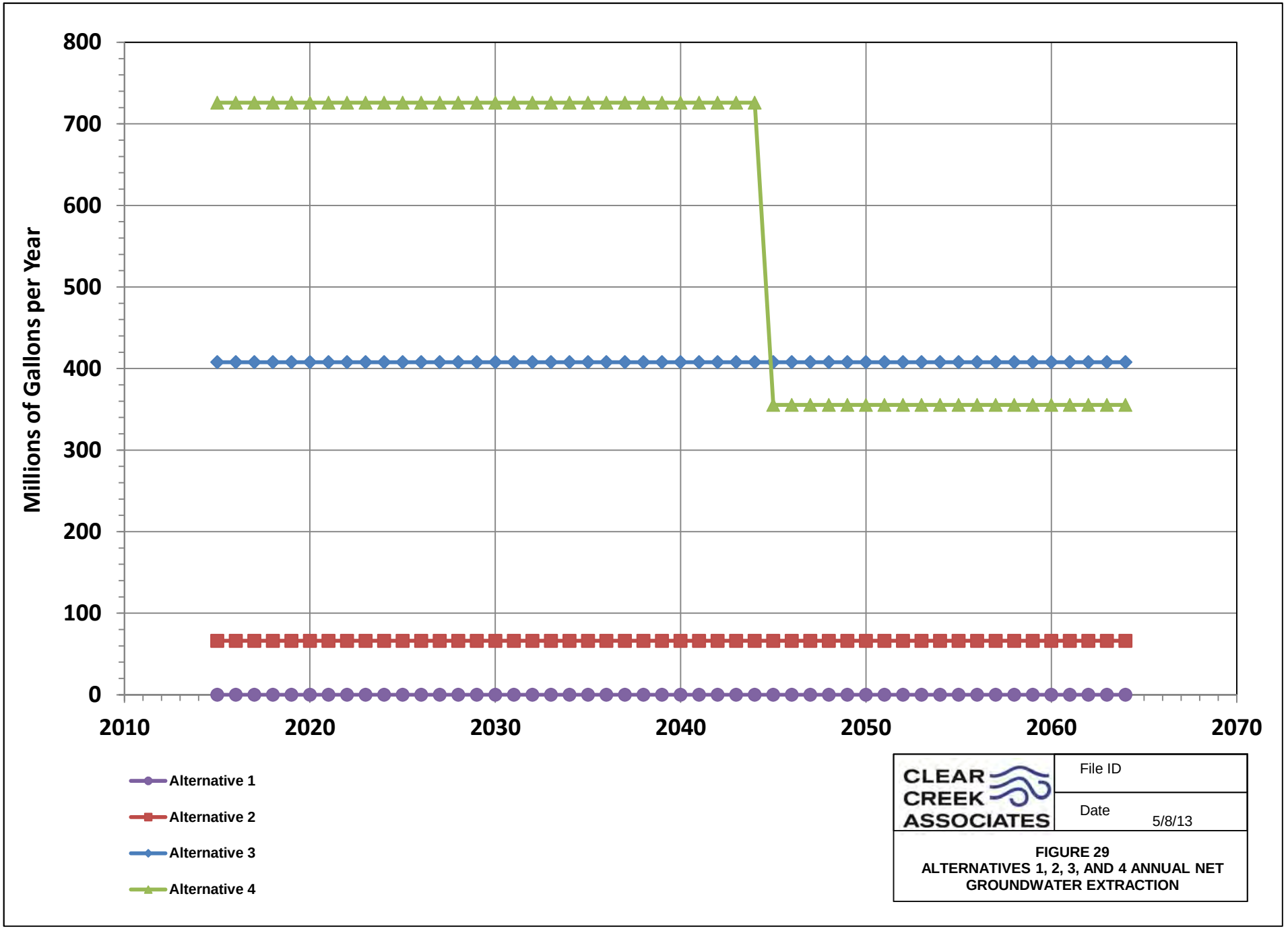
Date 5/8/13

FIGURE 26
ALTERNATIVE 2
GROUNDWATER EXTRACTION, RECHARGE, AND NET EXTRACTION RATES

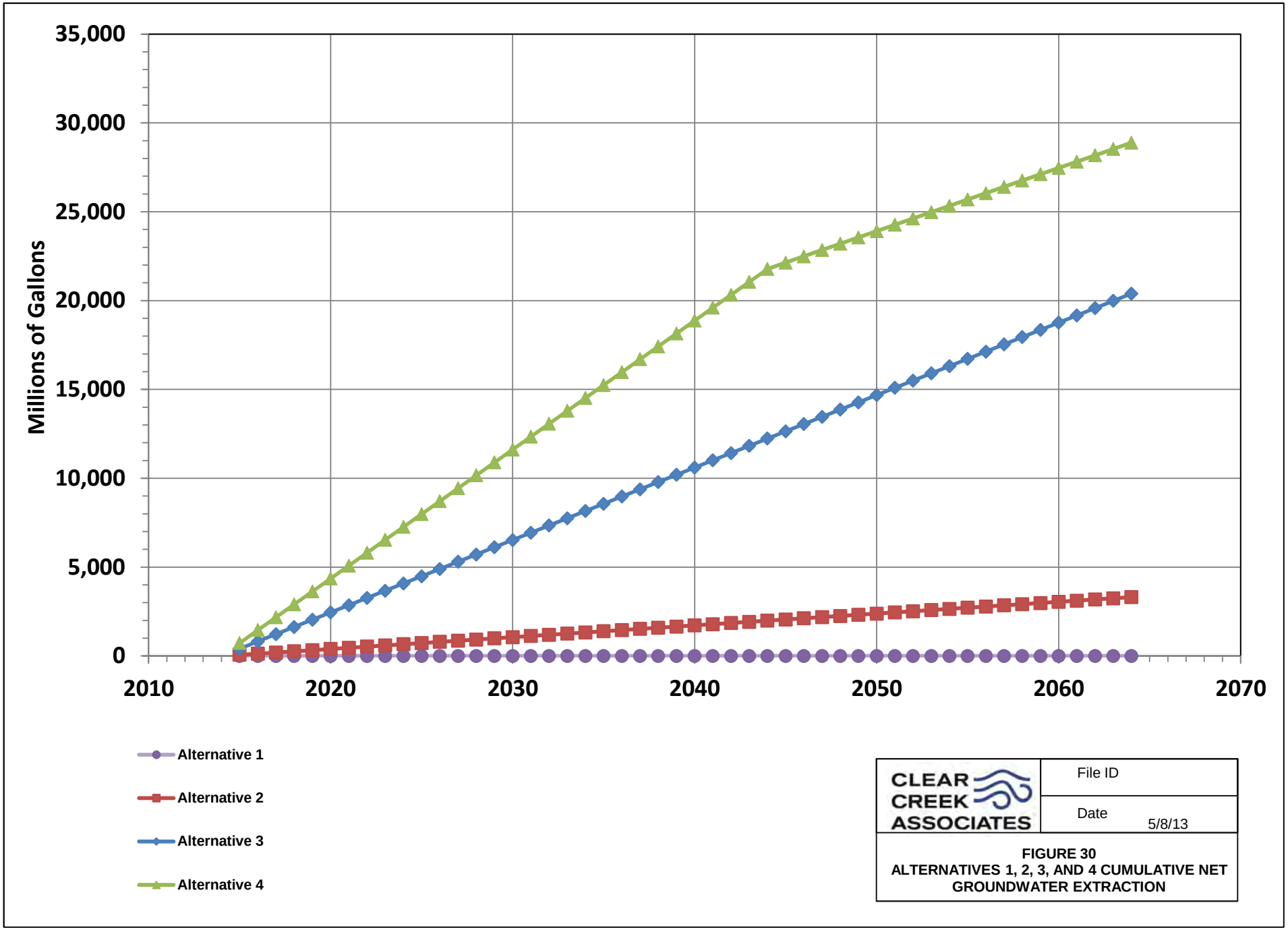


Preliminary:Alt 3 Rates


3500
3000
2500
2000
1500
1000
500
0
Gallons per Minute
2010
2020
2030
2040
2050
2060
2070
Extraction
Recharge
Net Extraction
CLEAR CREEK ASSOCIATES
File ID
Date 5/8/13
FIGURE 28
ALTERNATIVE 4
GROUNDWATER EXTRACTION, RECHARGE, AND NET EXTRACTION RATES



Preliminary:Compare Ann Ext



Preliminary:Compare Net Ext

Year 30

Year 50

AWC-04
AWC-03
AWC-05
NWC-06
NWC-02
NWC-04

4240 4250 4260 4270 4280 4300 4310 4320 4330 4340 4350 4360 4370 4380 4390 4400 4410 4420 4430 4440 4450 4460 4470 4480 4490 4500 4510 4520 4530 4540

Scale (Feet)

0 4,000 8,000

Legend

- Groundwater Elevation (ft amsl) in Model Layer 1 in 2045 and 2065
- Drinking Water Supply Well
- Basin Fill Unsaturated
- Basin Fill Inactive in Bedrock Area
- Numerical Model Domain
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

NOTES:
Contours are simulated heads from 2045 and 2056 in feet amsl.
Well locations based on reported cadastral locations, or survey data where available.
Projection is UTM Zone 12 NAD 83.

Date	File ID
7/21/13	055038-313

FIGURE 31
ALTERNATIVE 1
SIMULATED GROUNDWATER LEVELS IN 30 AND 50 YEARS

Year 30

Year 50

AWC-04
AWC-03
AWC-05
AWC-02
NWC-06
NWC-02
NWC-04

ESTADOS UNIDOS MEXICANOS

Legend

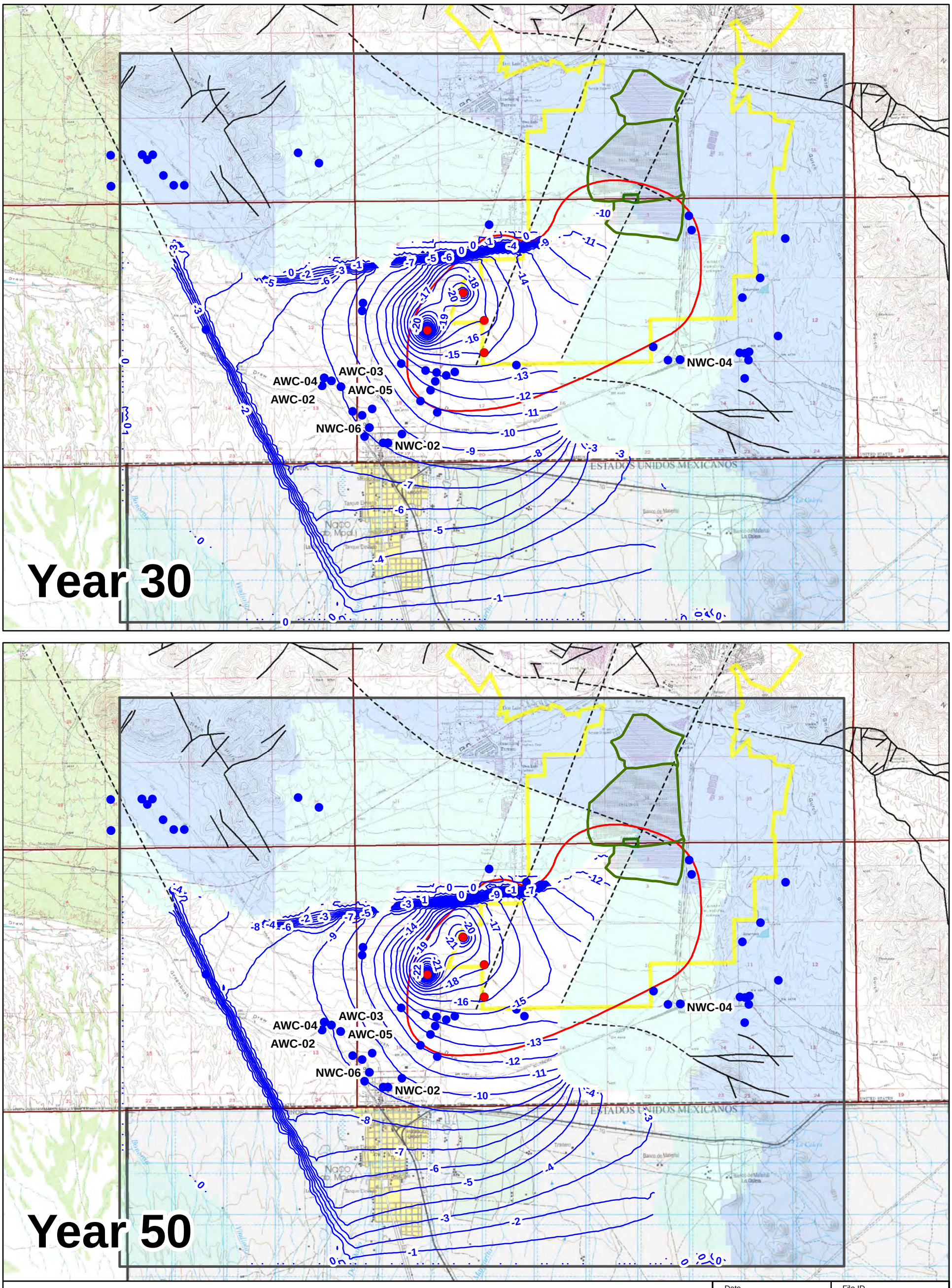
- Predicted Water Level Difference Between Alternative 2 and Alternative 1 (no mitigation pumping)
- Alternative 2 Extraction Well
- Drinking Water Supply Well
- Basin Fill Unsaturated
- Basin Fill Inactive in Bedrock
- Numerical Model Domain
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

NOTES:
Positive values indicate higher water levels than Alternative 1. Negative values indicate lower water levels than alternative 1
Projection: UTM Zone 12 NAD 83

Scale (Feet)
0 4,000 8,000

Date	File ID
7/21/13	055038-311

FIGURE 32
ALTERNATIVE 2
SIMULATED WATER LEVEL CHANGE IN 30 AND 50 YEARS RELATIVE TO ALTERNATIVE 1



Legend

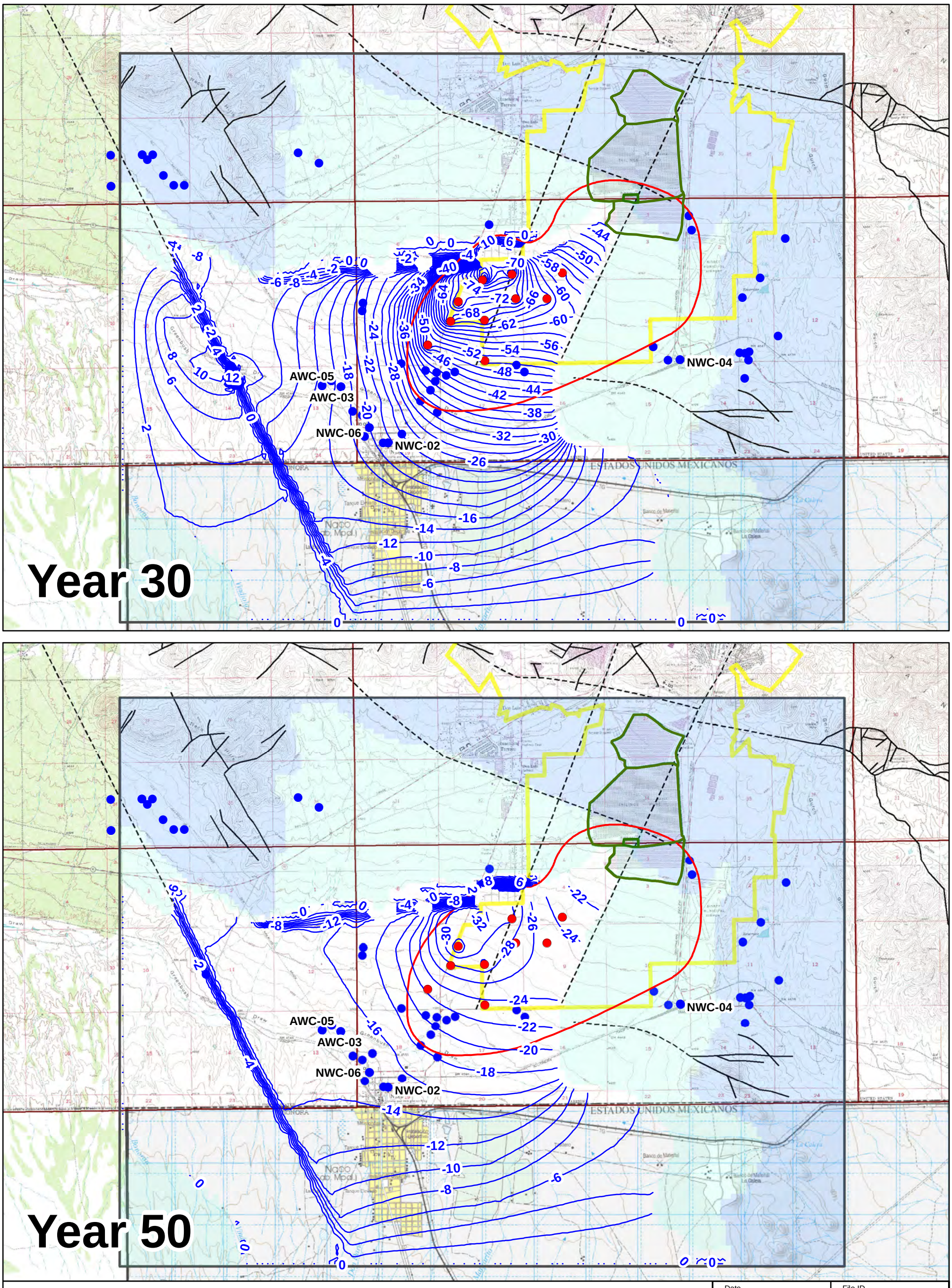
- Predicted Water Level Difference Between Alternative 3 and Alternative 1 (no mitigation pumping)
- Alternative 3 Extraction Well
- Drinking Water Supply Well
- Basin Fill Unsaturated
- Basin Fill Inactive in Bedrock Area
- Numerical Model Domain
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

NOTES:
Positive values indicate higher water levels than Alternative 1. Negative values indicate lower water levels than Alternative 1
Projection: UTM Zone 12 NAD 83

Scale (Feet)
0 4,000 8,000

Date	File ID
7/21/13	055038-310

FIGURE 33
ALTERNATIVE 3
SIMULATED WATER LEVEL CHANGE IN 30 AND 50 YEARS RELATIVE TO ALTERNATIVE 1



Legend

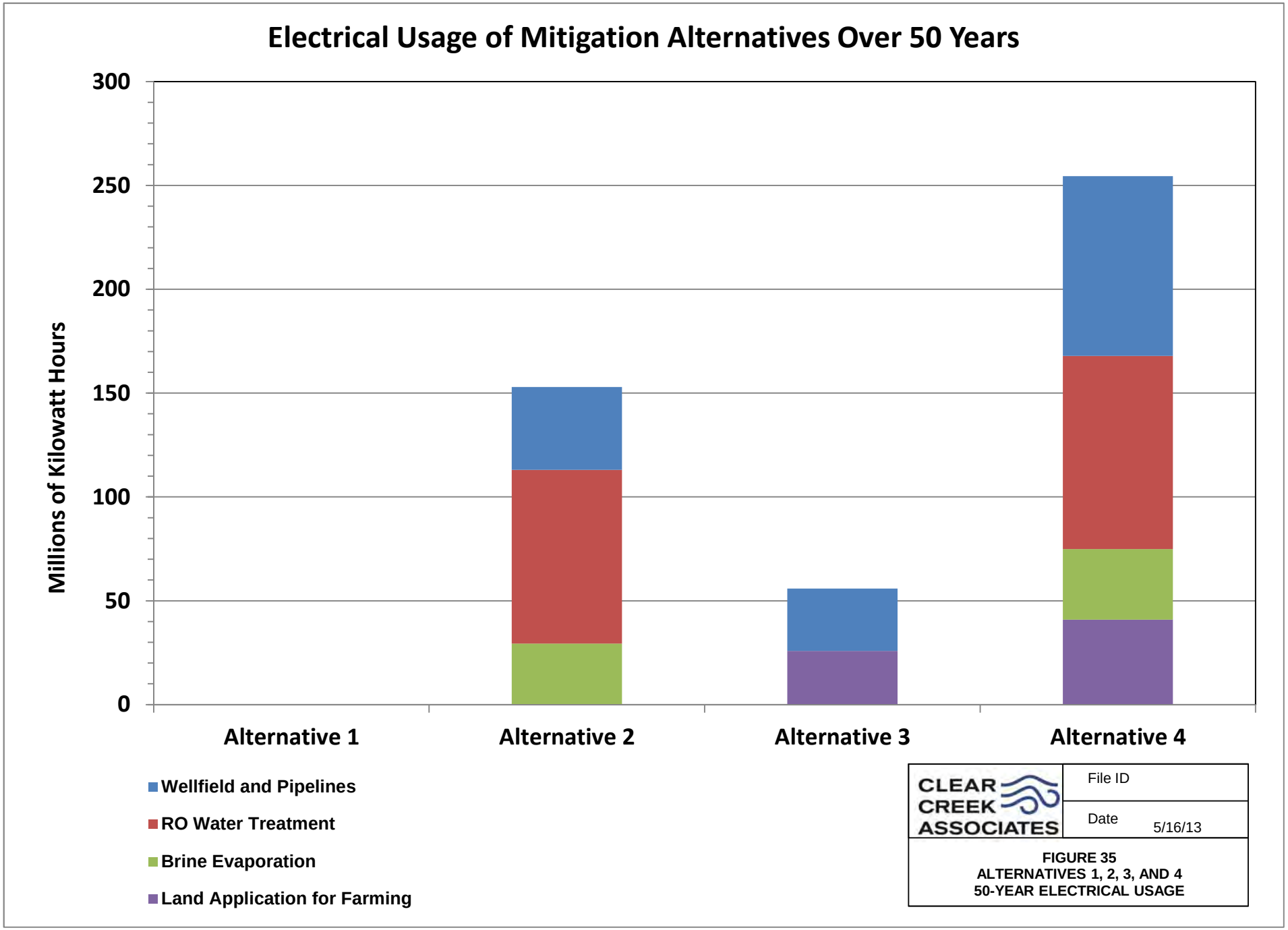
- Predicted Water Level Difference Between Alternative 4 and Alternative 1 (no mitigation pumping)
- Alternative 4 Extraction Well
- Drinking Water Supply Well
- Basin Fill Unsaturated
- Basin Fill Inactive in Bedrock
- Numerical Model Domain
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

NOTES:
Positive values indicate higher water levels than Alternative 1. Negative values indicate lower water levels than Alternative 1
Projection: UTM Zone 12 NAD 83

Scale (Feet)
0 4,000 8,000

Date	File ID
7/21/13	055038-312

FIGURE 34
ALTERNATIVE 4
SIMULATED WATER LEVEL CHANGE IN 30 AND 50 YEARS RELATIVE TO ALTERNATIVE 1



Preliminary:50 YR Electric

APPENDIX A

EVALUATION OF SULFATE MIGRATION IN REPSONSE TO PROPOSED INSTALLATION OF REPLACEMENT WELLS IN THE NACO HIGHWAY/PURDY LANE AREA

TECHNICAL MEMORANDUM

CLEAR CREEK ASSOCIATES

To: Mindi Cross and David Haag, Arizona Department of Environmental Quality

From: Paul Plato, R.G. and James Norris, R.G., Clear Creek Associates

Subject: Evaluation of Sulfate Migration in Response to Proposed Installation of Replacement Wells in the Naco Highway/Purdy Lane Area
Mitigation Order on Consent Docket No. P-121-07

Date: November 22, 2011

Expires September 30, 2013

1 INTRODUCTION

This memorandum presents the results of numerical groundwater flow and sulfate transport modeling to evaluate the installation of deep domestic water production wells as a mitigation measure in the Naco Highway/Purdy Lane area, north of Naco, Arizona (Figure 1). The purpose of modeling was to evaluate whether wells drilled deeper into the basin fill and bedrock would be adequately isolated from shallow groundwater containing sulfate at concentrations greater than 250 milligrams per liter (mg/l). Freeport-McMoRan Corporation Copper Queen Branch has proposed, as one mitigation measure and where feasible for certain well owners, to deepen wells in the Naco Highway/Purdy Lane area into the underlying bedrock which does not contain elevated sulfate concentrations at this location. To evaluate the influence of installing deeper wells on the future distribution of sulfate in groundwater, groundwater pumping and sulfate transport in the vicinity of the proposed replacement wells were simulated for a 100-year period using several different assumptions for hydraulic conductivity and pumping rate.

2 WELLS EVALUATED

Figure 2 illustrates the wells considered for replacement in the area. These wells are currently shallow wells completed in the upper portion of the basin fill aquifer. Table 1 lists the well construction and average sulfate concentrations for wells proposed for replacement. Average sulfate concentrations range from 362 to 909 mg/l.

Table 1 – Wells Proposed for Replacement

Well Name	East	North	Cadastral	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Elevation (feet-MSL)	Depth to Top of Screen (feet)	Depth to Bottom of Screen (feet)	Average Sulfate Since 2008 (mg/l)
ANDERSON	601135	3468816	D24024018AAA	236	110	8	4580.34	100	236	511
COOPER C	601350	3468913	D24024017BBB	220	220	6	4595.06	100	220	909
FRANCO	602850	3468836	D24024016BBB	200	200	6	4636.00	180	200	635
HOWARD	601282	3468769	D24024017BBC	600	4	6	4589.70	150	300	362
MCCONNELL 265	601463	3468840	D24024017BBB	216	216	8	4600.70	174	216	716
PIONKE	600936	3468837	D24024018AAA	300	300	6	4592.13	100	300	431
WEISKOPF	601155	3468659	D24024018AAD	200	200	6	4586.89	100	200	520

Elevations are feet above mean sea level. Depths are feet below land surface.

Figure 3 illustrates geologic Cross-Section C-C' (see Figure 1 for location of cross section) from the Aquifer Characterization Report (ACR) (Clear Creek Associates, 2010) overlain by a groundwater model cross-section showing the layers of the original numerical model. Layer 1 represents basin fill, Layers 2 and 3 are undifferentiated Bisbee Group bedrock, and Layer 4 is Glance Conglomerate bedrock. This section also shows wells in the Purdy Lane area. The domestic water supply wells are generally completed in the shallow portion of the basin fill aquifer (Layer 1).

Based on sampling data collected in 2001 and 2008, sulfate concentrations greater than 250 mg/l are limited to the upper portion of the basin fill aquifer. During 2001, a well at the Garner property was replaced with a deeper well (GARNER 635) drilled to bedrock. Samples collected from temporary wells during drilling of the GARNER 635 (GW-47 samples on Table 2) indicated that sulfate in excess of 250 mg/l did not extend below a depth of 350 feet below land surface, and that the lower basin fill and underlying bedrock contained sulfate concentrations in the range of 25 to 50 mg/l. GARNER 635 was constructed with approximately 100 feet of screen in the upper portion of the bedrock. After 10 years of continuous operation, the sulfate concentration at GARNER 635 remains in the 30 to 40 mg/l range (Clear Creek Associates, 2011); demonstrating that in the Naco Highway/Purdy Lane area well replacement in the bedrock aquifer is an effective mitigation option for obtaining drinking water with sulfate concentrations below 250 mg/l. In 2008, the installation of monitor well BMO-2008-4B provided depth specific sampling results indicating that the lower portion of the basin fill deeper than 450 feet below land surface had sulfate concentrations in the 10 to 20 mg/l range (Clear Creek Associates, 2010). Figure 4 is an east-west cross section along Purdy Lane illustrating the sulfate results for samples collected during drilling of the GARNER 635 and BMO-2008-4B wells and groundwater sampling at private wells.

Table 2 – Depth-Specific Sample Results from GARNER 635

Site ID	Depth Interval	Sample No.	Concentration (mg/l)	Type of Aquifer Material
GW-47	250-280	5	632	QTbf
GW-47	345-375	4	25.8	QTbf
GW-47	455-485	3	16.7	QTbf
GW-47	545-575	2	39.8	Km
GW-47	630-670	1	54.2	Km

These sampling results indicate that the lower portion of the basin fill (designated as QTbf on Figures 3 and 4) and the underlying bedrock (Km, Kml, Kmu, and Kc on Figures 3 and 4) in the Naco Highway/Purdy Lane area do not contain sulfate concentrations exceeding 250 mg/l. Concentrations are slightly higher in samples from the bedrock than in the deeper basin fill, but this is likely due to groundwater age and natural geochemical conditions, rather than transport from the shallow sulfate plume.

3 MODEL SIMULATION APPROACH

One consideration regarding the installation of deep wells beneath the sulfate plume is that the low hydraulic conductivity of the bedrock could result in significant well drawdowns during pumping, which may cause vertically downward hydraulic gradients and deeper migration of the shallow sulfate. To evaluate the

potential to draw groundwater with elevated sulfate concentrations to the deepened wells, model simulations were executed using the groundwater flow and sulfate transport model developed to simulate the sulfate plume for the ACR (Clear Creek Associates, 2010). Using the Groundwater Vistas™ telescopic mesh refinement (TMR) feature, a sub-model focused on the area around the Naco Highway/Purdy Lane wells was constructed from the larger original calibrated model (Figure 5). The TMR utility uses the original model to setup a sub-model domain, setting boundary conditions based upon the original model. The TMR model boundaries were designated as constant heads, and were set to the values from the end of the model calibration (end of 2008) as calculated in the model simulation. The resulting model used uniform model cells approximately 141 feet by 157.5 feet in size[1]. Other stresses, such as recharge, are assigned to the TMR model based on specifications in the original model.

In addition to the horizontal refinement of the model domain using TMR, the model was divided into additional layers to allow for better definition of the groundwater zone containing sulfate in excess of 250 mg/l. The basin fill aquifer layer (original model layer 1) was divided into 5 TMR model layers, each approximately 98 feet thick with the exception of the uppermost TMR layer which was partially saturated and varied in thickness. Original model Layer 2 (bedrock) was also split into 2 layers, such that the undifferentiated Bisbee Group is represented by 3 TMR model layers (2 new layers, plus former Layer 3). Figure 6 displays a cross-section along model row 28 of the TMR model, illustrating several potential replacement wells extending into the uppermost bedrock.

Using the information from depth specific sampling, high sulfate concentrations were generally restricted to TMR model Layers 1 through 4, which were set to an initial concentration of 800 mg/l (Figure 6). Each constant head boundary cell for TMR Layers 3 and 4 was also set to a constant concentration of 800 mg/l (TMR Layers 1 and 2 are unsaturated at the boundaries). TMR Layer 5 representing the low-sulfate zone in the basin fill was set to 20 mg/l. Constant head cells for TMR Layers 6, 7, 8, and 9 representing bedrock were set to 40, 45, 30, and 20 mg/l, respectively.

It should be noted that the simulation of an initial constant sulfate concentration of 800 mg/l in the shallow basin fill layers (TMR Layers 1 through 4) is a simplification of the system assumed to conveniently simulate the vertical extent of the sulfate plume. This assumption of a uniform, high sulfate concentration in the basin fill does not simulate the observed extent and concentration of the sulfate plume, which is less laterally extensive and has lower concentrations at the plume margin than was assumed for the TMR model (i.e., the TMR model does not represent the leading edge of the plume but, instead, assumes the plume is laterally continuous across the entire TMR model domain). Simulation of a more laterally continuous plume than the actual plume is conservative in that it overestimates the extent and, in places, the concentration of the plume; which allowed the simulations to focus on determining whether sulfate concentrations would spread vertically in response to pumping.

Each of the proposed replacement wells was initially simulated assuming continuous pumping at a rate of 0.35 gallons per minute (gpm) per well or 518 gallons per day (gpd). The replacement wells were simulated as being screened in TMR Layer 7 at the top of the bedrock. The initial simulation used the

[1] The TMR procedure allows interactive on-screen selection of a sub-model domain, which led to uniform model cells with odd dimensions.

same horizontal to vertical hydraulic conductivity ratios used in the calibrated model (approximately 8:1 in basin fill and 20:1 in bedrock). The horizontal to vertical hydraulic conductivity ratio was also tested in a simulation at 1:1 which allows the maximum opportunity for the vertical transport of sulfate.

3.1 Initial Model Simulation Results

Figure 7 displays the simulated sulfate concentrations in TMR model Layer 5, the lowermost basin fill layer, after 100 years (2109) of pumping from the proposed replacement well. The simulation results illustrate that sulfate concentrations are predicted to rise from the initial (2009) Layer 5 concentration of 20 mg/l to as much as 30 mg/l on the west side of the model domain in 2109. This indicates that vertical transport of sulfate is minimal over the 100 year period simulated and that bedrock would be unaffected by sulfate because concentrations in the overlying basin fill do not rise significantly.

Figure 8 shows the predicted concentrations in basin fill Layer 5 and bedrock Layers 6 and 7 (the proposed completion depth of replacement wells) at Observation Point 1 over the simulation. The proposed wells are simulated as pumping from Layer 7 (bedrock aquifer) at a rate of 0.36 gpm (518 gpd). The results indicate little change in the predicted sulfate concentrations in Layers 5, 6, and 7 over 100 years. The simulation results predict that pumping from the proposed bedrock replacement wells does not cause sulfate to migrate downward from the sulfate plume to the deeper basin fill or bedrock.

3.2 Vertical Hydraulic Conductivity

The initial simulation was run using the model horizontal to vertical hydraulic conductivity ratios from the calibrated model (approximately 8:1 in basin fill and 20:1 in bedrock). The ratio of horizontal to vertical hydraulic conductivity in the basin fill varies from approximately 9:1 to 7:1 in the model area. This ratio naturally limits the ability of contamination to migrate vertically in the basin fill to a deepened well because flow occurs more easily in the horizontal direction than the vertical direction. To test the sensitivity of the initial simulation to the assumed hydraulic conductivity ratios, the groundwater model was run with the hypothetical condition that the horizontal to vertical hydraulic conductivity are the same value, for both the bedrock and basin fill layers. A simulation of the horizontal to vertical hydraulic conductivity ratio set to 1:1 would tend to overestimate the vertical migration of sulfate compared to the initial simulation because it removes the naturally occurring resistance to vertical flow imparted by the lower vertical hydraulic conductivity. Figure 9 shows the results of the simulation with a 1:1 hydraulic conductivity ratio, which were nearly identical to the first simulation using the original ratios. Figure 10 shows that concentrations at Observation Point 2 in TMR model Layer 5 representing the lower basin fill are predicted to rise from the initial (2009) concentration of 20 mg/l to about 30 mg/l over the 100 year period. As in the initial simulation, the wells are pumping from TMR model Layer 7 at a rate of 0.36 gpm (518 gallons per day). Concentrations in TMR model Layer 7 are nearly constant over the course of the 100 year simulation.

3.3 Wells in Lower Basin Fill

As an additional test, a groundwater simulation was completed with the replacement wells moved to TMR model Layer 5, which is the layer of basin fill immediately below the zone of elevated sulfate in the shallow aquifer. This simulation used the same pumping rates as the previous two simulations and a 1:1 ratio of horizontal to vertical hydraulic conductivity. Figure 11 illustrates these results, with sulfate concentrations

rising from 20 to 28 mg/l over the 100-year period in TMR model Layer 5 at Observation Point 2. Based on these results, sulfate is not predicted to migrate vertically downward to the lower basin fill in response to pumping 518 gallons per day (0.36 gpm) from each of the proposed replacement wells if they were located in the lower basin fill. The conclusion is that the hydraulic stresses from the proposed domestic wells are not adequate to cause significant changes in the existing groundwater flow and transport conditions.

3.4 Pumping Rates Raised to 10 GPM

To evaluate the possibility for sulfate migration under a scenario of relatively high pumping, a simulation was conducted in which each of the proposed replacement wells was pumped from TMR model Layer 7 (bedrock) steadily at 10 gpm (14,400 gpd) for the entire 100 year projection period. These results are nearly identical to those in the previous simulation (see Figure 11). Concentrations in TMR model Layer 5 are predicted rise from the initial (2009) concentration of 20 mg/l to 28 mg/l over the 100-year period.

4 CONCLUSION

The groundwater model reported here simulates flow and transport using porous media assumptions. These standard modeling assumptions should accurately simulate flow through an aquifer not dominated by preferential flow paths, such as conductive fractures or layers more discrete than the scale of the layers or model cells. The conclusion of these simulations is that pumping from the replacement wells proposed for construction in the bedrock is not predicted to result in sufficient drawdown to cause the plume to move downward into the bedrock under the simulation assumptions used. The lack of significant vertical migration of sulfate predicted for continuous groundwater pumping at 10 gpm at the seven proposed replacement wells indicates that no impact would be predicted for the installation of several additional replacement wells pumping at rates expected for domestic supply wells (i.e., approximately 0.36 gpm).

The proper placement of annular seals in the proposed wells will be a significant factor in preventing sulfate migration down the borehole. Figure 12 is a proposed conceptual design for the replacement wells. The depth of bedrock in the vicinity of Purdy Lane ranges from 535 feet at TM-19A to 636 feet at BMO-2008-4B. The conceptual design includes drilling 150 feet into the bedrock and installation of 100 feet of screen from the bottom of the borehole to approximately 50 feet below the basin fill. Filter pack would be placed in the well annulus from the bottom of the borehole to 10 feet over the top of the screen. A bentonite seal would be placed above the filter pack to approximately 20 feet below land surface, with the remainder of the annulus consisting of a cement surface seal. The well screen and casing would be 5-inch (nominal) Schedule 80 polyvinylchloride.

References

Clear Creek Associates, 2010. *Revision 1 Aquifer Characterization Report – Task 4 of the Aquifer Characterization Workplan – Mitigation Order on Consent Docket No. P-121-07, Cochise County, Arizona.* December 15, 2011.

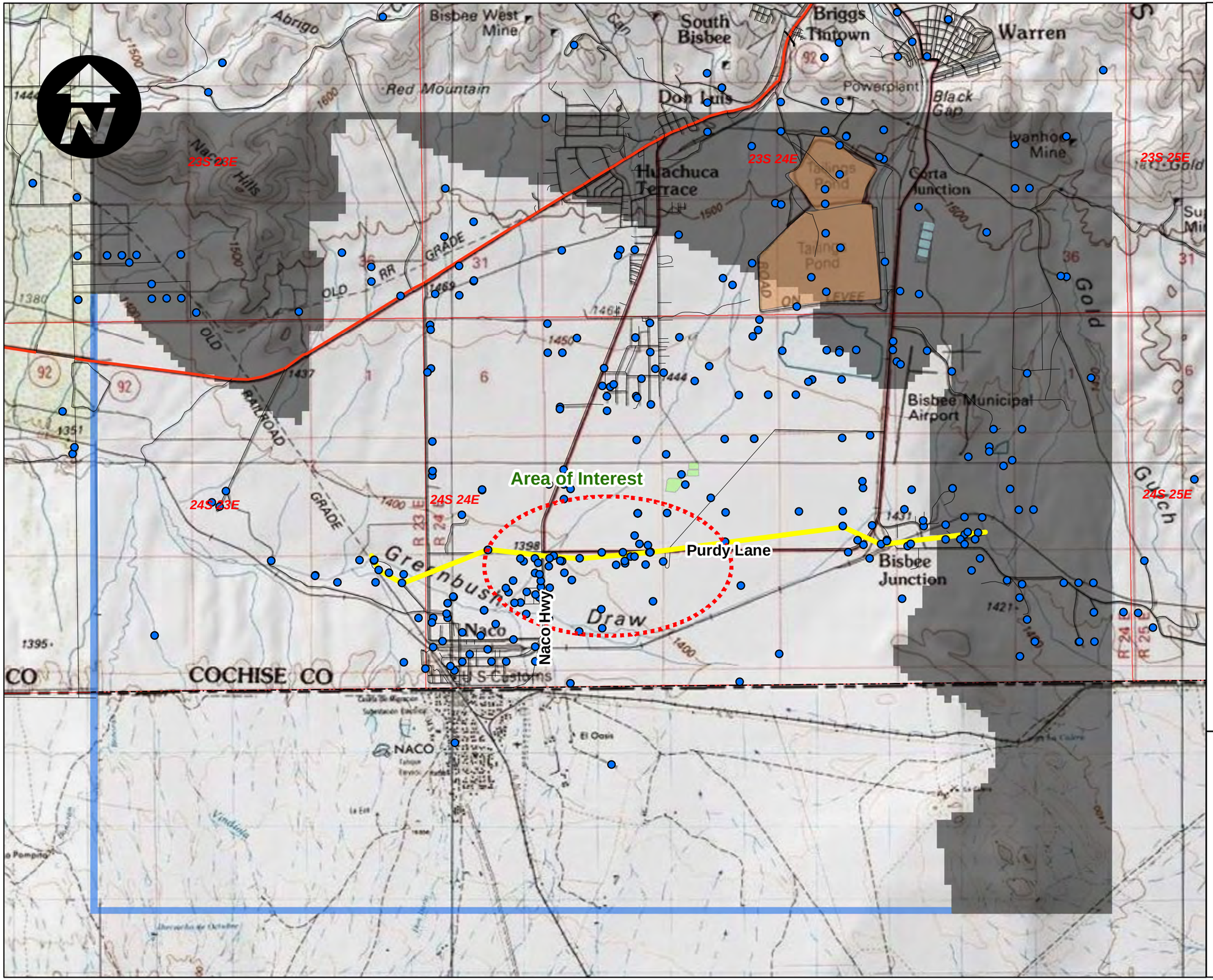
Clear Creek Associates, 2011. *Third Quarter 2011 Groundwater Monitoring Report.* October 7, 2011.

Environmental Simulations, Inc., 2010. Groundwater Vistas™ software, version 5.

Attachments

- Figure 1 – Mitigation Order Model Area
- Figure 2 – Wells Considered for Replacement
- Figure 3 – Model Cross Section in Purdy Lane Area
- Figure 4 – Depth Specific Sampling for Sulfate, Garner 635 and BMO-2008-4 Wells
- Figure 5 – TMR Model Domain
- Figure 6 - TMR Model Cross-Section Along Row 28
- Figure 7 – TMR Model Layer 5 Sulfate Concentrations in 2109 (Kv:Kh ratio from original model)
- Figure 8 – Projected Sulfate Concentration by TMR Model Layer, Observation Point 1 - 2009 to 2109
- Figure 9 – TMR Model Layer 5 Sulfate Concentrations in 2109 (Kv:Kh ratio 1:1)
- Figure 10 – Projected Sulfate Concentration by TMR Model Layer, Observation Point 2 - 2009 to 2109
- Figure 11 – Projected Sulfate Concentration by TMR Model Layer, Observation Point 2 - 2009 to 2109
- Figure 12 – Conceptual Design for Replacement Wells

- Table 1 – Wells to be Deepened (**in text**)
- Table 2 – Depth-Specific Sample Results from GARNER 635 (**in text**)



Legend

- Wells in Database
- Figure 3 Cross Section Location
- US/Mexico Border
- San Jose WWTP
- Warren WWTP
- Tailings

Boundary Conditions

Layer 1

- Constant Heads
- No Flow

0 0.25 0.5 1 1.5 Miles

Figure 1

Mitigation Order Model Area

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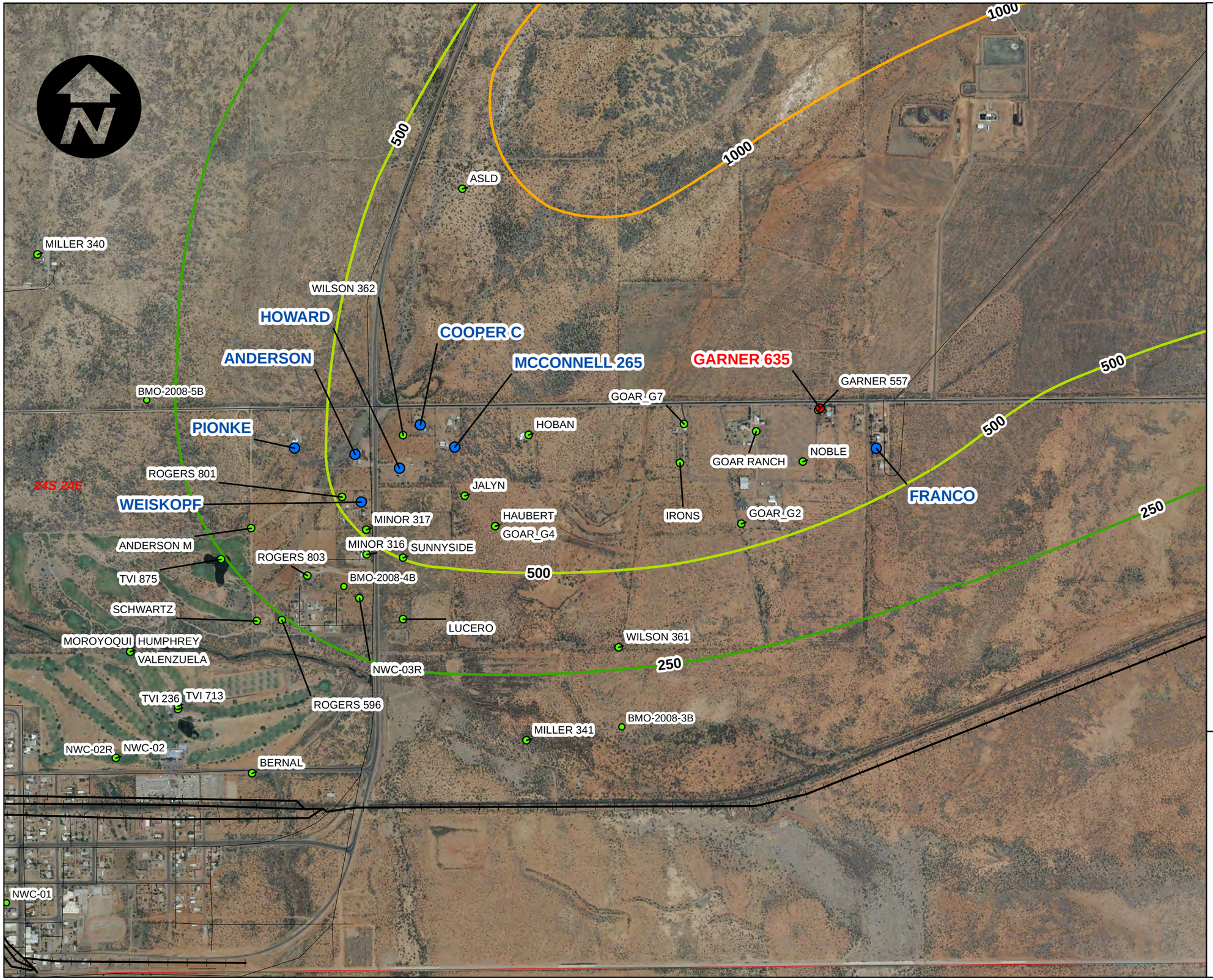
October 2011



Legend

Wells Along Purdy Lane

Well Type

- Potential Well to be Replaced
- Garner Well (previously replaced)
- Other Wells

3rd Quarter 2011 SO4 Contours

Sulfate Concentration Contour (mg/l)

- 250
- 500
- 1000
- 1500

Railroads

- Railroad

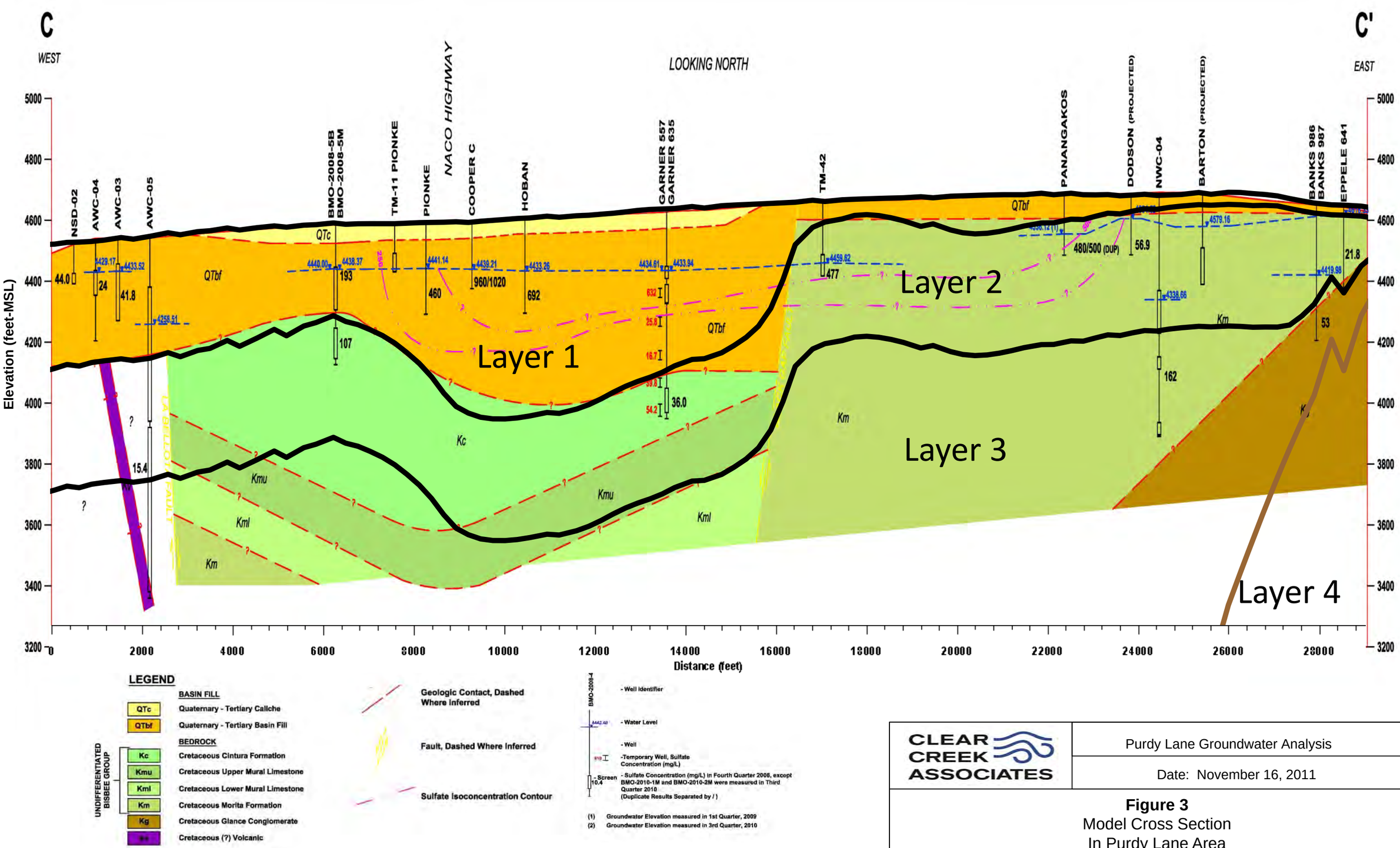
0 250 500 1,000 1,500 2,000 Feet

Figure 2

Wells Considered for Replacement

CLEAR CREEK ASSOCIATES

October 2011



CLEAR CREEK ASSOCIATES

Purdy Lane Groundwater Analysis

Date: November 16, 2011

Figure 3
Model Cross Section
In Purdy Lane Area

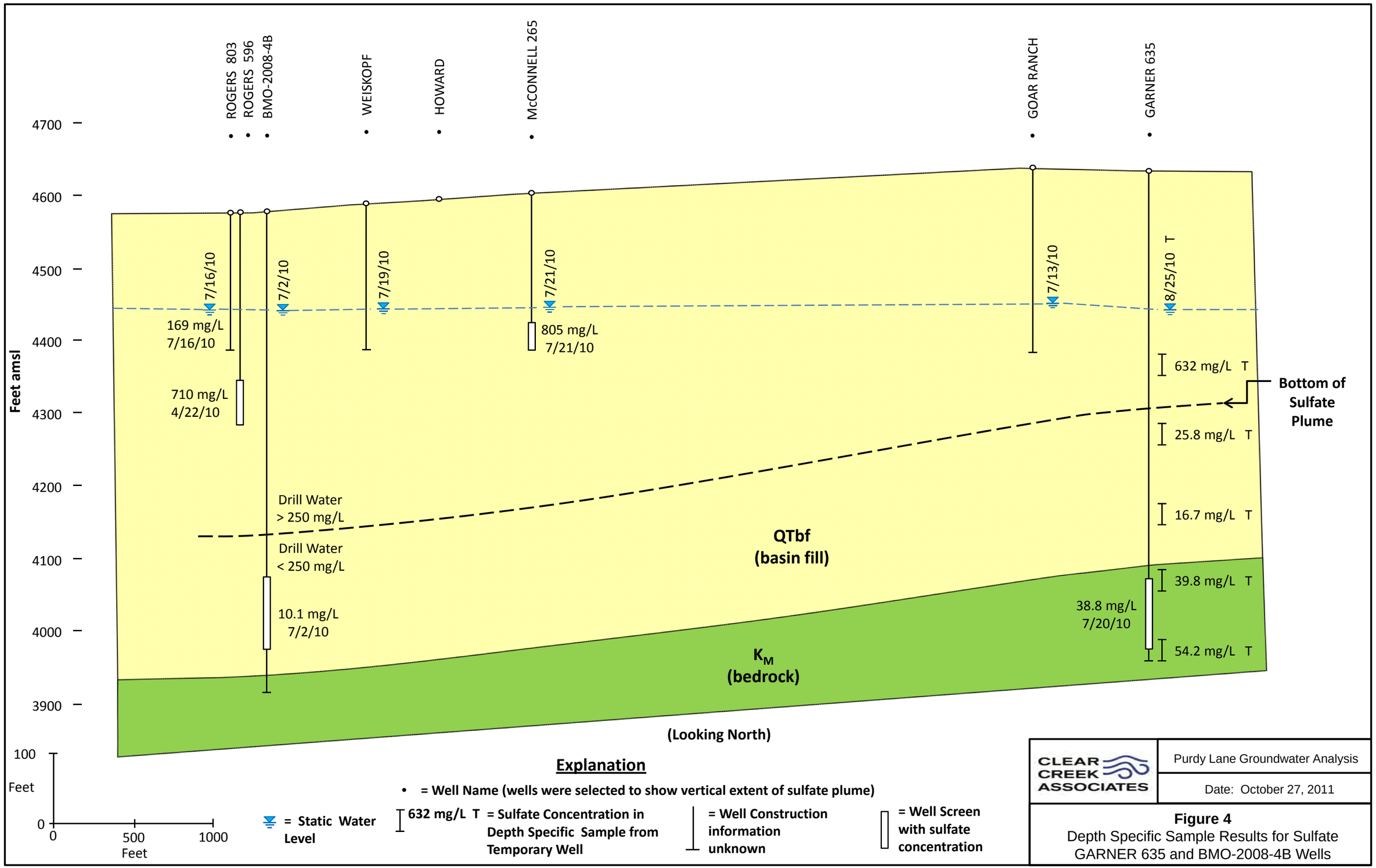
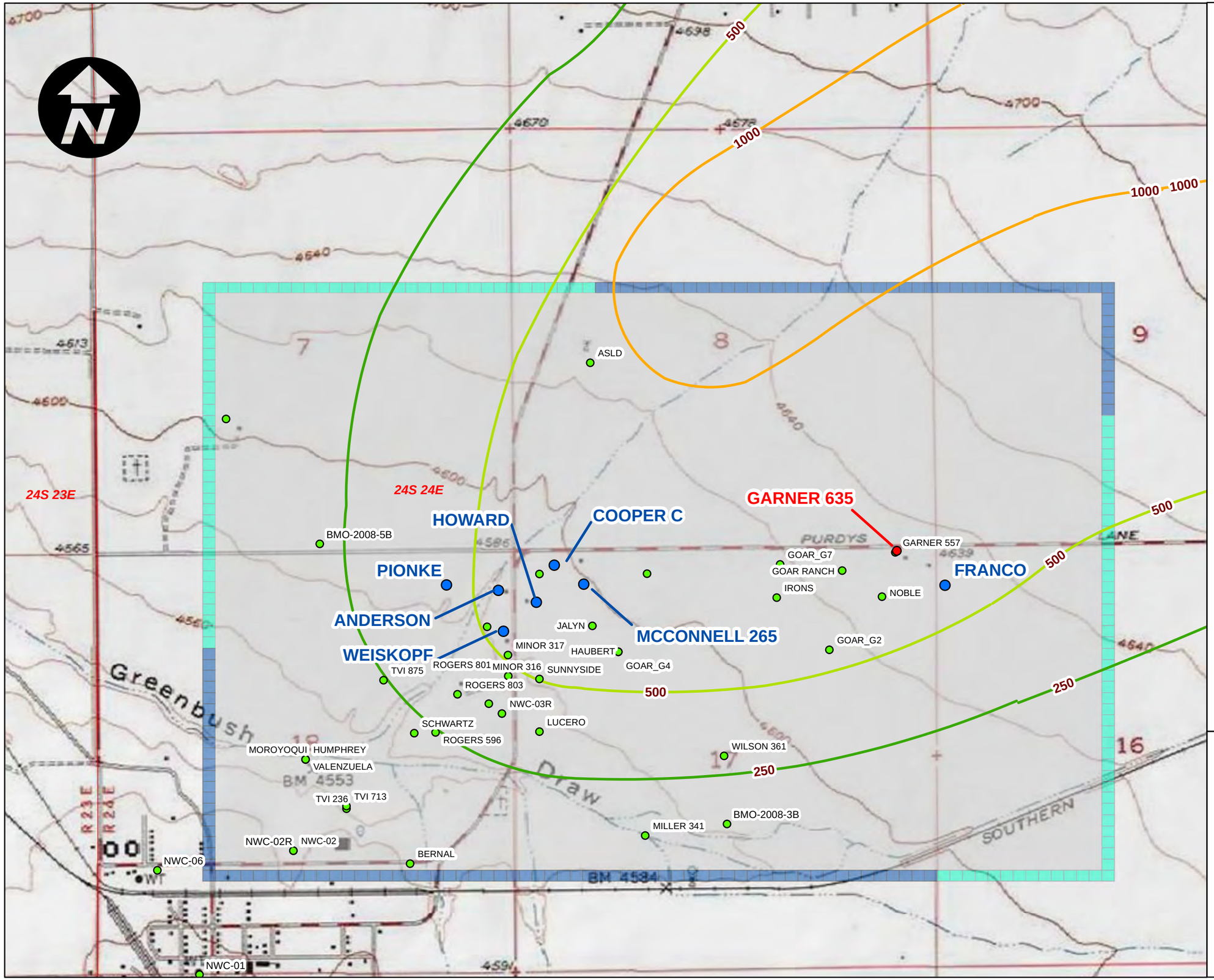


Figure 4
Depth Specific Sample Results for Sulfate
GARNER 635 and BMO-2008-4B Wells



Legend

Domestic Wells Along Purdy Lane

Well Type

- Potential Domestic Well to be Deepened
- Garner Well (previously deepened)
- Other Wells

3rd Quarter 2011 SO4 Contours for Basin Fill Aquifer

Contour (mg/l)

- 250
- 500
- 1000
- 1500

TMR Model Domain

Layers and Cells

- Active Model Cell: All Layers
- Constant Head: Layers 3-9
- Constant Head: Layers 4-9

NOTES:
Layers 1 and 2 are not saturated at the boundaries, so constant heads were not assigned.

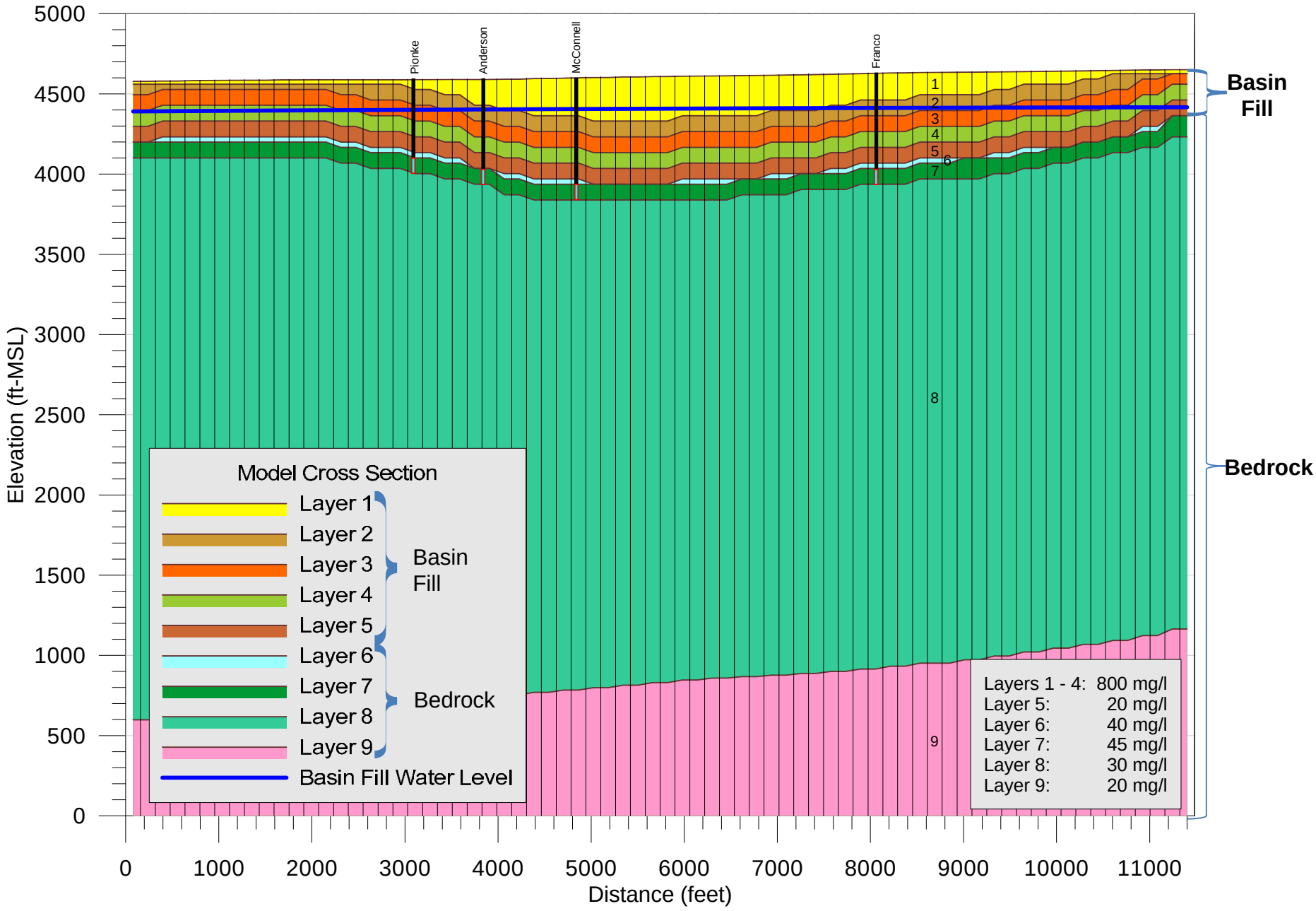
0 250 500 1,000 1,500 2,000 2,500 3,000 Feet

Figure 5

TMR Model Domain

CLEAR CREEK ASSOCIATES

October 2011



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6155 East Indian School Road
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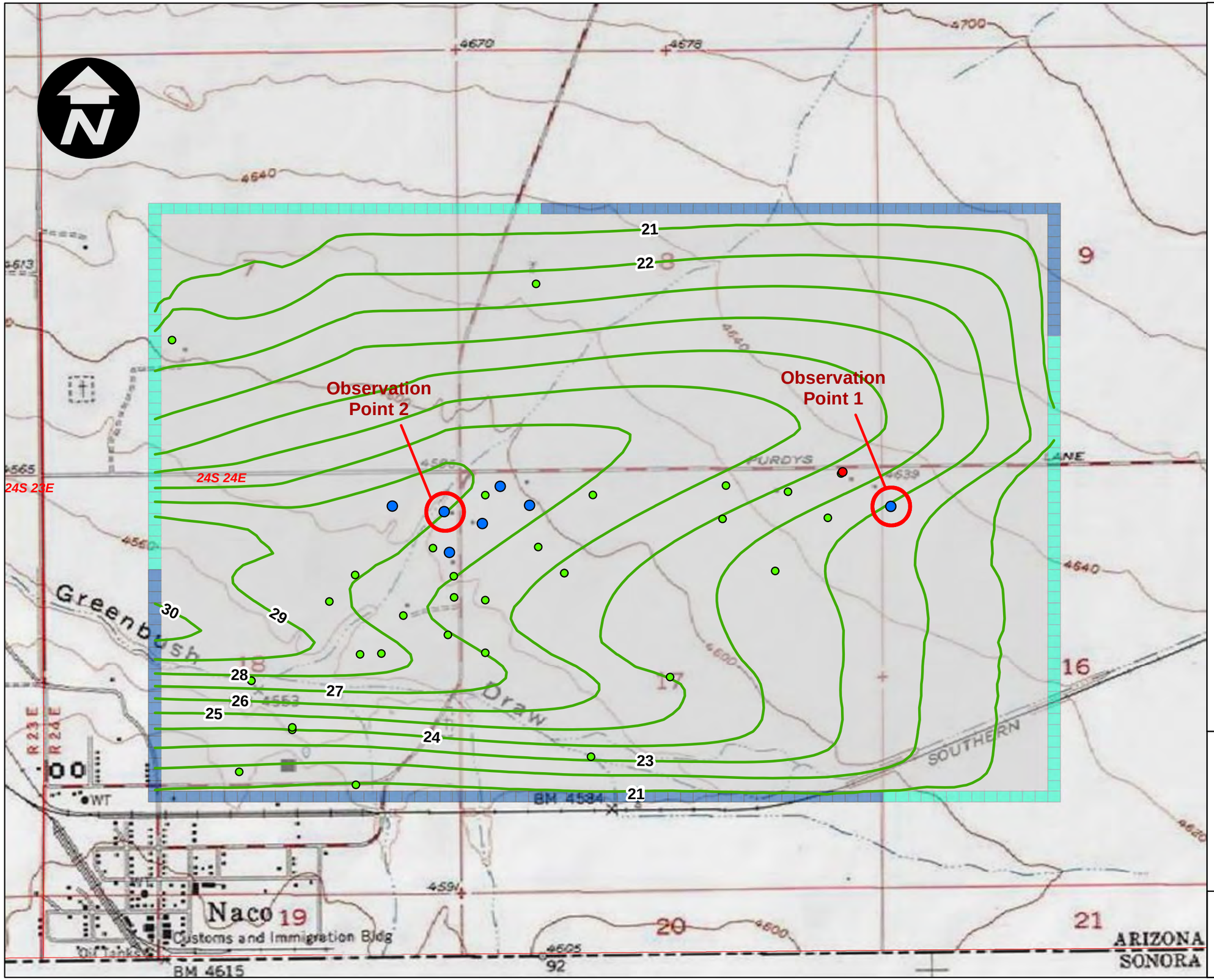
(480) 659-7131

October 20, 2011

Model Cross-Section along Row 28
TMR Model

Figure 6



Legend

Wells Along Purdy Lane

Well Type

- PotentialWell to be Replaced
- Garner Well (previously deepened)
- Other Wells
- 2109 Sulfate Concentraions in Layer 5

TMR Model Domain

Layers and Cells

- Active Model Cell: All Layers
- Constant Head: Layers 3-9
- Constant Head: Layers 4-9

0 250 500 1,000 1,500 2,000 2,500 Feet

Figure 7

TMR Model Layer 5
2109 Sulfate Concentrations

(Kv:Kh Ratio from Original Model)

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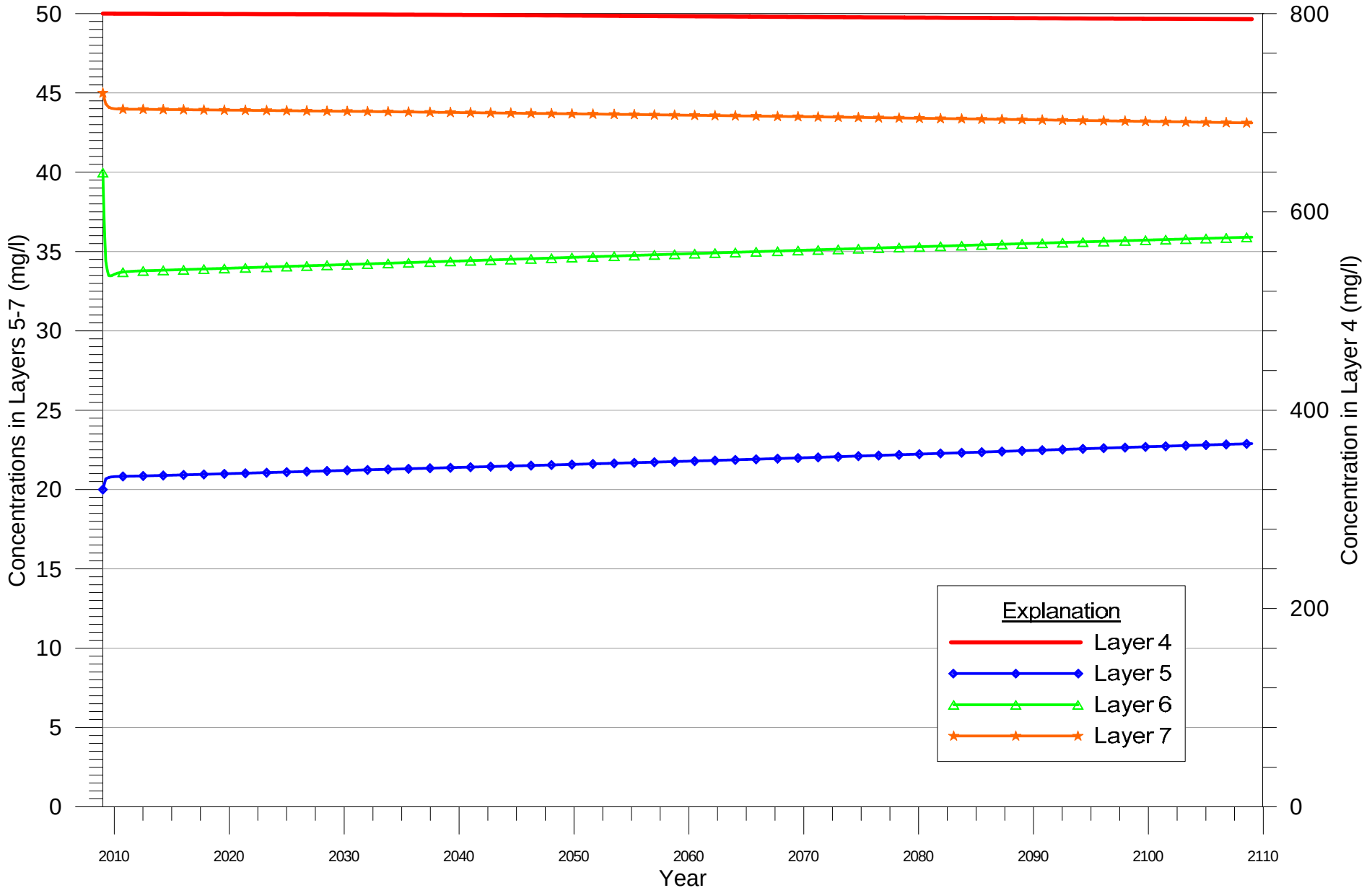
October 2011



Note: Pumping Rate at each well = 0.36 gpm or 518 gpd; K_V/K_H = Same as Original Model

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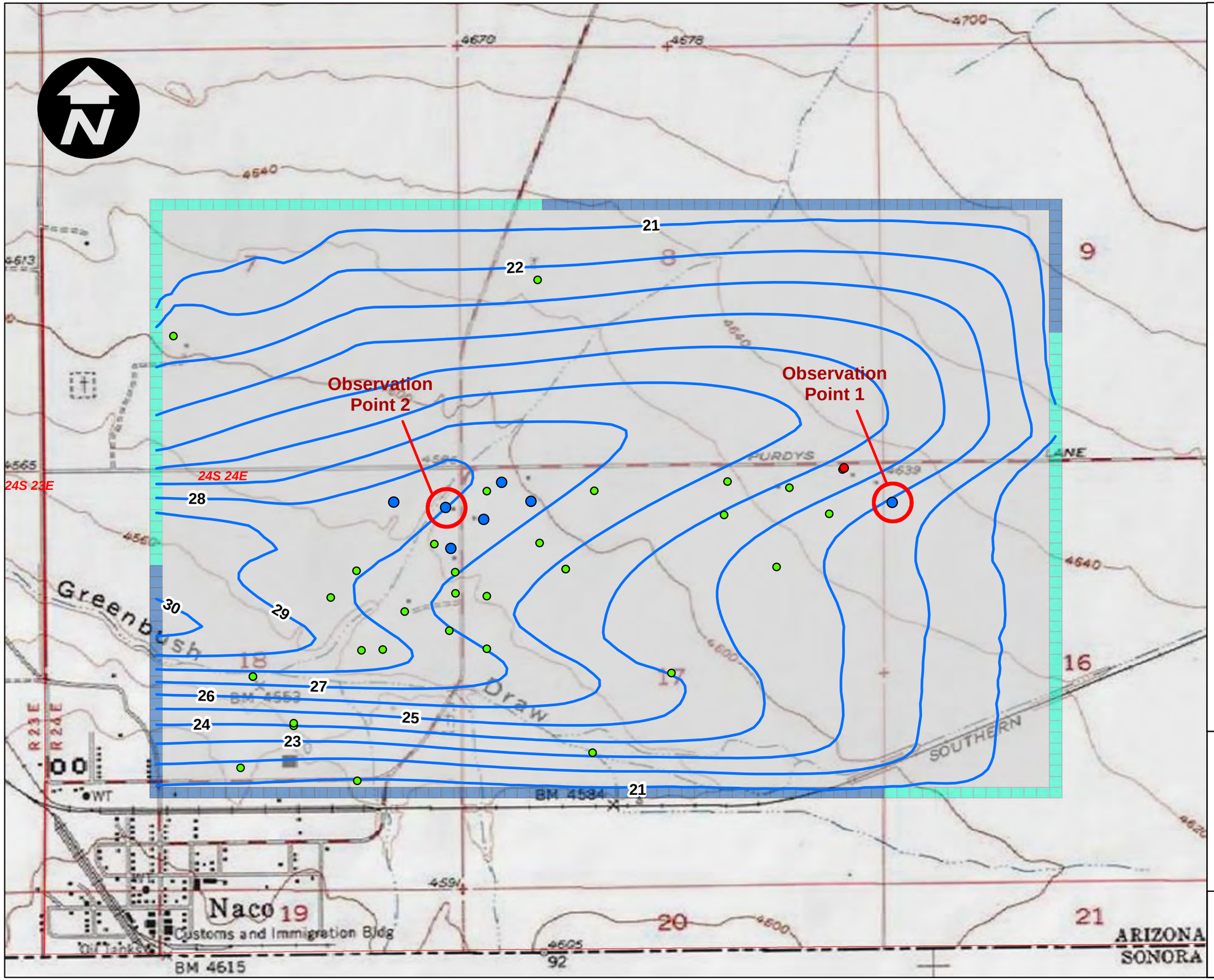
Projected Sulfate Concentration
TMR Model Layers
Observation Point 1 - 2009 to 2109

Figure 8



Legend

Wells Along Purdy Lane

Well Type

- Potential Well to be Replaced
- Garner Well (previously deepened)
- Other Wells
- 2109 Sulfate Concentraions in Layer 5

TMR Model Domain

Layers and Cells

- Active Model Cell: All Layers
- Constant Head: Layers 3-9
- Constant Head: Layers 4-9

0 250 500 1,000 1,500 2,000 2,500 Feet

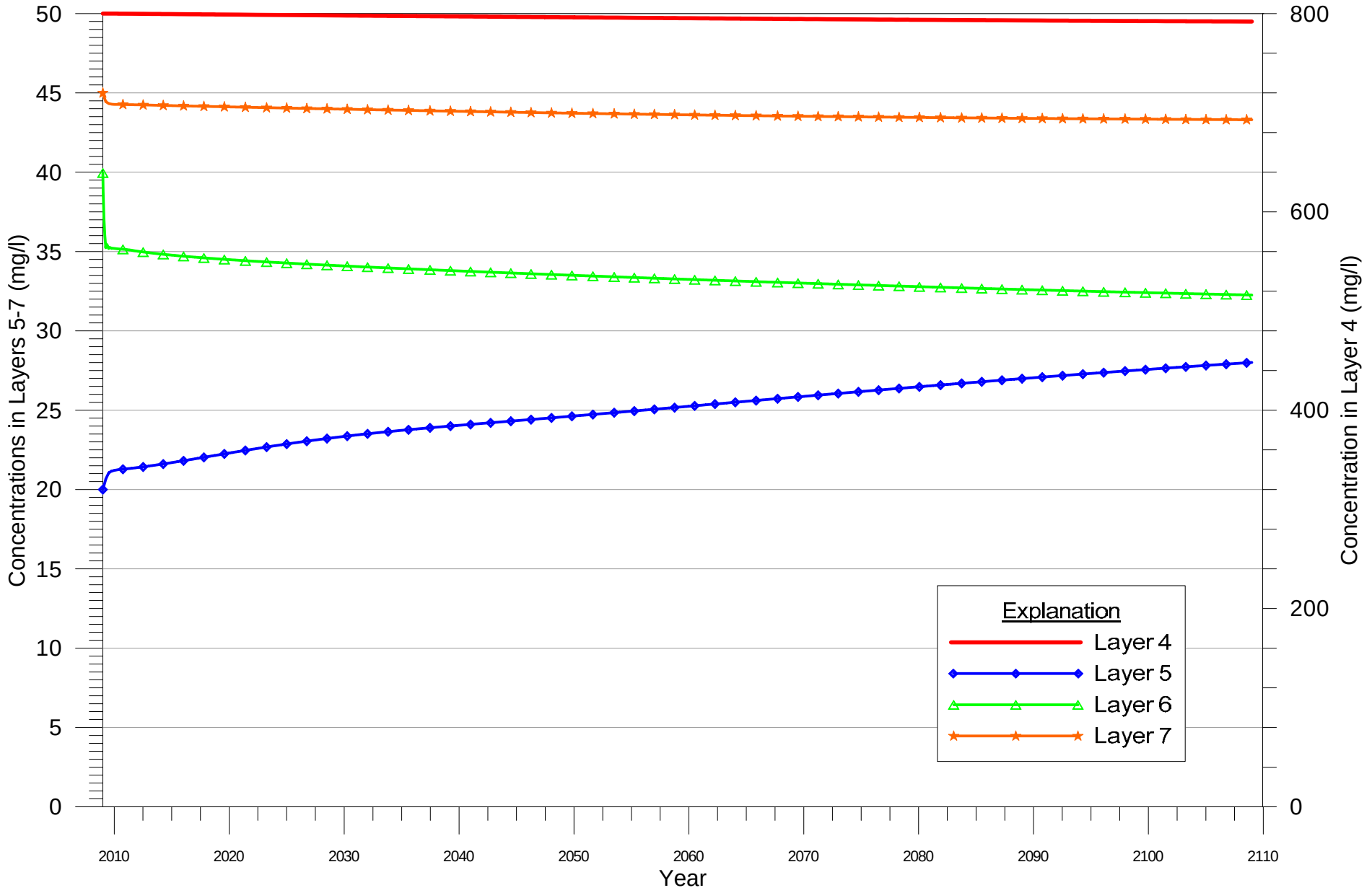
Figure 9

TMR Model Layer 5
2109 Sulfate Concentrations

(Kv:Kh Ratio set to 1:1)

CLEAR CREEK ASSOCIATES

October 2011



Note: Pumping Rate at each well = 0.36 gpm or 518 gpd; $K_V/K_H = 1$

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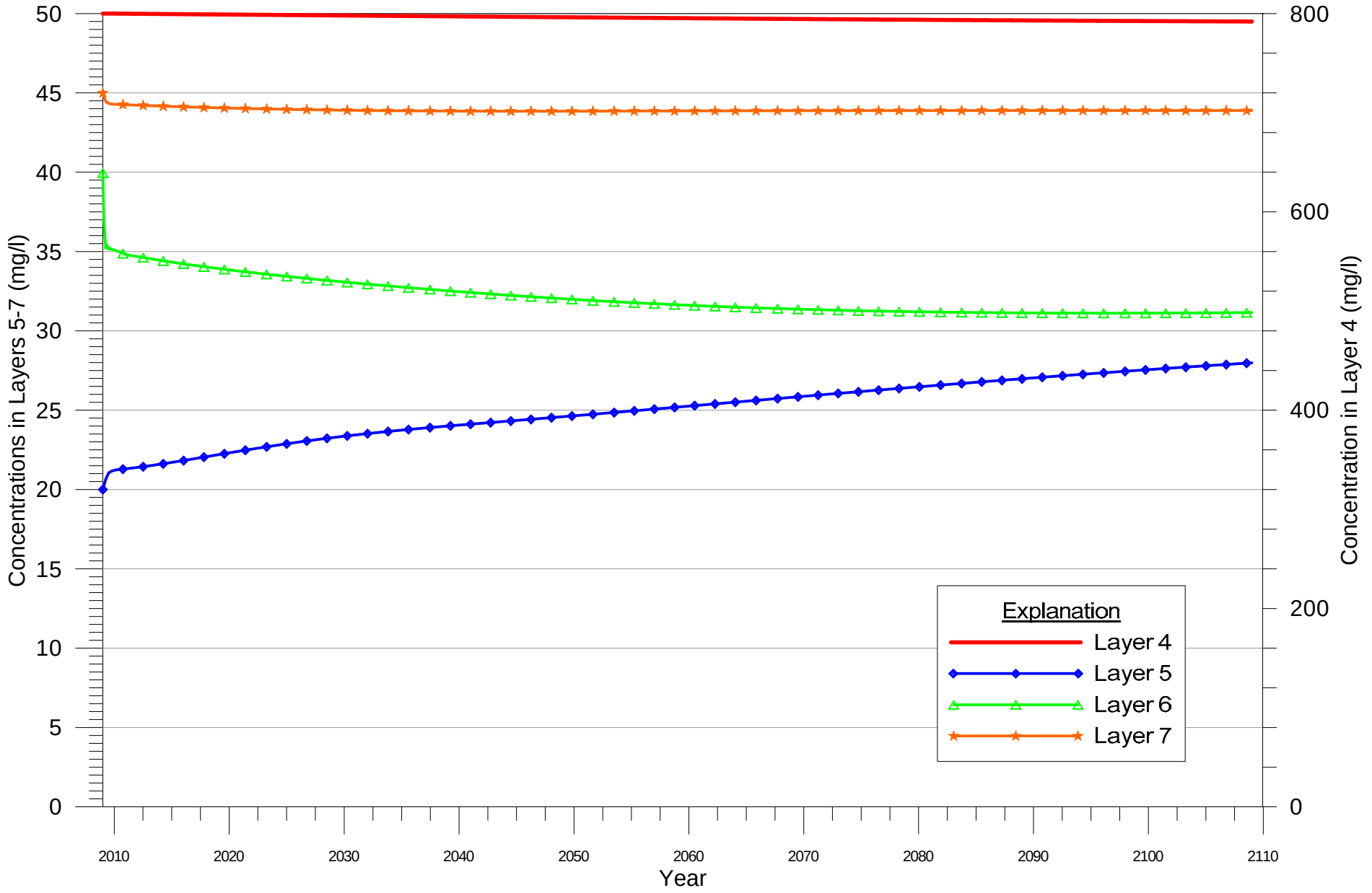
Projected Sulfate Concentration
TMR Model Layers
Observation Point 2 - 2009 to 2109

Figure
10



Note: Pumping Rate at each well = 10 gpm or 14400 gpd; $K_V/K_H = 1$

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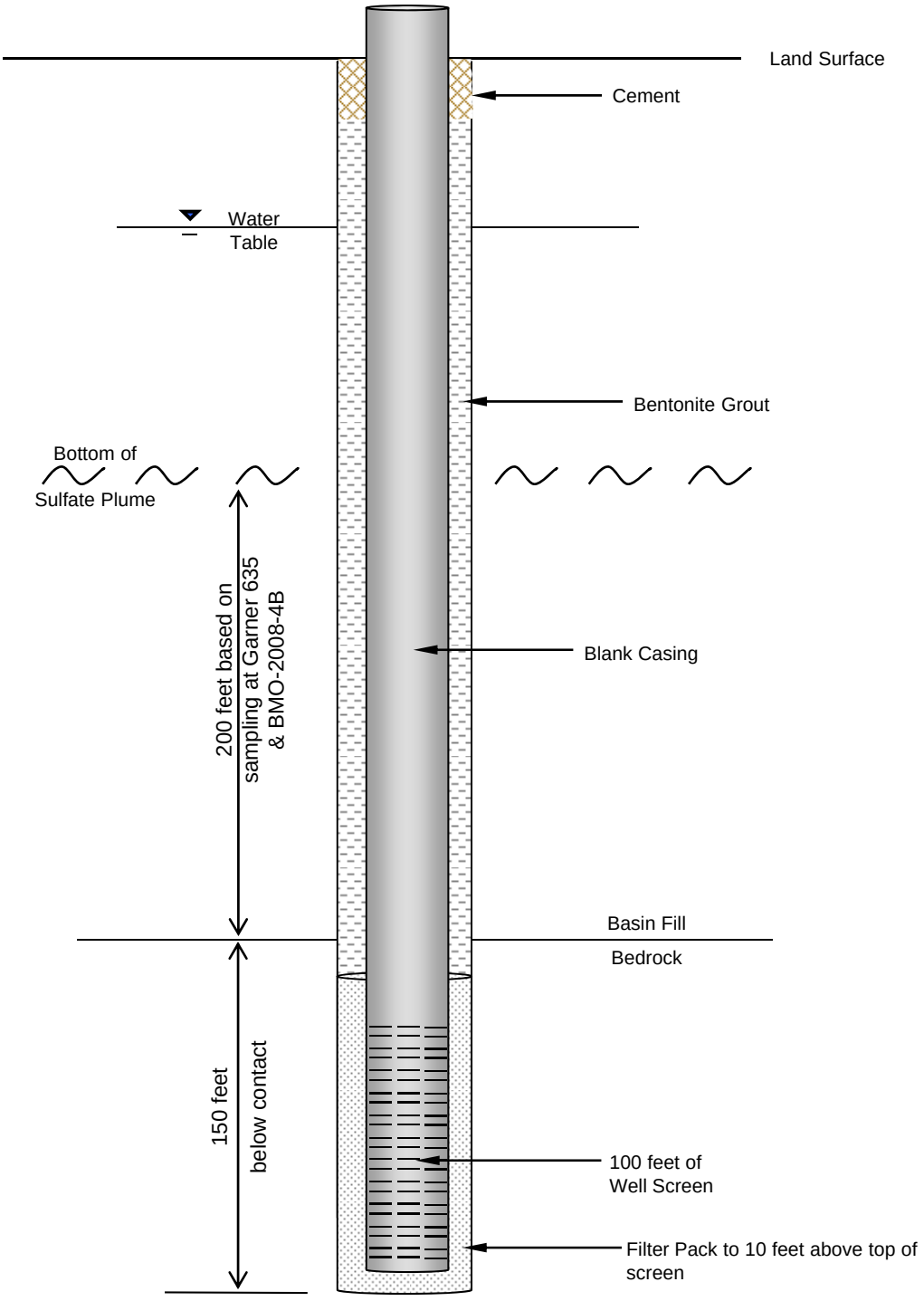
Projected Sulfate Concentration
TMR Model Layers
Observation Point 2 - 2009 to 2109

Figure 11



Not To Scale

CLEAR CREEK ASSOCIATES	Purdy Lane Groundwater Analysis
	Date: October 27, 2011

Figure 12
Conceptual Well Design for
Replacement Wells

APPENDIX B

REVISION 1 – TRAVEL TIME ANALYSIS FOR LEADING EDGE OF THE SULFATE PLUME

TECHNICAL MEMORANDUM

CLEAR CREEK ASSOCIATES

To: Rebecca Sawyer, Freeport-McMoRan Corporation, Copper Queen Branch
From: James Norris, R.G., Clear Creek Associates
Subject: Revision 1 - Travel Time Analysis for Leading Edge of the Sulfate Plume Mitigation Order on Consent No. P-121-07
Date: September 21, 2012

1 INTRODUCTION

This revised memorandum contains migration rate estimates for the leading edge of the sulfate plume[1] based on site-specific water level and hydraulic properties data. The purpose of the analysis is to evaluate the timeframe over which the sulfate plume could potentially migrate from its current location to the Arizona Water Company (AWC) wellfield west of the plume. This travel time memorandum was originally submitted to Arizona Department of Environmental Quality (ADEQ) in January 2012 and was revised in August 2012 based on comments from ADEQ (ADEQ, 2012).

A more detailed analysis of the direction and migration rate of the sulfate plume will be conducted using the groundwater flow and sulfate transport model presented in the *Aquifer Characterization Report* (Clear Creek Associates, 2010). The numerical modeling results will be used to determine whether the sulfate plume would migrate to the AWC wellfield and, if so, in what timeframe. The modeling results will be reported as part of the Feasibility Study for drinking water supply wells that might be impacted in the future.

2 BACKGROUND AND PROCEDURE

Figures 1 and 2 are maps showing sulfate concentrations and water levels, respectively, in the vicinity of the sulfate plume in the third quarter of 2011. Figure 3 shows wells completed in the basin fill aquifer at the leading edge of the sulfate plume.

The basin fill aquifer consists of unconsolidated sand and gravel deposits that contain the leading edge of the sulfate plume. This analysis focused on the basin fill aquifer because it is the only aquifer containing sulfate in excess of 250 mg/L at the front of the sulfate plume. The hydrology, nature, and extent of the westward-migrating sulfate plume are detailed in the *Aquifer Characterization Report* (Clear Creek Associates, 2010) submitted to ADEQ. The water level and water quality data presented in this analysis

[1] The sulfate plume is defined as the zone of groundwater with sulfate concentrations exceeding 250 milligrams per liter due to the Concentrator Tailing Storage Area.

are collected and reported quarterly to ADEQ (e.g., Clear Creek Associates, 2011) pursuant to Mitigation Order on Consent P-121-07 (Mitigation Order).

Darcy's Law calculations were used to estimate the rate of plume movement and potential travel times to the AWC wellfield, assuming that the amount of groundwater pumping at the front of the plume would remain at current levels into the future. Water levels in basin fill wells at the leading edge of the plume were used to calculate the hydraulic gradient that constitutes the driving force for groundwater flow. Hydraulic conductivity and porosity estimates for basin fill were used with the calculated hydraulic gradient to calculate the average groundwater flow velocity. The flow velocity and distance between the plume and points of interest were used to calculate the travel time assuming sulfate is transported at the same velocity as the average groundwater velocity (i.e., sulfate migration is not retarded by chemical processes). The following equations were used for this analysis.

Average Groundwater Flow Velocity = ((Hydraulic Conductivity) (Hydraulic Gradient))/Porosity (1)

Travel Time = Distance/Average Groundwater Flow Velocity (2)

3 WATER LEVELS, GROUNDWATER FLOW DIRECTION, AND HYDRAULIC GRADIENTS

Figure 2 illustrates groundwater elevations measured during the third quarter of 2011. Groundwater flow is perpendicular to equipotential lines such as the water elevation contours shown on Figure 2. Thus, groundwater in the region between the plume and the AWC wellfield flows westerly. The velocity of groundwater flow is directly proportional to the hydraulic gradient which is calculated as the water elevation difference between two measurement points divided by the distance separating them. Water level data for basin fill wells at the front of the plume were compiled and the distances between wells were determined to calculate the hydraulic gradient.

Wells selected for water level analysis and hydraulic gradient calculations are monitoring wells BMO-2008-4B, BMO-2008-5B, and BMO-2008-6B at the leading edge of the plume, BMO-2008-13B which is upgradient of BMO-2008-6B, BMO-2010-3B along Greenbush Draw between the plume edge and the AWC wellfield, wells at the AWC wellfield (extraction wells AWC-02, AWC-03, AWC-04, and AWC-05 and monitoring well COB MW-3), and monitoring wells NSD-02 and NSD-03 downgradient of the AWC wellfield (Figures 1, 2, and 3). Water level data for these wells are tabulated on Table 1. Figure 4 is a graph of water elevations over time at the wells.

The water level data on Figure 4 show contrasting behaviors in wells at and in front of the leading edge of the plume. Water elevations in wells distant to the AWC wellfield (e.g., BMO-2008-4B, BMO-2008-5B, and BMO-2008-6B, BMO-2010-3B, and NSD-03) vary less over time than do water elevations in wells within or peripheral to the wellfield (i.e., AWC-02, AWC-03, AWC-04, AWC-05[2], COB MW-3, and NSD-02). The large variation in water elevations in wells within or close to the wellfield is due to water level drawdown caused by pumping at the wellfield. The large fluctuations in water levels at the AWC wells are likely due to residual drawdown in the wells (i.e., incomplete recovery of the water levels at the time of measurement). In COB MW-03 and NSD-02 the fluctuations are likely due to drawdown which can vary over time due to changes in the rates and locations of pumping. The effect of the wellfield diminishes with distance from it such that NSD-03 which is farther from the wellfield has higher water level elevations and less water level fluctuation than NSD-02.

The regional hydraulic gradient is the driving force for movement of the sulfate plume. Static (non-pumping) groundwater elevations are the most representative data on which to base regional hydraulic gradient calculations. The water elevations at AWC-02, AWC-03, AWC-04, AWC-05, COB MW-03, and NSD-02 appear to be influenced by wellfield operations and do not represent water levels characteristic of regional conditions. Localized hydraulic gradients that occur in the vicinity of an individual pumping well or a wellfield can also influence sulfate movement, but only when the sulfate plume has moved within the capture zone of the wellfield. Localized hydraulic gradients caused by pumping wells may result in the capture of sulfate if the plume impinges on the wellfield, but do not control the large scale movement of the plume at a distance from the wellfield.

Water level data for wells near the front of the plume were used to characterize the water elevation in the upgradient area. With respect to the AWC wellfield, the upgradient area is the area from which sulfate-bearing groundwater is flowing. Water level data for the downgradient area, the direction in which sulfate–bearing groundwater is flowing, are provided by wells near and west of the AWC wellfield. However, water level data representing the regional hydraulic gradient are limited because many downgradient monitoring points are influenced by the AWC wellfield. Wells influenced by wellfield drawdown have lower water elevations than wells outside the influence of the wellfield. For example, the water elevations at NSD-03 are higher than those at COB MW-3 even though NSD-03 is downgradient of the wellfield with respect to the regional groundwater flow system. The use of water elevations influenced by drawdown would bias travel time calculations by yielding higher hydraulic

[2] Water level elevations at AWC-05 are not shown on Figure 4 because they are almost 200 feet lower than in other AWC wells with the exception of a measurement in June 2009 (Table 2). It is uncertain whether the lower water elevations were measured while the well was pumping, but the June 2009 measurement is comparable to pseudostatic water levels in the other AWC wells.

gradients and flow velocities, and shorter travel times (Equations 1 and 2) than would the use of water elevations from wells outside the influence of the wellfield.

Water levels at NSD-03 are the downgradient data most representative of the regional hydraulic gradient influencing migration of the sulfate plume. Although water levels at NSD-02 are influenced by wellfield pumping, they are more representative of the regional hydraulic gradient than water levels at COB MW-3 which are anomalously low compared to NSD-02, NSD-03, and the AWC wells. For this reason, hydraulic gradient calculations were conducted using data for NSD-02 to represent a downgradient water level condition between those at COB MW-3 and NSD-03.

The following well pairs were used to estimate the hydraulic gradient between the front of the plume and the AWC wellfield:

- BMO-2010-3B and BMO-2008-4B: characterizes potential flow path between the plume and BMO-2010-3B
- NSD-02 and BMO-2010-3B: characterizes potential flow path between BMO-2010-3B and AWC wellfield
- NSD-02 and BMO-2008-5B: characterizes potential flow path between BMO-2008 and AWC wellfield
- BMO-2008-6B and BMO-2008-13B: characterizes flow path north of the AWC wellfield

Table 2 contains water level differences for measurements collected at approximately the same time, distances between the well pairs, and the calculated apparent hydraulic gradients over time. The term “apparent” is used here to indicate that the hydraulic gradients are approximate in that they are calculated along lines between existing points that may not be orthogonal to the potentiometric field. The apparent hydraulic gradients at the well pairs range from 0.0012 feet per foot (ft/ft) to 0.0028 ft/ft.

4 HYDRAULIC CONDUCTIVITY

The hydraulic conductivity of basin fill has been estimated by interpretation of pumping tests conducted at various locations in the vicinity of the sulfate plume. The pumping test data and their interpretation are described in the *Aquifer Characterization Report* (Clear Creek Associates, 2010). Table 3 lists hydraulic conductivity estimates for basin fill, including the arithmetic and geometric means for the data set. Basin fill hydraulic conductivities range from 2.3 feet/day (ft/day) to 100.9 ft/day and have arithemetic and geometric means of 39.5 ft/day and 29.7 ft/day, respectively. Figure 5 is a cumulative frequency plot of the basin fill hydraulic conductivity estimates.

Hydraulic conductivity estimates for wells BMO-2008-4B, BMO-2008-5B, BMO-2008-6B, and BMO-2010-3B at the leading edge of the sulfate plume are 39.5 ft/day, 55 ft/day, 2.3 ft/day, and 15.5 ft/day, respectively (Figure 5). The arithmetic and geometric mean hydraulic conductivities of wells at the leading edge of the plume are 28.1 ft/day and 16.6 ft/day, respectively. The arithmetic mean of hydraulic conductivity (28.1 ft/day) was used as the best estimate of local conditions with which to calculate groundwater flow velocities.

5 GROUNDWATER FLOW VELOCITY AND TRAVEL TIME CALCULATIONS

Groundwater flow velocities were calculated using the apparent hydraulic gradients (Table 2), the average hydraulic conductivity of 28.1 ft/day, and an assumed average porosity of 25%. Travel time calculations for the edge of the sulfate plume to move to the east edge of the AWC wellfield were conducted by dividing the shortest distance between AWC-05 and plume edge depicted on Figure 1 (4,100 feet) by the calculated groundwater velocities. The other AWC wells range from 4,600 feet to 5,200 feet from the plume and would have longer travel times. Flow from BMO-2008-6B to AWC-05 was not considered likely given the westward trajectory of the plume.

Table 4 summarizes the groundwater flow velocity and travel time calculations. Calculated groundwater velocities ranged between 47 and 115 feet per year (ft/yr) for hydraulic gradients calculated between well pairs BMO-2010-3B and BMO-2008-4B, NSD-02 and BMO-2010-3B, NSD-02 and BMO-2008-5B, and BMO-2008-6B and BMO-2008-13B. The fastest velocities were calculated from hydraulic gradients that used the July 2011 water elevation at NSD-02 which was about 6 feet lower than previous measurements (Figure 4) and may be anomalously low. The calculated travel times for the plume edge to migrate to the AWC wellfield ranged from 36 years to 86 years.

6 TRAVEL TIME SENSITIVITY ANALYSIS

A sensitivity analysis was conducted by varying the assumptions used for calculations in two scenarios. The first scenario increases the hydraulic conductivity to 55 ft/day, the maximum value measured at the leading edge of the plume while maintaining the hydraulic gradients measured to NSD-02. The second scenario is that of high hydraulic gradients and a high hydraulic conductivity. The second scenario used the apparent hydraulic gradients between a well influenced by the AWC wellfield, COB MW-3, and upgradient wells BMO-2008-4B, BMO-2008-5B, and BMO-2010-3B, and assumed a hydraulic conductivity of 55 ft/day. Travel times in both scenarios represented the time to travel the shortest distance (4,100 feet) between the plume edge and AWC-05. The results of sensitivity calculations are provided on Table 5.

The first scenario resulted in flow velocities and travel times ranging from 93 ft/yr to 225 ft/yr and 18 years to 44 years, respectively. The first scenario is conservative in that it may overestimate flow velocities and underestimate travel times by using the highest hydraulic conductivity measured at the front of the plume (55 ft/day) which is almost double the arithmetic mean hydraulic conductivity (28 ft/day) measured at the front of the plume and 38% greater than the arithmetic mean of all hydraulic conductivity data (40 ft/day).

The second scenario resulted in flow velocities and travel times ranging from 93 ft/yr to 742 ft/year and 6 years to 44 years, respectively. Results for the second scenario indicate that travel times under 10 years could occur in the unlikely circumstances that the plume is moving under the high hydraulic gradients calculated with COB MW-3 which is clearly impacted by drawdown from the AWC wellfield and the same high hydraulic conductivity as the first scenario.

The sensitivity analysis results illustrate how the calculated flow velocities and travel times are highly sensitive to the assumed hydraulic gradients and hydraulic conductivity. The results of the first scenario are conservative because they are calculated with a high estimate of hydraulic conductivity. The second scenario results in unrealistically high velocities and short travel times because the hydraulic gradients are based on a well in the zone of drawdown of the AWC wellfield and a high hydraulic conductivity. Although the conditions of the second scenario may be appropriate in close proximity to the AWC wellfield, they do not control the migration of the plume at its current location.

The observed migration of the plume from NWC-03, the only well for which there is an approximate date of plume arrival, provides a point of comparison for the calculated migration rates. The first measured sulfate concentration in a sample from NWC-03 (Figures 1 and 2) was 460 mg/L in October 2005 based on data in the *Aquifer Characterization Report* (Clear Creek Associates, 2010). The edge of the sulfate plume in the third quarter of 2011 was upgradient of wells TVI-875 and SCHWARTZ which had sulfate concentrations of 239 and 116 mg/L, respectively (Figure 1). The water quality record at TVI-875 is complicated in that the well had sulfate in excess of 250 mg/L in 7 of 15 quarterly samples collected between the first quarter of 2008 and the third quarter of 2011. Although the first occurrence of sulfate in excess of 250 mg/L at TVI-275 was in the third quarter of 2008, samples collected from the fourth quarter of 2010 through the third quarter of 2011 had sulfate concentrations less than 250 mg/L. Sulfate concentrations in quarterly samples collected at SCHWARTZ between the first quarter of 2008 and the third quarter of 2011 range from 116 to 245 mg/L, average 134 mg/L, and show no increasing trend.

If the plume had just arrived at NWC-03 in October 2005, it would have moved the distance to TVI-875 (1,400 feet) in 3 years assuming the first measurement of elevated sulfate represents plume arrival and no more than the distance to SCHWARTZ (1,200 feet) in 6 years, indicating apparent velocities of 467 ft/yr for TVI-875 and less than 200 ft/yr for SCHWARTZ. The calculated travel times for the plume to migrate 4,100 feet to the AWC wellfield for the slowest and fastest apparent velocities would be at least 21 years and approximately 9 years, respectively. These apparent velocities and travel times are likely overestimates because the sulfate plume would have arrived at NWC-03 prior to 2008, sulfate concentrations at TVI-875 did not consistently exceed 250 mg/L until the fourth quarter 2011, and concentrations at SCHWARTZ do not exceed 250 mg/L.

7 CONCLUSION REGARDING TRAVEL TIME CALCULATIONS

Based on the foregoing Darcy's Law calculations using the average hydraulic conductivity at the front of the plume and hydraulic gradient calculated for NSD-02, our best estimate of the travel time from the current plume edge to the AWC wellfield is 36 years or more (Table 4). If the actual plume migration rate is closer to those calculated for the first sensitivity scenario (maximum hydraulic conductivity at front of plume) and the apparent plume migration rate from NWC-03 to SCHWARTZ, the travel time would be 18 years or more (Table 5). The second sensitivity scenario (maximum hydraulic conductivity at front of plume and maximum hydraulic gradient) is considered to yield unrealistically short travel times, although they are in the range of the apparent migration rate from NWC-03 to TVI-875.

Groundwater monitoring data being collected at the front of the plume pursuant to the groundwater monitoring plan may provide additional data with which to calculate plume velocity based on future plume arrival times. Additionally, the question of whether the AWC wellfield will capture the sulfate plume in the future is being addressed by numerical modeling of groundwater flow and sulfate transport.

8 SULFATE CONCENTRATION DATA AND GROUNDWATER MONITORING

Sulfate concentration data for basin fill aquifer wells downgradient of the leading edge of the sulfate plume are listed in Table 6. Figure 6 shows sulfate concentrations from 2008 through 2011 at the BMO-2008-5B, BMO-2008-6B, BMO-2010-3B, COB MW-3, AWC-02, AWC-03, AWC-04, and AWC-05. Sulfate concentrations at these wells are generally less than 50 mg/L except for BMO-2008-5B and COB MW-3. The sulfate concentration at BMO-2008-5B has ranged between 175 mg/L and 203 mg/L. Sulfate concentration data for COB MW-3 show two peaks of 102 mg/L and 112 mg/L against a

background of approximately 50 mg/L. The cause of the concentration peaks at COB MW-3 is uncertain, but both occurred in winter suggesting a possible relation to a seasonal variable.

The position of the sulfate plume is monitored at wells upgradient of the AWC wellfield. It is unlikely that the arrival of the sulfate plume at BMO-2008-6B would threaten the AWC wellfield given the westerly direction of groundwater flow. However, the arrival of the plume at BMO-2008-5B or BMO-2010-3B could indicate a potential for migration to the wellfield.

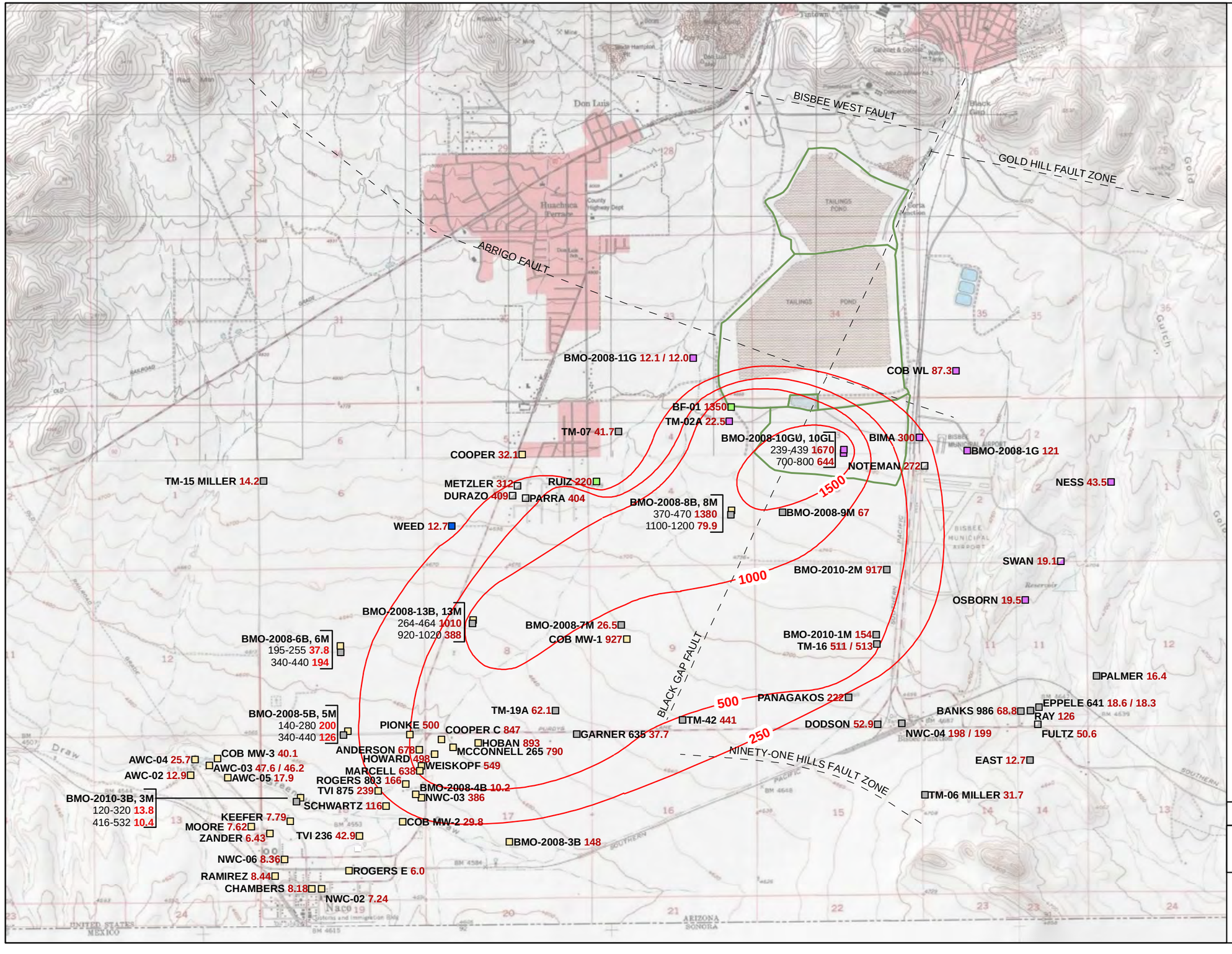
AWC-05 is 2,408 feet from BMO-2010-3B and 4,110 feet from BMO-2008-5B. The sulfate plume would take 21 years to migrate from BMO-2010-3B to AWC-05 and 35 years to migrate from BMO-2008-5B to AWC-05 at the fastest plume migration rate (115 ft/yr) calculated for our best estimate of average conditions (Table 5). The sulfate plume would take 5 years to migrate to AWC-05 from BMO-2010-3B and 9 years from BMO-2008-5B at the maximum apparent migration rate based on NWC-03 data (467 ft/yr), but the apparent travel time is probably underestimated because the timing of plume arrival at NWC-03 is uncertain. Ongoing quarterly groundwater sampling at BMO-2008-5B and BMO-2010-3B will be used to monitor the movement of the sulfate plume for refinement of the travel time calculations.

9 REFERENCES

Arizona Department of Environmental Quality. 2012. Correspondence from Mindi Cross, ADEQ, to Rebecca Sawyer, Copper Queen Branch, Re: Mitigation Order on Consent No. P-50-06, Fourth Quarter Groundwater Monitoring Report; Travel Time Analysis for Leading edge (sic) of the Sulfate Plume; and Extension Letter for Feasibility Study and Mitigation Plan. July 13, 2012.

Clear Creek Associates. 2010. Revision 1 Aquifer Characterization Report. December 15, 2010.

Clear Creek Associates. 2011. Third Quarter 2011 Groundwater Monitoring Report. October 7, 2011



Legend

- **POOL** Well ID
- 114 Sulfate Concentration (mg/L)
- Sulfate Concentration Contour (mg/L)
- Faults (inferred)
- CTSA Facility

Co-located Wells
- Well ID
- Screen (ft bls): SO4 Concentration (mg/L)

Screened Formation
- Basin Fill
- Basin Fill and Undifferentiated Bisbee Group
- Undifferentiated Bisbee Group
- Undifferentiated Bisbee Group - Estimated
- Undifferentiated Bisbee Group and Glance Conglomerate
- Glance Conglomerate
- Glance Conglomerate-Estimated

Undifferentiated Bisbee Group: Cintura, Mural Limestone, and Morita Formations

Scale (Feet)

0 3,000 6,000

Notes:

Projection: UTM Zone 12N NAD83

Date	File ID
9/20/11	055038-146

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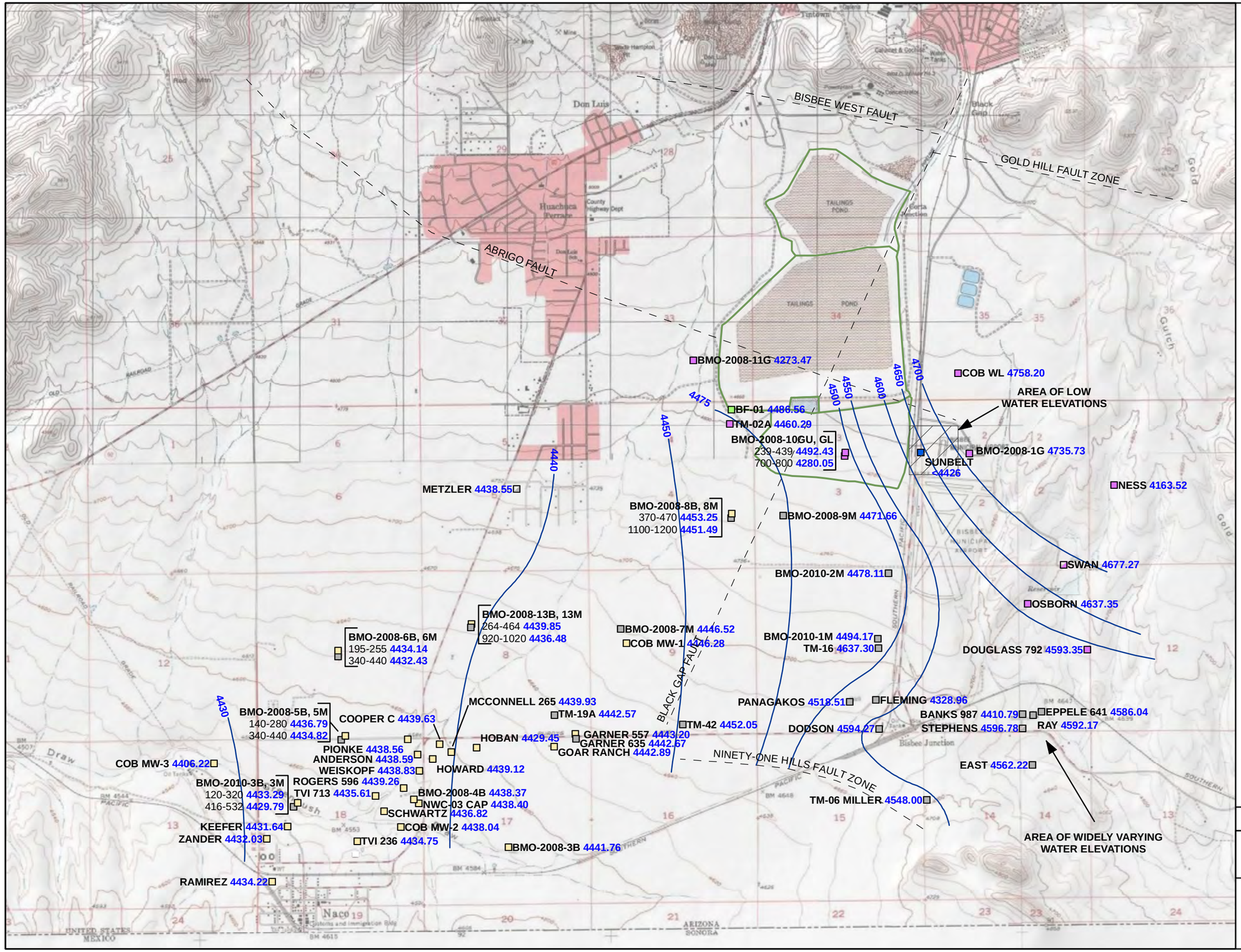
Figure 1
Sulfate Concentrations in Groundwater
Third Quarter 2011



Legend

- BIMA — Well ID
- 4406.83 — Groundwater Elevation (ft amsl)
- Groundwater Elevation Contours (dashed where inferred)
- Faults (inferred)
- CTSA Facility

Co-located Wells
- Well ID
- Screen (ft bls): Water Elevation (ft amsl)

Screened Formation
- Basin Fill
- Basin Fill and Undifferentiated Bisbee Group
- Undifferentiated Bisbee Group
- Undifferentiated Bisbee Group - Estimated
- Undifferentiated Bisbee Group and Glance Conglomerate
- Glance Conglomerate
- Glance Conglomerate-Estimated

Undifferentiated Bisbee Group: Cintura, Mural Limestone, and Morita Formations

Scale (Feet)

0 3,000 6,000

Notes:
Projection: UTM Zone 12N NAD83

Date	File ID
9/20/11	055038-145

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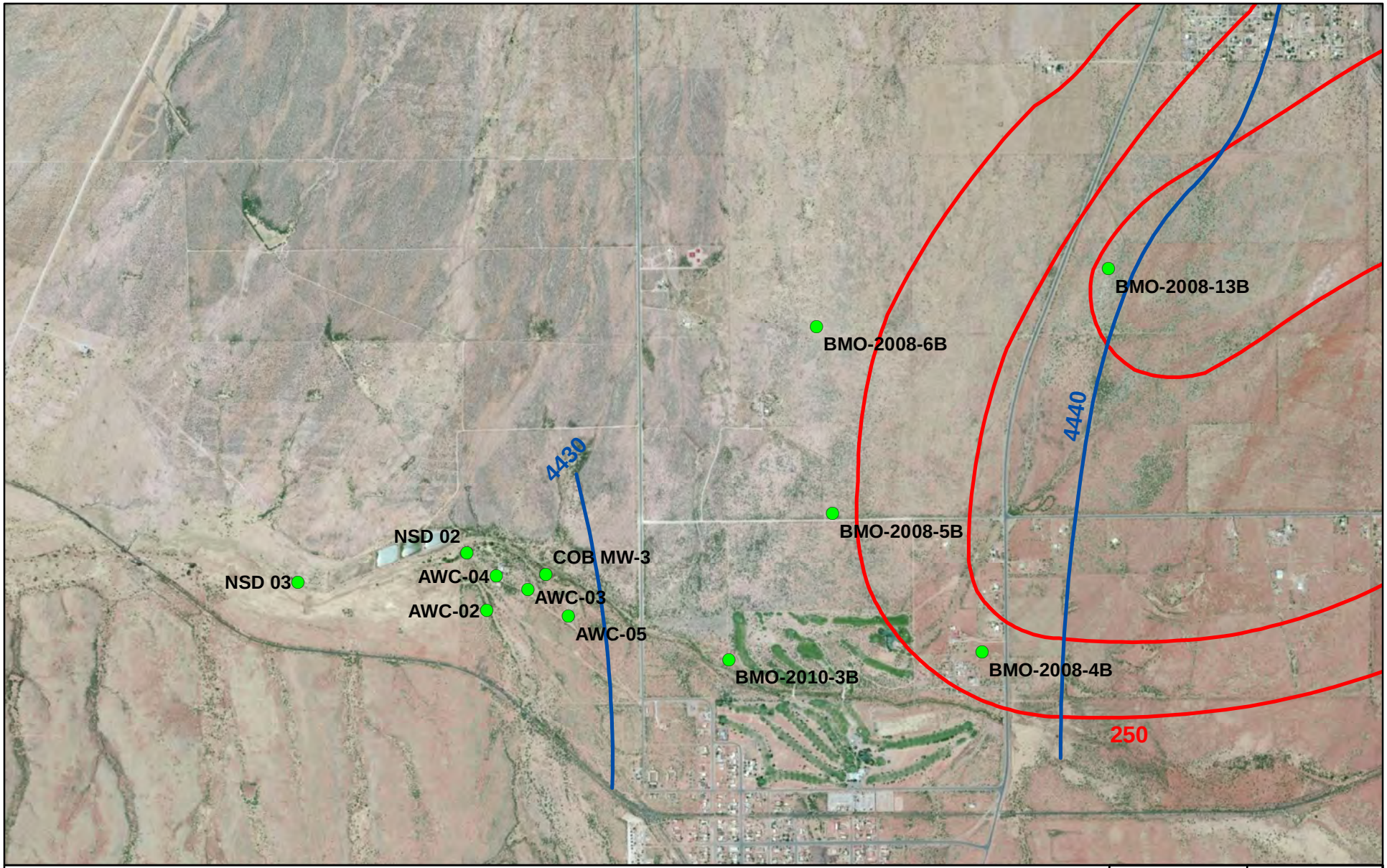
Figure 2
Groundwater Elevations
Third Quarter 2011



Legend

- Well Location
- Sulfate Concentration Contour Third Quarter 2011 (mg/L)
- Groundwater Elevation Contour Third Quarter 2011 (ft amsl)

0 1,000 2,000
Feet

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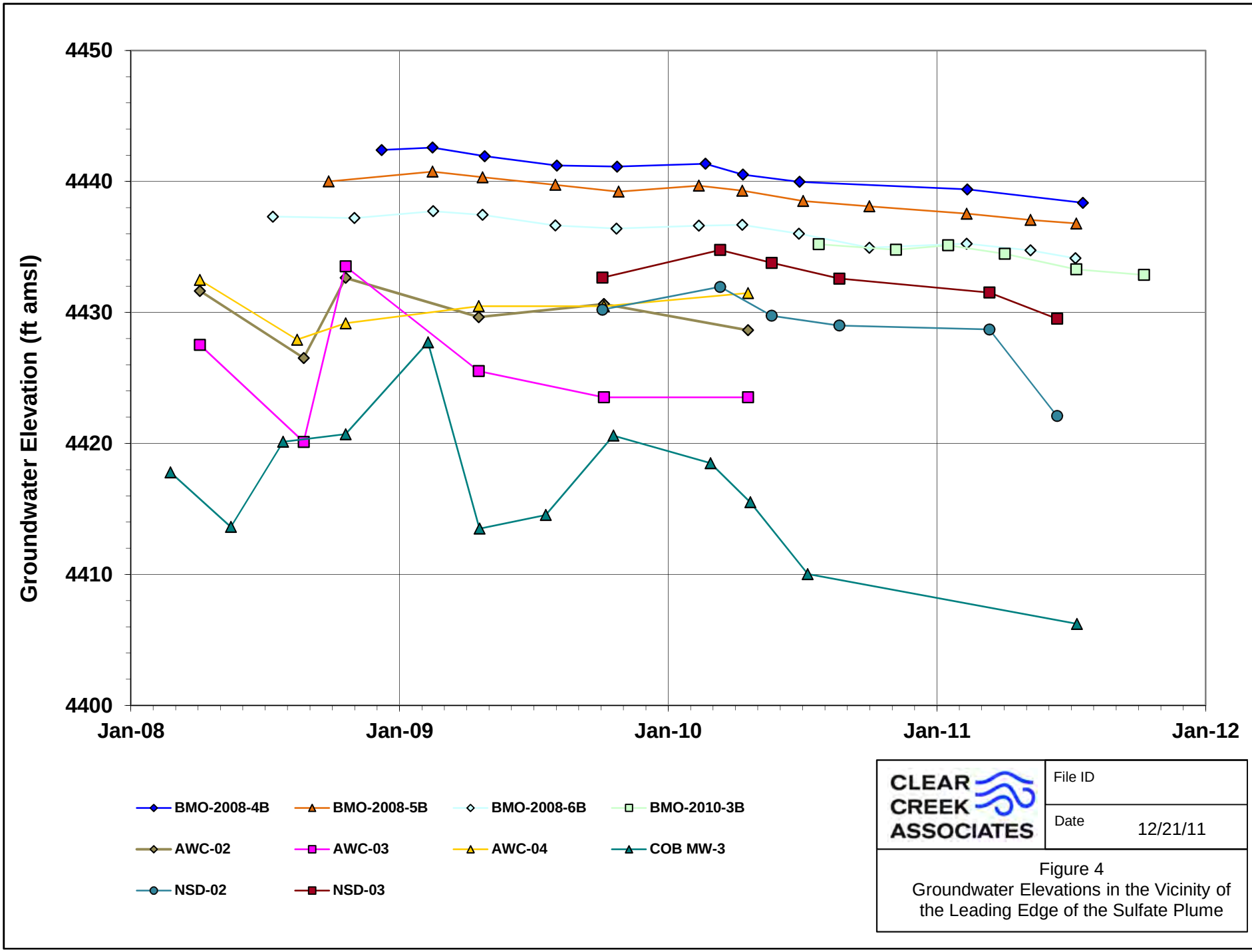
File ID 055038-167

Date 12/22/11

Figure 3
Basin Fill Wells
in the Vicinity of the Leading
Edge of the Sulfate Plume

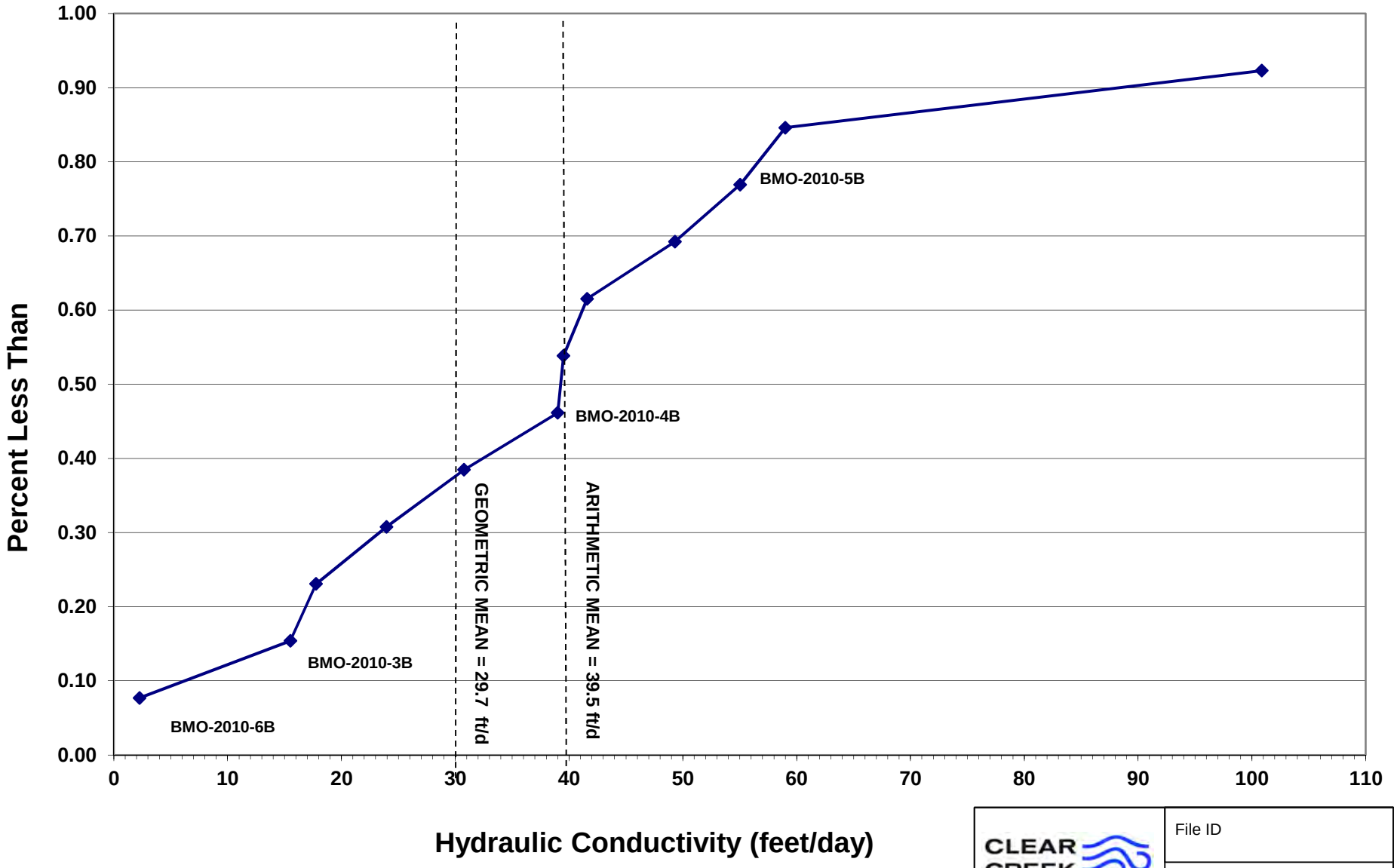


CLEAR CREEK ASSOCIATES

File ID

Date 12/21/11

Figure 4
Groundwater Elevations in the Vicinity of the Leading Edge of the Sulfate Plume



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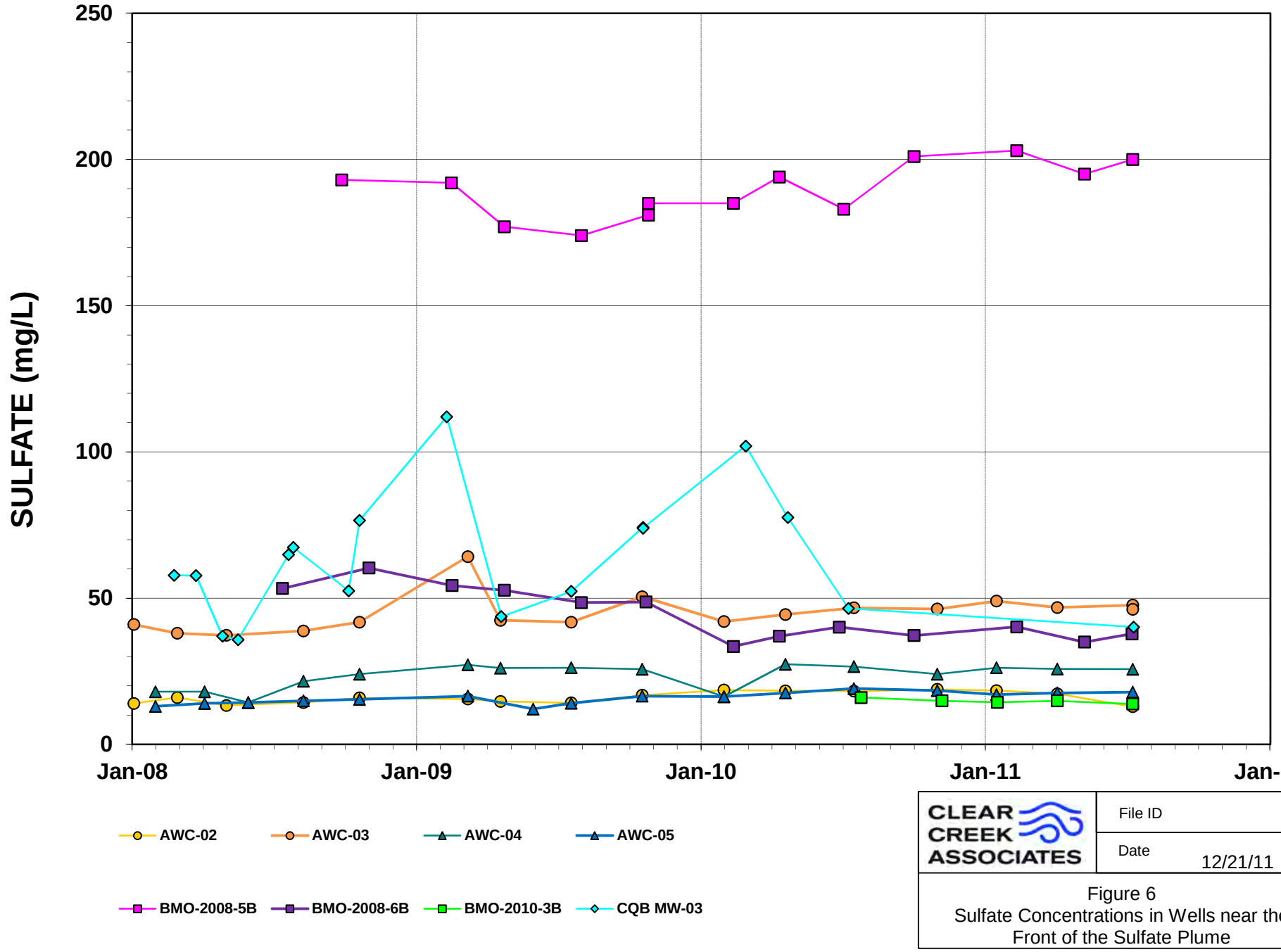
File ID

Date 12/21/11

Figure 5
Basin Fill Hydraulic Conductivities



CLEAR CREEK ASSOCIATES

File ID

Date 12/21/11

Figure 6
Sulfate Concentrations in Wells near the Front of the Sulfate Plume

TABLE 1
Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
AWC-02	616586	598907.911	3468549.357	4547.64	4/8/08	116	4431.64
					8/27/08	121.12	4426.52
					10/23/08	115	4432.64
					4/22/09	118	4429.64
					10/9/09	117	4430.64
					4/23/10	119	4428.64
AWC-03	616585	599090.322	3468681.898	4539.52	4/8/08	112	4427.52
					8/27/08	119.40	4420.12
					10/23/08	106	4433.52
					4/22/09	114	4425.52
					10/9/09	116	4423.52
					4/23/10	116	4423.52
AWC-04	616584	598949.929	3468717.084	4540.48	4/8/08	108	4432.48
					8/18/08	112.56	4427.92
					10/23/08	111.31	4429.17
					4/22/09	110	4430.48
					10/9/09	110	4430.48
					4/23/10	109	4431.48
AWC-05	590620	599269.904	3468541.692	4542.51	4/8/08	284	4258.51
					8/27/08	299.65	4242.86
					10/23/08	284	4258.51
					4/22/09	286	4256.51
					6/3/09	125	4417.51
					10/9/09	289	4253.51
					4/23/10	278	4264.51
BMO-2008-4B	910096	601099.405	3468383.430	4573.17	12/11/08	130.77	4442.40
					2/18/09	130.58	4442.59
					4/30/09	131.24	4441.93
					8/6/09	131.96	4441.21
					10/27/09	132.04	4441.13
					2/24/10	131.82	4441.35
					4/16/10	132.65	4440.52
					7/2/10	133.20	4439.97
					2/15/11	133.78	4439.39
					7/22/11	134.80	4438.37
BMO-2008-5B	909653	600438.159	3468994.715	4585.10	9/30/08	145.10	4440.00
					2/18/09	144.35	4440.75
					4/27/09	144.78	4440.32
					8/4/09	145.36	4439.74
					10/29/09	145.88	4439.22
					2/15/10	145.42	4439.68
					4/15/10	145.80	4439.30
					7/7/10	146.59	4438.51
					10/5/10	147.00	4438.10
					2/14/11	147.56	4437.54
					5/12/11	148.04	4437.06
					7/13/11	148.31	4436.79
BMO-2008-6B	909146	600366.523	3469820.644	4627.44	7/16/08	190.13	4437.31
					11/4/08	190.23	4437.21
					2/19/09	189.71	4437.73
					4/27/09	189.99	4437.45
					8/4/09	190.80	4436.64
					10/26/09	191.04	4436.40
					2/15/10	190.82	4436.62
					4/15/10	190.75	4436.69
					7/1/10	191.43	4436.01
					10/5/10	192.50	4434.94
					2/14/11	192.19	4435.25
					5/12/11	192.70	4434.74
					7/12/11	193.30	4434.14

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TABLE 1
Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
BMO-2008-13B	909551	601657.612	3470076.358	4649.21	10/3/08	206.42	4442.79
					2/17/09	206.11	4443.10
					5/6/09	206.32	4442.89
					8/5/09	206.79	4442.42
					10/28/09	207.08	4442.13
					2/16/10	207.26	4441.95
					4/14/10	207.27	4441.94
					7/6/10	207.68	4441.53
					2/10/11	208.51	4440.70
					5/13/11	208.95	4440.26
					7/15/11	209.36	4439.85
BMO-2010-3B	219970	599977.962	3468347.363	4550.59	7/28/10	115.38	4435.21
					11/10/10	115.80	4434.79
					1/20/11	115.46	4435.13
					4/7/11	116.11	4434.48
					7/13/11	117.30	4433.29
					10/13/11	117.72	4432.87
COB MW-3	906823	599169.225	3468726.000	4538.63	2/28/08	120.84	4417.79
					5/20/08	125.00	4413.63
					7/30/08	118.50	4420.13
					10/23/08	117.93	4420.70
					2/12/09	110.91	4427.72
					4/23/09	125.13	4413.50
					7/22/09	124.09	4414.54
					10/22/09	118.03	4420.60
					3/3/10	120.14	4418.49
					4/26/10	123.12	4415.51
					7/13/10	128.6	4410.03
					7/14/11	132.41	4406.22
NSD-02	527587	598820.051	3468821.474	4531.38	10/7/09	101.17	4430.21
					3/16/10	99.43	4431.95
					5/25/10	101.63	4429.75
					8/25/10	102.38	4429.00
					3/17/11	102.68	4428.70
					6/17/11	109.29	4422.09
NSD-03	527586	598070.538	3468694.259	4518.28	10/7/09	85.62	4432.66
					3/16/10	83.51	4434.77
					5/25/10	84.49	4433.79
					8/25/10	85.70	4432.58
					3/17/11	86.76	4431.52
					6/17/11	88.76	4429.52

ADWR = Arizona Department of Water Resources; UTM = Universal Transverse Mercator Zone 12, North American Datum 1983 (NAD83)

ft amsl = feet above mean sea level; NR = No Record

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TABLE 2
Water Levels and Apparent Hydraulic Gradient Calculations

Well	Date	Water Elevation (ft amsl)	Well	Date	Water Elevation (ft amsl)	Water Elevation Difference (ft)	Distance Between Wells (ft)	Apparent Hydraulic Gradient (ft/ft)
BMO-2010-3B	07/28/10	4435.21	BMO-2008-4B	07/02/10	4439.97	4.76	3680	0.0013
	01/20/11	4435.13		02/15/11	4439.39	4.26		0.0012
	07/13/11	4433.29		07/22/11	4438.37	5.08		0.0014
NSD-02	08/25/10	4429	BMO-2010-3B	07/28/10	4435.210	6.21	4104	0.0015
	03/17/11	4428.7		04/07/11	4434.480	5.78		0.0014
	06/17/11	4422.09		07/13/11	4433.290	11.2		0.0027
NSD-02	10/07/09	4430.21	BMO-2008-4B	10/27/09	4441.13	10.92	7613	0.0014
	03/16/10	4431.95		02/24/10	4441.35	9.4		0.0012
	05/25/10	4429.75		04/16/10	4440.52	10.77		0.0014
	08/25/10	4429		07/02/10	4439.97	10.97		0.0014
	03/17/11	4428.7		02/15/11	4439.39	10.69		0.0014
	06/17/11	4422.09		07/22/11	4438.37	16.28		0.0021
NSD-02	10/07/09	4430.21	BMO-2008-5B	10/29/09	4439.220	9.01	5338	0.0017
	03/16/10	4431.95		02/15/10	4439.680	7.73		0.0014
	05/25/10	4429.75		04/15/10	4439.300	9.55		0.0018
	08/25/10	4429		07/07/10	4438.510	9.51		0.0018
	03/17/11	4428.7		02/14/11	4437.540	8.84		0.0017
	06/17/11	4422.09		05/12/11	4437.060	14.97		0.0028
BMO-2008-6B	11/04/08	4437.21	BMO-2008-13B	10/3/08	4442.79	5.58	4317	0.0013
	02/19/09	4437.73		2/17/09	4443.10	5.37		0.0012
	04/27/09	4437.45		5/6/09	4442.89	5.44		0.0013
	08/04/09	4436.64		8/5/09	4442.42	5.78		0.0013
	10/26/09	4436.4		10/28/09	4442.13	5.73		0.0013
	02/15/10	4436.62		2/16/10	4441.95	5.33		0.0012
	04/15/10	4436.69		4/14/10	4441.94	5.25		0.0012
	07/01/10	4436.01		7/6/10	4441.53	5.52		0.0013
	02/14/11	4435.25		2/10/11	4440.70	5.45		0.0013
	05/12/11	4434.74		5/13/11	4440.26	5.52		0.0013
	07/12/11	4434.14		7/15/11	4439.85	5.71		0.0013

ft amsl = feet above mean sea level; ft = feet; ft/ft = feet per foot

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TABLE 3
Basin Fill Hydraulic Conductivity Estimates

Well	Hydraulic Conductivity (ft/day)
COB MW-1	100.9
TM-13	59.0
BMO-2008-5B	55.0
TVI 875	49.3
NWC-03	41.6
BMO-2008-4B	39.5
TM-11	39.0
BMO-2008-3B	30.8
BMO-2008-13B	24.0
BMO-2008-8B	17.8
BMO-2010-3B	15.5
BMO-2008-6B	2.3
Arithmetic Mean	39.5
Geometric Mean	29.7

ft/day = feet per day

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TABLE 4
Groundwater Flow Velocities and Travel Times

Well	Date	Well	Date	Apparent Hydraulic Gradient (ft/ft)	Hydraulic Conductivity (ft/day)	Porosity	Velocity (ft/day)	Velocity (ft/yr)	Distance (ft)		Travel Time (yr)
BMO-2010-3B	07/28/10	BMO-2008-4B	07/02/10	0.0013	28.1	0.25	0.15	53	Shortest Distance Between Plume Edge and AWC-05	4100	77
	01/20/11		02/15/11	0.0012			0.13	47			86
	07/13/11		07/22/11	0.0014			0.16	57			72
NSD-02	08/25/10	BMO-2010-3B	07/28/10	0.0015			0.17	62			66
	03/17/11		04/07/11	0.0014			0.16	58			71
	06/17/11		07/13/11	0.0027			0.31	112			37
NSD-02	10/07/09	BMO-2008-4B	10/27/09	0.0014			0.16	59			70
	03/16/10		02/24/10	0.0012			0.14	51			81
	05/25/10		04/16/10	0.0014			0.16	58			71
	08/25/10		07/02/10	0.0014			0.16	59			69
	03/17/11		02/15/11	0.0014			0.16	58			71
	06/17/11		07/22/11	0.0021			0.24	88			47
NSD-02	10/07/09	BMO-2008-5B	10/29/09	0.0017			0.19	69			59
	03/16/10		02/15/10	0.0014			0.16	59			69
	05/25/10		04/15/10	0.0018			0.20	73			56
	08/25/10		07/07/10	0.0018			0.20	73			56
	03/17/11		02/14/11	0.0017			0.19	68			60
	06/17/11		05/12/11	0.0028			0.32	115			36

ft/ft = feet per foot; ft/day = feet per day; ft/yr = feet per year; ft = feet; yr = year

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TABLE 5
Results of Sensitivity Calculations

Well	Date	Water Elevation (ft amsl)	Well	Date	Water Elevation (ft amsl)	Water Elevation Difference (ft)	Distance Between Wells (ft)	Apparent Hydraulic Gradient (ft/ft)			Velocity (ft/day)	Velocity (ft/yr)	Distance (ft)		Travel Time (yr)
First Scenario: Sensitivity Calculation with Regional Hydraulic Gradient and High Hydraulic Conductivity															
BMO-2010-3B	07/28/10	4435.21	BMO-2008-4B	07/02/10	4439.97	4.76	3680	0.0013	55	0.25	0.28	104	Shortest Distance Between Plume Edge and AWC-05	4100	39
	01/20/11	4435.13		02/15/11	4439.39	4.26		0.0012			0.25	93			44
	07/13/11	4433.29		07/22/11	4438.37	5.08		0.0014			0.30	111			37
NSD-02	08/25/10	4429	BMO-2010-3B	07/28/10	4435.210	6.21	4104	0.0015			0.33	122			34
	03/17/11	4428.7		04/07/11	4434.480	5.78		0.0014			0.31	113			36
	06/17/11	4422.09		07/13/11	4433.290	11.2		0.0027			0.60	219			19
NSD-02	10/07/09	4430.21	BMO-2008-4B	10/27/09	4441.13	10.92	7613	0.0014			0.32	115			36
	03/16/10	4431.95		02/24/10	4441.35	9.4		0.0012			0.27	99			41
	05/25/10	4429.75		04/16/10	4440.52	10.77		0.0014			0.31	114			36
	08/25/10	4429		07/02/10	4439.97	10.97		0.0014			0.32	116			35
	03/17/11	4428.7		02/15/11	4439.39	10.69		0.0014			0.31	113			36
	06/17/11	4422.09		07/22/11	4438.37	16.28		0.0021			0.47	172			24
NSD-02	10/07/09	4430.21	BMO-2008-5B	10/29/09	4439.220	9.01	5338	0.0017			0.37	136			30
	03/16/10	4431.95		02/15/10	4439.680	7.73		0.0014			0.32	116			35
	05/25/10	4429.75		04/15/10	4439.300	9.55		0.0018			0.39	144			29
	08/25/10	4429		07/07/10	4438.510	9.51		0.0018			0.39	143			29
	03/17/11	4428.7		02/14/11	4437.540	8.84		0.0017			0.36	133			31
	06/17/11	4422.09		05/12/11	4437.060	14.97		0.0028			0.62	225			18
Second Scenario: Sensitivity Calculation with High Hydraulic Gradient and High Hydraulic Conductivity															
BMO-2010-3B	07/28/10	4435.21	BMO-2008-4B	07/02/10	4439.97	4.76	3680	0.0013	55	0.25	0.28	104	Shortest Distance Between Plume Edge and AWC-05	4100	39
	01/20/11	4435.13		02/15/11	4439.39	4.26		0.0012			0.25	93			44
	07/13/11	4433.29		07/22/11	4438.37	5.08		0.0014			0.30	111			37
COB MW-3	07/13/10	4410.03	BMO-2010-3B	07/28/10	4435.21	25.18	2929	0.0086			1.89	690			6
	07/14/11	4406.22		07/13/11	4433.29	27.07		0.0092			2.03	742			6
COB MW-3	02/12/09	4427.72	BMO-2008-4B	02/18/09	4442.59	14.87	6430	0.0023			0.51	186			22
	04/23/09	4413.5		04/30/09	4441.93	28.43		0.0044			0.97	355			12
	07/22/09	4414.54		08/06/09	4441.21	26.67		0.0041			0.91	333			12
	10/22/09	4420.6		10/27/09	4441.13	20.53		0.0032			0.70	256			16
	03/03/10	4418.49		02/24/10	4441.35	22.86		0.0036			0.78	285			14
	04/26/10	4415.51		04/16/10	4440.52	25.01		0.0039			0.86	312			13
	07/13/10	4410.03		07/02/10	4439.97	29.94		0.0047			1.02	374			11
	07/14/11	4406.22		07/22/11	4438.37	32.15		0.0050			1.10	402			10
COB MW-3	10/23/08	4420.7	BMO-2008-5B	09/30/08	4440	19.3	4254	0.0045			1.00	364			11
	02/12/09	4427.72		02/18/09	4440.75	13.03		0.0031			0.67	246			17
	04/23/09	4413.5		04/27/09	4440.32	26.82		0.0063			1.39	506			8
	07/22/09	4414.54		08/04/09	4439.74	25.2		0.0059			1.30	476			9
	10/22/09	4420.6		10/29/09	4439.22	18.62		0.0044			0.96	351			12
	03/03/10	4418.49		02/15/10	4439.68	21.19		0.0050			1.10	400			10
	04/26/10	4415.51		04/15/10	4439.3	23.79		0.0056			1.23	449			9
	07/13/10	4410.03		07/07/10	4438.51	28.48		0.0067			1.47	538			8
	07/14/11	4406.22		07/13/11	4436.79	30.57		0.0072			1.58	577			7

ft amsl = feet above mean sea level; ft = feet; ft/ft = feet per foot; ft/day = feet per day; ft/yr = feet per year

CLEAR CREEK ASSOCIATES

Table 6
Sulfate Concentrations at Wells Downgradient of the Sulfate Plume

Well Name	ADWR 55 Registry No.	Sample Date	Sulfate, dissolved (mg/L)
AWC-02	616586	1/7/08	14
		3/3/08	16
		5/5/08	13.3
		8/12/08	14.3
		10/23/08	15.9
		3/11/09	15.5
		4/22/09	14.7
		7/22/09	14.2
		10/21/09	16.8
		2/3/10	18.6
		4/23/10	18.3
		7/20/10	18.2
		11/4/10	18.8
		1/19/11	18.4
		4/7/11	17.3
		7/13/11	12.9
AWC-03	616585	1/7/08	41
		3/3/08	38
		5/5/08	37.3
		8/12/08	38.8
		10/23/08	41.8
		3/11/09	64.2
		4/22/09	42.4
		7/22/09	41.8
		10/21/09	50.5
		2/3/10	42.0
		4/23/10	44.4
		7/20/10	46.7
		11/4/10	46.3
		1/19/11	49
		4/7/11	46.8
		7/13/11	47.6
		7/13/11	46.2
AWC-04	616584	2/4/08	18
		4/7/08	18
		6/2/08	14.3
		8/12/08	21.6
		10/23/08	24
		3/11/09	27.2
		4/22/09	26.1
		7/22/09	26.2
		10/21/09	25.7
		2/3/10	16.3
		4/23/10	27.4
		7/20/10	26.6
		11/4/10	24
		1/19/11	26.2
		4/7/11	25.8
		7/13/11	25.7

Table 6
Sulfate Concentrations at Wells Downgradient of the Sulfate Plume

Well Name	ADWR 55 Registry No.	Sample Date	Sulfate, dissolved (mg/L)
AWC-05	590620	2/4/08	13
		4/7/08	14
		6/2/08	14.3
		8/12/08	14.9
		10/23/08	15.4
		3/11/09	16.5
		6/3/09	12.1
		7/22/09	14.1
		10/21/09	16.5
		2/3/10	16.3
		4/23/10	17.6
		7/20/10	19.1
		11/4/10	18.4
		1/19/11	17
		4/7/11	17.6
		7/13/11	17.9
BMO-2008-5B	909653	9/30/08	193
		2/18/09	192
		4/27/09	177
		8/4/09	174
		10/29/09	181
		10/29/09	185
		2/15/10	185
		4/15/10	194
		7/7/10	183
		10/5/10	201
		2/14/11	203
		5/12/11	195
		7/13/11	200
BMO-2008-6B	909146	7/16/08	53.3
		11/4/08	60.3
		2/19/09	54.3
		4/27/09	52.7
		8/4/09	48.5
		10/26/09	48.7
		2/15/10	33.5
		4/15/10	37.0
		7/1/10	40.1
		10/5/10	37.2
		2/14/11	40.2
		5/12/11	35.0
		7/12/11	37.8
COB MW-3	906823	2/28/08	57.8
		3/27/08	57.7
		4/30/08	37
		5/20/08	35.8
		7/24/08	64.9
		7/30/08	67.3
		10/9/08	52.5
		10/23/08	76.6
		2/12/09	112
		4/23/09	43.7
		7/22/09	52.3
		10/22/09	74.2
		10/22/09	73.9
		3/3/10	102
		4/26/10	77.6
		7/13/10	46.5
		7/14/11	40.1

mg/L = milligrams per liter

APPENDIX C

EVALUATION OF INTERIM ACTION ALTERNATIVES FOR GROUNDWATER SULFATE MITIGATION IN ARIZONA WATER COMPANY WELL WATER BY BROWN AND CALDWELL

BROWN AND CALDWELL

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Technical Memorandum

FINAL

Prepared for: Freeport-McMoRan Corporation, Copper Queen Branch

Project Title: Groundwater Sulfate Mitigation

Project No: 134790-001

Technical Memorandum No. 1

Subject: Evaluation of Interim Action Alternatives for Groundwater Sulfate Mitigation in Arizona Water Company Well Water

Date: September 12, 2012

To: Freeport-McMoRan Corporation, Copper Queen Branch

From: Matthew B. Gerhardt, Ph.D., P.E.
Engineer in Responsible Charge
Arizona License No. 45570

Reviewed by: _____
Joseph M. Wong

Limitations:

This document was prepared solely for Freeport and Freeport-McMoRan (Freeport) in accordance with professional standards at the time the services were performed and in accordance with the contract between Freeport and Brown and Caldwell dated December 28, 2007. This document is governed by the specific scope of work authorized by Freeport; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

This Technical Memorandum documents Brown and Caldwell's 2008 evaluation of alternative interim actions that could be implemented to mitigate sulfate in groundwater pumped by Arizona Water Company (AWC) in Bisbee, Arizona in the event that sulfate concentrations are projected to exceed the 250-mg/L mitigation level established in Mitigation Order on Consent (Docket Number P-121-07). This document, based on an evaluation that was undertaken principally in 2008, presents those potential interim mitigation actions that could be implemented at the AWC well field if groundwater monitoring indicated that sulfate concentrations at the AWC well field may exceed 250 mg/L and no other actions were implemented to address ongoing migration of the sulfate plume. This document does not provide an evaluation of potential final mitigation actions for the AWC well field or the plume. Evaluation of potential final mitigation action actions will be conducted as part of a feasibility study completed in accordance with the Mitigation Order.

1. BACKGROUND

Hard-rock mining was performed in the Bisbee, Arizona area for most of the twentieth century. Underground workings were started in the 1800s, and the Lavender Pit was opened in 1952. In order to mine below the water table, groundwater was pumped to an evaporation pond located near the tailings impoundment. Sulfate migrated from the pond into underlying groundwater. There is now a plume of sulfate-laden groundwater that extends to the southwest of the former evaporation pond. Characterization and mitigation of the sulfate plume is being conducted under the Mitigation Order on Consent (Docket Number P-121-07) dated November 8, 2007 between the Arizona Department of Environmental Quality and Freeport-McMoRan Corporation, Copper Queen Branch (CQB).

Section III.D of the Mitigation Order states that CQB will identify and implement interim mitigation actions for a drinking water supply found to have a sulfate concentration in excess of 250 mg/L. The Work Plan prepared by CQB further clarifies that a mitigation action will be implemented if: (1) the sulfate concentration at the point of use in a drinking water supply exceeds 250 mg/L, or (2) if data demonstrate that the sulfate concentration at the point of use in a drinking water supply will exceed 250 mg/L before the Mitigation Plan is completed.

The Mitigation Order states that, under Arizona Revised Statute (A.R.S.) Section 49-286, one or more of the following mitigation measures must be performed if drinking water is rendered unusable due to sulfate:

- Provide an alternative water supply
- Mix or blend if economically practicable
- Economically and technically practicable treatment before ingesting the water
- Other mutually agreeable mitigation measures as are necessary to achieve the purposes of A.R.S. §49-286.

AWC operates four water supply wells located north of the community of Naco, Arizona. Monitoring data indicate that these wells are outside of the sulfate plume and currently have relatively low sulfate concentrations. However, AWC has expressed concerns that the plume may migrate far enough that the wells' sulfate concentrations could increase above the Mitigation Order action level of 250 milligrams per liter (mg/L) before a final mitigation action is fully implemented. To prepare for this possibility, CQB retained Brown and Caldwell to evaluate potential interim actions that could be implemented. This technical memorandum contains Brown and Caldwell's evaluation of potential interim actions.

1.1 Arizona Water Company System

Table 1-1 shows information provided by AWC. The four wells have a total capacity of approximately 2,000 gallons per minute (gpm). The actual flow rate averages about 700 gpm, or 1.0 million gallons per day

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(mgd). Well 5 is the newest and the deepest, having been installed in 2002 to a depth of 1,183 feet. The other three wells were installed in the 1950s at depths between 270 feet and 337 feet. All four are screened in the Basin Fill. The screen of Well Number 5 extends deeper into the underlying bedrock which is tentatively identified as the Morita Formation.

Table 1-1. Well Data Provided by Arizona Water Company

Well	Year Installed	Casing Diameter, inches	Depth, feet	Pumping Capacity, gpm	2006 Annual Average Pumping Rate, gpm
2	1955	20	333	100	72
3	1956	16	270	750	471
4	1959	16	337	600	14
5	2002	16	1,183	500	144
Total				1,730 – 2,100[a]	701

[a]*Mr. Joe Mauzy of AWC indicated the system could pump 1,730 gpm in the summer and 2,100 gpm in the winter*

At each wellhead, the water is chlorinated using PPG Accu-Tab calcium hypochlorite tablets. The chlorinated water flows from the wells into a common storage tank located, adjacent to Well 4, where sodium fluoride solution is added. It is then pumped into the AWC distribution system serving Bisbee and neighboring communities.

2. ALTERNATIVES EVALUATION

Brown and Caldwell evaluated the first three potential mitigation measures – providing an alternative supply, blending and treating.

2.1 Providing an Alternative Water Supply

Providing an alternative water supply is not a feasible interim action. The only other nearby water purveyor is Naco Water Company, and it does not have the excess capacity to supply 700 gpm water to AWC. Water from any other purveyor would have to be transported by truck many miles. Two hundred trips by 5,000-gallon water trucks would be needed per day.

Replacing the AWC wells would also be infeasible as an interim action. Given the capacity of existing AWC wellfield, it appears that two to four new wells would be needed to replace the current production rate. The time required to site, acquire land, permit, and install and commission several new wells would be prohibitive for an interim mitigation action. It may, however, be a potential final mitigation action.

2.2 Blending

As noted in Section 1.1, water from the four wells is pumped to a common tank before being pumped to the distribution system. The compliance point for water quality parameters is at the outlet of this tank, so individual wells' sulfate concentrations could exceed 250 mg/L provided the sulfate concentration in the blend was lower than this limit. The blended sulfate concentration could be controlled to some extent by selective pumping from the four wells.

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Well 5 extends into the Morita Formation, which is less likely to be impacted by sulfate because the plume is expected to migrate laterally through the overlying more permeable Basin Fill. Thus, AWC may be able to reduce the sulfate concentration in the tank (essentially the point of use) by pumping more from Well 5 and less from the other wells if sulfate concentrations increased in the Basin Fill.

Tables 2-1 through 2-5 show the effects of blending. Table 2-1 shows the condition as the system was operated in 2006: 701 gpm of flow with current sulfate concentrations. By calculation, the weighted average sulfate concentration was 31 mg/L.

Table 2-1. Blended Sulfate Concentration at Current Conditions

Well	Pumping Capacity, gpm	2006 Annual Average Pumping Rate, gpm	Operating Percentage[a]	Sulfate Concentration, mg/L[b]
2	100	72	72.0	14.3
3	750	471	62.8	38.8
4	600	14	2.3	21.6
5	500	144	28.8	14.9
Combined		701		31[c]

[a]*Average pumping rate divided by capacity*
[b]*Sampled August 12, 2008*
[c]*Calculated as weighted average concentration*

If we assume that the Basin Fill in the vicinity of Well 5 had the same concentration as at Well 3 (38.8 mg/L), then the Morita Formation sulfate concentration must have been lower, since the overall concentration of Well 5 water was 14.9 mg/L. The Morita Formation sulfate concentration cannot presently be higher than 14.9 mg/L. The fraction of Well 5 water coming from the two zones (Morita Formation and Basin Fill) could be calculated if the concentration in each zone were known. For instance, if the Morita Formation sulfate concentration were 10 mg/L, calculations show that 83 percent of the water pumped from Well 5 would be coming from the Morita Formation and 17 percent from the Basin Fill. Using these percentages, we can devise blending strategies to mitigate the impacts of increasing Basin Fill sulfate concentrations.

For example, if the Basin Fill sulfate concentration at Well 5 increased to 300 mg/L, water from Well 5 would have a concentration of 59.3 mg/L, assuming 83 percent of it came from the Morita Formation at 10 mg/L. Table 2-2 shows that if the Basin Fill sulfate concentration increased to 300 mg/L at each well, and 2006 pumping rates were used, the blended water at the tank would contain 251 mg/L, exceeding the 250-mg/L limit in the Mitigation Order.

Table 2-2. Blended Sulfate Concentration if Basin Fill Sulfate were 300 mg/L at Each Well and Morita Formation Sulfate were 10 mg/L, Using Current Pumping Rates

Well	Pumping Capacity, gpm	2006 Annual Average Pumping Rate, gpm	Operating Percentage[a]	Sulfate Concentration, mg/L
2	100	72	72.0	300
3	750	471	62.8	300
4	600	14	2.3	300
5	500	144	28.8	59.3[b]
Combined		701		251

[a]*Average pumping rate divided by capacity*

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[b]*Calculated as weighted average concentration, assuming 83 percent from Morita Formation at 10 mg/L and 17 percent from Basin Fill at 300 mg/L*

However, Table 2-3 shows that pumping rates could be adjusted to bring the blended water sulfate concentration to 214 mg/L. Well 3 would be operated less, and Well 5 would be used more.

Table 2-3. Blended Sulfate Concentration if Basin Fill Sulfate were 300 mg/L at Each Well and Morita Formation Sulfate were 10 mg/L, Using Modified Pumping Rates

Well	Pumping Capacity, gpm	Pumping Rate, gpm	Operating Percentage[a]	Sulfate Concentration, mg/L
2	100	72	72.0	300
3	750	365	48.7	300
4	600	14	2.3	300
5	500	250	50.0	59.3[b]
Combined		701		214

[a]*Average pumping rate divided by capacity*

[b]*Calculated as weighted average concentration, assuming 83 percent from Morita Formation at 10 mg/L and 17 percent from Basin Fill at 300 mg/L*

In the example above, we assumed that the Morita Formation sulfate concentration remained at 10 mg/L. Another case would be if the Morita Formation sulfate concentration increased. In the vicinity of the plume, where sulfate concentrations are in the hundreds of milligrams per liter in the Basin Fill, wells in the Morita Formation have sulfate concentrations ranging from 11.8 mg/L to 55.3 mg/L. If Well 5 drew 83 percent of its water from the Morita Formation at 55.3 mg/L sulfate and 17 percent from the Basin Fill at 300 mg/L, the combined Well 5 sulfate concentration would be 96.9 mg/L. Then, if the Basin Fill sulfate concentration were 300 mg/L at the other wells, the blended water in the tank would contain 258 mg/L sulfate, as shown in Table 2-4.

Table 2-4. Blended Sulfate Concentration if Basin Fill Sulfate were 300 mg/L at Each Well and Morita Formation Sulfate were 55.3 mg/L, Using Current Pumping Rates

Well	Pumping Capacity, gpm	2006 Annual Average Pumping Rate, gpm	Operating Percentage[a]	Sulfate Concentration, mg/L
2	100	72	72.0	300
3	750	471	62.8	300
4	600	14	2.3	300
5	500	144	28.8	96.9[b]
Combined		701		258

[a]*Average pumping rate divided by capacity*

[b]*Calculated as weighted average concentration, assuming 83 percent from Morita Formation at 55.3 mg/L and 17 percent from Basin Fill at 300 mg/L*

Again, as shown in Table 2-5, pumping rates at Well 3 and Well 5 could be adjusted to produce a water with a blended concentration below 250 mg/L.

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Table 2-5. Blended Sulfate Concentration if Basin Fill Sulfate were 300 mg/L at Each Well and Morita Formation Sulfate were 55.3 mg/L, Using Modified Pumping Rates

Well	Pumping Capacity, gpm	Pumping Rate, gpm	Operating Percentage[a]	Sulfate Concentration, mg/L
2	100	72	72.0	300
3	750	365	48.7	300
4	600	14	2.3	300
5	500	250	50.0	96.9[b]
Combined		701		228

[a]*Average pumping rate divided by capacity*

[b]*Calculated as weighted average concentration, assuming 83 percent from Morita Formation at 55.3 mg/L and 17 percent from Basin Fill at 300 mg/L*

Thus, blending could achieve 250 mg/L sulfate even if the Basin Fill groundwater concentration were 300 mg/L. This alternative could be implemented immediately and at any time.

2.3 Treatment

Groundwater pumped by AWC could be treated to remove sulfate before being pumped into the distribution system, but it would take over two years to design, procure, construct and start up a treatment system.

2.3.1 Treatment Technologies

Sulfate is relatively difficult to remove from water, because most forms are soluble. Lime (calcium hydroxide) can be added to precipitate sulfate in highly-impacted waters, but the residual sulfate concentration is in the range of 1,800 mg/L to 2,500 mg/L. The only insoluble salt is barium sulfate, but barium is a regulated parameter in drinking water, so it cannot be used for treatment.

Certain bacteria will reduce sulfate to sulfide under the right conditions (absence of oxygen and adequate concentrations of nutrients). The resulting sulfide can be removed by precipitation, stripping or conversion to solid elemental sulfur. Organic carbon must be added to provide carbon and energy to the bacteria. The carbon source must be added in excess to ensure complete removal of sulfate, so there is some residual organic carbon in the treated water. This residual could pose a problem in the water distribution system, where it could act as a food source for bacteria. To our knowledge, biological sulfate reduction has not been utilized in a drinking water treatment system.

The most proven treatment processes for sulfate removal involve membrane separation. Reverse osmosis (RO) and electrodialysis reversal (EDR) are alternative membrane treatment processes that can remove sulfate. They concentrate sulfate and other ions into a reject stream, producing a clean permeate that can be used for drinking water. Because of the advances in RO technology that have led to reductions in cost, RO is preferred over EDR for this application.

Pretreatment is required to remove fine solids and other materials that could foul the RO membranes. The groundwater has higher than normal turbidity and total organic compound (TOC) levels, which could foul the membranes if not removed prior to RO treatment. Membrane filtration either in the form of microfiltration (MF) or ultrafiltration (UF) has been demonstrated to be an excellent pretreatment method for RO to prolong chemical cleaning intervals and facilitate higher flux rates. MF and UF can remove turbidity without chemical coagulation but cannot remove dissolved TOC. With coagulation by a metal coagulant such as aluminum chlorohydrate (ACH), a significant portion of the TOC, especially natural organic matter (NOM), can be removed by MF/UF. The NOM could cause fouling of RO membranes. ACH is a highly

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concentrated solution of polyaluminum hydroxychloride which has the minimum effect on pH of the water to be treated.

2.3.2 Conceptual Treatment System Design

Brown and Caldwell worked with Siemens to develop a conceptual design for a UF/RO treatment system that could be used to treat water pumped from the AWC wellfield. Figure 2-1 shows this conceptual design. ACH would be added to the raw groundwater and mixed in a static mixer. The coagulated water would be pumped through a 500-micron strainer and then a pressure UF system as pretreatment to the RO. The UF system is expected to have a water recovery of 98 percent.

The UF permeate would be pumped to the RO system, which would include acid feed, antiscalant feed, cartridge filtration, RO membranes, degasification and chlorine disinfection. Brown and Caldwell projects a maximum 87 percent water recovery with acid and antiscalant feed to control scale formation in the reject side of the RO membrane.

RO can remove sulfate and TDS to very low levels, but it produces a reject water that would be managed by evaporation. For a given volume of product water, the amount of groundwater that is wasted as reject increases as the target sulfate concentration decreases. In order to save RO treatment cost and minimize RO reject volume for disposal, part of the UF permeate would bypass the RO system and blend with RO permeate to achieve a water quality meeting the sulfate action level. To estimate the amount of water that must be treated, we used data from a well water sample collected from within the sulfate plume on August 12, 2008, and analyzed by ACZ Laboratories, Inc. A computer projection indicates that a blending ratio of 30:70 (UF permeate:RO permeate) would yield a treated water with 220 mg/L of sulfate and 465 mg/L of TDS. To produce 1.0 mgd of treated water, 0.3 mgd of UF permeate would be blended with 0.7 mgd of RO permeate. At 87 percent RO recovery, 0.805 mgd (560 gpm) would have to be fed to the RO. Of this, 0.105 mgd (73 gpm) would become RO reject for disposal. The total UF permeate needed would be 1.105 mgd (768 gpm). At 98 percent recovery in the UF, the raw water requirement would be 1.128 mgd (784 gpm). The backwash wastewater from the UF system would be 0.023 mgd (15 gpm). There would also be a minor backwash flow from the strainers (average of 1 gpm).

RO reject and backwash wastes (approximately 89 gpm total) would be pumped to lined evaporation ponds. At an assumed average evaporation rate of 3 to 4 gpm per acre, approximately 30 acres of ponds would be needed. We assumed that this area would be divided into three ponds operated in series to maximize the evaporation rate. This pond acreage would increase to approximately 40 acres, with nearly 120 gpm water lost to evaporation, if all of the UF effluent received full RO treatment to produce a very low sulfate concentration product water. The evaporation pond area could be reduced by about 5 acres if the UF backwash water were concentrated in a secondary UF system.

2.3.3 Timing

Detailed design of this system, including procurement of engineering services, would require six months. Equipment procurement and system construction and start up would require another 24 months. Included in this is the lead time on the UF and RO equipment, which is approximately nine months (including contract negotiation).

3. CONCLUSIONS

Of the four potential mitigation options allowed under A.R.S. Section 49-286 – alternative water supply, mixing or blending, treatment, or other mutually agreeable measures – both blending and treatment are

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feasible interim mitigation actions. Blending could be implemented immediately and at any time, and it could produce water containing less than 250 mg/L sulfate even if the Basin Fill sulfate concentration were 300 mg/L. Treatment using UF/RO could also produce water containing less than 250 mg/L sulfate, but it would require approximately 30 months to implement.

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Attachment: Figure 2-1

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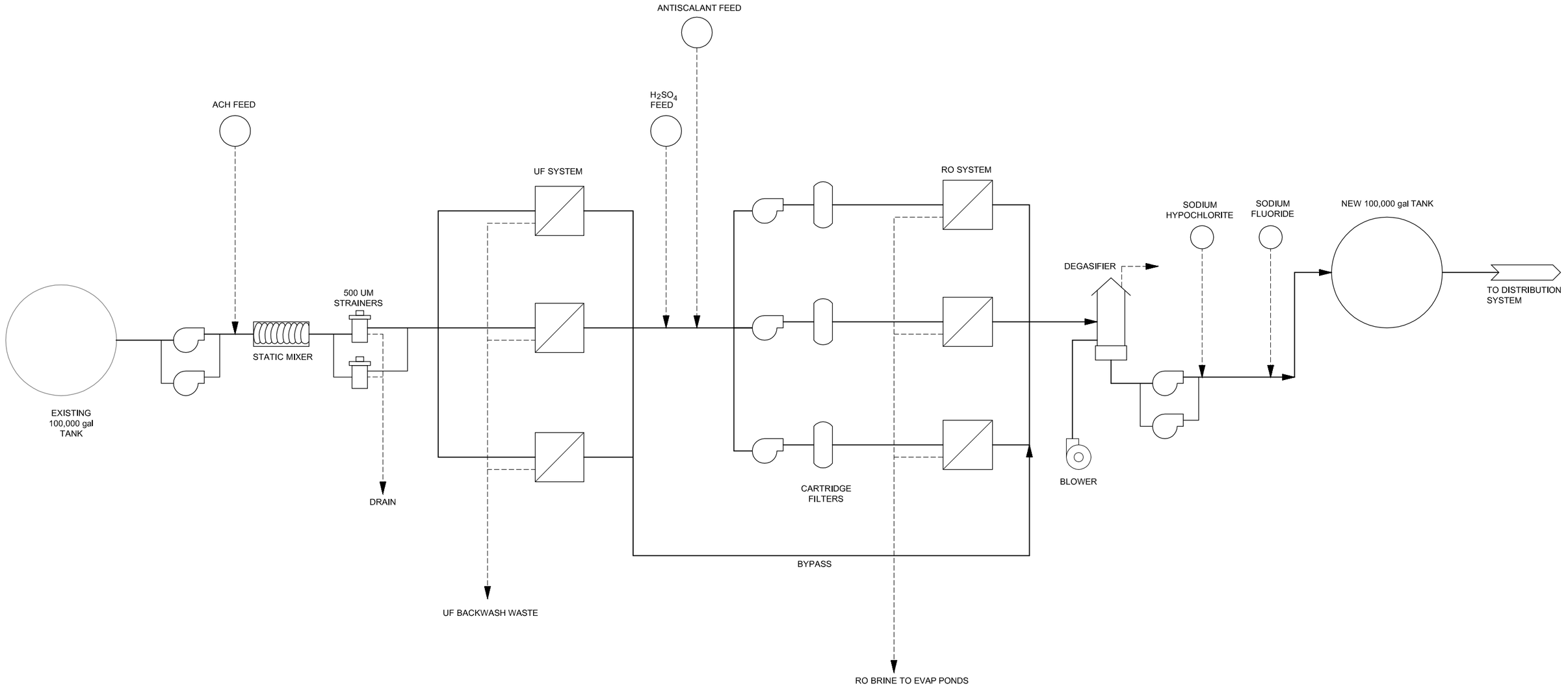

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Plot date: Sep 06, 2012-08:55:45am
CAD User: FBurke

BROWN AND CALDWELL

WALNUT CREEK, CALIFORNIA

SUBMITTED: _____ DATE: _____
PROJECT MANAGER

APPROVED: _____ DATE: _____
BROWN AND CALDWELL

LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2" - SCALE ACCORDINGLY)

DESIGNED: JW
DRAWN: TOH
CHECKED: MBG
CHECKED: _____

EXTERNAL REFERENCE FILES
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PRELIMINARY

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FREEPORT-McMoRan COPPER & GOLD

SULFATE TREATMENT SYSTEM

SCHEMATIC DIAGRAM

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APPENDIX D

GROUNDWATER TREATMENT/MANAGEMENT ALTERNATIVE EVALUATION BY MWH

Conceptual Groundwater Treatment / Management Alternative Evaluation

Freeport-McMoRan Corporation, Copper Queen Branch (Bisbee, Arizona)

July 2013

MWH
BUILDING A BETTER WORLD
CONSULTING •DESIGN •ENGINEERING •CONSTRUCTION •MANAGEMENT

Conceptual Groundwater Treatment/Management Alternative Evaluation
Freeport-McMoRan Corporation, Copper Queen Branch (Bisbee, Arizona)

JULY 2013

MWH

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1.0 INTRODUCTION

In 2009, under Mitigation Order on Consent Docket No. P-121-07 issued by the Arizona Department of Environmental Quality (ADEQ), Freeport-McMoRan Corporation (FMI), Copper Queen Branch (CQB) conducted an initial feasibility study to evaluate potential mitigation alternatives for a plume of sulfate impacted groundwater. One (or more) of the mitigation alternatives will include extraction and treatment of impacted groundwater to remove sulfate to the required 250 mg/L concentration. The purpose of this memorandum is to document the evaluation of treatment alternatives and our opinion of the estimated cost of water treatment based upon a 2013 revision of water quality information and available treatment process technology.

The objective of this study is to develop and to compare potential conceptual treatment and water quality management options for the groundwater plume containing sulfate and to provide a preliminary opinion of capital and operation and maintenance (O&M) costs for the feasible treatment options considered. In addition to the groundwater treatment option, a pond containment and total evaporative management option without treatment for the extracted groundwater, was also evaluated.

The 2013 memorandum evaluates water treatment/management technologies that could be implemented as part of an overall mitigation alternative to help meet the 250 mg/L sulfate concentration level established by ADEQ in Mitigation Order (MO) on Consent P-121-07. The memorandum presents conceptual water treatment/management option(s) that were used to: 1) develop conceptual design criteria, schematic layouts and sizing of equipment and facilities, and capital and operational costs, 2) evaluate issues related to operability, risk in terms of cost and reliability, and implementability, and 3) provide recommendations for the best apparent conceptual treatment/management approach(s) including a separate evaluation of a total pond evaporation option to manage water pumped as part of a mitigation alternative.

The memorandum does not address the wellfield and conveyance system needed to implement a mitigation alternative, potential uses of final treated water, land acquisition requirements and costs for well water supply and conveyance facilities, the availability of the necessary infrastructure (e.g., power) or closure of these facilities. Those aspects are beyond the scope of the study.

2.0 GROUNDWATER QUANTITY AND CHARACTERISTICS

For this study, the CQB requested that three groundwater extraction flow rates be evaluated: 1,000 gpm, 2,000 gpm and 4,000 gpm. The evaluation addressed treatment/management of those three influent flow rates as well as management of any residual brine, solids or other materials that would result from treatment. Treated water (i.e., effluent) management and disposal options were not evaluated. The finished water must satisfy the 250 mg/L sulfate concentration established by the ADEQ before it could be injected back into the aquifer if that were the selected treated effluent disposal option.

Existing water quality information for the sulfate plume was provided by CQB (Hydro Geo Chem Inc. 2008). This information was used to establish the water treatment plant influent water quality for treatment (see Table 1). The water quality information was developed as an average

of two well water sampling results (Pionke and McConnell 265 wells) that are reported to be representative of sulfate plume water quality. It would be assumed that the groundwater extracted from the sulfate plume would be a blend of several wells, but we do not have any information of well contribution except for the two identified sources. The potential influent water quality would be characterized as having moderate alkalinity (<250± mg/L) and total dissolved solids (1,000± mg/L). The raw water (influent) sulfate levels can vary in concentration. The available data indicates a range of 423 – 725 mg/L with a numerical average of approximately 575 mg/L (Hydro Geo Chem Inc. 2008); the calcium concentration is approximately 255 mg/L. From a water treatability standpoint, the only issues may be the calcium (250± mg/L) and silica (37 mg/L) concentrations that can be a concern in regard to scale formation potential and the necessity to consider pretreatment of the water to remove calcium and silica as part of the overall sulfate treatment process. The iron and manganese are both reasonably low and the water temperature is relatively warm, approximately 70° F (21° C), which will not impact treatability of the groundwater.

Table 1

Bisbee Area Groundwater Chemistry*
(Sulfate Plume Wells)

Parameter	Unit	Average Value
Aluminum	mg/L	ND
Barium	mg/L	0.036
Boron	mg/L	0.09
Calcium	mg/L	255
Iron	mg/L	0.03
Iron*	mg/L	1.66
Magnesium	mg/L	25.65
Manganese	mg/L	ND
Manganese*	mg/L	0.029
Potassium	mg/L	5.0
Silica	mg/L	37.1
Sodium	mg/L	38.25
Strontium	mg/L	2.24
Total Suspended Solids	mg/L	2.5
Alkalinity ($CaCO_3$)	mg/L	224
Total Organic Carbon	mg/L	7.5
Chloride	mg/L	20
Coliform	#100 ml	Ø
Conductivity µmhos/cm	µmhos/cm	1,440 (1,160 – 1,720)
Fluoride	mg/L	ND

Parameter	Unit	Average Value
NO_3 – N	mg/L	3.12
NO_2 – N	mg/L	ND
NH_4 – N	mg/L	ND
Phosphorus	mg/L	0.04
Sulfate	mg/L	575 (423 – 725)
Sulfide	mg/L	ND
Total Dissolved Solids	mg/L	1,077 (833 – 1,320)
Turbidity	NTU	17.2

*Total
ND – Non Detect

3.0 PRIMARY TREATMENT PROCESSES CONSIDERED AND SCREENED

There are a variety of chemical, physical and biological treatment processes that have been proposed for the removal or sequestering of sulfate. For the purpose of this memorandum, to be considered feasible, the treatment process technologies must be sufficiently developed to allow the process to be implemented at the scale required to treat the specified flow rates without additional technology development in order to provide a commercially reliable solution. A number of proposed processes are relatively experimental or require conditions and operational involvement beyond the practical consideration for a large scale treatment facility. Of the sulfate treatment methods typically cited in the literature as being applicable for commercial application, the following will be discussed:

- Biological Treatment (active and passive)
- Chemical Precipitation
- Ion Exchange
- Distillation and Thermal Evaporation
- Membrane Separation (electrodialysis and reverse osmosis)
- Pond Evaporation

Of these options, we have eliminated biological treatment, chemical precipitation, distillation and ion exchange (alone) for the following reasons.

Sulfate reducing bacteria (SRB) using an *ex situ* reactor or a managed wetland is a biological process that converts sulfate to a sulfide (reduction) where the sulfide is then precipitated as a metal complex or elemental sulfur. Typically the biochemical reaction requires the addition of a biologically available carbon source. This may be a variety of materials but methanol or molasses has been traditionally used as a supplemental carbon source. Although this process has been used for acid mine drainage and other water treatment applications, these were relatively low flow (less than 50 gpm) systems that had varying levels of success. Designing and constructing a biological treatment system capable of treating the flow rates evaluated in this memorandum would require considerable evaluation and pilot-scale testing. Because of the

additional technology development requirements and the unknowns involved, the biological treatment alternative was not evaluated further

Chemical precipitation with lime or caustic would not be expected to reduce the sulfate level below 1,000 – 1,500 mg/L (co-precipitation dependent). Additional chemical precipitation with barium salts can be used to further reduce the sulfate concentration but the process would be costly to operate and somewhat difficult to control. As can be seen from the reaction formula, this process will not significantly reduce total dissolved solids (TDS) and indicator of other dissolved ions. The reported sulfate removal limit, using lime and combinations with barium salts, is approximately 200 mg/L.

$$Na_2SO_4 + BaCl_2 \longrightarrow 2\ NaCl + BaSO_4$$

Given that other more effective methods for sulfate and related TDS removal are available, chemical precipitation will not be considered further in this evaluation. There are, reportedly, several proprietary chemical methods proposed to reduce sulfate in industrial process water. All involve multiple chemical reactions with various chemicals and changes in pH (SAVIN, CESR, etc.). The literature information on these processes is limited and MWH has no direct knowledge of applications of effectiveness so additional discussion is not warranted or possible.

Ion exchange is an option that could be considered. Selective sulfate exchange resins (non-anionic resins) will effectively adsorb sulfate. However, if the raw water has a significant amount of calcium or other ions, that would compete for adsorption sites on the exchange resin, it may require pretreatment using a two-stage ion exchange and/or lime softening to reduce the calcium ions. While this system could be designed to remove sulfate below 250 mg/L it would be expected to remove significant amounts of TDS due to the ionic exchange phenomenon. This would rapidly exhaust the ion exchange resin requiring frequent regeneration and brine disposal. Ion exchange also has a residual issue (regeneration brine) that must be considered and disposed of by a separate mechanism. While ion exchange for sulfate removal is not uncommon for a small system, it would require additional technology development and pilot-scale testing. There are several proprietary ion exchange processes proposed in the literature but none are well documented. Consequently ion exchange was not considered further for this scale of application.

Distillation and thermal evaporation could be considered as a method to produce a high quality and low sulfate and TDS finished water. Distillation will remove essentially all of the sulfate and most of the TDS, but it is a very energy intensive process. Distillation evaporation systems are used to produce potable water world-wide from brackish or saline sources, however, for this application, to evaporate all of the well water, the expenditure of the amount of energy required (±35,000 – 100,000 kWh/acre foot of feed water) is not a reasonable alternative given the large volumes of groundwater involved (1.4 - 5.6 million gallons per day (mgd), or 4.3 to 17.1 acre feet per day). Since the energy cost could be prohibitive, we would not consider this option feasible for the disposal of all of the intercepted well water. However, it could be an option to aide in disposal of brines produced by other treatment processes.

The only technically feasible treatment option that would appear to be reliable, feasible and economically reasonable is membrane separation. Membrane filtration alternatives including electrodialysis (ED), electrodialysis reversal (EDR) and reverse osmosis (RO) will be considered for the Bisbee application.

3.1 Electrodialysis Treatment

ED and EDR employ electrical current and a semi permeable membrane to separate ions from water. Flat sheet membranes are stacked with flow channel between each of the membranes. Cathode and anode electrodes are installed on either side of a stack of membranes. The electrical charge draws the opposite charge ions through the membrane providing a lower total dissolved solids (TDS) separate product water and a high TDS concentrate water (brine).

The efficiency of electrodialysis is dependent upon the solids fouling potential from organics and particulates in the feed water, the temperature, the flow rate, TDS, system size and required electrical current. Organics and weakly-charged inorganics are not removed by ED. Recent developments have improved the efficiency of ED by periodically reversing the polarity of the electrodes. This is referred to as EDR and has reduced the scaling and fouling problems common to ED. ED and EDR are not as commonly used for water treatment as RO since the product water quality is not as good, but the energy requirement for ED is lower. The 250 mg/L sulfate concentration objective is right at the generally reported limit for the ED process.

3.2 Reverse Osmosis Treatment

Reverse osmosis is a pressurized membrane process. The process can remove both dissolved organics and ionic salts. The pressure membrane process is more common than ED/EDR and has been developed for numerous applications including waste treatment, potable water supply and industrial manufacturing.

The use of reverse osmosis to provide low ion concentration water is a well understood and commercially accepted method to provide high quality industrial and potable water for a variety of uses. The technology involves the use of a fine porous membrane process to separate the very fine suspended and dissolved ions (salts) from the fresh water. The higher the total dissolved solids removal objective in the water to be treated, the more restrictive (tighter) the membrane porosity must be and, as a consequence, the higher the pressure required to maintain an acceptable product water (treated) flow rate. The product water flow (flux rate) and quality of the product water are, in part, a function of the feed water TDS (dissolved solids concentration) and the subsequent membrane pressure applied. Brackish water, with a lower TDS concentration (10,000 – 15,000 mg/L), can have a higher flux rate and produce better quality water at a lower membrane feed pressure (energy cost) than sea water (TDS typically in the 32,000 to 40,000 mg/L). In order to maintain the flux rate at higher TDS concentrations, the pressure across a desalination membrane must be increased. Sea water RO systems operate at 800 – 1,200+ psi while brackish water and membrane water softening systems are typically in the 300 – 600 psi range. Due to the higher pressures required to maintain a reasonable flux rate, desalination of ocean water has a higher capital cost and will require larger equipment and higher energy use than lower TDS brackish water sources. Another option that has recently become of more interest is nanofiltration. The advantage of the nanofiltration, a pressure driven membrane separation process, also referred to as membrane softening and ultra-low pressure reverse osmosis, is that it requires a much lower operating pressure – typically 50 to 150 psi. The reference to nanofiltration was derived from the membrane nominal pore size, which allows only ions smaller than one nanometer to pass to the product water. These systems exhibit a reactively high rejection for dissolved calcium and magnesium (softening), and sulfate – the target ion at Bisbee. The rejection of smaller ions and salts (sodium, chloride, etc.) is not

significant. Recovery rates for nanofiltration are reported in the 70 to 95 percent range with 80 to 90+ percent being common for two- and three-stage process. As long as sulfate is the main target parameter, then nanofiltration would be a reasonable treatment process to consider for membrane treatment.

3.2.1 Treatment Alternative Summary

EDR is useful in producing a high quality water source from higher TDS water, but would not be as effective in reducing the TDS concentration for meeting the sulfate concentration requirement as RO. However, EDR is not affected by higher silica concentrations that can, in some applications, impact RO recovery and membrane longevity.

The reported success in providing reliable sulfate reduction, in high sulfate water, using EDR is marginal (250± mg/L). In order to reliably satisfy the 250 mg/L finished water sulfate concentration requirement, the ED/EDR option will not be considered further. Only reverse osmosis and pond evaporation options will be considered as the primary candidates for treatment/disposal of extracted Bisbee groundwater.

3.3 Reverse Osmosis Treatment Criteria Discussion

Using the water quality information presented on Table 1, we modeled the theoretical performance of a RO brackish water membrane (BW30 – 440i) using the FilmTech program. The lower pressure single-pass (2-stage) model results provided a sulfate permeate (product water) concentration of less than 250 mg/L and a final TDS of approximately 200 mg/L. These systems, as modeled, would operate at under 200 psi pressure and provide a recovery of approximately 85± percent. The RO product water sulfate concentration (based on the RO model) is less than the 250 mg/L objective; therefore, blending raw water with the RO product water it is possible to satisfy the target 250 mg/L sulfate effluent objective. We also evaluated a second RO brine recovery option to reduce the volume of final brine that would need to be disposed of; however, the model indicated that silica saturation and scaling was problematic. Unless silica was removed, it would not be feasible to use a brine recovery step and provide acceptable membrane longevity. However, using a membrane sacrifice operational program (early fouling with regular membrane replacement), it may be possible to recover 30 to 40 percent of the brine as product water. This should be given additional consideration if the project goes to further design. We also modeled a nanofiltration membrane option. With nanofiltration, which is less susceptible to silica fouling, it may be possible to use a brine recovery stage and achieve approximately 90 percent recovery. The sulfate concentration would be below the required limit but the final TDS would be higher since the nanofiltration membranes do not reject smaller ions as well as brackish water units.

For this analysis, we elected to consider only the brackish water membrane model (85% recovery) since it is a more conventional approach. If the project progresses further beyond the concept stage, additional attention should be provided to further analyzing the potential advantage (brine volume reduction) for both nanofiltration and blending that product water with raw well water as well as treated the blended brackish RO product water in order to satisfy the 250 mg/L sulfate requirement, using the least amount of membrane treatment (bypassing and blending with product water). These options have the potential to help reduce the brine evaporation cost and commitment for evaporation ponds and other related issues.

The preliminary conceptual operational design criteria for the RO process are provided on Table 2 for the three flow options. We are assuming that a series of wells can be developed that will provide in excess of the 1,000, 2,000 and 4,000 gpm of clean (low total suspended solids – TSS) groundwater. The need for chemical addition (precipitation/flocculation/settling) and media prefiltration has been included in this analysis but may require additional refinement based upon analysis and further testing. The addition of this level of pretreatment would significantly increase capital and operating costs of the proposed system. The pumped well water would be collected in a storage head tank prior to treatment. We have assumed (without additional testing) that no other form of pretreatment other than slight acidification (to pH = 6.5), filtration and the addition of antiscalant. A 5 µm and/or 1 µm cartridge filtration will be required using the well water supply but it would typically be supplied as part of the RO package.

Table 2

Preliminary RO Operational Design Criteria for
Conceptual Assessment for A Well Water Treatment Plant
Bisbee Copper Queen Mine

Individual RO Unit (nominal)	Unit	Well Water Flow Options		
		1,000 gpm	2,000 gpm	4,000 gpm
		Value	Value	Value
RO Permeate Flow, Each RO Unit (design)	USGPM	850**	850**	850**
Number of Units (including one standby)	No.	2	3	5
RO Permeate Total* Flow, (all units)	USMGD	1.222	2.44	4.88
Water Recovery (assumed Design No.)	%	85	85	85
RO Feedwater Total* Flow, (all units)	USMGD	1.44	2.88	5.76
Reject (Concentrate Brine) Total Flow, (all units)	USMGD	0.23	0.46	0.92
Expected Sulfate Rejection***	%	80	80	80

*Commercial units @ 95% operating factor average year
**85% recovery assumed from model
***Minimal range brackish water to nanofiltration 80± to 78±

For purposes of treatment system evaluation, we have assumed the use of multiple 1,000 gpm (feed water) commercially available RO units that would process the required influent water flow with one unit (redundant) out of service in standby, cleaning or maintenance mode. This configuration will insure uninterrupted full service operation at design flow. However, this level of redundancy may not be required since it may be possible to reduce groundwater pumping if one unit is out of service for cleaning or maintenance. Also, given the reasonably high quality of this water and the high recovery rates we would expect to see, there is, as discussed, a potential to blend treated water with raw well water to meet the sulfate concentration required and reduce the overall cost of treatment.

Assuming a 30± minute operating detention time, both raw and treated water storage reservoirs would be included as part of the treatment system. We have typically experienced a 90 percent

plus operating factor for commercial RO units of good quality (major manufacturers). Normal down time is related to scheduled membrane cleaning and preventative maintenance. Figure 1 provides a typical schematic diagram of the system proposed. Each alternative flow would have a multiple of 1,000 gpm RO units as shown on Table 2. This approach assumes that the system could be staged and increased in 1,000 gpm increments as necessary.

Significant electrical power for the treatment equipment and ancillary facilities will be required. We have assumed that reliable commercial power is available at $0.08 kWh (as directed). No study has been undertaken to confirm this assumption or the availability of power in the vicinity of the area where the facilities may be installed. We have not included standby/emergency power (on site generator) in our analysis or cost opinion.

As shown in Figure 1, groundwater would be pumped from the well system to a head tank where the pH would be adjusted to 6.5±. If (as suspected) the total suspended solids (TSS) will be low in the well feed water (<5 mg/L) no additional pretreatment would be required. Filtration by pressure media filters using FRP filter units would be recommended if TSS treatment of the well water is required prior to RO. However, we would assume that, if the interception/collection well are properly constructed, and we can demonstrate that he TSS concentration is low and the silt density index (SDI) is consistently below 4, that prefiltration will not be required.

The pH adjusted water would be pumped to the individual RO systems by booster pumps. Each 1,000 gpm feed water unit would be sized to provide a minimum of approximately 850 gpm of product water. The anticipated average product recovery was assumed at 85 percent based on modeling results. This will need to be confirmed by empirical testing. The feed water would pass through fine cartridge filter(s) (1 to 5 micron) and an antiscalant solution will be added to reduce salt accumulation (scale) on the brine side of the membrane units. This will prolong membrane life and reduce the necessity for frequent cleaning of the membranes. Specialized antiscalants are available for higher calcium sulfate water to reduce scaling. Modeling results indicated that $CaSO_4$ will be the limiting constituent for controlling permeate recovery in the groundwater RO process. Additional raw water analysis and bench and possibly pilot scale RO testing would need to be completed to assess the need for and value of additional pretreatment and to better define actual operating parameters.

The feed pressure in the RO units is boosted by the high pressure RO pump and the water is forced through the membranes separating fine particulate and the dissolved ions (salts) into a concentrated brine and a high quality product (fresh) water. The brine will require final disposal. The RO filtration process involves several (2 to 3) separate internal separation steps that are designed to maximize recovered water flow (flux rate), provide a high quality (low salt concentration) product water and save and reuse available energy. The balance between recovery product water flow (membrane flux rate) and quality is a critical factor in the development of an effective membrane separation system.

The slightly acidic (pH 6.5±) product water (treated water) can be neutralized with caustic or lime slurry in a permeate storage tank if it is necessary to raise the pH to closer to a neutral conditions prior to discharge. Post treatment costs were not included in our estimates. Water to be injected back to the groundwater would typically not require final pH adjustment depending on the native geology.

The RO process can be assumed to remove at least 85 percent of the sulfate. A 1,000 gpm of feed water will provide approximately 850 gpm of product (treated) water. Assuming the

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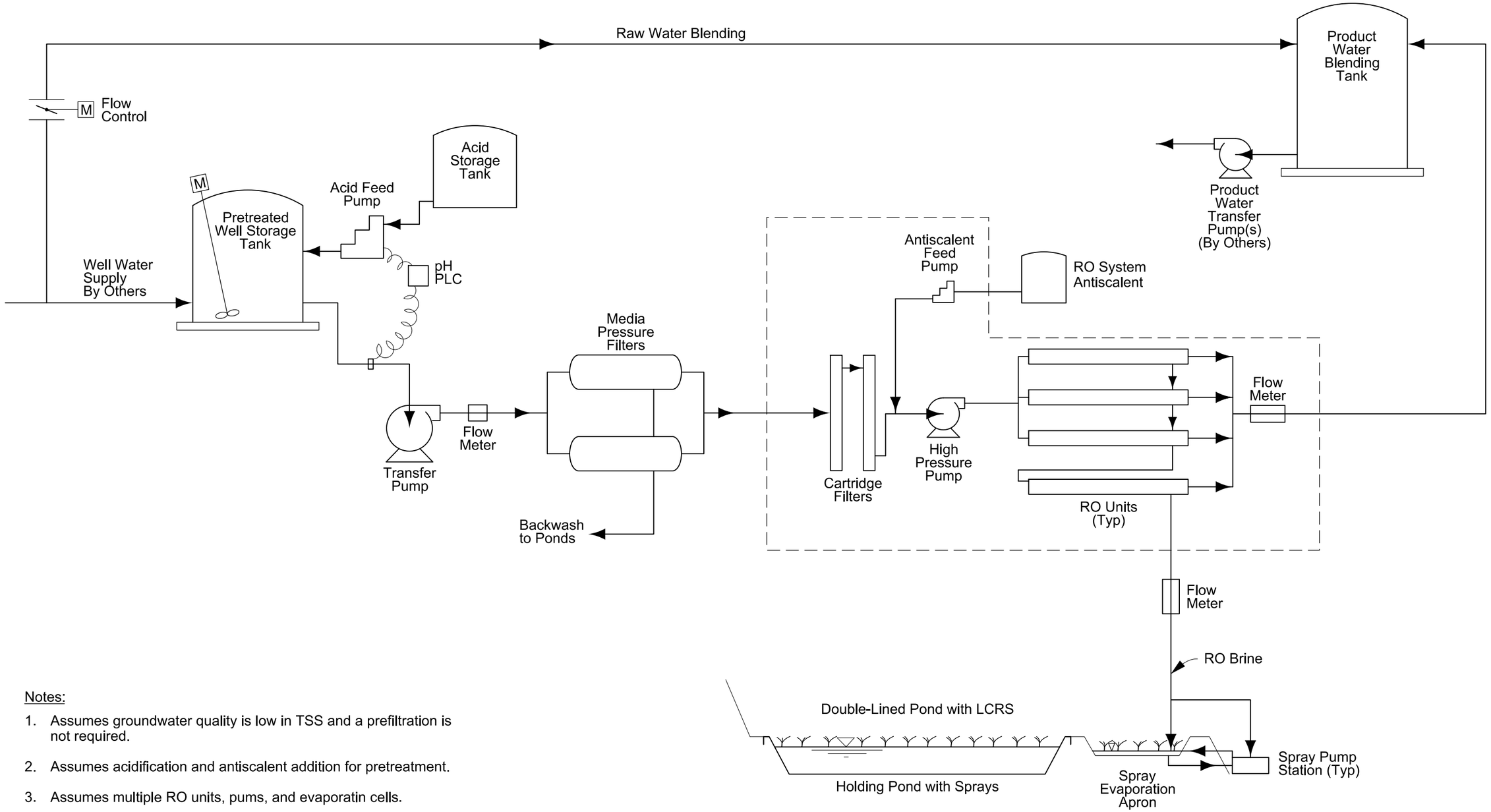

Enhanced Evaporation Pond Cell (Typ)

Notes:

1. Assumes groundwater quality is low in TSS and a prefiltration is not required.
2. Assumes acidification and antiscalent addition for pretreatment.
3. Assumes multiple RO units, pums, and evaporatin cells.
4. Assumes no prduct water pH adjustment required.
5 Components of skid mounded RO units.

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Bisbee Copper Queen Mine Groundwater Treatment Project
Schematic Diagram
Figure 1

average sulfate concentration presented on Table 1 (575 mg/L @ 80% removal) and the recovery and removals discussed above, a 1,000 gpm raw water RO treatment unit would produce 850 gpm of product water with a sulfate concentration of less than 250 mg/L. This treated water would be blended with raw well water to meet the water quality objective not to exceed 250 mg/L of sulfate.

Figure 2 provides a preliminary conceptual plan view and general dimensions of a typical water treatment building and ancillary facilities for the 2,000 gpm option (as an example). This would include three 71 sq.ft. media filters and three 1,000 gpm RO units. Expanding the treatment facilities to 4,000 gpm would require additional building space that could be added to the width of the building to accommodate an additional RO unit. Since the media filters are stacked (1+1), the space required would remain approximately the same for the four filters. A 1,000 gpm system would have a reduced footprint by approximately 20 to 25 percent.

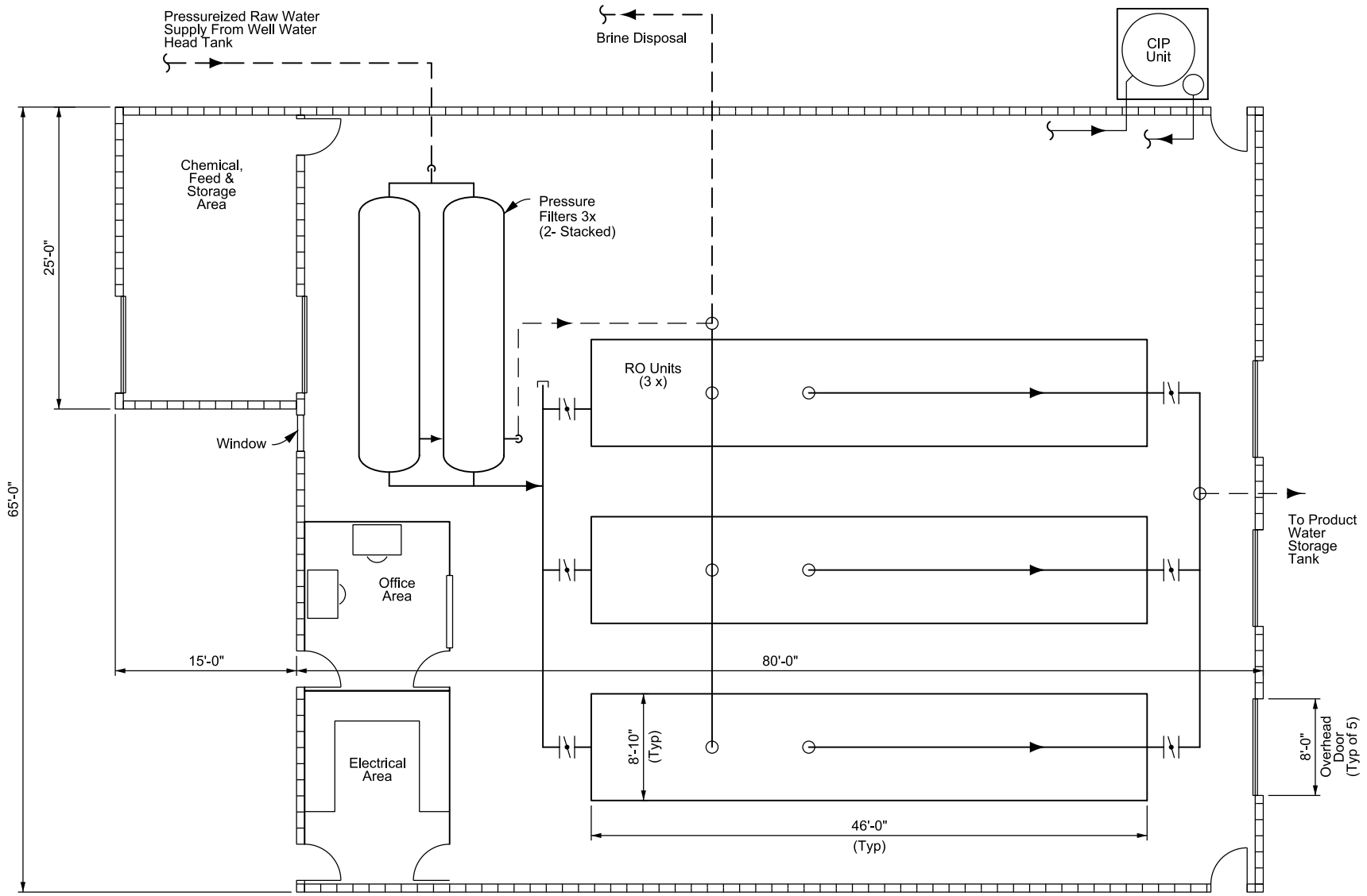
4.0 REVERSE OSMOSIS RESIDUAL MANAGEMENT OPTIONS CONSIDERED AND SCREENED

A major concern with most membrane separation treatment facilities involves not so much the operation of the RO equipment and production of a final, high quality, product water but the disposal of the concentrated brine. Typically (or at least historically) desalination (sea water treatment) brine was discharged back to the ocean or to an estuarine location. Inland treatment facilities pose much more complicated problems both in reducing the volume of brine and its final disposal.

There are several methods that can be considered for brine disposal. These include:

- Deep Well Injection
- Pond Solar Evaporation and Pond and Spray Solar Evaporation
- Thermal/Mechanical Evaporation

Generally, in the United States, deep well injection of brines and other high TDS fluids will not be approved if it adversely affects the capacity or quality of the aquifer. Typically, if an aquifer has a TDS greater than 10,000 mg/L, it might be permitted as acceptable for disposal of brine in some instances, if the aquifer has no beneficial use or is in higher TDS coastal environments. However, in some states, a disposal aquifer may need to have higher TDS concentrations (between 20,000 and 25,000 mg/L) before it would be considered suitable for injection disposal based upon specific state and federal regulations. As a practice, the aquifer must have little or no municipal, agricultural or industrial beneficial use. It may warrant further investigation as to the water quality and beneficial uses of the local deep aquifers to determine if an injection program could be authorized. While injection has the potential to significantly reduce capital and operation cost, the level of investigation required to evaluate feasibility was beyond the scope of this study. However, several facilities in the U.S. have utilized this approach. Recently (2009) the City of El Paso, Texas and Ft. Bliss Army Facility constructed a new potable water supply using low quality groundwater. The RO brine can be disposed of by injection back into the deep carbonate aquifer. This option is very dependent on local geology and regulatory agency approval.



Bisbee Copper Queen Mine Groundwater Treatment Project
2000 gpm Example RO Treatment Facility
Figure 2

MWH

We have no specific information regarding water quality in deep aquifers in the Bisbee, Arizona area. As a result, this option will not be considered further herein.

The other two feasible options involve some form of evaporation of the brine concentrate. We would not, at this point, consider any additional chemical or physical treatment for this flow to harvest salts or further concentrate the brine; however, technologies are being developed that would further optimize water recovery and brine minimization (i.e., AquaSel by GE). Most of these are proposed and not, as yet, in commercial applications or do not have any long-term operating history.

Evaporation of water requires that energy be applied to the water in an amount which equals or exceeds the enthalpy of vaporization of the water at a given pressure. Application of this energy goes first to raising the temperature of the water toward the boiling point and second to converting the liquid to a saturated vapor. Pond evaporation provides a passive solar method to vaporize water. Utilizing a pond spray system can enhance this process by adding mechanical, wind and solar energy as well as providing a very fine droplet size that enhances evaporation potential. Various techniques including dryers and falling- or rising-film evaporators and active solar heating (solar panels) also can be employed for transferring energy directly to the water (i.e., heating). Due to process inefficiencies, the amount of applied energy required by these techniques will typically exceed the theoretical amount of energy needed to convert water to vapor.

Several issues must be examined in the selection of a mechanical evaporation system. The composition of the water is a concern due to scaling and corrosion problems which can develop as water is evaporated and the solubility limits of salts are exceeded. These problems can be avoided by specifying the proper materials of construction and/or keeping the solution strength of the evaporated stream below the solubility limits of the salts in solution. For example, evaporating 100 gpm of a 112 gpm stream at a concentration of 5,000 ppm (0.5% solids) would produce a discharge stream of 12 gpm at a concentration of 50,000 ppm (5% solids). The corrosiveness or scaling potential of the actual evaporated (concentrated) solution would require characterization. If corrosion and/or scaling can be avoided, this will allow for capital costs of evaporation equipment to be based on less expensive materials of construction, but typically the chloride concentration alone in most waters would become corrosive to most metals when concentrated by evaporation.

Additional considerations in the selection of mechanical evaporation equipment include efficiency and energy consumption, reliability, turn-down, and maintenance. With respect to efficiency and energy consumption, falling/rising film evaporators could be expected to require less energy than dryers due to better heat transfer capabilities. One manufacturer indicated that thermal dryers would require from ten to fifteen times more energy than falling film or other types of evaporators to remove almost the same amount of water. Given the volume of water, power cost and the lack of any surplus heat or power at the Bisbee Copper Queen Mine site, dryers do not appear to be a feasible alternative due to the extremely high energy use. With respect to the remaining options, falling/rising film evaporators or variation of this type of mechanical heat transfer equipment can accommodate a wide range of flows and are considered reasonably reliable. Maintenance and power cost, however, could be a significant issue since these units would require an annual servicing and careful monitoring on a daily basis.

Both falling- and rising-film evaporators operate by passing films of water through tubes that are in contact with saturated steam or other heat sources on the other side. Steam/heat can be maintained in the evaporator via a boiler system or mechanical vapor re-compression. In the absence of an available commercial steam supply, mechanical vapor re-compression is the preferred method due to lower capital and operating costs. This method requires an initial source of heat/steam but substitutes the need for a boiler and associated equipment with a positive displacement compressor and equipment. Additional components of this system typically include a recirculation pump, a heat exchanger, a deaerator, controls, and piping, as discussed in the following section.

4.1 Active Brine Evaporation

We evaluated several active methods to optimize residual RO brine water management. Of the systems considered the following were given consideration:

- Solar heating of one or more ponds to improve evaporation using active thermal / mechanical heating systems (enhanced solar evaporation)
- Mechanical/thermal evaporation

None of these options can realistically result in the complete elimination of the RO concentrate or final drying out of storage ponds except for mechanical thermal evaporation (crystallization). They can, however, reduce the required pond capacity, and provide a more managed water balance and work in concert with the natural pond evaporation rates. While there are numerous approaches to adding heat to pond water in order to enhance evaporation and to reduce water volume, for this initial preliminary assessment, we considered only these two options for active enhanced evaporation. Both options are commercially available.

Enhanced Solar Evaporation

For a similar project, a brief analysis of the potential to use active solar technology (enhanced solar collectors) for essentially heating of an evaporation pond(s) was prepared for MWH by a third party proposing to market their technology for brine evaporation. Their initial proposal was for a relatively small unit capable of heating brine/pond water and evaporating 100 gpm on an annualized basis. They indicated that the capital cost would be in excess of $2,800,000 and the operating expense would be on the order of $150,000 per year (including pumping and solar collector panel maintenance). Scaling these costs up (Table 3) would indicate the following costs for the three flowrates options.

Table 3

Capital and Annual Operating Cost Opinion
Solar Evaporation

Options	Capital Cost	Annual Operation and Maintenance Cost
1,000 gpm	$7,200,000	$360,000
2,000 gpm	$13,000,000	$675,000
4,000 gpm	$25,000,000	$1,350,000

This commercial application appears to be very costly. However, the technology is relatively simple using solar heat collectors (solar panels) and the reliance on the sun as the energy source, makes this an interesting approach. The heat collected in the solar panels is transferred to the pond water with a heat exchanger. It may be possible to reduce this cost using a simplified approach. For example, we have used lengths of polyethylene irrigation pipe laid out in a grid pattern in the sun to increase water temperature prior to pond sprays. This approach allows for rapid evaporation and completion of the site restoration ahead of schedule.

Mechanical/Thermal Evaporation

A similar evaluation (100 gpm evaporation) prepared by a manufacturer of mechanical/thermal evaporators indicates that the capital installed cost for this system would be approximately $3,200,000. Estimates of the power requirements for 100 gpm evaporators ranged from 150 hp (112 kilowatts (kW)) to 180 hp (135 kW). Assuming a power cost of $0.08 per kW-hour, the calculated yearly power cost of the 100 gpm evaporators could range up to $1,260,000. The costs for evaporation are based on the assumption of production at 24 hours per day for 365 days per year. New technology has resulted in better efficiency but capital costs are still quite high.

The scaled-up (Table 4) cost for thermal/mechanical evaporation (based on the older technology) would typically be on the order of the following.

Table 4

Capital and Annual Operating Cost Opinion
Mechanical Thermal Evaporation

Options	Capital Cost	Annual Operation and Maintenance Cost
1,000 gpm	$7,200,000	$2,900,000
2,000 gpm	$14,500,000	$5,700,000
4,000 gpm	$29,000,000	$11,300,000

While these costs were based upon smaller units and scaled up to the sized required in order to evaluate their use for the Bisbee Copper Queen Mine project, they are representative of the typical costs for equipment for these systems without installation, site engineering, etc. The high operations cost of the thermal/mechanical system would indicate that this is impractical at the scale of this project, unless a waste heat (i.e., from a power plant) source were available (unlikely), and/or if there were a salable byproduct (salts) to recover. We will not consider this option further. Enhanced active solar evaporation does appear to be a potential for brine management and could be considered in more detail if the groundwater management project were to be taken to the next level of planning.

4.2 Passive Pond Evaporation of RO Brine

The use of shallow ponds to provide passive solar evaporation (no heat collector system) with or without surface aeration (sprays) is a more common method of RO brine management for

inland locations. For example, at an evaporation rate of 38.9 gallons per year per square foot (3.22 gpm/acre) of pond surface (75% of a class A evaporative pan rate less precipitation for the Bisbee area (Table 5), a 130 acre pond (surface area) would be required to evaporate 300± gpm (2,000 gpm Bisbee Copper Queen Mine Option) of brine produced on an average annual basis. Based upon a similar existing project in New Mexico with spray enhancement and comparable climatic conditions, empirical evaluation indicated that an annual evaporation rate increase of up to 2.5 times may be achieved using an effective pond spray system. While the term evaporation is used, we suspect that a significant portion of the increased evaporative loss was as a result of wind drift and not true volatilization. If sprays were included, the evaporation rate may be as high as 98 gallons per year per square foot (40± acres for 300 gpm). The capital cost of a 300 gpm passive solar pond would be approximately $6,400,000 (@ $3.80 ft^2 for double-lined pond construction) and the annual operation cost and liner maintenance would be approximately $50,000. The spray pond option for 300 gpm would have a capital cost (pond, liner, pumps, earthwork) of approximately $5,700,000 (32 acres at $4.20 ft^2) and the annual operation cost (pumping and pond maintenance) could be on the order of $520,000 to $680,000 at $0.08 kWh. This is an order of magnitude cost example that will be refined in a later section (5.2) of this document.

Table 5

Bisbee, Arizona Climatic Data

Month	Precip.* inches	Pan Evap.* inches	75% Pan Evap. inches	Precip.-Evap. inches	Average Temp F Degree
January	0.93	3.00	2.25	-1.32	45.8
February	0.73	4.00	3.00	-2.27	48.2
March	0.28	7.67	5.75	-5.47	53.1
April	0.43	10.00	7.50	-7.07	59.9
May	0.19	10.50	7.88	-7.69	67.3
June	0.45	14.10	10.58	-10.13	76.1
July	3.69	11.50	8.63	-4.94	76.5
August	3.68	11.20	8.40	-4.72	74.3
September	1.71	9.70	7.28	-5.57	71.7
October	0.62	8.70	6.53	-5.91	63.1
November	0.53	5.70	4.28	-3.75	53.3
December	0.57	4.30	3.23	-2.66	46.9
TOTAL	**13.81**	**100.37**	**75.28**	**-61.50**	

*Company provided data
-Negative Evaporation

4.3 Cogeneration Waste Heat Evaporation Option

Another option we investigated was cogeneration. Electrical power would be produced using turbine or micro turbine technology. The waste heat from the turbines would be used to raise the water temperature of the brine to increase the evaporation rate. Based upon turbine manufacturer's claim, a 60 kW turbine generator will generate enough waste heat to raise the temperature of 40 gpm of water approximately 40° F (transfer in efficiencies not included). For example, to raise the temperature of 150 gpm of brine from 50° F to 90° F would require approximately four to five 60 kW turbine units. This system would produce approximately 240 to 300 kW which is approximately enough to partially run only one of the proposed RO units. The effect on evaporation by spraying this heated water would vary with the ambient temperature and other climate conditions. Literature value indicates an increase of 10 times ambient pan evaporation can be expected from a 50° F to 90° F increase in water temperature. The actual water evaporative loss expected would require more evaluation but an even 25 percent or greater increase in total evaporative loss would begin to reclaim a significant pond volume. The actual rate of enhanced evaporation loss would have to be modeled in more detail.

The micro turbine systems are commercially available in factory assembled units with integral heat exchangers. A four-unit turbine array with a single heat exchanger (150 to 200 gpm of water flow) would have an installed capital cost of approximately $900,000 to $1,000,000. The annual operating cost using natural gas in the Bisbee Copper Queen Mine area would be approximately $140,000 (assume $0.35 therm). This operating cost would be offset by the production of approximately 5,800 kWh/day or $168,000 annually (@$0.08 kWh) of electrical power.

A 10 turbine unit array (575 kW) capable of heating 400 gpm would have capital cost of approximately $2,000,000 and a natural gas cost of approximately $350,000 per year. The offset electrical generation value would be approximately $420,000 which could help supply the energy requirements of a new water treatment plant. However, this option would only increase the pond evaporation rate and both the evaporation pond and possibly a pumped spray enhanced evaporation system would still be required.

We have reviewed the micro turbine option for several similar projects where power generation was necessary and concluded that the system is very resource intensive, requires a significant natural gas supply and has a number of mechanical operability (maintenance and replacement) and reliability concerns. It will therefore not be considered further since power generation has not been identified as an issue at Bisbee Copper Queen Mine.

4.4 RO Residual Management Summary

Pond evaporation and/or spray assisted pond evaporation with a spray system is the most likely and cost-effective candidate for brine management and disposal given the large amount of brine expected. While it may be possible to improve the membrane recovery of product water to as much as 90+ percent for this project, it would still result in a significant production of brine concentrate flow for the three inflow options. New systems for brine recovery are just now coming to the market place. GE's AquaSel and OASYS's forward osmosis system for brine recovery are intriguing options, but are not proven sufficiently for this study.

5.0 PROPOSED CONCEPTUAL WATER TREATMENT SYSTEM RECOMMENDATIONS

5.1 Treatment Using RO Membrane Separation

Based upon the foregoing information, the following water treatment option appears to be the best apparent feasible option for treating contaminated groundwater at the FMI Bisbee site.

- Pretreatment – Chemical pH adjustment, filtration and antiscalant addition
- Treatment – Ultrafiltration using lower pressure (brackish water) RO membranes followed by product water blending with raw well water to meet the sulfate criteria
- Brine Management – Pond evaporation with and without mechanical sprays

This assumes that the groundwater is relatively low in suspended solids (particulates) and that only media prefiltration is required and that calcium and sulfate scaling can be controlled (as indicated by modeling) by acidification and antiscalant addition. Bench and pilot scale testing will be required to determine (more accurately) potential product water recovery rates (product flux rates), scaling factors and membrane cleaning effectiveness. If suspended solids or scaling are problematic, then additional pretreatment prior to membrane filtration will be warranted.

For conceptual design purposes, we have selected a low pressure (brackish water) or nanofiltration membrane system. For estimating purposes, a basic 1,000 gpm feed flow RO unit was used to develop the three flow options. Options presented will have the capacity to treat the required influent flow (1,000, 2,000 and 4,000 gpm) and have one additional RO unit in standby to accommodate periodic cleaning without diminishing the total system capacity. The treatment system may not require this level of redundancy but for comparative purposes, all alternatives have been treated similarly the need for this level of redundancy will need to be discussed). The approach we have selected would accommodate an implementation of the project on a phased development schedule that would allow expansion from 1,000 gpm to 2,000 gpm and from 2,000 gpm to 4,000 gpm as desired.

The treatment system will include a raw well water storage tank, pH adjustment at the tank, pressure filters, multiple lower pressure RO units that includes a cartridge filter, antiscalant injection, RO feed (medium pressure) pumps 150 to 200± psi – depending on the membrane type, a two- to three-stage membrane array with limited energy recovery and a product water tank and effluent pumping.

The membrane treatment system would include 2 to 5 separate RO skid units of 1,000 gpm each depending on the ultimate requirement (1,000, 2,000 or 4,000 gpm raw water feed). In actual design, alternatively there may be a capital cost advantage using three 500 gpm RO units rather than two 1,000 gpm for a reliable 1,000 gpm treatment system.

The 1,000 gpm brackish water unit would include, for example, 318 first-stage and 207 second-stage brackish or nanofilter membranes (approximately 530 RO elements). The cartridge filter array would consist of 3 – 4 separate units using 1 to 5 µ filter elements. After filtration, but prior to the high pressure pump intake acid and antiscalant would be injected to

prevent calcium and iron scale formation on the concentrate side of the membranes. In high calcium sulfate waters this can be a problem. Gypsum ($CaSO_4$-$2H_2O$) formation can be very difficult to remove and can blind the membranes in such a manner that cleaning becomes very ineffective. The use of a mild acidification (pH 6.5±) and antiscalant addition would be expected to prolong membrane efficiency, but for a project of this size pilot testing on the actual water source is warranted in order to develop accurate design criteria and better understand operational issues. We do not anticipate that calcium sulfate formation will be an issue at the Bisbee Copper Queen Mine for a two-pass brackish water system (3-pass nanofiltration); however, if calcium fouling was to prove to be a problem, the influent water would need to be softened to remove the calcium using caustic or lime addition to precipitate calcium hydroxide and carbonates, settled to separate the calcium settable solids and media (or membrane) filtered to remove the non-settleable solids. This level of pretreatment would significantly increase not only the capital cost but would involve long-term operating costs for chemical consumption and solid/sludge disposal.

The question of when pretreatment is best used will depend upon the chemistry of the water. In a similar groundwater project the pilot scale study indicated that the high calcium and sulfate concentrations (230 – 2,300 mg/L, respectively) may not significantly impact membrane cleaning, but it was decided to remove the calcium (lime softening) any way in order to prolong operating periods, membrane life and reduce cleaning frequency. This project has been in operation over ten years and has been able to achieve much longer than originally projected membrane life by diligent pretreatment (5± years). However, on another more recent project with much higher calcium and sulfate concentration (350 and 2,600 mg/L, respectively), the RO membrane system has appeared to operate effectively using just acidification and antiscalant addition alone for over 12 months. The long-term operation using this approach is still a question that needs to be better defined with regard to membrane longevity in comparison to changing influent water chemistry.

We would anticipate that the Bisbee groundwater treatment project may need to be operated for an extended period of time. Since longevity is important, we will assume that the building(s) to house the treatment system and related infrastructures will need to be durable. Masonry or concrete construction will have a longer functional life than a pre-engineered metal structure. The difference in cost between a steel joist metal roof concrete/masonry construction and a metal building will be on the order of $30 to $50/ft^2. The estimate building sizes for the three options using cement masonry units (CMU) construction (slab included) with a metal joist and metal roof would be as shown in Table 6 below using $185/ft^2.

Table 6

Opinion of Capital Building Cost

Option	Construction Cost	Size (25±%)
1,000 gpm	$ 648,000	@ 3,500 ft^2
2,000 gpm	$1,110,000	@ 6,000 ft^2
4,000 gpm	$1,850,000	@ 7,500 ft^2

These represent the basic installation costs of slab on grade CMU building construction alone without primary electrical, heating ventilation and air conditioning (HVAC) or contractor mark-up, engineering and contingencies.

The treatment system will require significant electrical power. Based upon the conceptual design, the power requirements will include the RO transfer and high pressure feed pumps, the building demands (lights, chemical pumping, etc.) and miscellaneous power requirements. We have assumed that a new primary voltage transformer would be required for primary service. No cost for primary power lines has been included. However, if required, a new primary electrical service (power lines) for this type of system will be on the order of $750,000 – $1,000,000 per mile depending on terrain.

We would also include a final product storage tank (30 minutes hydraulic detention time) as the location for the finished water prior to discharge. A low pressure (50 psi) effluent delivery pump(s) has also been included to deliver product water to a discharge site by others. Table 7 presents the conceptual treatment design criteria for the three flow options. Figure 1 provides a conceptual schematic diagram.

Table 7

Bisbee Copper Queen Mine Water Treatment
Conceptual Design Criteria

Parameter	Unit	Option (gpm)		
		1,000	**2,000**	**4,000**
Influent Storage Total (30 min.)	Gallon	40,000	60,000	120,000
Construction	Type	Poly or Steel	Poly or Steel	Steel/Conc.
Transfer Pumps				
Number	No.	2	3	5
Flow (ea)	gpm	1,000	1,000	1,000
HP (ea)	HP	75	75	75
Pressure Filter				
Number	No.	3	4	6
Filter Rate	gpm/ft^2	12	12	12
Type	---	FRP/Pressure	FRP/Pressure	FRP/Pressure
Cartridge Filter Unit				
Number (each RO unit)	No.	2 – 3	2 – 3	2 – 3
Size	µm	5 – 10	5 – 10	5 – 10
RO Units				
Size Influent	gpm	1,000	1,000	1,000
Number	No.	2	3	5
HP Pumping (ea)	HP	200	200	200
VFD*	Yes/No	Yes	Yes	Yes
Antiscalant Unit (ea)	No.	1	1	1+

Parameter	Unit	Option (gpm)		
		1,000	2,000	4,000
Product Water Storage	Gallon	20,000	32,000	64,000
Construction	Type	FRP/Steel	FRP/Steel	FRP/Steel
Product Water Pumping				
Number	No.	2	2	2
Flow	gpm	850	1,700	3,500
HP (ea)	HP	30	60	140

* Variable frequency drive

5.2 Brine Disposal

The disposal of concentrated brine in an inland location can be a difficult issue for providing a reliable engineered solution. As discussed, mechanical or thermal evaporation of brine at the scale and volume being considered for this project will be very expensive from both a capital and O&M prospective. It would not appear to be practical to attempt to operate or maintain a thermal evaporation system to dispose of 0.22 to 0.86 mgd of brine to dryness at an estimated energy cost alone of at least $24.00 per 1,000 gallons ($24,000 per mgd) at today's energy prices. The future cost of energy is expected to continue to increase.

In this location (net evaporation climate area) brine could be cost effectively managed through discharge through pond evaporation. Pond evaporation systems can be operated as static shallow ponds that rely on pan (lake) evaporation or as spray assisted evaporation ponds. Spray ponds can use a variety of mechanical means to increase the surface area of the water by forming fine droplets to attempt to accelerate solar and wind evaporation. This can be accomplished with surface mechanical aerators/agitators, surface spray systems using pumps and a network of pipes and nozzles and systems that combine high volume fans or compressed air and pump and nozzle arrangement (a.k.a. snow-making equipment). We have assumed that all facilities would be located on the mine site where there is sufficient land area, electrical power and company infrastructure to provide effective operations.

During the operation of an evaporation spray pond only a small fraction of the sprayed water is actually evaporated. In theory, only approximately 2 to 4 percent of the spray water can be evaporated or is lost by drift (wind dependent) for each 10° F drop in water temperature (only 1 percent is by actual pond evaporation). In spray evaporation ponds, specifically designed for evaporating water, the same water is continually resprayed until the bulk of the water has been evaporated, leaving behind a concentrated brine high solids sludge. An effective evaporation rate is dependent on maintaining a significant difference between the pond water temperature and the wet bulb temperature of the environment. The actual efficiency of the evaporation pond is dependent on a proper pond location and layout, wet bulb temperature, prevailing wind conditions, pond construction, spray nozzles, spraying pressure, and water temperature.

Any water spraying operation will produce cooler water temperatures (evaporative cooling) in the spray process. Continuous respraying of the same water will result in a cooled pond water temperature that can eventually approach the wet bulb temperature; and evaporation rates will be reduced significantly. At this point, if effective evaporation is to continue, the heat for

evaporation must come from the pond water and individual spray droplets heat gain and the ambient air temperature gain, which can supply only minimal amount of heat. Therefore, in spray evaporation ponds, most external heat applied by solar radiation or other sources is into the pond water, which is necessary in order to maintain an actual water temperature higher than the wet bulb temperature. To enhance the solar heating effect, the pond should be shallow (to provide a larger heat loading to water surface area) and have a layer of black, heat absorbing material coating the bottom of the pond. Adding a dark dye to the water to enhance adsorption of solar radiation (heat) has also been proposed, but no empirical data has been found to support that approach.

As discussed earlier, increasing the water temperature with external heat exchanger equipment, possibly using hot wastewater from a fuel fired electrical generator or other salvage heat sources would also have a positive effect on increasing the evaporation rate. However, we have not assumed that any auxiliary source of thermal heat is available at the Bisbee Copper Queen Mine location.

It is difficult to generalize on the expected performance characteristics of an evaporative spray pond because the continuous respraying increases the solids concentration in the water which can have some effect on the flow and the efficiency of the spray characteristics of the system as the TDS increases. Each application and location would have its individual spray cooling/evaporation process characteristics which depend on atmospheric conditions, physical siting, diurnal changes, and the design and operation of the spray system.

Since the purposes of the spraying is to obtain a maximum evaporative effect, factors such as smaller spray droplet sizes (achieving a higher surface to mass ratio by using smaller capacity nozzles and/or higher pressures), and longer spray droplet dwell (air suspension) times (by using higher pressure nozzles and/or by positioning the nozzles higher above the pond level), can also improve the evaporation rate.

It takes a considerable amount of heat to evaporate water. To evaporate one pound of pure water it requires 1,000 lbs. of water losing 1° F or to evaporate 100 pounds of water losing 10° F. Evaporating 1 percent of the total inventory water being sprayed can cool the spray water by 10° F.

As discussed, continued respraying of the same water would eventually cool the spray water and reduce the pond water temperature down to a point that approaches the wet bulb temperature. Under these conditions the necessary heat for evaporation must come from the environment or other sources (artificial or natural). Since, in reality, the surrounding air environment can supply very little instantaneous heat to the droplets, external sources of heat supplied to the pond water such as solar heat, or mechanical heat transfer equipment, would be desirable to maintain a relatively warm (greater than ambient if possible) water temperature in the pond.

Most current spray evaporation systems have relied on relatively deep (10 ft±) storage-style ponds to reduce surface area (to save capital cost), these have marginal to poor spray evaporation efficiency since there is little actual ambient daily heat gain due to the depth/surface area relationship. Increasing spray water temperature is the only parameter that will significantly improve actual evaporation. For example, in theory if the water being sprayed is continually heated to 20° F above the spray-cooled water temperature, to provide a 2 percent

evaporation rate, it would take about 115 spray cycles to evaporate 90 percent of the water. If an 80° F water temperature difference (spray vs. pond) could be maintained, to provide an 8 percent actual evaporation rate, only about 30 spray cycles would be required to evaporate 90 percent of the water.

To aid this water evaporation process, it is useful to remove the vapors efficiently by providing for air replacement using the prevailing wind to best advantage. Therefore, the long side of the spray pond should be perpendicular to the prevailing wind direction. Most current pond systems in use at mines are designed primarily for water storage, not evaporation, and are typically square and not wind effective. However, significant wind drift loss of water (no evaporation) does occur which is often evidenced by the surrounding buildup of salts on the ground surrounding a pond.

While it is possible to theoretically estimate evaporative loss for a spray pond it is, at best, an imprecise calculation. For example, it is theoretically possible to evaporate 200 gpm if the following general Bisbee area conditions were assumed:

1.	Relative humidity (% assumed for summer)	20%
2.	Wet bulb temperature (summer average*)	60° F (15.6º C)
3.	Dry bulb temperature (summer daily average*, U.S. Weather Bureau)	95° F (35º C)
4.	Difference	35° F

5. Using a 70% cooling efficiency = (35° F) x 0.7 = 24.5° F
6. 1.0% evaporative loss per 10° F (0.001 rate/1° F drop) = 24.5° F x 0.001 = 0.0245% of water sprayed
7. Therefore to evaporate 200 gpm under these conditions over 8,163 gpm of water would have to be continually pumped and sprayed.

   $\frac{\text{200 gpm loss}}{\text{(0.0245 loss factor)}}$ = 8,163 gpm

*Estimated from ASHRAE – Heating and Mass Exchange Tables for not exceeded by 0.4% of the time

In theory at a spray pressure of 60 psi (including friction losses), this would require an installed pumping horsepower of over 356 hp. However, this is a theoretical calculation and most operating systems we have studied appear to do somewhat better for a variety of site specific reasons. For example, a large system in central New Mexico disposes of over 200 gpm (annualized) using approximately 400 hp (including pond evaporation losses).

Using lake surface (corrected pan evaporation rate) evaporation alone, based upon company-supplied historic information, the general Bisbee area annual pan evaporation rate is approximately 75 inches a year (corrected using a 75% pan coefficient factor) while the annual mean precipitation rate is 13.8 inches a year (15 years or record). This provides approximately 61.5 inches/year of total net pond evaporation (Table 5). Assuming the 61.5 inches/year is a suitable pan evaporation rate, this equates to approximately 3.2 gpm/acre on an average annual basis. Table 8 provides a summary of assumed pond evaporation rates and surface area

requirements with and without spray enhancement for both the total groundwater excavation flow (targets) and the resultant RO brine (Table 2).

Table 8

Average Annual Evaporation Area Requirements
Based upon Bisbee Climatic Data*

Groundwater Total Flow to Evaporation	**Pond Evaporation** (Acres)**	**Enhanced Pond*** Evaporation with Sprays (Acres)**
1,000 gpm	323	230
2,000 gpm	645	461
4,000 gpm	1,290	921
(on a calculated monthly basis)		

RO Brine Flow to Evaporate	**Pond Evaporation** (Acres)**	**Enhanced Pond*** Evaporation with Sprays (Acres)**
150 gpm (1,000 gpm source)	46	34
300 gpm (2,000 gpm source)	93	69
600 gpm (4,000 gpm source)	187	137

*Table 5
**Assumes annual average – 3.18 gpm/acre
***Assumes annual average – 4.34 gpm/acre combination of pan and sprays conservative

The addition of a spray system is able to reduce the required area significantly depending on climatic conditions as shown on Table 8, based upon the approach presented.

Using the theoretical spray loss formula discussed above, Table 9 provides the projected total evaporative criteria necessary to evaporate the full RO brine flow produced for the three influent flow options.

Table 9

Evaluation of Enhanced Evaporation System Criteria

RO Option (Raw Water Flow)	**Projected* Brine Flow (gpm)**	**Spray* Pond Rate (gpm)**	**HP Required @ 60** psi (138 ft)**
1,000 gpm	150	6,122	272
2,000 gpm	300	12,230	551
4,000 gpm	600	24,500	1,082

*Derived from example 0.0245 loss factor for midsummer
**Assumes ±50% friction losses – 135 ft head and 80% pump efficiency

Assuming $0.08 kWh, Table 10 presents the estimated energy cost would be associated with the theoretical evaporation of the total RO brine flow for the three options.

Table 10

Estimated Operation and Maintenance Cost Opinion for Enhanced Evaporation

RO Option (Raw Water Flow)	RO Brine Energy Projected kWh/day	$* Cost/Day	$* Cost/Year
1,000 gpm	4,888	$391	$142,700
2,000 gpm	9,917	$793	$290,000
4,000 gpm	19,468	$1,557	$568,000

*$0.08/KWH – 24 hr/7-day

While these are all theoretical values and our cost opinions would be subject to actual field conditions, they are used to demonstrate the significance of the operating cost on a spray evaporation project of this magnitude and the necessity to balance the use of available pond (pan) evaporation rates with enhanced spray effects. A combination of the two approaches, that can take advantage of specific site condition (significant wet bulb/dry bulb differences, site climatic conditions, design, etc.), should be employed to determine the most cost effective method to manage brine inventory in a pond. A significant effort is necessary to provide a final optimized design for a large evaporation system.

The cost of shallow (heat gaining) holding/evaporation ponds for this type of system are typically expensive. We would assume that a double membrane lined (flexible polyethylene membrane liner or similar) pond with a leach collection and recovery systems (LCRS) will be required by the state regulators (to be confirmed by FMI). Estimating the balance between having a very large evaporation pond and installing a spray system to reduce the pond size is not an intuitive exercise. Weather conditions can change and enough storage capacity needs to be provided to insure that the treatment system can continue to operate under less than ideal evaporation conditions. For conceptual planning purposes we have assumed in the following example that 60 percent of the evaporation can be achieved from pond surface (pan) evaporation and 40 percent is derived from a spray system. The systems would be separate (an intensive spray area and a deeper pond) but connected to prevent the intensive spray system from interfering with the pond system solar evaporation. We have also assumed that the ponds will need to contain storage for at least one month of RO brine if no evaporation were to occur, which is unlikely given the information provided in Table 5. We also assumed that the pond would have a spray system covering the entire surface to take advantage of warmer air temperatures in the Bisbee area and maximize evaporative loss. The validity of this assumption needs to be confirmed.

Table 11 provides an evaluation of the brine evaporation balance for the RO brine for each of the three flow options.

Table 11

RO Brine Disposal by Enhanced Evaporation Using a Conceptual Balanced Pond Surface Area/Spray Approach Bisbee Copper Queen Mine

Concept Design Criteria	Flow Option		
Flow Option (gpm)	**1,000**	**2,000**	**4,000**
Total Brine Flow (gpm) (85% recovery)	150	300	600
Pond Evaporation Rate (gpm) (60% loss)*	90	180	360
Spray Evaporation Pump Flow (gpm) (40% loss)**	2,450	4,897	9,760
Pond Surface Area (acres)	34	69	137
Spray (HP)**	108	220	433
Pond volume @ 6 feet storage (million gallons)	8±	16±	32±
3-Month RO Storage required (million gallons)	7	14	28

*Table 8
**Table 9

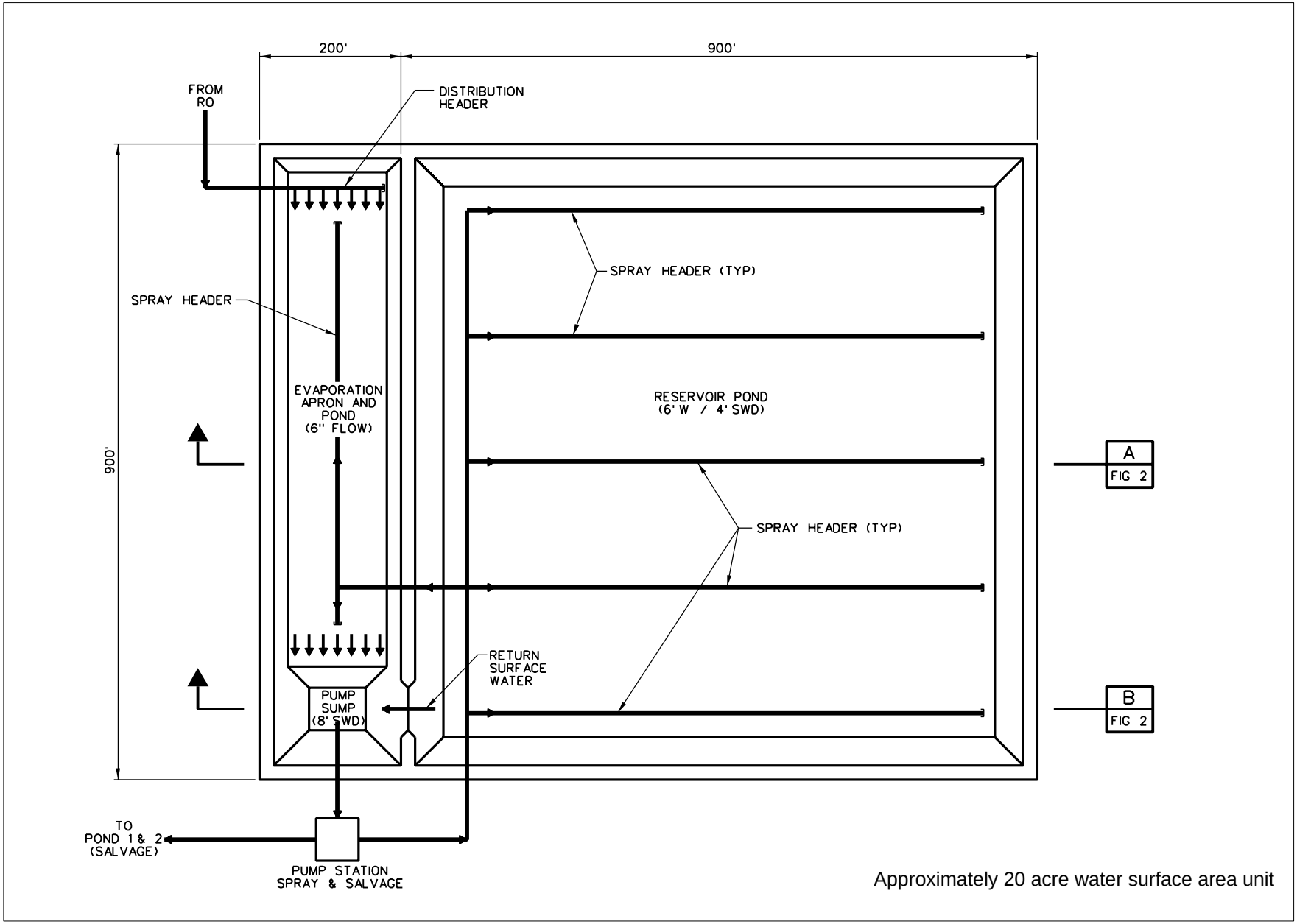
The use of sprays (enhanced spray evaporation only no drift accounted for – typically 2% additional loss) could conceptually reduce the pond (see discussion in Section 5.2), respectively for 150, 300 and 600 gpm of RO brine, to 34, 69 and 137 acres (Table 11). At $3.80 (see Table 21) a square foot for pond installation (this unit cost assumes a very large lining project with the appropriate unit cost savings), the use of sprays could offer a significant reduction in construction cost (discussed in more detail in Section 6); however, the operating cost as a result of brine spray pumping will be significant.

Figures 3 and 4 provide one concept of a typical design for a high efficiency, enhanced evaporation pond. Multiple units of this concept would be used to meet the total demand. This provides the opportunity to balance the flows and pond levels and allow for maintenance, cleaning and repair as required.

5.3 Pond Evaporation of Total Groundwater Flow

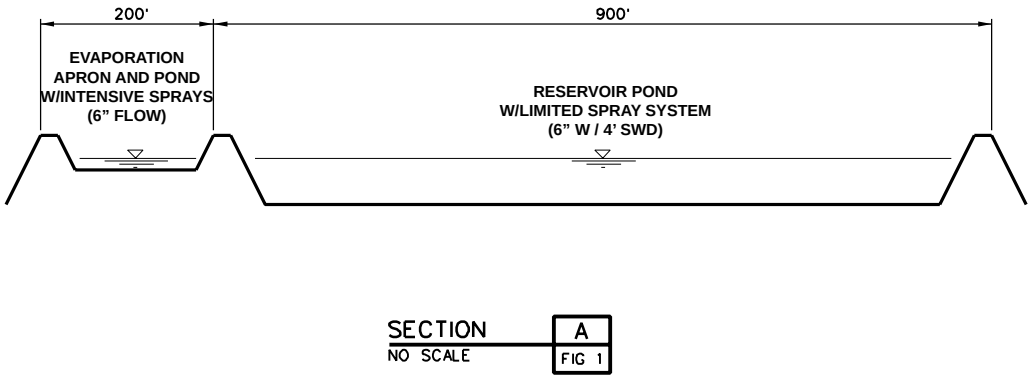
The other management/disposal option considered was the use of a pond evaporation system to eliminate and manage the entire groundwater flow. As discussed earlier, in regards to brine disposal, the addition of mechanical dehydration or thermal evaporation would not be practical given the high capital and energy cost. The use of active solar heating devices may be useful but will not be addressed herein due to insufficient site specific information.

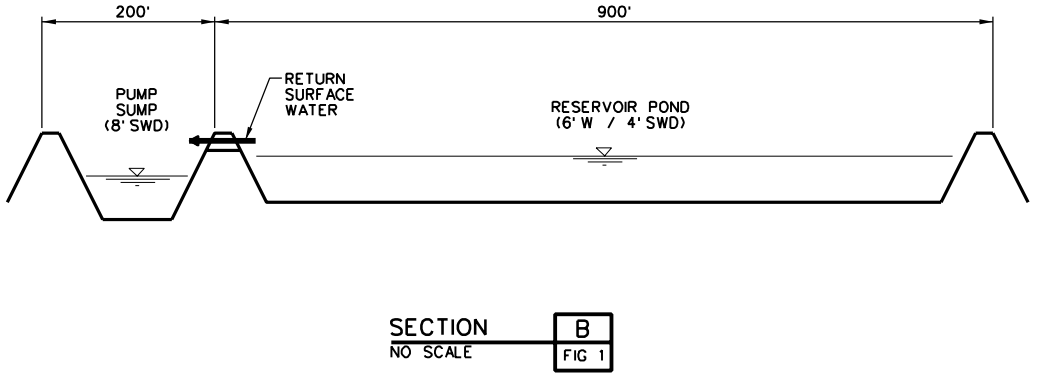
Assuming the same conditions and characteristics as the brine evaporation option for managing the RO concentrate, the size of solar evaporation ponds to eliminate 1,000, 2,000 or 4,000 gpm of groundwater was calculated based on the corrected pan evaporation rates for the Bisbee area. We only looked at passive pond evaporation. Spray or enhanced evaporation facilities



MWH

Schematic Layout - Copper Queen Mine Enhanced Evaporation Pond System
Figure 3





MWH

Schematic Cross Sections - Copper Queen Mine Enhanced Evaporation Pond System
Figure 4

are possible and would reduce the size of the ponds; however, the energy use will be significant.

For example, using the information generated for brine disposal, the necessary installed spray horsepower would be on the following order (Table 12):

Table 12

Spray System Energy Use (Installed HP)

Flow	HP	kWh/Day
1,000 gpm	2,397 hp	43,100 kWh/day
2,000 gpm	4,790 hp	86,220 kWh/day
4,000 gpm	9,585 hp	172,530 kWh/day

Table 13 presents the pond sizing summary for passive (no spray system) evaporation of the three proposed groundwater flow options. Based upon having a minimal safety factor the evaporation pond area(s) required for the two options are as follows:

Table 13

Pond Evaporation System (no sprays) Area Requirements

Flow	Acres
1,000 gpm	323 acres (surface)
2,000 gpm	645 acres (surface)
4,000 gpm	1,290 acres (surface)

Using this surface area and a 6 to 8 foot deep pond, sufficient storage would be provided to maintain enough storage volume to meet the 4 to 6 months (see Table 14) when evaporation will not exceed groundwater inflow and precipitation. If an evaporation option were to be considered, seasonal variation in groundwater pumping would need to be evaluated to better balance inflow and periods of higher evaporation.

Table 14

Total Groundwater Extracted to Evaporation
Evaluation of Passive Evaporation Rates Vs. Pond Size

Assumes 1000 GPM to Evaporation

Month	Net Evap Rate Inches	Net Evap Rate Ac GPM/Acre	Evap w/ 323 Acres Gal/Month	323 Acres Gal/Acre/Mo.	Groundwater to Evap. GPM	Waste Gal/Month	323 Acres Evap-Waste Gal/Month
January	1.32	0.80	11,584,670	17,961	1000	44,640,000	-33,055,330
February	2.27	1.38	19,922,122	30,887	1000	44,640,000	-24,717,878
March	5.47	3.33	48,006,171	74,428	1000	44,640,000	3,366,171
April	7.07	4.30	62,048,196	96,199	1000	44,640,000	17,408,196
May	7.69	4.68	67,489,480	104,635	1000	44,640,000	22,849,480
June	10.13	6.17	88,903,567	137,835	1000	44,640,000	44,263,567
July	4.94	3.01	43,354,751	67,217	1000	44,640,000	-1,285,249
August	4.72	2.87	41,423,972	64,223	1000	44,640,000	-3,216,028
September	5.57	3.39	48,883,798	75,789	1000	44,640,000	4,243,798
October	5.91	3.60	51,867,728	80,415	1000	44,640,000	7,227,728
November	3.75	2.28	32,910,995	51,025	1000	44,640,000	-11,729,005
December	2.66	1.62	23,344,866	36,194	1000	44,640,000	-21,295,134
YEARLY	**61.5**	**3.18**	**539,740,316**			**535,680,000**	**4,060,316**

Assumes 2000 GPM to Evaporation

Month	Net Evap Rate Inches	Net Evap Rate Ac GPM/Acre	Evap w/ 645 Acres Gal/Month	645 Acres Gal/Acre/Mo.	Groundwater to Evap. GPM	Waste Gal/Month	645 Acres Evap-Waste Gal/Month
January	1.32	0.80	23,133,475	35,866	2000	89,280,000	-66,146,525
February	2.27	1.38	39,782,566	61,678	2000	89,280,000	-49,497,434
March	5.47	3.33	95,863,716	148,626	2000	89,280,000	6,583,716
April	7.07	4.30	123,904,292	192,100	2000	89,280,000	34,624,292
May	7.69	4.68	134,770,015	208,946	2000	89,280,000	45,490,015
June	10.13	6.17	177,531,892	275,243	2000	89,280,000	88,251,892
July	4.94	3.01	86,575,276	134,225	2000	89,280,000	-2,704,724
August	4.72	2.87	82,719,697	128,248	2000	89,280,000	-6,560,303
September	5.57	3.39	97,616,252	151,343	2000	89,280,000	8,336,252
October	5.91	3.60	103,574,875	160,581	2000	89,280,000	14,294,875
November	3.75	2.28	65,720,098	101,892	2000	89,280,000	-23,559,902
December	2.66	1.62	46,617,456	72,275	2000	89,280,000	-42,662,544
YEARLY	**61.5**	**3.18**	**1,077,809,609**			**1,071,360,000**	**6,449,609**

Assume 4000 GPM to Evaporation

Month	Evap Rate Inches	Evap Rate Ac GPM/Acre	Evap w/ 1290 Acres Gal/Month	1290 Acres Gal/Acre/Mo.	Groundwater to Evap. GPM	Waste Gal/Month	1290 Acres Evap-Waste Gal/Month
January	1.32	0.80	46,266,949	35,866	4000	178,560,000	-132,293,051
February	2.27	1.38	79,565,132	88,406	4000	178,560,000	-98,994,868
March	5.47	3.33	191,727,433	213,030	4000	178,560,000	13,167,433
April	7.07	4.30	247,808,583	275,343	4000	178,560,000	69,248,583
May	7.69	4.68	269,540,029	299,489	4000	178,560,000	90,980,029
June	10.13	6.17	355,063,783	394,515	4000	178,560,000	176,503,783
July	4.94	3.01	173,150,552	192,390	4000	178,560,000	-5,409,448
August	4.72	2.87	165,439,394	183,822	4000	178,560,000	-13,120,606
September	5.57	3.39	195,232,505	216,925	4000	178,560,000	16,672,505
October	5.91	3.60	207,149,749	230,166	4000	178,560,000	28,589,749
November	3.75	2.28	131,440,196	146,045	4000	178,560,000	-47,119,804
December	2.66	1.62	93,234,913	103,594	4000	178,560,000	-85,325,087
YEARLY	**61.5**	**3.18**	**2,155,619,219**			**2,142,720,000**	**12,899,218**

6.0 OPINION OF PROBABLE CONCEPTUAL PROJECT COST

Our opinion of the capital and operating cost for the two groundwater management/treatment/disposal systems discussed in Section 5 are provided in this section. The two management systems include:

Alternative 1 Water treatment by reverse osmosis and brine disposal by evaporation using enhanced spray evaporation pond. Final product water disposal was not addressed. Groundwater collection and conveyance were likewise not considered. Raw and product water for final blending will be collected in tanks and a product water pump station will be included.

Alternative 2 Evaporation of extracted groundwater using passive solar ponds. Groundwater collection was not considered and we did not attempt to physically site the required ponds at the Bisbee site or determine the availability of land. An enhanced spray system would be very energy intensive and was not considered herein but may be another option or future consideration.

Cost estimates for equipment and material are based on recent manufacturers' quotes and from other similar projects completed by MWH. Labor and civil-work were assumed to be similar to typical historic southwestern United States projects. All costs assume a 2012 base year. No cost for test or production well drilling or exploration, transportation and freight, taxes, spare parts, licenses, permitting, right-of-ways, legal or land costs were included in these conceptual costs. The availability and actual purchase price for commercial electrical power needs to be confirmed. A relatively high contingency of 25 percent was used for capital costs. Given that power is a very significant cost (capital and O&M) for the project, determination of the actual power system requirements and purchase price will require careful additional investigation. The FMI provided power cost for this analysis is $0.08 kWh. Accuracy of this opinion of capital and operation costs should be assumed at ±40 percent at this conceptual level of study. We would consider this a Class 4 or 5 level estimation (opinion) based upon the AAEC International estimating classification system (concept design/planning). The estimated costs can be refined with further design development and specific site information.

Figure 2 provides an example of a typical building plan layout (2,000 gpm option) of the desalination building (95 ft x 65 ft), for housing a system using three 1,000 gpm (feed) water RO units. This would be typical for the 2,000 gpm influent well water option. The building (concrete block or metal) would include an electrical room, operators area, and a space for chemical feed and storage. All water and major bulk chemical storage tanks will be located outside the building and be constructed of polypropylene, fiberglass reinforced plastic (FRP), concrete, or lined steel. We have not, at this point, assumed the need for other support buildings, maintenance facilities, residences or ancillary facilities. We have assumed that these facilities will be located elsewhere. A new substation/transformer would be located onsite to provide power for the water treatment and primary pumping and a medium voltage supply will be installed from an available commercial line. We have not included cost of a new primary power line to the site (as yet unidentified). The building could be expanded in stages or at the initiation of the project to accommodate the 4,000 gpm option. The 1,000 gpm option would reduce the building size by approximately 15 to 20 percent.

6.1 Bisbee Copper Queen Mine Groundwater Treatment Alternative 1 Opinion of Cost

Tables 15, 16 and 17 provides our opinion of capital cost estimated for the membrane treatment facilities for the three flow options considered.

Tables 18, 19 and 20 present our opinion of operational and maintenance cost for the flow alternatives.

Table 15

Estimated Conceptual Capital Cost Opinion
For Water Treatment System
1,000 gpm Option (150 gpm RO Brine)

Description	Units	$ Material & Equipment Cost	$ Labor Cost	$ Total Cost
1) Site Civil Preparation (roads, paving, etc.)	1	LS	---	$150,000
2) Raw Water Storage with Mixing (15 min. HDT)	1	70,000	40,000	110,000
3) Chemical Storage and Mixing (poly) and Feed Pumps (2)	1	60,000	25,000	85,000
4) Booster Pumping	2	12,000	46,000	70,000
5) Pressure Filters	3	120,000	90,000	450,000
6) Antiscalent and Acid and Mixing (2 pumps, each system)	1	35,000	45,000	80,000
7) RO Units, complete (1,000 gpm feed) w/piping, pumps, controls, etc.	2	510,000	480,000	1,500,000
8) Building Piping	LS	80,000	---	80,000
9) Permeate Storage with 10 min. HDT	1	20,000	40,000	60,000
10) Brine Disposal Pipeline (off-site treatment plant 1,000 ft)	LS	75,000	---	75,000
11) RO Building (3,500 ft^2) CMU	1	185 ft^2	---	648,000
12) CIP System, complete with heater and piping/valves	1	LS	---	50,000
13) Yard Piping and Valves (influent to WTP from well system holding tank)	1	LS	---	180,000
14) Site Electrical*	1	LS	---	500,000
15) Controls & Instrumentation	1	LS	---	100,000
16) Electrical Service**	1	LS	---	410,000
17) Miscellaneous	1	LS	---	100,000
Subtotal (direct cost)				**$4,648,000**
18) Contractor OH&P (32%)****				1,487,000
19) Engineering & CMS (13%)***				604,000
Subtotal				**$6,739,000**
20) Legal & Admin. (2%)				93,000
21) Permitting (4%)				186,000
22) Spare Parts (5%)				232,000
23) Transportation (1%)				47,000
24) Contingencies (25%)				1,162,000
TOTAL				**$8,459,000**

*Secondary electrical supply estimate
**Building electrical
***8% and 5%
****% Direct cost all % factors

Table 16

Estimated Conceptual Capital Cost Opinion
For Water Treatment System
2,000 gpm Option (300 gpm RO Brine)

Description	Units	$ Material & Equipment Cost	$ Labor Cost	$ Total Cost
1) Site Civil Preparation (roads, paving, etc.)	1	LS	---	$150,000
2) Raw Water Storage with Mixing (15 min. HDT)	1	90,000	40,000	130,000
3) Chemical Storage and Mixing (poly) and Feed Pumps (2)	1	60,000	25,000	85,000
4) Booster Pumping	3	12,000	69,000	105,000
5) Pressure Filters	4	120,000	120,000	600,000
6) Antiscalent and Acid and Mixing (2 pumps, each system)	1	50,000	50,000	100,000
7) RO Units, complete (1,000 gpm feed) w/piping, pumps, controls, etc.	3	510,000	570,000	2,100,000
8) Building Piping	LS	80,000	---	80,000
9) Permeate Storage with 10 min. HDT	1	20,000	40,000	60,000
10) Brine Disposal Pipeline (off-site treatment plant 1,000 ft)	LS	75,000	---	75,000
11) RO Building (6,000 ft^2) CMU	1	185 ft^2	---	1,110,000
12) CIP System, complete with heater and piping/valves	1	LS	---	50,000
13) Yard Piping and Valves (influent to WTP from well system holding tank)	1	LS	---	200,000
14) Site Electrical*	1	LS	---	650,000
15) Controls & Instrumentation	1	LS	---	150,000
16) Electrical Service**	1	LS	---	600,000
17) Miscellaneous	1	LS	---	100,000
Subtotal (direct cost)				**$6,345,000**
18) Contractor OH&P (32%)****				2,031,000
19) Engineering & CMS (13%)***				825,000
Subtotal				**$9,201,000**
20) Legal & Admin. (2%)				127,000
21) Permitting (4%)				254,000
22) Spare Parts (5%)				317,000
23) Transportation (1%)				64,000
24) Contingencies (25%)				1,586,000
TOTAL				**$11,549,000**

*Secondary electrical supply estimate
**Building electrical
***8% and 5%
****% Direct cost all % factors

Table 17

Estimated Conceptual Capital Cost Opinion
For Water Treatment System
4,000 gpm Option (600 gpm RO Brine)

Description	Units	$ Material & Equipment Cost	$ Labor Cost	$ Total Cost
1) Site Civil Preparation (roads, paving, etc.)	1	LS	---	$200,000
2) Raw Water Storage with Mixing (15 min. HDT)	2	150,000	50,000	200,000
3) Chemical Storage and Mixing (poly) and Feed Pumps (2)	1	75,000	25,000	100,000
4) Booster Pumping	5	12,000	115,000	175,000
5) Pressure Filters	6	120,000	180,000	900,000
6) Antiscalent and Acid and Mixing (2 pumps, each system)	1	100,000	60,000	160,000
7) RO Units, complete (1,000 gpm feed) w/piping, pump, etc.	5	510,000	1,650,000	4,200,000
8) Building Piping	LS	150,000	---	150,000
9) Permeate Storage with 10 min. HDT	1	50,000	50,000	100,000
10) Brine Disposal Pipeline (off-site treatment plant 1,000 ft)	1	LS	---	95,000
11) RO Building (7,500 ft^2) CMU	1	185 ft^2	---	1,388,000
12) CIP System, complete with heater and piping and valves	1	60,000	---	60,000
13) Yard Piping and Valves (influent to WTP from holding tank)	LS	200,000	---	200,000
14) Site Electrical*	1	LS	---	1,000,000
15) Controls & Instrumentation	1	LS	---	200,000
16) Electrical Service**	1	LS	---	1,200,000
17) Miscellaneous	1	LS	---	150,000
Subtotal (direct cost)				**$10,478,000**
18) Contractor OH&P (32%)****				3,353,000
19) Engineering & CMS (13%)***				1,362,000
Subtotal				**$15,193,000**
20) Legal & Admin. (2%)				210,000
21) Permitting (4%)				419,000
22) Spare Parts (5%)				524,000
23) Transportation (1%)				105,000
24) Contingencies (25%)				2,620,000
TOTAL				**$19,071,000**

*Secondary electrical supply estimate
**Building electrical
***8% and 5%
****% Direct cost all % factors

Table 18

2013 Estimate of Annual Operating and Maintenance Cost Opinion For Groundwater Treatment 1,000 gpm of Raw Water Option (150 gpm RO Brine)

Description	Units	Unit Price	Cost ($)
Power Cost Utility Power (Treatment)*		$0.08 kWh**	
1) Booster Pumping (1 x 100 Hp)	628,000 kWh		
2) RO Pumping (1 x 200 Hp)	1,250,000 kWh		
3) Miscellaneous Chemicals	40,000 kWh		
4) CIP	50,000 kWh		
5) Building	20,000 kWh		
Utility Electrical Power Subtotal	1,988,000 kWh		**$159,000**
Chemicals (delivery included)*			
6) Acid	42,000 lbs	$0.112/lb	$2,400
7) Antiscalent and Flocculent	45,000 lbs	$0.85/lb	$20,000
8) Polymer	26,300 lbs	$4/lb	$52,000
Chemical Subtotal			**$72,000**
Membrane Filter Replacement			
9) 42 months Replacement of 270 Membranes @ $600 unit (assumed replacement accrual at 155 units each year)****			$47,000
10) Cartridge Filter Replacement 12 x year (57 x 12 x 2)		$6.00/ea	$5,000
			$52,000
Labor			
11) 5 FTUs @$85.00 hour (burdened)			**$884,000**
Miscellaneous			
12) Admin, Laboratory, Engineering, Misc., etc.			**$300,000**
TOTAL			**$1,467,000**

*Assumes 95+% operation year-round for the service required
**Assumed
***Based upon available water quality
****Equipment maintenance replacement cost

Table 19

2013 Estimate of Annual Operating and Maintenance Cost Opinion For Groundwater Treatment 2,000 gpm of Raw Water Option (300 gpm RO Brine)

Description	Units	Unit Price	Cost ($)
Power Cost Utility Power (Treatment)*		$0.08 kWh**	
1) Booster Pumping (2 x 100 Hp)	1,248,000 kWh		
2) RO Pumping (2 x 200 Hp)	2,500,000 kWh		
3) Miscellaneous Chemicals	50,000 kWh		
4) CIP	50,000 kWh		
5) Building	26,000 kWh		
Utility Electrical Power Subtotal	3,874,000 kWh		**$310,000**
Chemicals (delivery included)*			
6) Acid	42,000 lbs	$0.112/lb	$4,700
7) Antiscalent and Flocculent	45,000 lbs	$0.85/lb	$38,250
8) Polymer	26,300 lbs	$4/lb	$105,200
Chemical Subtotal			**$148,000**
Membrane Filter Replacement			
9) 42 months Replacement of 540 Membranes @ $600 unit (assumed replacement accrual at 155 units each year)****			$93,000
10) Cartridge Filter Replacement 12 x year (57 x 12 x 2)		$6.00/ea	$8,200
			$101,000
Labor			
11) 5 FTUs @$85.00 hour (burdened)			**$884,000**
Miscellaneous			
12) Admin, Laboratory, Engineering, Misc., etc.			**$350,000**
TOTAL			**$1,793,000**

*Assumes 95+% operation year-round
**Assumed
***Based upon available water quality
****Equipment maintenance replacement cost

Table 20

2013 Estimate of Annual Operating and Maintenance Cost Opinion For Groundwater Treatment 4,000 gpm of Raw Water Option (600 gpm RO Brine)

Description	Units	Unit Price	Cost ($)
Power Cost Utility Power (Treatment)*		$0.08 kWh**	
1) Booster Pumping (4 x 100 Hp)	2,497,000 kWh		
2) RO Pumping (4 x 200 Hp)	4,993,000 kWh		
3) Miscellaneous Chemicals	75,000 kWh		
4) CIP	75,000 kWh		
5) Building	50,000 kWh		
Utility Electrical Power Subtotal	7,690,000 kWh		**$615,000**
Chemicals (delivery included)			
6) Acid	84,000 lbs	$0.112/lb	$9,400
7) Antiscalent	90,000 lbs	$0.85/lb	$76,500
8) Polymer	52,600 lbs	$4/lb	$210,400
Chemical Subtotal			**$296,100**
Membrane Replacement			
9) 42 months Replacement of 1,080 Membranes @ $600 unit (assumed replacement accrual at 309 units each year)****			$186,000
10) Cartridge Filter Replacement 12 x year (57 x 12 x 4)		$6.00/ea	$16,000
			$202,000
Labor			
11) 5 FTUs @$85.00 hour (burdened)			**$884,000**
Miscellaneous			
12) Admin, Laboratory, Engineering, Misc., etc.			**$400,000**
TOTAL			**$2,397,000**

*Assumes 95+% operation year-round.
**Assumed
***Based on available water quality
****Equipment maintenance replacement cost

We have assumed that any new evaporation pond would be required to be built to hazardous material type standards. The use of double containment (2 layers of flexible membrane liner) with a leak detection and containment/recovery system would represent an assumed level required for those facilities have that a hydraulic head in excess of 72 inches (i.e., deeper pond area). A 40-mil underliner (bottom) and an 80 mil top flexible membrane liner was assumed for costing purposes. A HDPE "Geonet" type leak collection material would be sandwiched between the two liners. The liner would be connected (bonded) on 50-ft. centers and soil anchors installed to prevent wind movement. The maximum average pond operating depth should be maintained at 5 – 6 feet.

The use of sprays for enhanced evaporation depends on adding solar or other heat sources to the water to allow more rapid evaporation to occur. Significant heat gain by solar radiation is possible for a thin film flow in the project area. We have proposed a two element pond for the new evaporation system. This would include 1) a heat gaining apron area with intensive spray system including a catchment sump, and 2) a larger shallow storage pond with a pump pack and some spray capability. Water would be sprayed over the apron area and allowed to flow slowly over the apron. This would allow time for solar heat accumulation and surface evaporation. Additional sprays would be added at the end of the apron to take advantage of heat gain. Water that did not evaporate by the end of the apron would be collected in a sump and pumped to a spray system installed in the pond. The actual pond would be designed for approximately a 6 foot operating depth with 2 feet of freeboard (more could be added for emergency storage). The shallow depth and a pressurized spray system would encourage evaporation (See Figures 3 and 4). The effectiveness of this system would depend largely upon the weather and climate (daytime temperature, precipitation, humidity cloud cover, and wind) in the area, and the final size and design.

Solids buildup on the apron liner could be a concern but should be controlled (resuspended) by surface flow during cooler operating periods when precipitation is depressed and by occasional cleaning with pressurized water, and scale sloughing. In a similar operation, solids sloughing has occurred, however, some regular maintenance should be anticipated in order to maintain the spray system for effective evaporation. The option to add dye to the water to aid in solar heat gain has been recommended by some authors, but we have had no direct experience in implementing this option and addition research would be required. The sump would be interconnected to the pond via an adjustable weir. If the pond water elevation were to reach a point higher than the weir, the water would flow back into the pump sump and be resprayed either over the apron or the pond. By using a flow control weir this system should be somewhat self-regulating. Both the holding pond and apron would have separate spray pumping systems. This is a conceptual unit design and would be subject to modification for an actual installation. Multiple units would be installed to meet the brine disposal and reliability requirements.

Using the general pond evaporation design information (components) presented in Table 21, the cost for the evaporation/storage pond was estimated. Based upon our experience and recent costs for similar systems, we have estimated that the unit cost (cost/ft^2) of the double-lined pond section would be as shown on Table 21.

Table 21

In Place Double Liner Cost For Evaporation Ponds
(assumes flat native surface)

Item	Unit Cost/ft^2
Grubbing	0.10
Over excavation	0.25
Base material & berms	1.00
80-mil FML - Top Liner	1.00
Geonet and LCRS	0.60
40-mil FML – Bottom Liner	0.65
Soil anchors/restraints	0.20
	$3.80*

*Includes contractor OH&P, labor and materials assuming a very large scale project to reduce unit cost

The estimated area of coverage includes the area in Table 22.

Table 22

Projected Pond Area

Component (Total Area)	Option (gpm)		
	1,000	**2,000**	**4,000**
Apron (7%)	2.5	3.4 acres	7.0
Sump (1%)	0.5	0.5 acre	1.0
Pond (93%)	31.0	44.2	86.0
TOTAL	**34 Acres**	**69 Acres**	**137 Acres**

The installed capital cost of the brine management system for the three flow options are presented on Table 23. This includes the estimated cost for the enhanced evaporation spray system, piping and pump station(s), electrical services (secondary) and ancillary facilities.

Table 24 (A, B & C) provides our opinion of potential year-one operating cost (for 2012 dollars). These costs do not include ultimate disposal of salts and residual from the evaporation pond system, but it would be assumed, that upon final reclamation, the pond(s) with dry solids would be encapsulated within the existing membrane liner system and would be buried on the mine site in a dedicated facility. Alternatively, the encapsulated material could be disposed of offsite at a commercial waste handling location.

Table 23

Alternative 1 RO Brine Evaporation System
Opinion of Conceptual Capital Cost*

Option	1,000 gpm	2,000 gpm	4,000 gpm
Pond Area (ft^2) (total)	34 acres	69 acres	137 acres
Lined Pond Unit Cost ($/$ft^2$)	$3.80	$3.80	$3.80
Spray System Size (HP)	105	210	420
Unit Cost ($) Spray System ($ft^2$) – total distribution area	$0.77	$0.77	$0.77
Total Pond cost ($)	$5,628,000	$11,421,000	$22,677,000
Pump Cost ($) (est. as several pump stations)	$225,000	$450,000	$900,000
Total Spray System Cost ($)	$1,140,000	$2,314,000	$4,595,000
Total System Cost ($)	**$6,993,000**	**$14,185,000**	**$28,172,000**
Cost per acre, Total	**$206,000**	**$206,000**	**$206,000**

*Does not include engineering, administration and contingency. See Table 27.

Table 24-A

Flow Option 1 RO Brine Evaporation System
Opinion of Annual Operations & Maintenance Cost
(1,000 gpm Option)

Description	Units	Unit Price(s)	Total Annual Cost ($)
1) Annual Power Cost*	0.70 million kWh	$0.08 kWh	$56,000
2) Spray System Maintenance	5% Capital*	Lump Sum	$57,000
3) Liner Maintenance	0.5% Capital*	Lump Sum	$28,000
4) Annual Labor	3 Full Time Employees	$40,000	$120,000
5) Pump Station Maintenance	5% Capital	$27,000	$11,000
6) Management & Administration	0.5 Full Time Employee	$80,000	$40,000
7) Miscellaneous	Lump Sum	$50,000	$50,000
TOTAL ANNUAL			**$362,000**

* Assumes 24/7 full operation

Table 24-B

Flow Option 2 RO Brine Evaporation System
Opinion of Annual Operations & Maintenance Cost
(2,000 gpm Option)

Description	Units	Unit Price(s)	Total Annual Cost ($)
1) Annual Power Cost*	1.38 million kWh	$0.08 kWh	$110,000
2) Spray System Maintenance	5% Capital*	Lump Sum	$116,000
3) Liner Maintenance	0.5% Capital*	Lump Sum	$57,000
4) Annual Labor	3 Full Time Employees	$40,000	$120,000
5) Pump Station Maintenance	5% Capital	$27,000	$23,000
6) Management & Administration	0.5 Full Time Employee	$80,000	$40,000
7) Miscellaneous	Lump Sum	$50,000	$50,000
TOTAL ANNUAL			**$516,000**

* Assumes 24/7 full operation

Table 24-C

Flow Option 3 RO Brine Evaporation System
Opinion of Annual Operations & Maintenance Cost
(4,000 gpm Option)

Description	Units	Unit Price(s)	Total Annual Cost ($)
1) Annual Power Cost*	2.76 million kWh	$0.08 kWh	$221,000
2) Spray System Maintenance	5% Capital*	Lump Sum	$229,000
3) Liner Maintenance	0.5% Capital*	Lump Sum	$113,000
4) Annual Labor	3 Full Time Employees	$40,000	$120,000
5) Pump Station Maintenance	5% Capital	$27,000	$45,000
6) Management & Administration	0.5 Full Time Employee	$80,000	$40,000
7) Miscellaneous	Lump Sum	$50,000	$50,000
TOTAL ANNUAL			**$818,000**

* Assumes 24/7 full operation

6.2 Bisbee Copper Queen Mine Groundwater Evaporation Alternative 2 Opinion of Cost

The cost for the total groundwater flow evaporation alternative (Alternative 2) was based upon the evaporation pond costs presented in Table 21. This alternative is of such a significant physical size in terms of space required, a very detailed evaluation would be required to further determine its feasibility and related consequences.

Table 25 presents our opinion of the cost for solar evaporation ponds to handle the entire proposed groundwater flow of 1,000 gpm, 2,000 gpm and 4,000 gpm. O&M cost is limited to our estimate of liner maintenance and repair (Table 26). No mechanical equipment is included in this option.

Table 25

Alternative 2 Flow Options 1 – 3 Full Solar Evaporation Ponds
Opinion of Capital Cost
Bisbee Copper Queen Mine

Option	Pond Area Required* Acres	Cost Per Acre** $	Total Cost*** $
1,000 gpm	323	$166,000	$75,066,000
2,000 gpm	645	$166,000	$149,899,000
4,000 gpm	1,290	$166,000	$251,615,000

*Basis Table 8
**Assumed cost Table 21 at $3.80/ft^2
***Includes 15% for engineering & admin. and 25% contingency

Table 26

Alternative 2 Flow Options 1 – 3 Evaporation Ponds
Opinion of Annual Operation and Maintenance Cost
Bisbee Copper Queen Mine

Option	Pond Size Acres	Cost/Acres $	Annual Cost $
1,000 gpm	323	0.5% Capital Cost	$375,000
2,000 gpm	645	0.5% Capital Cost	$750,000
4,000 gpm	1,290	0.5% Capital Cost	$1,258,000

6.3 Groundwater Treatment Alternative Comparison

Table 27 summarizes and compares the capital and operational and maintenance cost opinion for the RO blended water and evaporative disposal at the three groundwater extraction rates alternatives.

The comparison evaluates the capital and operating opinion of potential cost between the treatment of groundwater by RO filtration, the injection of treated product water back to the aquifer and the enhanced evaporation of RO concentration (brine), versus the pond evaporation of extracted groundwater.

Table 27

Comparison of Full Treatment vs. Full Evaporation Treatment
Capital and Annual O&M Cost Opinion

	Groundwater Extraction Rate		
	1,000 gpm	**2,000 gpm**	**4,000 gpm**
Full Treatment			
Capital Cost			
Treatment	$8,459,000	$11,549,000	$19,071,000
Evaporation*	$9,790,000	$19,859,000	$39,444,000
O&M Cost			
Treatment	$1,467,000	$1,793,000	$2,397,000
Evaporation	$362,000	$516,000	$818,000
Total Evaporation			
Capital Cost*	$75,066,000	$149,899,000	$251,615,000
O&M Cost	$375,000	$750,000	$1,258,000

*includes 15% for engineering and admin. And 25% contingency

6.4 Future Mechanical Equipment Replacement Planning

Modern industrial quality mechanical equipment can be expected to have a reasonable effective operating life of from ten to twenty years. The capital cost opinions presented in Tables 15, 16 and 17 include a factor for spare and replacement parts (5% of direct capital). In the expected life of the project the mechanical equipment that will require major replacement are presented on Table 28. These are components that will need to be significantly repaired or completely replaced beyond the typical elements included in the annual operation and maintenance cost presented (i.e., cartridge filters, RO membrane modules, etc.). This estimate is based on a

maximum 30-year expected operational life cycle for all mechanical components. The life cycle estimate assumes a significant level of operational preventative maintenances.

6.5 Site Closure Cost

The major concern with closure, of the type of treatment facilities discussed, is the pond areas. The buildings and equipment, tanks and civil appurtenances can all be thoroughly cleaned to remove any potential contaminants and the facilities either salvaged or demolished and disposed of as construction waste. We would not envision any residual environmental hazard once properly decontamination processes are applied.

The pond areas represented the most difficult demolition challenge. The ponds, once water/brine is no longer discharged, will need to continue to operate the spray evaporation system until such point that spraying no longer results in significant enhanced evaporation due to the effects of very high total dissolved solids. Once total solid drying from solar heating and drying occurs and the dry salts are accumulated on the pond bottoms, the membrane liner can be used to encapsulate the salts in place.

The liner will typically be freed from its confining trench system that holds the liner in place and the liner folded over to seal the salts *in situ*. The membrane can be divided into smaller section and, once encapsulated, can be covered with soil and the surface reclaimed as appropriate. The site would typically be fenced and marked as potential hazard for long-term stabilization. Depending on the site final revegetation may be appropriate.

Other future uses of the site would be discouraged since those may disturb the reclaimed area and require additional site restoration or even removal of the liner and encapsulated materials to a licensed disposal site.

Table 28

Major Mechanical Equipment Replacement Life Cycle Estimate and Cycle Replacement Cost Opinion**

Components	Replacement Life Cycle Years	Replacement Cost per Cycle		
		1,000 gpm	2,000 gpm	4,000 gpm
Water storage Tankages	30	$115,000	$150,000	$200,000
Chemical Storage Tanks	30	50,000	50,000	50,000
Chemical Mixing and Feed*	15	35,000	35,000	50,000
Booster Transfer Pumps				
Motors	3 – 5	22,000	33,000	55,000
Pumps	5 – 7	48,000	72,000	120,000
Pressure Filters and Controls*	20 – 25	450,000	600,000	900,000
RO Units				
Piping & Valves	20	125,000	175,000	350,000
Cartridge Filter Units	30	50,000	70,000	140,000
High pressure Pumps	10	200,000	270,000	540,000
Chemical Feed	3 – 5	50,000	70,000	140,000
Controls	10 – 15	250,000	350,000	670,000
CIP Units	20	75,000	160,000	210,000
RO Body & Vessels	30	750,000	1,050,000	2,100,000
Spray Pump Brine (includes motors)	3 – 5	225,000	450,000	900,000
Spray System	10 – 15	915,000	1,864,000	3,700,000
System Controls, Instrumentation & Electrical	10 – 15	1,100,000	1,400,000	2,400,000
Valves and Control Valves*	5 – 10	255,000	275,000	295,000
Building Mechanical	10 – 20	648,000	1,110,000	1,388,000
Pond Liner	25	5,628,000	11,421,000	22,677,000

*Operation cycle dependent
**Based upon 2012

The cost components for *in situ* reclamation (Table 29) following final evaporation of pond solution drying would be estimated on a per acre basis is estimated as follows:

Table 29

Evaporation Pond Reclamation Cost Opinion

Activity	Cost
Liner Preparation and Manipulation	$40,000
Liner Sealing	$5,000
Liner *In situ* Boring and Earthwork (4 ft)	$36,000
Final Grading and Restoration	$4,500
Seeding	$4,500
Fencing/Security/Misc.	$9,500
TOTAL	**$100,000/acre**

Note: WTP demolition and site restoration cost

This assumed 2012 prices and relatively uncomplicated site access.

6.6 Summary

The summarized (of water treated) capital and O&M costs for water treatment management alternatives, are provided in Table 27.

REFERENCES

Hydro Geo Chen, Inc. 2007
Aquifer Characterization Report
Task 5 of Aquifer Characterization Plan
Mitigation Order on Consent Docket No. P-50-06, Pima County Arizona
Spray System Co., Technical Manual No. 401A
EnviroSolve's Technical Data Sheets
RCC Technical Data Brochure

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APPENDIX E

DESIGN BASIS AND COST ESTIMATES FOR LAND APPLICATION BY CASCADE EARTH SCIENCES

APPENDIX E

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APPENDIX E.1

DESIGN BASIS MEMO AND BUDGETARY COST ESTIMATE FOR A LAND APPLICATION SYSTEM, MITIGATION ALTERNATIVE 3

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MEMORANDUM

DATE: May 13, 2013

TO: Rebecca Sawyer – Freeport-McMoRan Corporation, Copper Queen Branch

FROM: Dan Burgard, Dan Bruner, and Jonathan Paetz – Cascade Earth Sciences

SUBJECT: Design Basis Memo and Budgetary Cost Estimate for a Land Application System, Mitigation Alternative 3

Freeport-McMoRan Corporation, Copper Queen Branch (CQB) is conducting a feasibility study of potential mitigation alternatives for groundwater enriched with sulfate beneath, and downgradient, of a former evaporation pond. Four mitigation alternatives are being evaluated:

- Alternative 1 (A1) is monitored, natural attenuation;
- A2 is to pump groundwater at 840 gallons per minute (gpm) using extraction wells to stabilize the plume location and then treat the groundwater;
- A3 is to pump groundwater at 900 gpm to produce agricultural crops on a land application system (LAS); and
- A4 is to pump the groundwater at 2,950 gpm, of which 1,600 gpm will be treated by reverse osmosis (which will generate a brine that will be discharged to a lined evaporation pond) and the remaining 1,350 gpm of untreated groundwater will be used to produce agricultural crops on a LAS.

A LAS will provide effective use of the water for crop production, while providing effective management of calcium and sulfate by precipitation of gypsum in soil and crop production. Gypsum is a common agricultural amendment in areas with sodic soils and is a harmless solid. Gypsum precipitation, in conjunction with meeting the leaching requirement for crops, will also control soil salinity. Soil accumulation of gypsum in the LAS will provide a unique, effective, permanent solution that will not generate a waste stream. The LAS concept is scalable if design criteria or constraints change. Land area and crop acreage within the LAS can be expanded or reduced.

Cascade Earth Sciences (CES) was retained by CQB to prepare the design basis, conceptual designs and cost evaluations for LASs in A3 and A4. This memo addresses the LAS for A3, and a companion memo will address the LAS for A4.

DESIGN BASIS

A conceptual design and budgetary cost estimate were prepared based upon the following criteria and assumptions:

Objectives and General Constraints

- The primary objective of the LAS is to provide cost-effective, beneficial use of water from the extraction wells for crop production and grazing.
- The crops selected for the LAS include alfalfa hay and native grass for seed. Other crops commonly grown in Cochise County, Arizona, include grass hay, barley, grain corn, grain sorghum, and durum wheat (USDA NASS, 2008). For cost estimating, production costs and revenues for wheat were used instead of native grass for seed, since wheat is a more common crop but has similar water usage and crop management requirements as native grass for seed.
- The LAS crop yields and market values will match those published for irrigated crops in Arizona over the past three years (2009-2011) (USDA NASS, 2013).
- The crop leaching requirement will be met in the LAS soil water balance to prevent soil salinity from limiting crop production.

Water Supply

- Groundwater will be supplied from the extraction wells at a continuous flow of 900 gpm to a single point of connection at the LAS. Monthly and annual design flows are listed in Table 1.
- Groundwater pH is nearly neutral (6.86), and predominant solutes are calcium and sulfate (Table 2). The design sulfate concentration specified by CQB is 1,000 milligrams per liter (mg/L).
- Water containing sulfate has a high potential to accelerate corrosion of steel and galvanized materials. Corrosion-resistant materials for irrigation, piping and pumping are preferred to avoid costly premature replacement/repair costs.
- The LAS will be operated with its own control package. Integration of controls with the extraction wells or other off-site communications was not considered.

Climate

- Temperature and precipitation at the Site are represented in Table 3 by normal values for 1971-2000 determined for the Douglas Federal Aviation Administration (FAA) meteorological station (WRCC, 2012). Normal precipitation values were corrected to represent amounts that may infiltrate into the soil and provide moisture for plant growth (USDA-NRCS, 1995).

- Reference evapotranspiration (ETr) data are averages for short grass from 1991-2010 at Hachita Valley, New Mexico.
- Monthly warm season grass potential evapotranspiration (PET) values were calculated as Penman-Monteith Reference ET (ETo) times the crop growth coefficient (Kc), assuming a base growth temperature of 50°F and maturity at 2000 growing degree days (GDDs). Crop growth coefficient values were calculated as ETo divided by the PET of buffalograss, estimated by the New Mexico Climate Service for 1991-2010 at Hachita Valley. Crop growth coefficient values in July and August were reduced to compensate for senescence and seed harvest.
- Monthly alfalfa hay PET values were calculated as ETr times Kc, assuming a base growth temperature of 41°F. Crop growth coefficient values were calculated as ETo divided by the PET of alfalfa hay, estimated by New Mexico Climate Service for 1991-2010 at Hachita Valley.

Site Location and Features

- The LAS will be located within the Warren Ranch. The Warren Ranch is owned by CQB and located within portions of Sections 3, 4, 5, 8 and 9 of Township 24 South, Range 24 East of the Gila and Salt River Meridian (Figure 1).
- Water managed by the LAS will be applied over the thick alluvium in the graben west of the Black Gap Fault (fault).
- There are approximately 680 acres of land west of the fault on the Warren Ranch for establishing a LAS.
- The LAS concept is contingent upon availability of suitable soil for crop production, as determined by a site soil investigation conducted by a qualified soil scientist. This conceptual design is based upon published descriptions and data for the Libby-Gulch Complex (USDA NRCS, 2007).
- Land proposed for development of the LAS will not require significant land leveling, or shaping, or installation of surface water drainage controls.
- The LAS can be constructed without any geotechnical constraints.
- Three-phase power for the operation of electrical equipment at the LAS (pumps, irrigation systems, etc.) is available or will be provided by others.

CONCEPTUAL PROPOSAL

The LAS concept is to beneficially use a constant flow of groundwater at 900 gpm for crop production, allowing calcium sulfate from the groundwater to evapo-concentrate and precipitate as gypsum in the soil, while meeting the agronomic leaching requirement to control salinity for crop production.

Soil salinity will be managed by allowing enough moisture to accumulate in the soil to leach salts below the crop rooting zone. By meeting the agronomic leaching requirement, soil salinity will be controlled at levels that will not inhibit crop or native vegetation growth.

Alfalfa hay was selected because it is the only perennial crop commonly produced in Cochise County. At the suggestion of CQB, native warm-season grass was also selected for production of seed. Alfalfa hay and warm season grass consume water throughout most of the year at a rate that is temperature dependent. When crops are dormant, some of the water will evaporate while the rest will replenish the moisture content of the soil and leach salts from the soil.

Soil Water Balance

The soil water balance in Tables 4a, 4b and 5 indicates that a 375-acre LAS can be operated to beneficially use the water to produce alfalfa hay and native grass seed. The proposed LAS will use six center pivot irrigation machines (pivots); four pivots will make full rotations to cover 75 acres each and two will make partial rotations to cover 33.6 and 41.4 acres each. Alfalfa hay will be grown on 150 acres (2 pivots) and native grass seed will be produced on 225 acres (4 pivots).

The alfalfa hay will potentially require 76.4 inches of water per year (Table 4a), which is nearly 2.5 times as much water as native grass seed (31.3 inches, Table 4b). On a volumetric basis, 322 million gallons (MG) of water will be applied to the alfalfa and 117 MG will be applied to the native grass (Table 5).

Maximizing dry matter production from alfalfa hay will require frequent applications of water throughout the growing season months of March through October with only brief interruptions during hay harvests (Table 4a). Alfalfa hay will be harvested several times per year as the alfalfa plants begin to mature; whereas, the native grass seed will be harvested once in late June or early July. Irrigation of native grass will be terminated during the month of June during maturation and production of seed (Table 4b).

During the non-growing season months of November through February, water will be applied to all of the fields to replenish soil moisture and leach salts to mitigate soil salinity buildup in the crop rooting zone (CRZ; depth of 5 feet). The leaching requirement in the LAS water balances was calculated using a crop salinity tolerance of 4.0 millimhos per centimeter (mmho/cm), which is the average salinity throughout the CRZ. Soil salinity under irrigation in arid climates increases with depth because soil wetting fronts created by irrigation leach salts deeper into the soil profile until they dissipate with depth. This is the same phenomenon that naturally creates caliche horizons in arid climates. So, soil salinity at the LAS will be managed by providing adequate irrigation applications to create wetting fronts that will leach salts to the base of the soil CRZ.

The LAS is designed to meet the leaching fractions by providing leaching fractions of 12.2 inches for alfalfa hay (Table 4a) and 2.8 inches for native grass seed (Table 4b). On an annual basis, the leaching fractions will equate to soil drainage water flow rates of 96 gpm from the alfalfa fields (150 acres, Table 6a) and 33 gpm from the native grass fields (225 acres, Table 6b).

Soil Salinity and Sulfate Management

An important consideration for soil salinity control and groundwater quality is the fate of sulfate applied to the LAS. The annual sulfate application to the LAS will be 3,375,000 pounds per year (lbs/yr) (Table 7). The alfalfa crop is expected to remove 105 pounds of sulfate per acre per year from 150 acres (Table 6a), while the native grass seed harvest will remove negligible sulfate (Table 6b) for an annual crop sulfate removal of 16,000 lbs/yr (Table 7). The remaining 3,359,000 pounds of sulfate applied to the LAS can precipitate with calcium as gypsum in the crop rooting zone (CRZ; generally 5 feet thick) or leach from the CRZ. Research on LASs that have operated for over 30 years at coal mines in South Africa indicates 50% of the sulfate precipitates as gypsum in the soil (Gobler, 2002; Jovanovich et al, 2005; Annandale et al, 2006; and Vermeulen et al, 2008).

The fate of sulfate in the soil of the LAS is largely dependent upon gypsum solubility. The gypsum solubility limit is approximately 2,400 mg/L in pure water at standard conditions (CRC Press, 1984). A pure water solution at the gypsum solubility limit would have an electrical conductance (EC) of 3.75 mmho/cm, which was estimated by dividing the solubility limit by 640 (US Salinity Lab Staff, 1954). The solubility of gypsum increases with ionic strength of the solution. Based upon the chemistry of the water that will be applied to the LAS, and a published relationship of gypsum solubility to ionic strength (Dow Chemical Company, 2009), the maximum concentration of dissolved gypsum in soil drainage water at the proposed LAS could reach 6,887 mg/L (EC of 10.8 mmho/cm) under the alfalfa fields and 6,973 mg/L (EC of 10.9 mmho/cm) under the native grass see fields. The sulfate concentrations could reach 4,347 mg/L under the alfalfa fields and 4,293 mg/L under the native grass seed fields.

At the crop salinity tolerance of 4.0 mmho/cm (average salinity throughout the CRZ), the salinity of soil water drainage from the CRZ could approach 18.72 mmho/cm (Rhoades, 1982). However, the soil water drainage salinity will be limited by the solubility of gypsum to approximately 10.8 to 10.9 mmho/cm. Consequently, the soil water drainage sulfate concentrations will be limited by gypsum solubility to 4,293 to 4,347 mg/L.

Conservatively assuming that all of the soil water drainage will become saturated with calcium sulfate (gypsum), it is estimated that 2,415,000 pounds of sulfate (66% of the applied sulfate) can leach from the CRZ of the LAS and 1,226,000 lbs/yr (34% of applied) of sulfate will be precipitated as gypsum in the soil. This is a conservative estimate compared to research on coal mine LASs in South Africa with wetter climates and higher water application rates, where only 50% of the sulfate has leached from the soil CRZ. The preceding estimates of sulfate precipitation are conservatively low because they assume consistently saturated conditions. The base of the soil CRZ at the land application system will not become saturated under normal operating conditions. Wetting and drying cycles from sprinkler irrigation applications will promote more gypsum precipitation than simple solution chemistry would predict.

By removing at least one-third of the applied sulfate by gypsum precipitation at the base of the soil CRZ, operation of the LAS will remove sulfate from groundwater. Precipitation of gypsum will

avoid having to develop a secondary waste management alternative that would be required for most conventional water treatment approaches. More detailed water balance modeling and geochemical modeling beyond the scope of this phase of the study would provide additional confidence and improved estimates of percolation and gypsum precipitation.

CONCEPTUAL DESIGN

A conceptual design of the LAS was prepared to estimate capital costs for construction. This conceptual design is merely a rough plan and is only intended for planning purposes for the feasibility study.

System Layout

The tentative LAS layout consists of a small (2.5 MG) storage pond with a pump station that will serve six center pivots (Figure 1). The entire system could be constructed west of the fault.

Storage Pond

A 2.5 MG storage pond will provide approximately 46 hours of operational storage at the design flow rate of 900 gpm. The storage pond will provide storage during monsoon rains to mitigate runoff. The storage pond will also provide operational storage during maintenance of pump or pivot systems and temporary capacity if recovery well flow rates drop below 900 gpm or go offline. For budgetary purposes, the storage pond is estimated to cover approximately 0.6 acres at a depth of ten feet and consist of a 0.060-inch thick, high density polyethylene (HDPE) liner. A single liner configuration was selected based upon Aquifer Protection Permit Rules of Arizona Administrative Code (AAC) Title 18, Chapter 9, Article 3, Parts D and E, which were accessed on September 28, 2009.

Pump Station

Pump Sump

A sump will be utilized to deliver water to the pumps and provide connection to the storage pond from which stored water can be drawn.

Building

The irrigation pump station will be a metal sided structure with a concrete footing and concrete slab floor. The structure will house the pump controls, electrical panels, and pivot remote monitoring computer and will be air conditioned with insulated walls and ceiling. The building will include one man door. Pumps will be located outside of the building.

Pump System

- Two irrigation pumps will be sized to provide approximately 35 pounds per square inch (psi) at each center pivot hub at a flow rate of 675 gpm. Both pumps will be able to operate

simultaneously to deliver 1,350 gpm to two center pivots an average of 67% of the time to match the water supply flow rate of 900 gpm.

- For conservative planning, each pump will have a 50 horsepower electric motor capable of providing 675 gpm at a total dynamic head of 190 feet. Pumps will be mounted in a sump pit connected to the storage pond.
- Stainless steel pipe will be utilized in the pump station piping due to the concentration of sulfate in the recovered groundwater. Stainless steel in-line filters will be located after each pump to prevent damage to the irrigation equipment. Alternate pipeline materials such as carbon steel or HDPE could also be considered after the completion of a life cycle/cost analysis of optional pipeline materials.

Pump Controls

A Programmable Logic Controller will be installed in the pump house with a display screen to operate the following system components:

- Pumps and variable frequency drive pump controls
- Inline filter flush control

Water Transmission Pipeline

- The groundwater transmission pipeline from the recovery wells will be provided by others and terminated at the irrigation pump sump/storage pond.
- The pipeline(s) within the LAS will transmit 675 gpm to the distal pivot(s) at a maximum pressure of 35 psi.
- The pipeline(s) will be composed of polyvinyl chloride with a pressure rating of 100 psi. Alternate pipeline material such as HDPE could also be considered during the design and bidding phase of the project to determine the material that will provide the most cost effective pipeline material and installation cost based on current market price and contractor cost.
- The pipeline(s) will be required to be buried at a depth of 48 inches below grade, since each pipeline will travel under center pivot irrigated fields (Figure 1).
- Budgetary pipeline costs include: pipeline material, fittings, excavation, installation and freight.
- Gate valves and check valves have been included to provide necessary control of water flow throughout the pipeline system.

Center Pivot Irrigation Machines

Pivot Requirements

- The sulfate concentration of the groundwater to be irrigated has a strong corrosion potential. To mitigate corrosion, center pivots will be manufactured with integrated HDPE liners. Capital expenses assume purchase of six Valley® Model 8000P Poly Span Center Pivots.
- A Sprinkler Package consisting of Nelson Rotators and pressure regulators. Sprinklers will be positioned on drops, 48 inches from the ground surface.
- Tire size will be 14.9 x 24 inch.
- Both regular (34 revolution per minute) and high speed drive motors (68 revolutions per minute) will be required.

Pivot Panel and Electrical Conduit

- Center pivot panels that can be controlled remotely are desired to reduce labor and provide capability to automatically maintain records of pivot operations for environmental management and reporting. The budget includes a Valley® Pro2 Panel mounted at each pivot point.
- A flow meter mounted at the pivot point will be connected to the Pro2 Panel to allow for the manual or remote monitoring of totalized pivot flow rate.
- Pivot electrical power conduit will consist of four conductor electrical wires (with two individual control wires installed between the pump station pump panel and each pivot panel). Electrical cable will be installed in a separate trench along the pipeline trench.

Pivot Controls and Remote Communications

Center pivots will be monitored and manually operated by the Valley® BaseStation2 remote monitoring and control program. Monitoring and manual control of each irrigation system pump will be provided through an Auxiliary Link Panel located at the pump station, in addition to the automated control provided by the Programmable Logic Controller. Communication between the pivot panel and pump station will be by Federal Communications Commission licensed data radio.

BUDGETARY COST ESTIMATES

The budgetary cost estimates for capital, indirect, operation, maintenance, and farming are rough planning-level estimates based upon limited information but should be adequate for comparing the land application concept to other alternatives for managing groundwater pumped from the extraction wells. Costs are intended to be as realistic as possible but given the natural tendency to err on the conservative side, flexibility of the land application concept, and opportunity for refinement during design these costs are likely to prove conservative.

Construction and Startup Cost Estimate

Table 8a presents the Engineers Opinion of Probable Costs for construction and startup of the 375-acre LAS. The estimated total direct cost is $2,184,900, which includes labor, equipment, and materials. The estimated total indirect cost is $436,900, which includes legal and administrative, permitting, engineering design, and construction management.

Annual System Operation and Maintenance Costs

The CQB does not have agricultural equipment, so operation and maintenance (O&M) costs were developed assuming all farming activities would be contracted or equipment would be leased as an operational expense. Crop revenue and production costs for native grass were based upon published information for wheat because wheat is a more common crop that has similar water and management requirements.

The total estimated net annual O&M cost for the LAS is $89,900 (Table 8b), which includes the following:

- $41,300 for electrical power (pumps and center pivot irrigation machines)
- $19,000 for equipment maintenance
- $27,900 for equipment replacement
- $367,800 for farming expenses (labor, crop establishment and monitoring), see Attachments 1 and 2 for details
- -$366,100 for farming income (crop revenue), see Attachment 3 for details

The estimated annual farming cost and annual income from crop production are listed in Table 8b, with detailed outlines of the cost basis provided in Attachments 1, 2 and 3. The farming costs and revenues were estimated by CES based on published information and other land application systems of similar size.

Attachment 1 presents a farming income and revenue summary for the utilization of a Contract Farmer to farm the LAS throughout the year. The Contract Farmer would be paid to farm per the instructions and objectives from CQB and would be responsible for the operation of the pivots and the performance of daily maintenance of the system such as daily or monthly maintenance of pump and pivot systems, un-plugging of sprinkler nozzles, and observation of the pump and pivot systems for preventative maintenance.

Potential farming operations and monitoring expenses are summarized in Attachment 2. The operations expenses include all of the labor, vehicle and disposable expenses associated with the LAS, which would be performed by the Contract Farmer (Irrigation Operator and Site Manager). The final form of the contractual arrangement between the Contract Farmer and CQB, and the number of individual(s) contracted to perform the site operations, will determine the final cost of performing the system operations. CES also provided an estimate for the collection and testing of

soil and crop tissue samples to provide for data on the condition of the soil and uptake of nutrients and sulfate by the crop system.

Labor expenses for all aspects of the LAS are listed in the Farm Operation and Monitoring Costs included in Attachment 2. The Contract Farmer will be responsible for land preparation at system startup and establishment/re-establishment of crops every five years. The Contract Farmer would also be responsible for obtaining the inputs (seed, fertilizer, etc.) to establish the crop and perform all harvesting activities and would bill CQB for those costs. Crop revenue would be shared between the Contract Farmer on a percentage basis. Contracting a farmer ensures the farmer gets paid for operating within the guidelines, and the revenue sharing provides incentive to do a good job of farming. This arrangement is an example that can be modified depending on the level of risk each party is willing to accept. For the estimate of cost in Attachment 1, 20% of the estimated crop revenue would be shared with the Contract Farmer. A greater or smaller percentage of the crop revenue could be earned by the Contract Farmer based on production above a certain yield or tonnage target or based on meeting specific operating requirements.

Crop revenue projections for alfalfa hay and wheat are exhibited in Attachment 3. Crop yield and price inputs were the most recent 3-year averages for Arizona (2009-2011). Actual yields and crop value will vary from year to year, but this evaluation provides a basis from which crop revenue can be estimated.

Accuracy and Financial Criteria Assumptions for Budgetary Cost Estimates

All budgetary cost estimates in Tables 8a and 8b are based on the following assumptions and criteria:

- A 30% contingency on the capital costs is assumed for this estimate as the costs are not from direct quotations but are based on engineering estimates from previous projects of a similar size and scope. Also, the ultimate timing of the construction of the project will affect the cost of labor, materials, and equipment.
- The budgetary cost estimates are likely to be +30 to - 50% accurate.
- Bonding and state and federal taxes are not included in the budgetary cost estimate.
- CQB will enter into an agreement with a Contract Farmer to conduct all farming activities to operate the center pivot system on a year round basis.

Thank you for the opportunity to provide this feasibility assessment. We look forward to the opportunity to refine these designs, costs and feasibility determinations as the alternative selection

process continues. If you have questions or comments please contact Dan Bruner at (208) 233-6565 or Dan Burgard at (509) 921-0290.

6DJB:5DJB/8djp:mab:lvw
Att: Tables 1-8
Figure 1
Attachments 1-3
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Tables

Table 1. **Monthly Extraction Well Volumes**
Freeport-McMoRan Corporation
Copper Queen Branch, Bisbee, Arizona

Month	Days per Month	Design [1]	
		MGD	MG
Nov	30	1.30	39
Dec	31	1.30	40
Jan	31	1.30	40
Feb	28	1.30	36
Mar	31	1.30	40
Apr	30	1.30	39
May	31	1.30	40
Jun	30	1.30	39
Jul	31	1.30	40
Aug	31	1.30	40
Sep	30	1.30	39
Oct	31	1.30	40
Total Annual (MG)			**473**
Average Daily (MGD)		**1.30**	

NOTES:
Abbreviations: MG = million gallons; MGD = million gallons per day
[1] Design flow is 900 gallons per minute, as indicated by client on April 15, 2013.

Table 2. Land Application Water Quality
Freeport-McMoRan Corporation,
Copper Queen Branch, Bisbee, Arizona

Parameter	Concentration		
	mg/L	meq/L	mmol/L
Potassium	5.8	0.15	0.00015
Sodium	43.3	1.88	0.00188
Calcium	386	19.26	0.03852
Magnesium	58.8	4.84	0.00968
Sulfate	1,040	21.67	0.04333
Chloride	46.5	1.31	0.00131
Bicarbonate as $CaCO_3$	235	2.35	0.00235
Carbonate as $CaCO_3$	<2		
Ionic Strength			0.186
TDS (calculated)	1,740		

NOTES:

Abbreviations: meq/L = millequivalents per liter, mg/L = milligrams per liter, mmol/L = millimoles per liter, CaCO3 = calcium carbonate, TDS = total dissolved solids.
Concentrations are dissolved fractions at a pH of 6.86, based upon sample collected on July 15, 2008, from the "Cooper C" well (per Table 19, Aquifer Characterization Report, Clear Creek Associates, December 2010).

Table 3. Climate Data for Project Site
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Month	Precipitation[1]		Daily Average Temperature[2]			Reference ET[3]	Warm Season Grass PET[4]				Alfalfa Hay PET[5]			
	Normal	Effective	Air - Max	Air - Min	Soil		Monthly GDD	Cumul GDD	Kc	PET	Monthly GDD	Cumul GDD	Kc	PET
	inches		degrees Fahrenheit				days		unitless	inches	days		unitless	inches
Nov	0.74	0.54	69.8	47.1	52.5	3.58			0.37	1.32			1.44	5.15
Dec	1.06	0.73	62.4	35.2	46.9	2.67			0.32	0.86			1.44	3.85
Jan	0.75	0.52	62.2	29.4	45.3	2.77			0.34	0.95			0.65	1.79
Feb	0.64	0.45	66.3	32.1	47.9	3.34			0.36	1.19			0.70	2.33
Mar	0.46	0.34	71.4	36.4	54.1	5.08	332	332	0.39	1.96	400	400	0.78	3.97
Apr	0.20	0.11	78.7	41.9	62.0	7.03	431	762	0.42	2.95	579	979	0.86	6.06
May	0.33	0.27	86.3	50.2	69.5	8.51	566	1328	0.50	4.28	845	1824	1.02	8.67
Jun	0.63	0.60	95.1	59.2	75.3	8.81	701	2029	0.59	5.20	1121	2944	1.16	10.25
Jul	3.14	2.53	93.5	64.4	77.1	7.07	756	2785	0.45	3.18	1139	4083	1.40	9.90
Aug	2.88	2.18	91.3	63.3	75.6	5.73	846	3631	0.65	3.73	1125	5208	1.61	9.20
Sep	1.63	1.26	88.4	58.5	68.7	5.17	704	4334	0.65	3.36	974	6182	1.59	8.21
Oct	1.30	1.00	80.1	47.1	60.2	4.75	467	4801	0.48	2.28	701	6882	1.48	7.02
Annual														
Average			**78.8**	**47.1**	**61.3**									
Total	**13.76**	**10.53**				**64.5**				**31.3**				**76.4**

NOTES:

Abbreviations: ET = evapotranspiration, PET = potential ET, max = maximum, min = minimum, GDD = growing degree days, Kc = crop growth coefficient

[1] Normal precipitation values are from 1971-2000 at Douglass FAA, AZ (NOAA NCDC, accessed at http://www.wrcc.dri.edu). Effective precipitation computed per USDA SCS Technical Release No 21, 1967.

[2] Maximum and minimum air temperatures are normal values from 1971-2000 at Douglas FAA, AZ (NOAA NCDC, accessed at http://www.wrcc.dri.edu). Soil temperatures are averages from 2000-2011 at Hachita Valley, NM (NMCS, 2012).

[3] Reference evapotranspiration values are averages by Penman-Monteith method for short grass during 1991-2010 at Hachita Valley, NM.

[4] Warm season grass PET values were calculated as Reference ET x Kc. GDD were calculated from Douglas FAA, AZ air temperature data using base temperatures of 50 degrees F. Irrigated warm season native grass may reach maturity at 2000 GDD (Wight and Hanson, 1990). Kc values were calculated as Penman-Monteith Reference ET (ETo) / PET of buffalograss estimated by New Mexico Climate Services for 1991-2010 at Hachita Valley, NM, then reduced based on professional judgment during drying period in July and August for senescence and seed harvest.

[5] Alfalfa PET values were calculated as Reference ET x Kc. GDD were calculated from Douglas FAA, AZ air temperature data using base temperatures of 41 degrees F. Alfalfa Kc values were calculated as Penman-Monteith Reference ET (ETo) / PET of buffalograss estimated by New Mexico Climate Services for 1991-2010 at Hachita Valley, NM.

Table 4a. Water Balance for Alfalfa Hay Irrigated to Meet Leaching Requirement
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Total Acres: 150
Crop: Alfalfa

Soil Type: Libby-Gulch Complex
Soil Water Holding Capacity: [1] 6.92
Initial Soil Water Content: [2] 5.84

Month	Precipitation [3]	Extraction Well Water Supply [4]		Gross Irrigation [5]	Net Irrigation [6]	Net Total Input [7]	Evapotranspiration [8]		Soil Water [9]	Percolate Loss [10] (surplus)
							Potential	Estimate		
	inches	fraction	MG	inches	inches	inches	inches		inches	inches
Nov	0.54	0.65	25.3	6.20	5.58	6.12	5.15	4.73	6.92	0.31
Dec	0.73	0.60	24.1	5.92	5.33	6.06	3.85	3.85	6.92	2.21
Jan	0.52	0.62	24.9	6.12	5.50	6.02	1.79	1.79	6.92	4.23
Feb	0.45	0.65	23.6	5.79	5.21	5.66	2.33	2.33	6.92	3.34
Mar	0.34	0.65	26.1	6.41	5.77	6.11	3.97	3.97	6.92	2.15
Apr	0.11	0.65	25.3	6.20	5.58	5.69	6.06	6.06	6.56	0.00
May	0.27	0.65	26.1	6.41	5.77	6.04	8.67	8.44	4.16	0.00
Jun	0.60	1.00	38.9	9.55	8.59	9.19	10.25	7.95	5.40	0.00
Jul	2.53	0.70	28.1	6.90	6.21	8.75	9.90	8.75	5.41	0.00
Aug	2.18	0.70	28.1	6.90	6.21	8.39	9.20	8.13	5.66	0.00
Sep	1.26	0.65	25.3	6.20	5.58	6.85	8.21	7.42	5.09	0.00
Oct	1.00	0.65	26.1	6.41	5.77	6.77	7.02	6.02	5.84	0.00
Annual (in)	**10.5**			**79.0**	**71.1**	**81.7**	**76.4**	**69.4**		**12.2**
Annual (MG)	**42.9**		**322**							

Leaching Fraction [11]	**0.14**	**12.2**	**inches**
Leaching Requirement	**0.14**	**12.2**	**inches**

NOTES:

[1] Water Holding Capacity derived from Soil Survey of Cochise County, Arizona, Northwestern Part (USDA NRCS, 2007).

[2] Initial Soil Water Content based on end of year soil water to provide more realistic irrigation management.

[3] Precipitation is effective precipitation computed from normal precipitation for 1971-2000 at Douglas FAA, AZ (NOAA NCDC, accessed @ http://www.wrcc.dri.edu).

[4] Extraction well water supply assumes 900 gallons per minute continuous flow, per client. Fraction is portion of total supply diverted for irrigation of these fields.

[5] Gross Irrigation = Volume (MG) x 2.715 MG/acre-inch / Total Acres

[6] Net Irrigation = effective irrigation reaching the soil profile for crop use = Gross Irrigation * Irrigation Efficiency of 90% (assumes low pressure spray application close to ground surface).

[7] Net Total Input = Net Irrigation + Precipitation

[8] Potential evapotranspiration (ET) values were copied from Table 3 for native grass during April though September and bare soil the rest of the year. Estimated ET = Potential ET x (previous month's Soil Water Content / Soil Water Holding Capacity)1/2

[9] Soil Water = water held in soil for crop use at month end. Dependent on estimated ET, Net Total Input, and previous month Soil Water (does not exceed Soil Water Holding Capacity). Maximum soil water content is soil water holding capacity. Irrigation schedule to maintain at least 50% of soil water holding capacity to sustain alfalfa crop.

[10] Percolate loss: Soil water in excess of the Soil Water Holding Capacity assumed to drain out of the root zone; computed as: Soil water holding capacity - (previous month's Soil Water + Net Total Input - ET estimate). Negative values indicate a deficit and zero percolate loss.

[11] Leaching Fraction = % of gross water input estimated to percolate beyond root zone = Surplus / (Precip + gross irrigation). Leaching Requirement based on flow-weighted EC (precip and irrigation water) using formula by Rhoades, 1982 and 4 mmho/cm target soil EC.

Table 4b. Water Balance for Native Grass Seed Crop Irrigated to Meet Leaching Requirement
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Total Acres: 225
Crop: Native Grass

Soil Type: Libby-Gulch Complex
Soil Water Holding Capacity: [1] 6.92
Initial Soil Water Content: [2] 5.29

Month	Precipitation [3]	Extraction Well Water Supply [4]		Gross Irrigation [5]	Net Irrigation [6]	Net Total Input [7]	Evapotranspiration [8]		Soil Water [9]	Percolate Loss [10] (surplus)
							Potential	Estimate		
	inches	Fraction	MG	inches	inches	inches	inches		inches	inches
Nov	0.54	0.25	9.7	1.59	1.43	1.97	1.32	1.15	6.10	0.00
Dec	0.73	0.30	12.1	1.97	1.78	2.51	0.86	0.81	6.92	0.88
Jan	0.52	0.30	12.1	1.97	1.78	2.29	0.95	0.95	6.92	1.35
Feb	0.45	0.25	9.1	1.48	1.34	1.79	1.19	1.19	6.92	0.60
Mar	0.34	0.25	10.0	1.64	1.48	1.82	1.96	1.96	6.78	0.00
Apr	0.11	0.25	9.7	1.59	1.43	1.54	2.95	2.92	5.40	0.00
May	0.27	0.30	12.1	1.97	1.78	2.05	4.28	3.78	3.67	0.00
Jun	0.60	0.00	0.0	0.00	0.00	0.60	5.20	3.78	0.49	0.00
Jul	2.53	0.30	12.1	1.97	1.78	4.31	3.18	0.85	3.95	0.00
Aug	2.18	0.25	10.0	1.64	1.48	3.66	3.73	2.82	4.79	0.00
Sep	1.26	0.25	9.7	1.59	1.43	2.69	3.36	2.80	4.69	0.00
Oct	1.00	0.25	10.0	1.64	1.48	2.48	2.28	1.88	5.29	0.00
Annual (in)	**10.5**			**19.1**	**17.2**	**27.7**	**31.3**	**24.9**		**2.8**
Annual (MG)	**64.4**		**117**							

Leaching Fraction [11]	**0.10**	**2.8**	**inches**
Leaching Requirement	**0.10**	**2.8**	**inches**

NOTES:

[1] Water Holding Capacity derived from Soil Survey of Cochise County, Arizona, Northwestern Part (USDA NRCS, 2007).

[2] Initial Soil Water Content based on end of year soil water to provide more realistic irrigation management.

[3] Precipitation is effective precipitation computed from normal precipitation for 1971-2000 at Douglas FAA, AZ (NOAA NCDC, accessed @ http://www.wrcc.dri.edu).

[4] Extraction well water supply assumes 900 gallons per minute continuous flow, per client. Fraction is portion of total supply diverted for irrigation of these fields. No water is irrigated on native grass during June and most of July, from flowering until harvest.

[5] Gross Irrigation = Volume (MG) x 2.715 MG/acre-inch / Total Acres

[6] Net Irrigation = effective irrigation reaching the soil profile for crop use = Gross Irrigation * Irrigation Efficiency of 90% (assumes low pressure spray application close to ground surface).

[7] Net Total Input = Net Irrigation + Precipitation

[8] Potential evapotranspiration (ET) values were copied from Table 3 for warm season grass. Estimated ET = Potential ET x (previous month's Soil Water Content / Soil Water Holding Capacity)1/2

[9] Soil Water = water held in soil for crop use at month end. Dependent on estimated ET, Net Total Input, and previous month Soil Water (does not exceed Soil Water Holding Capacity). Maximum soil water content is soil water holding capacity. Irrigation schedule to maintain at least 50% of soil water holding capacity to sustain native grass seed crop.

[10] Percolate loss: Soil water in excess of the Soil Water Holding Capacity assumed to drain out of the root zone; computed as: Soil water holding capacity - (previous month's Soil Water + Net Total Input - ET estimate). Negative values indicate a deficit and zero percolate loss.

[11] Leaching Fraction = % of gross water input estimated to percolate beyond root zone = Surplus / (Precip + gross irrigation). Leaching Requirement based on flow-weighted EC (precip and irrigation water) using formula by Rhoades, 1982 and 4 mmho/cm target soil EC.

Table 5. Land Application Hydraulic and Sulfate Loading Summary
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Site Acres	**375**
Alfalfa Acres	**150**
Grass Acres	**225**

Month	Days	Volume Applied[1]			Sulfate Load[2]		
		Alfalfa	Grass	Site	Alfalfa	Grass	Site
		million gallons			pounds per acre		
Nov	30	25	10	35	1405	360	778
Dec	31	24	12	36	1340	447	804
Jan	31	25	12	37	1385	447	822
Feb	28	24	9	33	1311	336	726
Mar	31	26	10	36	1452	372	804
Apr	30	25	10	35	1405	360	778
May	31	26	12	38	1452	447	849
Jun	30	39	0	39	2162	0	865
Jul	31	28	12	40	1564	447	894
Aug	31	28	10	38	1564	372	849
Sep	30	25	10	35	1405	360	778
Oct	31	26	10	36	1452	372	804
Annual							
Average		**27**	**10**	**37**	**1491**	**360**	**813**
Total	**365**	**322**	**117**	**438**	**17,897**	**4,321**	**9,751**

NOTES:

[1]Volumes were copied from Table 4a for Alfalfa Hay and Table 4b for Native Grass Seed.

[2]Sulfate Loads were calculated as Volume (million gallons) x Concentration (1000 mg SO4/L) / Area (acres).

Table 6a. Land Application Soil Percolate and Sulfate Leaching Summary for Alfalfa Hay Crop
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Area: 150 Acres

Month	Soil Percolate[1]		Soil Sulfate Mass Balance - Alfalfa				
			Load	Crop Removal[2]	Precipitation as Gypsum[3]	Leaching[4]	
	inches	gpm	lbs/ac		lbs/ac	lbs/ac	mg/L
Nov	0.31	29	1405	0	148	301	4293
Dec	2.21	201	1340	0	1059	2149	4293
Jan	4.23	386	1385	0	2033	4125	4293
Feb	3.34	337	1311	0	1602	3251	4293
Mar	2.15	196	1452	0	1031	2092	4293
Apr	0.00	0	1405	0	0	0	0
May	0.00	0	1452	30	0	0	0
Jun	0.00	0	2162	0	0	0	0
Jul	0.00	0	1564	45	0	0	0
Aug	0.00	0	1564	0	0	0	0
Sep	0.00	0	1405	30	0	0	0
Oct	0.00	0	1452	0	0	0	0
Annual							
Average		**96**					
Annual	**12.23**		**17,897**	**105**	**5,874**	**11,918**	
Sulfate Fraction			**1.000**	**0.006**	**0.328**	**0.666**	

NOTES:
Abbreviations: gpm = gallons per minute, lbs/ac = pounds per acre, mg/L = milligrams per liter.

[1] Soil percolate was copied from water balance estimates in Table 4a.

[2] Sulfate Crop Removal was calculated for alfalfa hay crop assuming an annual dry matter of yield of 7.0 tons per acre (2 tons/ac in May, 3 tons/ac in July, 2 tons/ac in September) which would remove 15 pounds of sulfate per ton.

[3] Sulfate Precipitation as Gypsum = (Annual Application - Annual Crop Removal - Leaching)*Monthly Soil Percolate/Annual Soil Percolate.

[4] Sulfate Leaching is based upon solubility of gypsum in soil water at an estimated ionic strength of 1.20 mol/L. Soil water ionic strength of 1.20 mol/L was calculated by multiplying ionic strength of irrigation water (0.186 mol/L) by a concentration factor of 6.47, which was determined by dividing the predicted soil drainage salinity of 17.6 mmho/cm from Table 4a (base of crop rooting zone) by the electrical conductivity of irrigation water (2.72 mmho/cm).

Table 6b. Land Application Soil Percolate and Sulfate Leaching Summary for Native Grass Seed Crop Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Area: 225 Acres

Month	Soil Percolate[1]		Soil Sulfate Mass Balance - Native Grass Seed				
			Load	Crop Removal[2]	Precipitation as Gypsum[3]	Leaching[4]	
	inches	gpm	lbs/ac		lbs/ac	lbs/ac	mg/L
Nov	0.00	0	360	0	0	0	0
Dec	0.88	121	447	0	480	871	4347
Jan	1.35	184	447	0	731	1328	4347
Feb	0.60	90	336	0	324	588	4347
Mar	0.00	0	372	0	0	0	0
Apr	0.00	0	360	0	0	0	0
May	0.00	0	447	0	0	0	0
Jun	0.00	0	0	0	0	0	0
Jul	0.00	0	447	0	0	0	0
Aug	0.00	0	372	0	0	0	0
Sep	0.00	0	360	0	0	0	0
Oct	0.00	0	372	0	0	0	0
Annual							
Average		**33**					
Annual	**2.82**		**4,321**	**0**	**1,535**	**2,787**	
Sulfate Fraction			**1.000**	**0.000**	**0.355**	**0.645**	

NOTES:

Abbreviations: gpm = gallons per minute; lbs/ac = pounds per acre; mg/L = milligrams per liter.

[1] Soil percolate was copied from water balance estimates in Table 4b.

[2] Sulfate removal by grass seed harvest assumed to be negligible.

[3] Sulfate Precipitation as Gypsum = (Annual Application - Annual Crop Removal - Leaching)*Monthly Soil Percolate/Annual Soil Percolate.

[4] Sulfate Leaching is based upon solubility of gypsum in soil water at an estimated ionic strength of 1.25 mol/L. Soil water ionic strength of 1.25 mol/L was calculated by multiplying ionic strength of irrigation water (0.186 mol/L) by a concentration factor of 6.72, which was determined by dividing the predicted soil drainage salinity of 18.2 mmho/cm from Table 4b (base of crop rooting zone) by the electrical conductivity of irrigation water (2.72 mmho/cm).

Table 7. **Soil Water Balance and Sulfate Mass Balance for Land Application System**
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Month	Soil Water Balance[1]					Soil Sulfate Mass Balance[2]				
	Precipitation	Application	Evapo-transpiration	Percolate	Change in Storage	Application	Crop Removal	Precipitation as Gypsum	Leaching	Change in Storage
	million gallons					pounds in 1000s				
Nov	5.4	31.5	26.3	1.3	9.4	292	0	22	45	225
Dec	7.4	32.5	20.6	14.4	5.0	302	0	267	518	-484
Jan	5.3	33.3	13.1	25.5	0.0	308	0	469	918	-1079
Feb	4.6	29.4	16.8	17.2	0.0	272	0	313	620	-661
Mar	3.5	32.5	28.1	8.7	-0.8	302	0	155	314	-167
Apr	1.1	31.5	42.5	0.0	-9.9	292	0	0	0	292
May	2.8	34.3	57.5	0.0	-20.4	318	4.5	0	0	314
Jun	6.2	35.0	55.5	0.0	-14.3	324	0	0	0	324
Jul	25.8	36.2	40.8	0.0	21.2	335	7	0	0	328
Aug	22.2	34.3	50.3	0.0	6.2	318	0	0	0	318
Sep	12.9	31.5	47.3	0.0	-3.0	292	4.5	0	0	287
Oct	10.2	32.5	36.0	0.0	6.7	302	0	0	0	302
Annual										
Average	**8.9**	**32.9**	**36.2**	**5.6**						
Annual	**107.3**	**394.6**	**434.8**	**67.1**	**0.0**	**3,657**	**16**	**1,226**	**2,415**	
Sulfate Fraction						**1.000**	**0.004**	**0.335**	**0.660**	

NOTES:

[1] Volumes were computed from depth values (expressed in inches) in Table 4a (150 acres of alfalfa) and Table 4b (225 acres of native grass seed). Volume, million gallons = Depth, inches * Area, acres * 0.027154 million gallons / acre-inch.

[2] Sulfate mass balance values are area-weighted averages of values in Table 4a (150 acres of alfalfa) and Table 4b (225 acres of native grass seed).

Table 8a. 375-Acre Land Application System
Engineers Opinion of Probable Cost for Construction and Startup
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Description	Quantity	Unit of Measure	Unit Costs	Total Amount Quantity x Unit Price
Direct Costs				
Labor (incl subcontractors)				
Installation of HDPE lined Storage Pond (2.5 MG)	2.5	MG	$100,000	$250,000
Pump Station - Site Preparation [1]	1	ls	$10,000	$10,000
Installation of wet well sump for pumps [2]	1	ea	$25,000	$25,000
Pump station mobilization/labor	1	ls	$20,000	$20,000
Land clearing and grubbing [3]	375	per ac	$50	$18,800
Center Pivot Installation -1019' machines	6	ea	$10,000	$60,000
			Subtotal	**$383,800**
Materials				
Stainless (SS) steel pipe and fittings at pump station	2	ea	$10,000	$20,000
Piping 6 inch PVC 125 psi [4]	2,500	lf	$9	$22,500
Piping 8 inch PVC 125 psi [4]	3,300	lf	$11	$36,300
Piping 10 inch PVC 125 psi [4]	2,750	lf	$16	$44,000
Piping 12 inch PVC 125 psi [4]	2,900	lf	$18	$52,200
Piping 14 inch PVC 125 psi [4]	2,400	lf	$22	$52,800
Electrical pivot power cable [5]	5,850	lf	$8	$46,800
			Subtotal	**$274,600**
Equipment				
Skid mounted pump system [6]	1	ea	$237,500	$237,500
SS Filter and backflush controls	2	ea	$10,000	$20,000
Wireless pump station main relay control	1	ea	$5,000	$5,000
Check Valves	4	ls	$2,000	$8,000
Gate Valves	4	ls	$2,000	$8,000
Steel Pipe Sleeve Crossings (Roadways & Utilities) [7]	2	ea	$1,500	$3,000
Center Pivot - 1,019' Model 8000P Poly Span	6	ea	$100,300	$601,800
Sprinkler packages - 1019' machines	6	ea	$7,000	$42,000
Wireless pivot controls	6	ea	$2,000	$12,000
Pivot control valve, flow meter, air relief, pivot pipe	6	ea	$10,000	$60,000
Pivot Remote Control (software/hardware)	1	ea	$25,000	$25,000
			Subtotal	**$1,022,300**
Contingency (30% of Direct Costs)				**$504,200**
Total Direct Costs (+30%/-50%)				**$2,184,900**

Table 8a. 375-Acre Land Application System
Engineers Opinion of Probable Cost for Construction and Startup
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Description	Quantity	Unit of Measure	Unit Costs	Total Amount Quantity x Unit Price
Indirect Costs [2]				
Engineering (10% of Direct Cost)	1	ls	$218,500	$218,500
Legal and Administrative (5% of Direct Cost)	1	ls	$109,200	$109,200
Permitting (5% of Direct Cost)	1	ls	$109,200	$109,200
Construction Management (10% of Direct Cost)	1	ls	$218,500	$218,500
Spare parts - startup and first year operation [8]	1	ls	$ -	$0
Transportation and Freight [9]	1	ls	$ -	$0
Total Indirect Costs [2]				**$436,900**

NOTES:

Cost estimates as of May 1, 2013, and are subject to change. Does not including bonding, state, or federal tax.

Abbreviations: AC = air conditioning, HDPE = high density polyethylene, MG = million gallons, ls = lump sum, lf = linear feet, ea = each, psi = pounds per square inch, PVC = polyvinyl chloride pipe, VFD = variable frequency drive.

[1] Site leveling, excavation, and final grading.

[2] Wet well sump connected to pond.

[3] Land clearing of existing vegetation and leveling of irregular soil surfaces.

[4] Water delivery pipeline from recovery wells to pump station provided by others. Assume pipeline installed 36 inches below surface grade through pivot fields. Anticipate excavation of cemented material and gravels and cobbles. Cost includes pipe, fittings, excavation, installation and freight (FOB Tuscon).

[5] Electrical pivot control cable based on six -#12 copper conductors. Electrical pivot power cable based on 3-#4/0, 1-#2 aluminum with 2- #12 conductors in conduit. Electrical service (3 phase 480 volts) to pump station provided by others. Electrical line installed in separate trenches across fields. Main electrical service consisting of overhead lines, transformers and electrical drop to pivot locations provided by others.

[6] Two (2) 50 horsepower turbine pumps at 675 gallons per minute, 190 feet total dynamic head and 80% Efficiency. VFD, soft start and fully enclosed system.

[7] Crossings of roadways, natural gas, and existing water mains to be sleeved with Schedule 40 Steel Casing Pipe

[8] No additional equipment or materials should be necessary during startup or within the first year of operation.

[9] Transportation and freight are included in equipment and material cost estimates for this conceptual-level cost estimate.

Table 8b. 375-acre Land Application System
Engineers Opinion of Probable Operation and Maintenance Costs
Freeport-McMoRan Corporation, Bisbee, Arizona

Annual System Operation and Maintenance Costs				
Electrical Power (pump) [1]	2	per year	$17,520	$35,000
Electrical Power (pivot) [2]	6	per year	$1,047	$6,300
Pump System - Maintenance	2	per year	$5,000	$10,000
Irrigation System - Service/Maintenance	6	per year	$1,500	$9,000
Pivot Poly Span Replacement (20 year cycle)[3]	1.4	per year	$11,299	$16,300
Gearbox/Motor/Shaft Replacement (15 year cycle)	2.2	per year	$1,666	$3,600
Riser Pipe/Lower Elbow Replacement (10 year cycle)	1	per year	$8,040	$8,000
Farming Expenses - Labor, Crop Establishment, Monitoring[4]	1	per year	$367,848	$367,800
Farming Income - Crop Revenue	1	per year	-$366,053	-$366,100
Total Annual O&M				**$89,900**

NOTES:

Abbreviations: hp = horsepower, kw = kilowatt, hr = hour, yr = year, kwh = kilowatt-hour, I = interest, % = percent, O&M = operation and maintenance

[1] Electrical power cost calculated for each pump based on: 50 hp (37.5 kw) X 5,840 hr/yr X $0.08 / kwh

[2] Electrical power cost calculated for one pivot based on: 7.5 hp (5.6 kw) per pivot X 2,336 hr/yr X $0.08 / kwh. Energy rate is $0.08 / kwh per client.

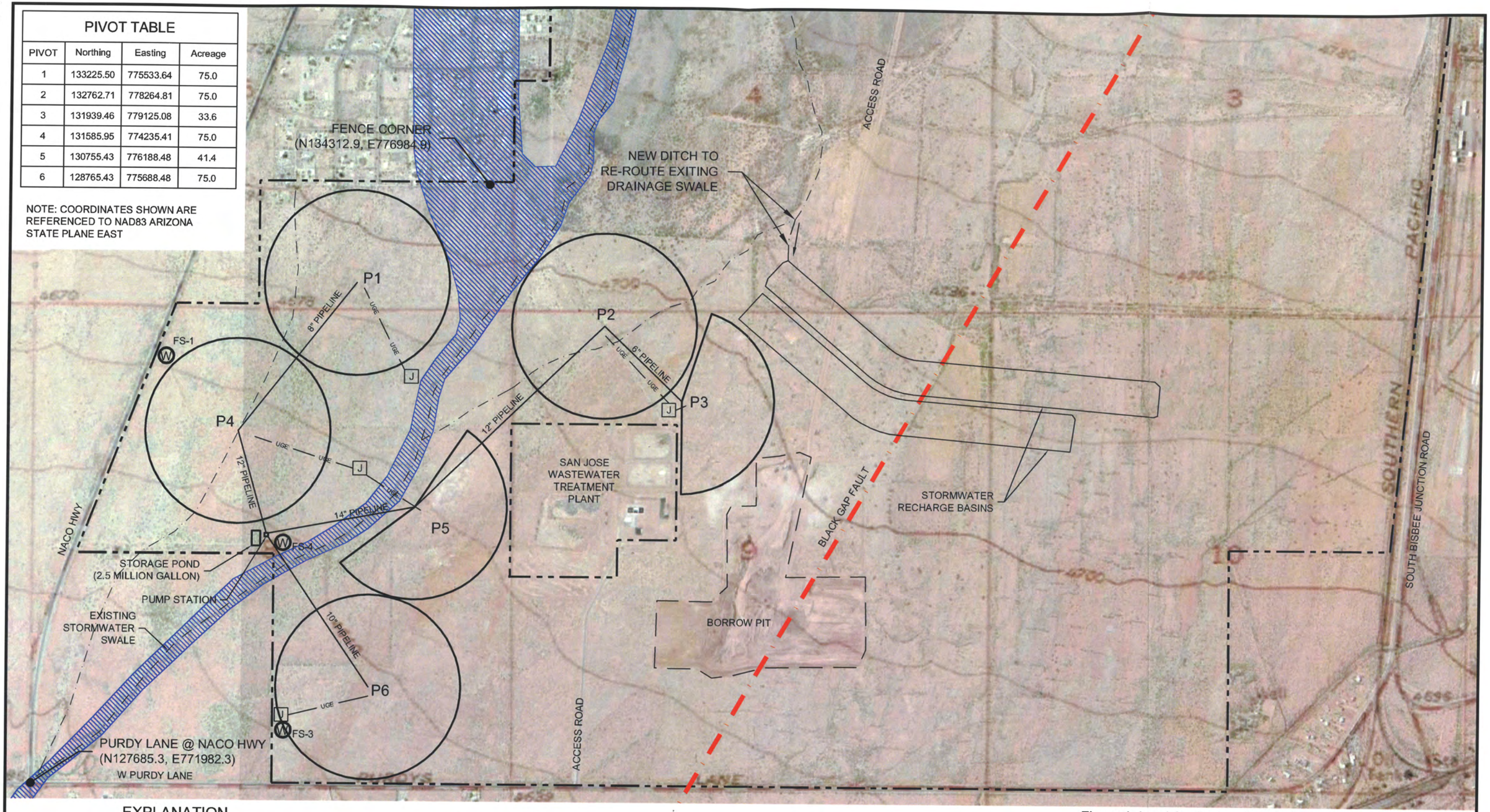
[3] Irrigation system replacement costs calculated on a annual basis per pivot assuming a 50-year project life. Replacement cycle

[4] Assumes 150 acres of site planted in alfalfa and 225 acres planted in wheat or native grass seed. Refer to Attachment 1, 2, and 3 for Contract Farmer, Operation and Monitoring, Crop Cost and Crop Revenue estimates.

Figure

PIVOT TABLE			
PIVOT	Northing	Easting	Acreage
1	133225.50	775533.64	75.0
2	132762.71	778264.81	75.0
3	131939.46	779125.08	33.6
4	131585.95	774235.41	75.0
5	130755.43	776188.48	41.4
6	128765.43	775688.48	75.0

NOTE: COORDINATES SHOWN ARE REFERENCED TO NAD83 ARIZONA STATE PLANE EAST



EXPLANATION

- PROPERTY BOUNDARY (APPROXIMATE)
- BLACK GAP FAULT (APPROXIMATE)
- SWALE
- WATERLINE (IRRIGATION)
- FS-4 PROPOSED WELL SITE
- FLOOD HAZARD AREA (ZONE A)
- J ELECTRICAL JUNCTION
- UGE UNDERGROUND ELECTRIC

(SOURCE: USGS Topo Quad Map and Bing Aerial from ArcGIS Desktop 10, ©ESRI 2013)

0 1000'
1"=1000'
(SCALE AND LOCATIONS ARE APPROXIMATE)

Figure 1. Land Application System Layout Map - Alternative 3

PROJECT NUMBER: 2012220017	Land Application Feasibility Study
DATE: 5/10/2013	
DWG NO: 2012220017 F1 Alt 3.dwg	Copper Queen Branch, Freeport-McMoran Corporation
DWG BY: 6RKB / PROJECT MANAGER: 5DJB	36 West Highway 92
REVISED:	Bisbee, Arizona 85603
	CES CASCADE EARTH SCIENCES A Valmont Industries Company

S:\[Working Drafting]\2012220017 Freeport McMoran\Drawings\2012220017 F1 Alt 3.dwg May 10, 2013 RKB

Attachments

Attachment 1. Farming Income and Expense Summary
Contract Farmer Pay for Performance
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Annual Average Income and Expenses			Source
Income	Crop Revenues	$ 366,053	Att 3
	Subtotal	**$ 366,053**	
Expenses	Labor	$ 128,450	Att 2
	Pay for Performance Incentive[1]	$ 73,211	
	Farm Operations (Contractor)		Att 3
	Crop Establishment	$ 39,389	
	Crop Transportation	$ 47,444	
	Crop Harvest	$ 59,600	
	Site Operations		Att 2
	Field Vehicle	$ 3,450	
	Disposables	$ 4,000	
	Monitoring		Att 2
	Groundwater[2]	$ -	
	Crop	$ 1,254	
	Soil	$ 1,050	
	Consulting[3]		
	General Ag Consulting and Annual Report Preparation	$ 10,000	
	Subtotal	**$ 367,848**	
	Annual Gross Profit[4]	**$ (1,795)**	

NOTES:

[1] Pay for performance equals 20% of crop revenue as bonus above base pay level. However more revenue could be shared based on the actual incentive program developed.

[2] Cost for groundwater samples collection and analysis will be covered by existing monitoring program.

[3] Consulting is an estimate for reporting and limited general technical advice and does not include site permitting, design, or special projects services.

[4] Does not account for cost of land, capital infrastructure development, and power consumption.

Attachment 2 **Farm Operation and Monitoring Expenses**
Contract Farmer Pay for Performance
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Operations[1]	
Irrigation Operator[2]	$ 45,240
Site Manager[2]	$ 83,210
Field Vehicle[3]	$ 3,450
Disposables[4]	$ 4,000
Total	**$ 135,900**

Monitoring	Frequency/ Type	Number of Fields	Samples per Field	Sampling Events per Year	Total Number of Samples	Analysis Cost per Sample	Total
Groundwater[5]	Quarterly	0	1	4	0	$ 405	$ -
	Annual	0	1	1	0	$ 1,444	$ -
Soil[6]	Bi-Annual	7	1	2	14	$ 75	$ 1,050
Crop Tissue[7]	Alfalfa	2	1	5	10	$ 114	$ 1,140
	Wheat	5	1	1	5	$ 114	$ 570
						Subtotal	**$ 2,760**

NOTES:

[1] FMI will provide site management objectives and BMP for contract farmer to achieve.

[2] Irrigation Operator and Farm Manager costs includes base wage, estimated benefits, overhead, and profit. It is assumed that the Operator and the Farm Manager will be employed 40 hours per week. Labor costs were determined by using the average from Cochise County, Arizona Department of Commerce 2011 and adding 50% to account for benefits, taxes, profit, and overhead costs.

[3] Field vehicle is a farm suitable ATV with an expected life of 7+ years. Cost are included for usage, gas, and maintenance.

[4] Disposables include field supplies, patch seeding, sample shipping, etc. These items are consumed annually and require replacement each year.

[5] Groundwater sample collection and testing, if required, is provided as part of normal plume monitoring program.

[6] Soil monitoring is conducted by the contract operator twice per year, two locations per field and six depths per location.

[7] Crop tissue samples are collected by contract operator at each harvest and submitted to laboratory.

Attachment 3. **Projected Crop Revenues**
Contract Farmer Pay for Performance
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

YEAR 1								
Revenue								
Crop	Acres[1]	Yield per Acre[2]	Total Yield	Value[2] (price/yield unit)	Raw Crop Revenue	Transportation Cost[3]	Harvest Cost[4]	Gross Revenue[5]
Alfalfa	150	4.0	600	$ 157	$ 94,400	$ 15,174	$ 30,000	$ 49,226
Wheat	225	112	25,200	$ 7.53	$ 189,840	$ 19,119	$ 3,600	$ 167,121
Subtotal					**$ 284,240**	**$ 34,293**	**$ 33,600**	**$ 216,347**

Crop Establishment Expenses[6]								
Crop	Acres Planted	Tilling	Planting	Seed	Fertilizer[7]	Pesticide Herbicide[8]	Total	Total
		cost per acre						cost per year
Alfalfa	150	$ 10.00	$ 10.00	$ 50.00	$ 100.00	$ 40.00	$ 210.00	$ 31,500
Wheat	225	$ 14.13	$ 3.77	$ 39.88	$ 45.43	$ 22.52	$ 125.73	$ 28,289
Subtotal								**$ 59,789**
Projected Net Revenue - Year 1								**$ 156,558**

YEARS 2-5								
Revenue								
Crop	Acres[1]	Yield per Acre[2]	Total Yield	Value[2] (price/yield unit)	Raw Crop Revenue	Transportation Cost[3]	Harvest Cost[4]	Gross Revenue[5]
Alfalfa	150	8.3	1,250	$ 157	$ 196,667	$ 31,613	$ 62,500	$ 102,554
Wheat	225	112	25,200	$ 7.53	$ 189,840	$ 19,119	$ 3,600	$ 167,121
Subtotal					**$ 386,507**	**$ 50,732**	**$ 66,100**	**$ 269,675**

Crop Establishment Expenses[6]								
Crop	Acres Planted	Tilling	Planting	Seed	Fertilizer[7]	Pesticide Herbicide[8]	Total	Total
		cost per acre						cost per year
Alfalfa	150	$ -	$ -	$ -	$ -	$ 40.00	$ 40.00	$ 6,000
Wheat	225	$ 14.13	$ 3.77	$ 39.88	$ 45.43	$ 22.52	$ 125.73	$ 28,289
Subtotal								**$ 34,289**
Projected Net Revenue Per Year - Years 2 -5								**$ 235,386**

NOTES:

[1] Years 1 - 5 will have 2 pivots irrigating 150 acres planted to alfalfa. After year 5 a new alfalfa crop will rotated to wheat on rotation from wheat.

[2] Yield units are tons of dry matter for alfalfa and bushels of wheat. Harvest projection based on United States Department of Agriculture (USDA) National Agriculture Statistics Service (NASS) yields and prices for 2009-2011 in Arizona.

[3] Assumes a 90 mile transportation haul at a rate of $0.281/ton-mile. This value is based on CES professional experience and a search of estimated shipping from uShip Shipping Price Estimator (www.uship.com) on July 30, 2009.

[4] Harvest costs were estimated at $50 per ton for alfalfa to hay cut, rake, turn, bale, and load (professional judgement), and $16 per acre to harvest wheat (Univ c AZ, 1998, Income and Cash Operating Summary for Durum Wheat, Cochise County). Price per ton will vary depending on yields, labor and fuel costs.

[5] Equals Raw Crop Revenue minus Transportation and Harvest Costs.

[6] Alfalfa establishment costs include seed cost at $2 per pound planted at 25 pounds per acre.

[7] Fertilizer for alfalfa establishment is based on 100 pounds of nitrogen with a micronutrient supplement application to assist in crop establishment.

[8] Herbicide and pesticide cost for alfalfa assume one application per field per year for materials (costs for application are included separately as farm expenses).

APPENDIX E.2

DESIGN BASIS MEMO AND BUDGETARY COST ESTIMATE FOR A LAND APPLICATION SYSTEM, MITIGATION ALTERNATIVE 4

Cascade Earth Sciences
A valmont COMPANY

Conserving Resources. Improving Life.

12720 E. Nora Ave., Ste. A
Spokane, WA 99216

Ph: 509.921.0290
Fax: 509.921.1788

MEMORANDUM

DATE: May 13, 2013

TO: Rebecca Sawyer – Freeport-McMoRan Corporation, Copper Queen Branch

FROM: Dan Burgard, Dan Bruner, and Jonathan Paetz – Cascade Earth Sciences

SUBJECT: Design Basis Memo and Budgetary Cost Estimate for a Land Application System, Mitigation Alternative 4

Freeport-McMoRan Corporation, Copper Queen Branch (CQB) is conducting a feasibility study of potential mitigation alternatives for groundwater enriched with sulfate beneath, and downgradient, of a former evaporation pond. Four mitigation alternatives are being evaluated:

- Alternative 1 (A1) is monitored, natural attenuation;
- A2 is to pump groundwater at 840 gallons per minute (gpm) using extraction wells to stabilize the plume location and then treat the groundwater;
- A3 is to pump groundwater at 900 gpm to produce agricultural crops on a land application system (LAS); and
- A4 is to pump the groundwater at 2,950 gpm, of which 1,600 gpm will be treated by reverse osmosis (which will generate a brine that will be discharged to a lined evaporation pond) and the remaining 1,350 gpm of untreated groundwater will be used to produce agricultural crops on a LAS.

A LAS will provide effective use of the water for crop production, while providing effective management of calcium and sulfate by precipitation of gypsum in soil and crop production. Gypsum is a common agricultural amendment in areas with sodic soils and is a harmless solid. Gypsum precipitation, in conjunction with meeting the leaching requirement for crops, will also control soil salinity. Soil accumulation of gypsum in the LAS will provide a unique, effective, permanent solution that will not generate a waste stream. The LAS concept is scalable if design criteria or constraints change. Land area and crop acreage within the LAS can be expanded or reduced.

Cascade Earth Sciences (CES) was retained by CQB to prepare the design basis, conceptual designs and cost evaluations for LASs in A3 and A4. This memo addresses the LAS for A4, and a companion memo will address the LAS for A3.

DESIGN BASIS

A conceptual design and budgetary cost estimate were prepared based upon the following criteria and assumptions:

Objectives and General Constraints

- The primary objective of the LAS is to provide cost-effective, beneficial use of water from the extraction wells for crop production and grazing.
- The crops selected for the LAS include alfalfa hay and native grass for seed. Other crops commonly grown in Cochise County, Arizona, include grass hay, barley, grain corn, grain sorghum, and durum wheat (USDA NASS, 2008). For cost estimating, production costs and revenues for wheat were used instead of native grass for seed, since wheat is a more common crop but has similar water usage and crop management requirements as native grass for seed.
- The LAS crop yields and market values will match those published for irrigated crops in Arizona over the past three years (2009-2011) (USDA NASS, 2013).
- The crop leaching requirement will be met in the LAS soil water balance to prevent soil salinity from limiting crop production.

Water Supply

- Groundwater will be supplied from the extraction wells at a continuous flow of 1,350 gpm to a single point of connection at the LAS. Monthly and annual design flows are listed in Table 1.
- Groundwater pH is nearly neutral (6.86), and predominant solutes are calcium and sulfate (Table 2). The design sulfate concentration specified by CQB is 1,000 milligrams per liter (mg/L).
- Water containing sulfate has a high potential to accelerate corrosion of steel and galvanized materials. Corrosion-resistant materials for irrigation, piping and pumping are preferred to avoid costly premature replacement/repair costs.
- The LAS will be operated with its own control package. Integration of controls with the extraction wells or other off-site communications was not considered.

Climate

- Temperature and precipitation at the Site are represented in Table 3 by normal values for 1971-2000 determined for the Douglas Federal Aviation Administration (FAA) meteorological station (WRCC, 2012). Normal precipitation values were corrected to represent amounts that may infiltrate into the soil and provide moisture for plant growth (USDA-NRCS, 1995).

- Reference evapotranspiration (ETr) data are averages for short grass from 1991-2010 at Hachita Valley, New Mexico.
- Monthly warm season grass potential evapotranspiration (PET) values were calculated as Penman-Monteith Reference ET (ETo) times the crop growth coefficient (Kc), assuming a base growth temperature of 50°F and maturity at 2000 growing degree days (GDDs). Crop growth coefficient values were calculated as ETo divided by the PET of buffalograss, estimated by the New Mexico Climate Service for 1991-2010 at Hachita Valley. Crop growth coefficient values in July and August were reduced to compensate for senescence and seed harvest.
- Monthly alfalfa hay PET values were calculated as ETr times Kc, assuming a base growth temperature of 41°F. Crop growth coefficient values were calculated as ETo divided by the PET of alfalfa hay, estimated by New Mexico Climate Service for 1991-2010 at Hachita Valley.

Site Location and Features

- The LAS will be located within the Warren Ranch. The Warren Ranch is owned by CQB and located within portions of Sections 3, 4, 5, 8 and 9 of Township 24 South, Range 24 East of the Gila and Salt River Meridian (Figure 1).
- Most of the water managed by the LAS will be applied over the thick alluvium in the graben west of the Black Gap Fault (fault).
- There are approximately 680 acres of land west of the fault on the Warren Ranch for establishing a LAS. Additional Warren Ranch land is available east of the fault.
- The LAS concept is contingent upon availability of suitable soil for crop production, as determined by a site soil investigation conducted by a qualified soil scientist. This conceptual design is based upon published descriptions and data for the Libby-Gulch Complex (USDA NRCS, 2007).
- Land proposed for development of the LAS will not require significant land leveling, or shaping, or installation of surface water drainage controls.
- The LAS can be constructed without any geotechnical constraints.
- Three-phase power for the operation of electrical equipment at the LAS (pumps, irrigation systems, etc.) is available or will be provided by others.

CONCEPTUAL PROPOSAL

The LAS concept is to beneficially use a constant flow of groundwater at 1,350 gpm for crop production, allowing calcium sulfate from the groundwater to evapo-concentrate and precipitate as gypsum in the soil, while meeting the agronomic leaching requirement to control salinity for crop production.

Soil salinity will be managed by allowing enough moisture to accumulate in the soil to leach salts below the crop rooting zone. By meeting the agronomic leaching requirement, soil salinity will be controlled at levels that will not inhibit crop or native vegetation growth.

Alfalfa hay was selected because it is the only perennial crop commonly produced in Cochise County. At the suggestion of CQB, native warm-season grass was also selected for production of seed. Alfalfa hay and warm season grass consume water throughout most of the year at a rate that is temperature dependent. When crops are dormant, some of the water will evaporate while the rest will replenish the moisture content of the soil and leach salts from the soil.

Soil Water Balance

The soil water balance in Tables 4a, 4b and 5 indicates that a 675-acre LAS can be operated to beneficially use the water to produce alfalfa hay and native grass seed. The proposed LAS will use 11 center pivot irrigation machines (pivots). Alfalfa hay will be grown on 225 acres, and native grass seed will be produced on 450 acres.

The alfalfa hay will potentially require 76.4 inches of water per year (Table 4a), which is nearly 2.5 times as much water as native grass seed (31.3 inches, Table 4b). On a volumetric basis, 488 million gallons (MG) of water will be applied to the alfalfa and 222 MG will be applied to the native grass (Table 5).

Maximizing dry matter production from alfalfa hay will require frequent applications of water throughout the growing season months of March through October with only brief interruptions during hay harvests (Table 4a). Alfalfa hay will be harvested several times per year as the alfalfa plants begin to mature; whereas, the native grass seed will be harvested once in late June or early July. Irrigation of native grass will be terminated during the month of June during maturation and production of seed (Table 4b).

During the non-growing season months of November through February, water will be applied to all of the fields to replenish soil moisture and leach salts to mitigate soil salinity buildup in the crop rooting zone (CRZ; depth of 5 feet). The leaching requirement in the LAS water balances was calculated using a crop salinity tolerance of 4.0 millimhos per centimeter (mmho/cm), which is the average salinity throughout the CRZ. Soil salinity under irrigation in arid climates increases with depth because soil wetting fronts created by irrigation leach salts deeper into the soil profile until they dissipate with depth. This is the same phenomenon that naturally creates caliche horizons in arid climates. So, soil salinity at the LAS will be managed by providing adequate irrigation applications to create wetting fronts that will leach salts to the base of the soil CRZ.

The LAS is designed to meet the leaching fractions by providing leaching fractions of 12.41 inches for alfalfa hay (Table 4a) and 2.73 inches for native grass seed (Table 4b). On an annual basis, the leaching fractions will equate to soil drainage water flow rates of 146 gpm from the alfalfa fields (225 acres, Table 6a) and 63 gpm from the native grass fields (450 acres, Table 6b).

Soil Salinity and Sulfate Management

An important consideration for soil salinity control and groundwater quality is the fate of sulfate applied to the LAS. The annual sulfate application to the LAS will be 5,918,000 pounds per year (lbs/yr) (Table 7). The alfalfa crop is expected to remove 105 pounds of sulfate per acre per year from 225 acres (Table 6a), while the native grass seed harvest will remove negligible sulfate (Table 6b) for an annual crop sulfate removal of 24,000 lbs/yr (Table 7). The remaining 3,359,000 pounds of sulfate applied to the LAS can precipitate with calcium as gypsum in the crop rooting zone (CRZ; generally 5 feet thick) or leach from the CRZ. Research on LASs that have operated for over 30 years at coal mines in South Africa indicates 50% of the sulfate precipitates as gypsum in the soil (Gobler, 2002; Jovanovich et al, 2005; Annandale et al, 2006; and Vermeulen et al, 2008).

The fate of sulfate in the soil of the LAS is largely dependent upon gypsum solubility. The gypsum solubility limit is approximately 2,400 mg/L in pure water at standard conditions (CRC Press, 1984). A pure water solution at the gypsum solubility limit would have an electrical conductance (EC) of 3.75 mmho/cm, which was estimated by dividing the solubility limit by 640 (US Salinity Lab Staff, 1954). The solubility of gypsum increases with ionic strength of the solution. Based upon the chemistry of the water that will be applied to the LAS, and a published relationship of gypsum solubility to ionic strength (Dow Chemical Company, 2009), the maximum concentration of dissolved gypsum in soil drainage water at the proposed LAS could reach 6,887 mg/L (EC of 10.8 mmho/cm) under the alfalfa fields and 6,973 mg/L (EC of 10.9 mmho/cm) under the native grass see fields. The sulfate concentrations could reach 4,347 mg/L under the alfalfa fields and 4,293 mg/L under the native grass seed fields.

At the crop salinity tolerance of 4.0 mmho/cm (average salinity throughout the CRZ), the salinity of soil water drainage from the CRZ could approach 18.72 mmho/cm (Rhoades, 1982). However, the soil water drainage salinity will be limited by the solubility of gypsum to approximately 10.8 to 10.9 mmho/cm. Consequently, the soil water drainage sulfate concentrations will be limited by gypsum solubility to 4,293 to 4,347 mg/L.

Conservatively assuming that all of the soil water drainage will become saturated with calcium sulfate (gypsum), it is estimated that 3,932,000 pounds of sulfate (66% of the applied sulfate) can leach from the CRZ of the LAS and 1,962,000 lbs/yr (34% of applied) of sulfate will be precipitated as gypsum in the soil. This is a conservative estimate compared to research on coal mine LASs in South Africa with wetter climates and higher water application rates, where only 50% of the sulfate has leached from the soil CRZ. The preceding estimates of sulfate precipitation are conservatively low because they assume consistently saturated conditions. The base of the soil CRZ at the land application system will not become saturated under normal operating conditions. Wetting and drying cycles from sprinkler irrigation applications will promote more gypsum precipitation than simple solution chemistry would predict.

By removing at least one-third of the applied sulfate by gypsum precipitation at the base of the soil CRZ, operation of the LAS will remove sulfate from groundwater. Precipitation of gypsum will avoid having to develop a secondary waste management alternative that would be required for most

conventional water treatment approaches. More detailed water balance modeling and geochemical modeling beyond the scope of this phase of the study would provide additional confidence and improved estimates of percolation and gypsum precipitation.

CONCEPTUAL DESIGN

A conceptual design of the LAS was prepared to estimate capital costs for construction. This conceptual design is merely a rough plan and is only intended for planning purposes for the feasibility study.

System Layout

The tentative LAS layout consists of a small (2.5 MG) storage pond with a pump station that will serve six center pivots (Figure 1). The pump station and eight of the pivots would be constructed west of the Black Gap Fault, and three of the 75-acre pivots would be constructed east of the fault. Alfalfa would be established on three of the 75-acre pivots west of the fault, and native grass would be established on the remaining pivots.

Storage Pond

A 2.5 MG storage pond will provide approximately 30 hours of operational storage at the design flow rate of 1,350 gpm. The storage pond will provide storage during monsoon rains to mitigate runoff. The storage pond will also provide operational storage during maintenance of pump or pivot systems and temporary capacity if recovery well flow rates drop below 1,350 gpm or go offline. For budgetary purposes, the storage pond is estimated to cover approximately 0.6 acres at a depth of ten feet and consist of a 0.060-inch thick, high density polyethylene (HDPE) liner. A single liner configuration was selected based upon Aquifer Protection Permit Rules of Arizona Administrative Code (AAC) Title 18, Chapter 9, Article 3, Parts D and E, which were accessed on September 28, 2009.

Pump Station

Pump Sump

A sump will be utilized to deliver water to the pumps and provide connection to the storage pond from which stored water can be drawn.

Building

The irrigation pump station will be a metal sided structure with a concrete footing and concrete slab floor. The structure will house the pump controls, electrical panels, and pivot remote monitoring computer and will be air conditioned with insulated walls and ceiling. The building will include one man door. Pumps will be located outside of the building.

Pump System

- Two irrigation pumps will be sized to provide approximately 35 pounds per square inch (psi) at each center pivot hub at a flow rate of 675 gpm. Both pumps will be able to operate simultaneously to deliver 2,700 gpm to four, 75-acre center pivots an average of 50% of the time to match the water supply flow rate of 1350 gpm.
- For conservative planning, each pump will have a 100 horsepower electric motor capable of providing 1,350 gpm at a total dynamic head of 215 feet. Pumps will be mounted in a sump pit connected to the storage pond.
- Stainless steel pipe will be utilized in the pump station piping due to the concentration of sulfate in the recovered groundwater. Stainless steel in-line filters will be located after each pump to prevent damage to the irrigation equipment. Alternate pipeline materials such as carbon steel or HDPE could also be considered after the completion of a life cycle/cost analysis of optional pipeline materials.

Pump Controls

A Programmable Logic Controller will be installed in the pump house with a display screen to operate the following system components:

- Pumps and variable frequency drive pump controls
- Inline filter flush control

Water Transmission Pipeline

- The groundwater transmission pipeline from the recovery wells will be provided by others and terminated at the irrigation pump sump/storage pond.
- The pipeline(s) within the LAS will transmit 675 gpm to the distal pivot(s) at a maximum pressure of 35 psi.
- The pipeline(s) will be composed of polyvinyl chloride with a pressure rating of 100 psi. Alternate pipeline material such as HDPE could also be considered during the design and bidding phase of the project to determine the material that will provide the most cost effective pipeline material and installation cost based on current market price and contractor cost.
- The pipeline(s) will be required to be buried at a depth of 48 inches below grade, since each pipeline will travel under center pivot irrigated fields (Figure 1).
- Budgetary pipeline costs include: pipeline material, fittings, excavation, installation and freight.
- Gate valves and check valves have been included to provide necessary control of water flow throughout the pipeline system.

Center Pivot Irrigation Machines

Pivot Requirements

- The sulfate concentration of the groundwater to be irrigated has a strong corrosion potential. To mitigate corrosion, center pivots will be manufactured with integrated HDPE liners. Capital expenses assume purchase of six Valley® Model 8000P Poly Span Center Pivots.
- A Sprinkler Package consisting of Nelson Rotators and pressure regulators. Sprinklers will be positioned on drops, 48 inches from the ground surface.
- Tire size will be 14.9 x 24 inch.
- Both regular (34 revolution per minute) and high speed drive motors (68 revolutions per minute) will be required.

Pivot Panel and Electrical Conduit

- Center pivot panels that can be controlled remotely are desired to reduce labor and provide capability to automatically maintain records of pivot operations for environmental management and reporting. The budget includes a Valley® Pro2 Panel mounted at each pivot point.
- A flow meter mounted at the pivot point will be connected to the Pro2 Panel to allow for the manual or remote monitoring of totalized pivot flow rate.
- Pivot electrical power conduit will consist of four conductor electrical wires (with two individual control wires installed between the pump station pump panel and each pivot panel). Electrical cable will be installed in a separate trench along the pipeline trench.

Pivot Controls and Remote Communications

Center pivots will be monitored and manually operated by the Valley® BaseStation2 remote monitoring and control program. Monitoring and manual control of each irrigation system pump will be provided through an Auxiliary Link Panel located at the pump station, in addition to the automated control provided by the Programmable Logic Controller. Communication between the pivot panel and pump station will be by Federal Communications Commission licensed data radio.

BUDGETARY COST ESTIMATES

The budgetary cost estimates for capital, indirect, operation, maintenance, and farming are rough planning-level estimates based upon limited information but should be adequate for comparing the land application concept to other alternatives for managing groundwater pumped from the extraction wells. Costs are intended to be as realistic as possible but given the natural tendency to err on the conservative side, flexibility of the land application concept, and opportunity for refinement during design these costs are likely to prove conservative.

Construction and Startup Cost Estimate

Table 8a presents the Engineers Opinion of Probable Costs for construction and startup of the 375-acre LAS. The estimated total direct cost is $3,558,800, which includes labor, equipment, and materials. The estimated total indirect cost is $711,700, which includes legal and administrative, permitting, engineering design, and construction management.

Annual System Operation and Maintenance Costs

The CQB does not have agricultural equipment, so operation and maintenance (O&M) costs were developed assuming all farming activities would be contracted or equipment would be leased as an operational expense. Crop revenue and production costs for native grass were based upon published information for wheat because wheat is a more common crop that has similar water and management requirements.

The total estimated net annual O&M cost for the LAS is $14,600 (Table 8b), which includes the following:

- $66,600 for electrical power (pumps and center pivot irrigation machines)
- $26,500 for equipment maintenance
- $43,300 for equipment replacement
- $522,200 for farming expenses (labor, crop establishment and monitoring), see Attachments 1 and 2 for details
- -$644,000 for farming income (crop revenue), see Attachment 3 for details

The estimated annual farming cost and annual income from crop production are listed in Table 8b, with detailed outlines of the cost basis provided in Attachments 1, 2 and 3. The farming costs and revenues were estimated by CES based on published information and other land application systems of similar size.

Attachment 1 presents a farming income and revenue summary for the utilization of a Contract Farmer to farm the LAS throughout the year. The Contract Farmer would be paid to farm per the instructions and objectives from CQB and would be responsible for the operation of the pivots and the performance of daily maintenance of the system such as daily or monthly maintenance of pump and pivot systems, un-plugging of sprinkler nozzles, and observation of the pump and pivot systems for preventative maintenance.

Potential farming operations and monitoring expenses are summarized in Attachment 2. The operations expenses include all of the labor, vehicle and disposable expenses associated with the LAS, which would be performed by the Contract Farmer (Irrigation Operator and Site Manager). The final form of the contractual arrangement between the Contract Farmer and CQB, and the number of individual(s) contracted to perform the site operations, will determine the final cost of performing the system operations. CES also provided an estimate for the collection and testing of

soil and crop tissue samples to provide for data on the condition of the soil and uptake of nutrients and sulfate by the crop system.

Labor expenses for all aspects of the LAS are listed in the Farm Operation and Monitoring Costs included in Attachment 2. The Contract Farmer will be responsible for land preparation at system startup and establishment/re-establishment of crops every five years. The Contract Farmer would also be responsible for obtaining the inputs (seed, fertilizer, etc.) to establish the crop and perform all harvesting activities and would bill CQB for those costs. Crop revenue would be shared between the Contract Farmer on a percentage basis. Contracting a farmer ensures the farmer gets paid for operating within the guidelines, and the revenue sharing provides incentive to do a good job of farming. This arrangement is an example that can be modified depending on the level of risk each party is willing to accept. For the estimate of cost in Attachment 1, 20% of the estimated crop revenue would be shared with the Contract Farmer. A greater or smaller percentage of the crop revenue could be earned by the Contract Farmer based on production above a certain yield or tonnage target or based on meeting specific operating requirements.

Crop revenue projections for alfalfa hay and wheat are exhibited in Attachment 3. Crop yield and price inputs were the most recent 3-year averages for Arizona (2009-2011). Actual yields and crop value will vary from year to year, but this evaluation provides a basis from which crop revenue can be estimated.

Accuracy and Financial Criteria Assumptions for Budgetary Cost Estimates

All budgetary cost estimates in Tables 8a and 8b are based on the following assumptions and criteria:

- A 30% contingency on the capital costs is assumed for this estimate as the costs are not from direct quotations but are based on engineering estimates from previous projects of a similar size and scope. Also, the ultimate timing of the construction of the project will affect the cost of labor, materials, and equipment.
- The budgetary cost estimates are likely to be +30 to - 50% accurate.
- Bonding and state and federal taxes are not included in the budgetary cost estimate.
- CQB will enter into an agreement with a Contract Farmer to conduct all farming activities to operate the center pivot system on a year round basis.

Thank you for the opportunity to provide this feasibility assessment. We look forward to the opportunity to refine these designs, costs and feasibility determinations as the alternative selection

process continues. If you have questions or comments please contact Dan Bruner at (208) 233-6565 or Dan Burgard at (509) 921-0290.

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Att: Tables 1-8
Figure 1
Attachments 1-3
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Tables

Table 1. Monthly Extraction Well Volumes
Freeport-McMoRan Corporation
Copper Queen Branch, Bisbee, Arizona

Month	Days per Month	Design [1]	
		MGD	MG
Nov	30	1.94	58
Dec	31	1.94	60
Jan	31	1.94	60
Feb	28	1.94	54
Mar	31	1.94	60
Apr	30	1.94	58
May	31	1.94	60
Jun	30	1.94	58
Jul	31	1.94	60
Aug	31	1.94	60
Sep	30	1.94	58
Oct	31	1.94	60
Total Annual (MG)			**710**
Average Daily (MGD)		**1.94**	

NOTES:
Abbreviations: MG = million gallons; MGD= million gallons per day
[1] Design flow is 1,350 gallons per minute, as indicated by client on August 19, 2009.

Table 2. Land Application Water Quality
Freeport-McMoRan Corporation,
Copper Queen Branch, Bisbee, Arizona

Parameter	Concentration		
	mg/L	meq/L	mmol/L
Potassium	5.8	0.15	0.00015
Sodium	43.3	1.88	0.00188
Calcium	386	19.26	0.03852
Magnesium	58.8	4.84	0.00968
Sulfate	1,040	21.67	0.04333
Chloride	46.5	1.31	0.00131
Bicarbonate as $CaCO_3$	235	2.35	0.00235
Carbonate as $CaCO_3$	<2		
Ionic Strength			0.186
TDS (calculated)	1,740		

NOTES:

Abbreviations: meq/L = millequivalents per liter, mg/L = milligrams per liter, mmol/L = millimoles per liter, CaCO3 = calcium carbonate, TDS = total dissolved solids.
Concentrations are dissolved fractions at a pH of 6.86, based upon sample collected on July 15, 2008, from the "Cooper C" well (per Table 19, Aquifer Characterization Report, Clear Creek Associates, December 2010).

Table 3. Climate Data for Project Site
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Month	Precipitation[1]		Daily Average Temperature[2]			Reference ET[3]	Warm Season Grass PET[4]				Alfalfa Hay PET[5]			
	Normal	Effective	Air - Max	Air - Min	Soil		Monthly GDD	Cumul GDD	Kc	PET	Monthly GDD	Cumul GDD	Kc	PET
	inches		degrees Fahrenheit				days		unitless	inches	days		unitless	inches
Nov	0.74	0.54	69.8	47.1	52.5	3.58			0.37	1.32			1.44	5.15
Dec	1.06	0.73	62.4	35.2	46.9	2.67			0.32	0.86			1.44	3.85
Jan	0.75	0.52	62.2	29.4	45.3	2.77			0.34	0.95			0.65	1.79
Feb	0.64	0.45	66.3	32.1	47.9	3.34			0.36	1.19			0.70	2.33
Mar	0.46	0.34	71.4	36.4	54.1	5.08	332	332	0.39	1.96	400	400	0.78	3.97
Apr	0.20	0.11	78.7	41.9	62.0	7.03	431	762	0.42	2.95	579	979	0.86	6.06
May	0.33	0.27	86.3	50.2	69.5	8.51	566	1328	0.50	4.28	845	1824	1.02	8.67
Jun	0.63	0.60	95.1	59.2	75.3	8.81	701	2029	0.59	5.20	1121	2944	1.16	10.25
Jul	3.14	2.53	93.5	64.4	77.1	7.07	756	2785	0.45	3.18	1139	4083	1.40	9.90
Aug	2.88	2.18	91.3	63.3	75.6	5.73	846	3631	0.65	3.73	1125	5208	1.61	9.20
Sep	1.63	1.26	88.4	58.5	68.7	5.17	704	4334	0.65	3.36	974	6182	1.59	8.21
Oct	1.30	1.00	80.1	47.1	60.2	4.75	467	4801	0.48	2.28	701	6882	1.48	7.02
Annual														
Average			**78.8**	**47.1**	**61.3**									
Total	**13.76**	**10.53**				**64.5**				**31.3**				**76.4**

NOTES:

Abbreviations: ET = evapotranspiration, PET = potential ET, max = maximum, min = minimum, GDD = growing degree days, Kc = crop growth coefficient

[1] Normal precipitation values are from 1971-2000 at Douglass FAA, AZ (NOAA NCDC, accessed at http://www.wrcc.dri.edu). Effective precipitation computed per USDA SCS Technical Release No 21, 1967.

[2] Maximum and minimum air temperatures are normal values from 1971-2000 at Douglas FAA, AZ (NOAA NCDC, accessed at http://www.wrcc.dri.edu). Soil temperatures are averages from 2000-2011 at Hachita Valley, NM (NMCS, 2012).

[3] Reference evapotranspiration values are averages by Penman-Monteith method for short grass during 1991-2010 at Hachita Valley, NM.

[4] Warm season grass PET values were calculated as Reference ET x Kc. GDD were calculated from Douglas FAA, AZ air temperature data using base temperatures of 50 degrees F. Irrigated warm season native grass may reach maturity at 2000 GDD (Wight and Hanson, 1990). Kc values were calculated as Penman-Monteith Reference ET (ETo) / PET of buffalograss estimated by New Mexico Climate Services for 1991-2010 at Hachita Valley, NM, then reduced based on professional judgment during drying period in July and August for senescence and seed harvest.

[5] Alfalfa PET values were calculated as Reference ET x Kc. GDD were calculated from Douglas FAA, AZ air temperature data using base temperatures of 41 degrees F. Alfalfa Kc values were calculated as Penman-Monteith Reference ET (ETo) / PET of buffalograss estimated by New Mexico Climate Services for 1991-2010 at Hachita Valley, NM.

Table 4a. Water Balance for Alfalfa Hay Irrigated to Meet Leaching Requirement
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Total Acres: 225
Crop: Alfalfa

Soil Type: Libby-Gulch Complex
Soil Water Holding Capacity: [1] 6.92
Initial Soil Water Content: [2] 5.63

Month	Precipitation [3]	Extraction Well Water Supply [4]		Gross Irrigation [5]	Net Irrigation [6]	Net Total Input [7]	Evapotranspiration [8]		Soil Water [9]	Percolate Loss [10] (surplus)
							Potential	Estimate		
	inches	fraction	MG	inches	inches	inches	inches		inches	inches
Nov	0.54	0.60	35.0	5.73	5.15	5.69	5.15	4.65	6.68	0.00
Dec	0.73	0.60	36.2	5.92	5.33	6.06	3.85	3.78	6.92	2.03
Jan	0.52	0.60	36.2	5.92	5.33	5.84	1.79	1.79	6.92	4.06
Feb	0.45	0.70	38.1	6.24	5.61	6.07	2.33	2.33	6.92	3.74
Mar	0.34	0.70	42.2	6.90	6.21	6.56	3.97	3.97	6.92	2.59
Apr	0.11	0.50	29.2	4.77	4.30	4.40	6.06	6.06	5.27	0.00
May	0.27	0.70	42.2	6.90	6.21	6.49	8.67	7.56	4.19	0.00
Jun	0.60	1.00	58.3	9.55	8.59	9.19	10.25	7.98	5.41	0.00
Jul	2.53	0.85	51.2	8.38	7.55	10.08	9.90	8.75	6.74	0.00
Aug	2.18	0.70	42.2	6.90	6.21	8.39	9.20	9.08	6.05	0.00
Sep	1.26	0.70	40.8	6.68	6.01	7.28	8.21	7.67	5.65	0.00
Oct	1.00	0.60	36.2	5.92	5.33	6.32	7.02	6.34	5.63	0.00
Annual (in)	**10.5**			**79.8**	**71.8**	**82.4**	**76.4**	**70.0**		**12.4**
Annual (MG)	**64.4**		**488**							

Leaching Fraction [11]	**0.14**	**12.41 inches**
Leaching Requirement	**0.14**	**12.33 inches**

NOTES:

[1] Water Holding Capacity derived from Soil Survey of Cochise County, Arizona, Northwestern Part (USDA NRCS, 2007).

[2] Initial Soil Water Content based on end of year soil water to provide more realistic irrigation management.

[3] Precipitation is effective precipitation computed from normal precipitation for 1971-2000 at Douglas FAA, AZ (NOAA NCDC, accessed @ http://www.wrcc.dri.edu).

[4] Extraction well water supply assumes 1350 gallons per minute continuous flow, per client. Fraction is portion of total supply diverted for irrigation of these fields.

[5] Gross Irrigation = Volume (MG) x 2.715 MG/acre-inch / Total Acres

[6] Net Irrigation = effective irrigation reaching the soil profile for crop use = Gross Irrigation * Irrigation Efficiency of 90% (assumes low pressure spray application close to ground surface).

[7] Net Total Input = Net Irrigation + Precipitation

[8] Potential evapotranspiration (ET) values were copied from Table 3 for alfalfa hay during April though September and bare soil the rest of the year. Estimated ET is adjusted down from Potential ET to account for soil moisture content = Potential ET x (previous month's Soil Water Content / Soil Water Holding Capacity)1/2

[9] Soil Water = water held in soil for crop use at month end. Dependent on estimated ET, Net Total Input, and previous month Soil Water (does not exceed Soil Water Holding Capacity). Maximum soil water content is soil water holding capacity. Irrigation schedule to maintain at least 50% of soil water holding capacity to sustain alfalfa crop.

[10] Percolate loss: Soil water in excess of the Soil Water Holding Capacity assumed to drain out of the root zone; computed as: Soil water holding capacity - (previous month's Soil Water + Net Total Input - ET estimate). Negative values indicate a deficit and zero percolate loss.

[11] Leaching Fraction = % of gross water input estimated to percolate beyond root zone = Surplus / (Precip + gross irrigation). Leaching Requirement based on flow-weighted EC (precip and irrigation water) using formula by Rhoades, 1982 and 4 mmho/cm target soil EC.

Table 4b. Water Balance for Native Grass Seed Crop Irrigated to Meet Leaching Requirement
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Total Acres: 450
Crop: Native Grass

Soil Type: Libby-Gulch Complex
Soil Water Holding Capacity: [1] 6.92
Initial Soil Water Content: [2] 5.01

Month	Precipitation [3]	Extraction Well Water Supply [4]		Gross Irrigation [5]	Net Irrigation [6]	Net Total Input [7]	Evapotranspiration [8]		Soil Water [9]	Percolate Loss [10] (surplus)
							Potential	Estimate		
	inches	Fraction	MG	inches	inches	inches	inches		inches	inches
Nov	0.54	0.40	23.3	1.91	1.72	2.25	1.32	1.12	6.14	0.00
Dec	0.73	0.40	24.1	1.97	1.78	2.51	0.86	0.81	6.92	0.92
Jan	0.52	0.40	24.1	1.97	1.78	2.29	0.95	0.95	6.92	1.35
Feb	0.45	0.30	16.3	1.34	1.20	1.66	1.19	1.19	6.92	0.46
Mar	0.34	0.30	18.1	1.48	1.33	1.68	1.96	1.96	6.64	0.00
Apr	0.11	0.50	29.2	2.39	2.15	2.26	2.95	2.89	6.00	0.00
May	0.27	0.30	18.1	1.48	1.33	1.60	4.28	3.99	3.62	0.00
Jun	0.60	0.00	0.0	0.00	0.00	0.60	5.20	3.76	0.47	0.00
Jul	2.53	0.15	9.0	0.74	0.67	3.20	3.18	0.82	2.84	0.00
Aug	2.18	0.30	18.1	1.48	1.33	3.51	3.73	2.39	3.96	0.00
Sep	1.26	0.30	17.5	1.43	1.29	2.55	3.36	2.55	3.97	0.00
Oct	1.00	0.40	24.1	1.97	1.78	2.77	2.28	1.73	5.01	0.00
Annual (in)	**10.5**			**18.2**	**16.3**	**26.9**	**31.3**	**24.2**		**2.7**
Annual (MG)	**128.7**		**222**							

Leaching Fraction [11]	**0.095**	**2.73 inches**
Leaching Requirement	**0.094**	**2.70 inches**

NOTES:

[1] Water Holding Capacity derived from Soil Survey of Cochise County, Arizona, Northwestern Part (USDA NRCS, 2007).

[2] Initial Soil Water Content based on end of year soil water to provide more realistic irrigation management.

[3] Precipitation is effective precipitation computed from normal precipitation for 1971-2000 at Douglas FAA, AZ (NOAA NCDC, accessed @ http://www.wrcc.dri.edu).

[4] Extraction well water supply assumes 1350 gallons per minute continuous flow, per client. Fraction is portion of total supply diverted for irrigation of these fields.

[5] Gross Irrigation = Volume (MG) x 2.715 MG/acre-inch / Total Acres

[6] Net Irrigation = effective irrigation reaching the soil profile for crop use = Gross Irrigation * Irrigation Efficiency of 90% (assumes low pressure spray application close to ground surface).

[7] Net Total Input = Net Irrigation + Precipitation

[8] Potential evapotranspiration (ET) values were copied from Table 3 for warm season grass. Estimated ET = Potential ET x (previous month's Soil Water Content / Soil Water Holding Capacity)1/2

[9] Soil Water = water held in soil for crop use at month end. Dependent on estimated ET, Net Total Input, and previous month Soil Water (does not exceed Soil Water Holding Capacity). Maximum soil water content is soil water holding capacity. Irrigation schedule to maintain at least 50% of soil water holding capacity to sustain native grass seed crop.

[10] Percolate loss: Soil water in excess of the Soil Water Holding Capacity assumed to drain out of the root zone; computed as: Soil water holding capacity - (previous month's Soil Water + Net Total Input - ET estimate). Negative values indicate a deficit and zero percolate loss.

[11] Leaching Fraction = % of gross water input estimated to percolate beyond root zone = Surplus / (Precip + gross irrigation). Leaching Requirement based on flow-weighted EC (precip and irrigation water) using formula by Rhoades, 1982 and 4 mmho/cm target soil EC.

Table 5. Land Application Hydraulic and Sulfate Loading Summary
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Site Acres	**675**
Grass Acres	**450**
Alfalfa Acres	**225**

Month	Days	Volume Applied[1]			Sulfate Load[2]		
		Alfalfa	Grass	Site	Alfalfa	Grass	Site
		million gallons			pounds per acre		
Nov	30	35	23	58	1297	432	721
Dec	31	36	24	60	1340	447	745
Jan	31	36	24	60	1340	447	745
Feb	28	38	16	54	1412	303	673
Mar	31	42	18	60	1564	335	745
Apr	30	29	29	58	1081	540	721
May	31	42	18	60	1564	335	745
Jun	30	58	0	58	2162	0	721
Jul	31	51	9	60	1899	168	745
Aug	31	42	18	60	1564	335	745
Sep	30	41	17	58	1513	324	721
Oct	31	36	24	60	1340	447	745
Annual							
Average		**41**	**18**	**59**	**1506**	**343**	**731**
Total	**365**	**488**	**222**	**710**	**18,076**	**4,113**	**8,767**

NOTES:

[1]Volumes were copied from Table 4a for Alfalfa Hay and Table 4b for Native Grass Seed.

[2]Sulfate Loads were calculated as Volume (million gallons) x Concentration (1000 mg SO4/L) / Area (acres).

Table 6a. Land Application Soil Percolate and Sulfate Leaching Summary for Alfalfa Hay Crop
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Area: 225 Acres

Month	Soil Percolate[1]		Soil Sulfate Mass Balance - Alfalfa				
			Load	Crop Removal[2]	Precipitation as Gypsum[3]	Leaching[4]	
	inches	gpm	lbs/ac		lbs/ac	lbs/ac	mg/L
Nov	0.00	0	1297	0	0	0	0
Dec	2.03	278	1340	0	961	1979	4293
Jan	4.06	555	1340	0	1919	3952	4293
Feb	3.74	566	1412	0	1768	3642	4293
Mar	2.59	355	1564	0	1226	2525	4293
Apr	0.00	0	1081	0	0	0	0
May	0.00	0	1564	30	0	0	0
Jun	0.00	0	2162	0	0	0	0
Jul	0.00	0	1899	45	0	0	0
Aug	0.00	0	1564	0	0	0	0
Sep	0.00	0	1513	30	0	0	0
Oct	0.00	0	1340	0	0	0	0
Annual							
Average		**146**					
Annual	**12.41**		**18,076**	**105**	**5,873**	**12,097**	
Sulfate Fraction			**1.000**	**0.006**	**0.325**	**0.669**	

NOTES:

Abbreviations: gpm = gallons per minute, lbs/ac = pounds per acre, mg/L = milligrams per liter.

[1] Soil percolate was copied from water balance estimates in Table 4a.

[2] Sulfate Crop Removal was calculated for alfalfa hay crop assuming an annual dry matter of yield of 7.0 tons per acre (2 tons/ac in May, 3 tons/ac in July, 2 tons/ac in September) which would remove 15 pounds of sulfate per ton.

[3] Sulfate Precipitation as Gypsum calculated as: (Annual Load - Annual Crop Removal - Leaching)*Monthly Soil PercolateAnnual Soil Percolate

[4] Sulfate Leaching is based upon solubility of gypsum in soil water at an estimated ionic strength of 1.20 mol/L. Soil water ionic strength of 1.20 mol/L was calculated by multiplying ionic strength of irrigation water (0.186 mol/L) by a concentration factor of 6.47, which was determined by dividing the predicted soil drainage salinity of 17.6 mmho/cm from Table 4a (base of crop rooting zone) by the electrical conductivity of irrigation water (2.72 mmho/cm).

Table 6b. Land Application Soil Percolate and Sulfate Leaching Summary for Native Grass Seed Cro
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Area: 450 Acres

Month	Soil Percolate[1]		Soil Sulfate Mass Balance - Grass				
			Load	Crop Removal[2]	n as Gypsum[3]	Leaching[4]	
	inches	gpm	lbs/ac		lbs/ac	lbs/ac	mg/L
Nov	0.00	0	432	0	0	0	0
Dec	0.92	252	447	0	479	908	4347
Jan	1.35	368	447	0	701	1328	4347
Feb	0.46	140	303	0	241	456	4347
Mar	0.00	0	335	0	0	0	0
Apr	0.00	0	540	0	0	0	0
May	0.00	0	335	0	0	0	0
Jun	0.00	0	0	0	0	0	0
Jul	0.00	0	168	0	0	0	0
Aug	0.00	0	335	0	0	0	0
Sep	0.00	0	324	0	0	0	0
Oct	0.00	0	447	0	0	0	0
Annual							
Average		**63**					
Annual	**2.73**		**4,113**	**0**	**1,421**	**2,692**	
Sulfate Fraction			**1.000**	**0.000**	**0.346**	**0.654**	

NOTES:

Abbreviations: gpm = gallons per minute; lbs/ac = pounds per acre; mg/L = milligrams per liter.

[1] Soil percolate was copied from water balance estimate in Table 4b.

[2] Sulfate removal by grass seed harvest assumed to be negligible.

[3] Sulfate Precipitation as Gypsum calculated as: (Annual Load - Annual Crop Removal - Leaching)*Monthly Soil Percolate/Annual Soil Percolate

[4] Sulfate Leaching is based upon solubility of gypsum in soil water at an estimated ionic strength of 1.25 mol/L. Soil water ionic strength of 1.25 mol/L was calculated by multiplying ionic strength of irrigation water (0.186 mol/L) by a concentration factor of 6.72, which was determined by dividing the predicted soil drainage salinity of 18.2 mmho/cm from Table 4b (base of crop rooting zone) by the electrical conductivity of irrigation water (2.72 mmho/cm).

Table 7. Soil Water Balance and Sulfate Mass Balance for Land Application System
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Month	Soil Water Balance[1]					Soil Sulfate Mass Balance[2]				
	Precipitation	Application	Evapo-transpiration	Percolate	Change in Storage	Application	Crop Removal	Precipitation as Gypsum	Leaching	Change in Storage
	million gallons					1000's pounds				
Nov	9.8	52.5	42.1	0.0	20.2	486	0	0	0	486
Dec	13.4	54.2	33.0	23.6	11.0	503	0	432	854	-783
Jan	9.5	54.2	22.5	41.2	0.0	503	0	747	1487	-1731
Feb	8.3	49.0	28.8	28.5	0.0	454	0	506	1025	-1077
Mar	6.3	54.2	48.2	15.8	-3.5	503	0	276	568	-341
Apr	2.0	52.5	72.3	0.0	-17.8	486	0	0	0	486
May	5.0	54.2	94.9	0.0	-35.7	503	7	0	0	496
Jun	11.1	52.5	94.7	0.0	-31.1	486	0	0	0	486
Jul	46.4	54.2	63.5	0.0	37.1	503	10	0	0	492
Aug	39.9	54.2	84.6	0.0	9.5	503	0	0	0	503
Sep	23.1	52.5	78.0	0.0	-2.3	486	7	0	0	480
Oct	18.3	54.2	59.9	0.0	12.6	503	0	0	0	503
Annual										
Average	**16.1**	**53.2**	**60.2**	**9.1**						
Annual	**193.1**	**638.6**	**722.5**	**109.2**	**0.0**	**5,918**	**24**	**1,961**	**3,933**	
Sulfate Fraction						**1.000**	**0.004**	**0.331**	**0.665**	

NOTES:

[1] Volumes were computed from depth values (expressed in inches) in Table 4a (225 acres of alfalfa) and Table 4b (450 acres of native grass seed). Volume, million gallons = Depth, inches * Area, acres * 0.027154 million gallons / acre-inch.

[2] Sulfate mass balance values are area-weighted averages of values in Table 4a (225 acres of alfalfa) and Table 4b (450 acres of native grass seed).

Table 8a. 675-Acre Land Application System
Engineers Opinion of Probable Cost for Construction and Startup
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Description	Quantity	Unit of Measure	Unit Costs	Total Amount Quantity x Unit Cost
Direct Costs				
Labor (incl subcontractors)				
Installation of HDPE lined Storage Pond (2.5 MG)	2.5	MG	$100,000	$250,000
Pump Station - Site Preparation [1]	1	ls	$10,000	$10,000
Installation of wet well sump for pumps [2]	1	ea	$25,000	$25,000
Pump station mobilization/labor	1	ls	$20,000	$20,000
Land clearing and grubbing [3]	675	per ac	$50	$33,800
Center Pivot Installation -1019' machines	9	ea	$10,000	$90,000
Center Pivot Installation (800' machines)	2	ea	$9,000	$18,000
			Subtotal	**$446,800**
Materials				
Stainless (SS) steel pipe and fittings at pump station	2	ea	$10,000	$20,000
Piping 6 inch PVC 125 psi [4]	2,500	lf	$9	$22,500
Piping 8 inch PVC 125 psi [4]	8,550	lf	$11	$94,100
Piping 10 inch PVC 125 psi [4]	6,400	lf	$16	$102,400
Piping 12 inch PVC 125 psi [4]	2,900	lf	$18	$52,200
Piping 14 inch PVC 125 psi [4]	2,400	lf	$22	$52,800
Piping 15 inch PVC 125 psi [4]	9,400	lf	$24	$225,600
Electrical pivot power cable [5]	12,890	lf	$8	$103,100
			Subtotal	**$672,700**
Equipment				
Skid mounted pump system [6]	1	ea	$256,300	$256,300
SS Filter and backflush controls	2	ea	$10,000	$20,000
Wireless pump station main relay control	1	ea	$5,000	$5,000
Check Valves	8	ls	$2,000	$16,000
Gate Valves	8	ls	$2,000	$16,000
Steel Pipe Sleeve Crossings (Roadways & Utilities) [7]	4	ea	$1,500	$6,000
Center Pivot - 1,019' Model 8000P Poly Span	9	ea	$100,300	$902,700
Sprinkler packages - 1019' machines	9	ea	$7,000	$63,000
Center Pivot - Full Circle (800' Model 8000P Poly Span)	2	ea	$82,000	$164,000
Sprinkler packages - 800' machines	2	ea	$6,000	$12,000
Wireless pivot controls	11	ea	$2,000	$22,000
Pivot control valve, flow meter, air relief, pivot pipe	11	ea	$10,000	$110,000
Pivot Remote Control (software/hardware)	1	ea	$25,000	$25,000
			Subtotal	**$1,618,000**
Contingency (30% of Direct Costs)				**$821,300**
Total Direct Costs (+30%/-50%)				**$3,558,800**

Table 8a. 675-Acre Land Application System
Engineers Opinion of Probable Cost for Construction and Startup
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Description	Quantity	Unit of Measure	Unit Costs	Total Amount Quantity x Unit Cost
Indirect Costs [2]				
Engineering (10% of Direct Cost)	1	ls	$355,900	$355,900
Legal and Administrative (5% of Direct Cost)	1	ls	$177,900	$177,900
Permitting (5% of Direct Cost)	1	ls	$177,900	$177,900
Construction Management (10% of Direct Cost)	1	ls	$355,900	$355,900
Spare parts - startup and first year operation [8]	1	ls	$ -	$0
Transportation and Freight [9]	1	ls	$ -	$0
Total Indirect Costs [2]				**$711,700**

NOTES:

Cost estimates as of May 1, 2013, and are subject to change. Does not including bonding, state, or federal tax.

Abbreviations: AC = air conditioning, HDPE = high density polyethylene, MG = million gallons, ls = lump sum, lf = linear feet, ea = each, psi = pounds per square inch, PVC = polyvinyl chloride pipe, VFD = variable frequency drive.

[1] Site leveling, excavation, and final grading.

[2] Wet well sump connected to pond.

[3] Land clearing of existing vegetation and leveling of irregular soil surfaces.

[4] Water delivery pipeline from recovery wells to pump station provided by others. Assume pipeline installed 36 inches below surface grade through pivot fields. Anticipate excavation of cemented material and gravels and cobbles. Cost includes pipe, fittings, excavation, installation and freight (FOB Tuscon).

[5] Electrical pivot control cable based on six -#12 copper conductors. Electrical pivot power cable based on 3-#4/0, 1-#2 aluminum with 2- #12 conductors in conduit. Electrical service (3 phase 480 volts) to pump station provided by others. Electrical line installed in separate trenches across fields. Main electrical service consisting of overhead lines, transformers and electrical drop to pivot locations provided by others.

[6] Two (2) 100 horsepower turbine pumps at 1,350 gallons per minute, 215 total dynamic head and 80% Efficiency. VFD, soft start and fully enclosed system.

[7] Crossings of roadways, natural gas, and existing water mains to be sleeved with Schedule 40 Steel Casing Pipe

[8] No additional equipment or materials should be necessary during startup or within the first year of operation.

[9] Transportation and freight are included in equipment and material cost estimates for this conceptual-level cost estimate.

Table 8b. 675-Acre Land Application System
Engineers Opinion of Probable Operation and Maintenance Costs
Freeport-McMoRan Corporation, Bisbee, Arizona

Annual System Operation and Maintenance Costs				
Electrical Power (pump) [1]	2	per year	$30,600	$61,200
Electrical Power (pivot) [2]	11	per year	$493	$5,400
Pump System - Maintenance	2	per year	$5,000	$10,000
Irrigation System - Service/Maintenance	11	per year	$1,500	$16,500
Pivot Poly Span Replacement (20 year cycle)[3]	2.6	per year	$11,299	$28,900
Gearbox/Motor/Shaft Replacement (15 year cycle)	3.8	per year	$1,666	$6,400
Riser Pipe/Lower Elbow Replacement (10 year cycle)	1	per year	$8,040	$8,000
Farming Expenses - Labor, Crop Establishment, Monitoring[4]	1	per year	$522,159	$522,200
Farming Income - Crop Revenue	1	per year	-$644,000	-$644,000
Total Annual O&M				**$14,600**

NOTES:

Abbreviations: hp = horsepower, kw = kilowatt, hr = hour, yr = year, kwh = kilowatt-hour, I = interest, % = percent, O&M = operation and maintenance

[1] Electrical power cost calculated for two pump based on: 100 hp (75 kw) X 5,100 hr/yr X $0.08 / kwh

[2] Electrical power cost calculated for one pivot based on: 7.5 hp (5.6 kw) per pivot X 1,100 hr/yr X $0.08 / kwh
Energy rate is estimated at $0.08 / kwh per client.

[3] Irrigation system replacement costs calculated on a annual basis per pivot assuming a 50-year project life. Replacement cycle for each system component group varies from 10 to 20 years.

[4] Assumes 225 acres of site planted in alfalfa and 450 acres planted in wheat or native grass seed. Refer to Attachment 1, 2, and 3 for Contract Farmer, Operation and Monitoring, Crop Cost and Crop Revenue estimates.

Figure

PIVOT TABLE			
PIVOT	Northing	Easting	Acreage
1	133000.13	775737.57	46.2
2	132762.71	778264.81	75.0
3	131939.46	779125.08	33.6
4	133884.18	781546.63	75.0
5	131471.17	775117.27	46.2
6	130755.43	776188.48	46.8
7	128765.43	775688.48	75.0
8	128762.01	776992.41	52.2
9	130790.06	784245.81	75.0
10	128744.33	782098.91	75.0
11	128744.33	784150.49	75.0

NOTE: COORDINATES SHOWN ARE REFERENCED TO NAD83 ARIZONA STATE PLANE EAST

FENCE CORNER
(N134312.9, E776984.9)

NEW DITCH TO RE-ROUTE EXITING DRAINAGE SWALE

ACCESS ROAD

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11

PR-0 PR-1 PR-2 PR-3 PR-4 PR-5 PR-6 PR-7 PR-9

8" PIPELINE
6" PIPELINE
10" PIPELINE
12" PIPELINE
14" PIPELINE
15" PIPELINE
UGE

48 MILLION GALLON EVAPORATION POND

SAN JOSE WASTEWATER TREATMENT PLANT

STORMWATER RECHARGE BASINS

BLACK GAP FAULT

BORROW PIT

NACO HWY

STORAGE POND (2.5 MILLION GALLON)

PUMP STATION

EXISTING STORMWATER SWALE

PURDY LANE @ NACO HWY
(N127685.3, E771982.3)
W PURDY LANE

SOUTH BISBEE JUNCTION ROAD

PACIFIC SOUTHERN

EXPLANATION

- PROPERTY BOUNDARY (APPROXIMATE)
- BLACK GAP FAULT (APPROXIMATE)
- SWALE
- WATERLINE (IRRIGATION)
- PR-3 PROPOSED WELL SITE
- FLOOD HAZARD AREA (ZONE A)
- J ELECTRICAL JUNCTION
- UGE UNDERGROUND ELECTRIC

(SOURCE: USGS Topo Quad Map and Bing Aerial from ArcGIS Desktop 10, ©ESRI 2013)

N

0 1000'
1"=1000'
(SCALE AND LOCATIONS ARE APPROXIMATE)

Figure 1. Land Application System Layout Map - Alternative 4

PROJECT NUMBER: 2012220017	Land Application Feasibility Study
DATE: 5/8/2013	
DWG NO: 2012220017 F1 Alt 4.dwg	Copper Queen Branch, Freeport-McMoran Corporation
DWG BY: 6RKB / PROJECT MANAGER: 5DJB	36 West Highway 92
REVISED:	Bisbee, Arizona 85603
	CES CASCADE EARTH SCIENCES A Valmont Industries Company

S:\[Working Drafting]\2012220017 Freeport McMoran\Drawings\2012220017 F1 Alt 4.dwg May 8, 2013 RKB

Attachments

Attachment 1. Farming Income and Expense Summary
Contract Farmer Pay for Performance
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Annual Average Income and Expenses			Source
Income	Crop Revenues	$ 644,000	Att 3
	Subtotal	**$ 644,000**	
Expenses	Labor	$ 128,450	Att 2
	Pay for Performance Incentive[1]	$ 128,800	
	Farm Operations (Contractor)		Att 3
	Crop Establishment	$ 73,229	
	Crop Transportation	$ 80,726	
	Crop Harvest	$ 91,200	
	Site Operations		Att 2
	Field Vehicle	$ 3,450	
	Disposables	$ 4,000	
	Monitoring		Att 2
	Groundwater[2]	$ -	
	Crop	$ 1,254	
	Soil	$ 1,050	
	Consulting[3]		
	General Ag Consulting and Annual Report Preparation	$ 10,000	
	Subtotal	**$ 522,159**	
Annual Gross Profit[4]		**$ 121,841**	

NOTES:

[1] Pay for performance equals 20% of crop revenue as bonus above base pay level. However more revenue could be shared based on the actual incentive program developed.

[2] Cost for groundwater samples collection and analysis will be covered by existing monitoring program.

[3] Consulting is an estimate for reporting and limited general technical advice and does not include site permitting, design, or special projects services.

[4] Does not account for cost of land, capital infrastructure development, and power consumption.

Attachment 2. **Farm Operation and Monitoring Expenses**
Contract Farmer Pay for Performance
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

Operations[1]	
Irrigation Operator[2]	$ 45,240
Site Manager[2]	$ 83,210
Field Vehicle[3]	$ 3,450
Disposables[4]	$ 4,000
Total	**$ 135,900**

Monitoring	Frequency/ Type	Number of Fields	Samples per Field	Sampling Events per Year	Total Number of Samples	Analysis Cost per Sample	Total
Groundwater[5]	Quarterly	0	1	4	0	$ 405	$ -
	Annual	0	1	1	0	$ 1,444	$ -
Soil[6]	Bi-Annual	11	1	2	22	$ 75	$ 1,650
Crop Tissue[7]	Alfalfa	3	1	5	15	$ 114	$ 1,710
	Wheat	8	1	1	8	$ 114	$ 912
						Subtotal	**$ 4,272**

NOTES:

[1] FMI will provide site management objectives and BMP for contract farmer to achieve.

[2] Irrigation Operator and Farm Manager costs includes base wage, estimated benefits, overhead, and profit. It is assumed that the Operator and the Farm Manager will be employed 40 hours per week. Labor costs were determined by using the average from Cochise County, Arizona Department of Commerce 2011 and adding 50% to account for benefits, taxes, profit, and overhead costs.

[3] Field vehicle is a farm suitable ATV with an expected life of 7+ years. Cost are included for usage, gas, and maintenance.

[4] Disposables include field supplies, patch seeding, sample shipping, etc. These items are consumed annually and require replacement each year.

[5] Groundwater sample collection and testing, if required, is provided as part of normal plume monitoring program.

[6] Soil monitoring is conducted by the contract operator twice per year, two locations per field and six depths per location.

[7] Crop tissue samples are collected by contract operator at each harvest and submitted to laboratory.

Attachment 3. **Projected Crop Revenues**
Contract Farmer Pay for Performance
Freeport-McMoRan Corporation, Copper Queen Branch, Bisbee, Arizona

YEAR 1								
Revenue								
Crop	**Acres[1]**	**Yield per Acre[2]**	**Total Yield**	**Value[2] (price/yield unit)**	**Raw Crop Revenue**	**Transportation Cost[3]**	**Harvest Cost[4]**	**Gross Revenue[5]**
Alfalfa	225	4.0	900	$ 157	$ 141,600	$ 22,761	$ 45,000	$ 73,839
Wheat	450	112	50,400	$ 7.53	$ 379,680	$ 38,238	$ 7,200	$ 334,242
Subtotal					**$ 521,280**	**$ 60,999**	**$ 52,200**	**$ 408,081**

Crop Establishment Expenses[6]								
Crop	**Acres Planted**	**Tilling**	**Planting**	**Seed**	**Fertilizer[7]**	**Pesticide Herbicide[8]**	**Total**	**Total**
		cost per acre						**cost per year**
Alfalfa	225	$ 10.00	$ 10.00	$ 50.00	$ 100.00	$ 40.00	$ 210.00	$ 47,250
Wheat	450	$ 14.13	$ 3.77	$ 39.88	$ 45.43	$ 22.52	$ 125.73	$ 56,579
Subtotal								**$ 103,829**
Projected Net Revenue - Year 1								**$ 304,252**

YEARS 2-5								
Revenue								
Crop	**Acres[1]**	**Yield per Acre[2]**	**Total Yield**	**Value[2] (price/yield unit)**	**Raw Crop Revenue**	**Transportation Cost[3]**	**Harvest Cost[4]**	**Gross Revenue[5]**
Alfalfa	225	8.3	1,875	$ 157	$ 295,000	$ 47,419	$ 93,750	$ 153,831
Wheat	450	112	50,400	$ 7.53	$ 379,680	$ 38,238	$ 7,200	$ 334,242
Subtotal					**$ 674,680**	**$ 85,657**	**$ 100,950**	**$ 488,073**

Crop Establishment Expenses[6]								
Crop	**Acres Planted**	**Tilling**	**Planting**	**Seed**	**Fertilizer[7]**	**Pesticide Herbicide[8]**	**Total**	**Total**
		cost per acre						**cost per year**
Alfalfa	225	$ -	$ -	$ -	$ -	$ 40.00	$ 40.00	$ 9,000
Wheat	450	$ 14.13	$ 3.77	$ 39.88	$ 45.43	$ 22.52	$ 125.73	$ 56,579
Subtotal								**$ 65,579**
Projected Net Revenue Per Year - Years 2 -5								**$ 422,494**

NOTES:

[1] Years 1 - 5 will have 2 pivots irrigating 150 acres planted to alfalfa. After year 5 a new alfalfa crop will rotated to wheat on rotation from wheat.

[2] Yield units are tons of dry matter for alfalfa and bushels of wheat. Harvest projection based on United States Department of Agriculture (USDA) National Agriculture Statistics Service (NASS) yields and prices for 2009-2011 in Arizona.

[3] Assumes a 90 mile transportation haul at a rate of $0.281/ton-mile. This value is based on CES professional experience and a search of estimated shipping from uShip Shipping Price Estimator (www.uship.com) on July 30, 2009.

[4] Harvest costs were estimated at $50 per ton for alfalfa to hay cut, rake, turn, bale, and load (professional judgement), and $16 per acre to harvest wheat (Univ AZ, 1998, Income and Cash Operating Summary for Durum Wheat, Cochise County). Price per ton will vary depending on yields, labor and fuel costs.

[5] Equals Raw Crop Revenue minus Transportation and Harvest Costs.

[6] Alfalfa establishment costs include seed cost at $2 per pound planted at 25 pounds per acre.

[7] Fertilizer for alfalfa establishment is based on 100 pounds of nitrogen with a micronutrient supplement application to assist in crop establishment.

[8] Herbicide and pesticide cost for alfalfa assume one application per field per year for materials (costs for application are included separately as farm expenses)

APPENDIX F

DESIGN BASIS MEMORANDA AND BUDGETARY COST ESTIMATES FOR CIVIL, MECHANICAL, AND ELECTRICAL SYSTEMS OF MITIGATION ALTERNATIVES BY WESTLAND RESOURCES, INC.

APPENDIX F

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APPENDIX F.1

DESIGN BASIS MEMORANDUM AND BUDGETARY COST ESTIMATE FOR FMI COPPER QUEEN BRANCH MITIGATION ALTERNATIVE NO.2

MEMORANDUM

EXPIRES 9/30/2013

Prepared for: James R. Norris, R.G., Clear Creek Associates

Prepared by: Mark F. Taylor, P.E., WestLand Resources, Inc.

Date: July 11, 2013

CC: Erik Christenson, E.I.T., Westland Resources, Inc.

Project No.: **DESIGN BASIS MEMORANDUM AND BUDGETARY COST ESTIMATE FOR FMI COPPER QUEEN BRANCH MITIGATION ALTERNATIVE NO.2**
WESTLAND PROJECT NO. 260.17 07 07

EXECUTIVE SUMMARY

WestLand Resources, Inc. (WestLand) was retained by Clear Creek Associates (Clear Creek) to construct conceptual designs for the wellfield, transmission piping, electrical transmission, radio-telemetry coordination, and low-voltage equipment; and to provide feasibility-level cost estimates for distinct alternatives to mitigate a groundwater sulfate plume.

These cost estimates include both initial capital costs, and annual operations and maintenance (O&M) costs of the alternatives. This memorandum was prepared to demonstrate the analysis used to prepare the conceptual designs, as well as list the assumptions made in determining a budgetary cost. Cost estimates for equipment and materials are based upon manufacturers' quotes, governmental agency cost estimation recommendations, and on prices observed from similar projects completed by WestLand, Richard Canney Engineering (RCE), and Hanlon Engineering (Hanlon). Estimated major equipment replacement schedules not included in the annual O&M are provided to assist FMI to estimate and plan for future capital expenditures.

Alternative 2 is comprised of four wells designed and located by Clear Creek to stabilize the sulfate plume and prevent further expansion. These wells pump elevated sulfate groundwater through a collection pipeline system to a 2.5 million gallon (MG) storage pond, which serves as temporary storage for a water treatment plant where the groundwater is treated through a reverse osmosis (RO) system.

The cost estimate and concept design for the water treatment plant were prepared by MWH and described in a memorandum entitled *Bisbee Arizona Copper Queen Mine Groundwater Treatment/Management Alternative.* This RO system is intended to separate the groundwater from the wells into low-sulfate effluent and high-sulfate brine. The low-sulfate treated water is to be pumped at a rate of approximately 715 gallons per minute (gpm) via the three-pump Greenbush Booster Station to be discharged into Greenbush Draw at a location west of Naco, Arizona. The high sulfate brine is pumped to an evaporation pond for disposal.

The Alternative 2 Mitigation Wellfield, including well locations, collection pipeline locations, treated discharge piping, standpipe, and reservoir delivery location are shown in ***Figure 1.*** A feasibility cost estimate for the portions of the project contained within this memo is included as ***Attachment 1***.

1. WELLFIELD BASIS

1.1. WELL DESIGN

The new mitigation well field will consist of four new wells. All well locations and flow rates were set by Clear Creek and are intended to accomplish the groundwater mitigation objective per groundwater modeling results.

1.1.1. Well Overview

All new wells 100 gpm or less will be equipped with submersible pumps. All new wells greater than 100 gpm will be vertical turbine line shaft pumps. Well site design will be typical per the American Water Works Association (AWWA) A100 unless otherwise specified. Typical site manifolds will include a check valve, well service air release valve, flow meter, isolation valve, and a pressure relief valve.

1.1.2. Column Pipe and Casing Selection

WestLand's cost estimate assumes stainless steel is used for all well components in contact with groundwater. The elevated sulfate levels in the groundwater create a solution that is corrosive to carbon steels, limiting their expected life cycle. The increased initial expense of 304 stainless steel casing is likely to be counterbalanced by its longer expected life due to increased corrosion resistance.

The depth of drilling was determined to be 40 feet (ft) below bedrock as determined by Clear Creek. A 304 stainless steel casing will be installed along the entire depth of drilling, with well screen installed as designed by Clear Creek. The column pipe length was determined to be approximately 100 ft below the dynamic pumping water surface level at maximum drawdown.

The well column pipe was designed to maintain a velocity between 3 ft per second (fps) and approximately 5.25 fps. This velocity is sufficient to prevent sand in the water column from settling out and clogging the pump bowls, but is slow enough to prevent excessive head loss due to friction losses in the column pipe.

The casing size was determined to be a minimum of 2-inches in diameter greater than the likely nominal bowl size of the submersible pump, rounded up to the nearest common pipe diameter. The estimated borehole diameter is approximately 16-inches in diameter. ***Table 1.1.2*** lists the size of the well components in Alternative 2:

Table 1.1.2. Well Column Pipe Sizing

Well ID	Flow (gpm)	Column Size	Column Velocity	Nominal Bowl Size	Casing Size	Borehole Size
FS-1	240	6	3.06	8	10	12
FS-2	400	6	5.11	8	10	12
FS-2*	100	3	4.54	5	8	10
FS-4*	100	3	4.54	5	8	10

*denotes a submersible pump

1.1.3. Total Dynamic Head Calculation

The Total Dynamic Head (TDH) is the total equivalent height that the groundwater is to be pumped, and is a measurement of the pressure head added to the groundwater by the pump. Well TDH is the sum of the static head and the head losses, and the units are in feet. The static head is the difference in elevation between the groundwater surface level and the pressure sustaining valve high water elevation. The head losses are the loss of energy due to friction of the water against the pipe, column pipe, valves, and bends.

Estimated pumping water levels for initial and future conditions of Alternative 2 were provided by Clear Creek. ***Table 1.1.3*** shows the initial and final dynamic pumping depths, which is a portion of the static head. The remainder of the static head is the difference in elevation between the well discharge and the inlet to the 2.5 MG pond. Because several of the mitigation well sites are higher in elevation than the inlet to the 2.5 MG pond, a pressure sustaining valve was added to the inlet of this pond to ensure that the well pumps are pumping against pressure and do not flow from gravity. This prevents the pipeline from draining to the tank when the well pumps are shut off. For hydraulic calculations, this pressure sustaining valve was set to maintain at least 40 psi (92 ft of static head) at the inlet to the treatment plant. Hydraulically, this has the effect of adding 92 ft to the static head required to supply water to the pond.

A hydraulic computer model for the Alternative 2 Well Field and the well collection pipeline string was created in WaterCAD V8i to determine TDH. An AutoCAD base was used to trace the proposed pipeline alignments, and approximate elevations at junctions and reservoirs were entered into the model. The anticipated well flow rates were entered into the model using inflow junctions which input a specified flow rate regardless of junction pressure. Model iterations were performed to determine pipe sizes per the pipeline design criteria. This model was then used to determine well head pressures. Preliminary Well pumps and motors sizes were selected using the calculated discharge pressures at the specified flow rate.

The TDH for each well was calculated as the sum of the static head from the water surface of the well to the well head, the static head from the well head to its delivery location, the head necessary to allow flow through the pressure sustaining valve at the inlet to the 2.5 MG pond, and the head losses incurred by pumping the water through the column pipe and distribution pipes.

The initial well head pressure tabulation is shown in ***Table 1.1.3.*** All estimated dynamic pumping levels were determined by Clear Creek.

Table 1.1.3. TDH Estimates

Well ID	Static Head from Reservoir to Pressure Sustaining HW Elevation (ft)	Pipeline and Column Losses (ft)	Initial Dynamic Pumping Depth (ft)	Final Dynamic Pumping Depth (ft)	Initial Total Dynamic Head (ft)	Final Total Dynamic Head (ft)
FS-1	56	39	235	279	330	374
FS-2	93	27	200	238	320	358
FS-3	108	48	184	211	340	367
FS-4	85	28	206	238	319	351

1.1.4. Horsepower Calculation

The new well field will be equipped for initial conditions with some provisions for future projected conditions. Calculated horsepower (HP) is determined by the following equation, with an assumed pump efficiency (η_{pump}) of 85 percent.

Equation 1.1.4

$$Power\ (HP) = \frac{(Final\ TDH) \times (Flow)}{(3960)(\eta_{pump})}$$

The Motor HP column in ***Table 1.1.4*** will be used to size the pump, motor, starter, other onsite 480V electrical equipment, wiring and conduit, including the transformer.

Well TDH values tabulated in ***Table 1.1.3*** and HP's calculated using those TDH's are subject to change pending the new information, including well pump tests which will be done after the wells are drilled. All values shown are per the best available information known to date.

Table 1.1.4. Well HP and Column Pipe

Well ID	Flow (gpm)	Final TDH (ft)	Calculated HP	Motor HP
FS-1	240	374	27	30
FS-2	400	358	43	50
FS-2	100	367	11	15
FS-4	100	351	10	15

1.2. DESIGN CRITERIA – PIPELINE DESIGN

1.2.1. Pipeline Sizing

In Alternative 2, the Mitigation Well Field collection pipeline layout and treated effluent main are

arranged as shown in ***Figure 1.*** The total pipe lengths required for the pipelines in Alternative 2 are shown in ***Table 1.2.1***.

Table 1.2.1. Pipe Table -WaterCAD v8

Label	Nominal Pipe Size (in)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Head Loss (ft)	Length (ft)
P-1	8	6.96	400	3.37	2.02	400
P-2	4	3.63	100	3.09	2.05	225
P-3	4	3.63	100	3.09	21.55	2,350
P-4	10	8.68	640	3.47	2.26	550
P-5a	12	10.29	840	3.24	0.07	22
P-5b	12	10.29	840	3.24	0.02	8
P-6	6	5.35	200	2.86	6.85	1,350
P-7	6	5.35	240	3.43	14.61	2,060
TE-1	10	8.678	715	3.88	27.66	12,725
TE-2	10	8.678	715	3.88	NA	2,335

The Mitigation Well Field collection pipeline and the treated effluent pipeline are sized to maintain a head loss gradient of less than 3 ft of head loss per 1000 ft of pipe (using a Hazen-Williams coefficient of 150), and ideally maintain velocities less than 5 fps.

1.2.2. Pipeline Material

Pipe material for all well transmission pipelines will be DR 11 HDPE 4710. DR 11 pipe has a thick wall which allows the pipe to be more self-supporting and durable. Additionally, the pipe has a pressure rating of 202 psi, which is de-rated to 131 psi (65 percent of working pressure for a test temperature of 140 degrees Fahrenheit) when laid at grade and exposed to the sun (Plastic Pipe Institute, TR-3, 2010).

1.2.3. Pipeline Installation Methods

New pipeline will be installed below ground in all locations as requested by FMI personnel. All below ground pipe will be installed at a 4-foot minimum depth with tracer wire and magnetic tape. The pipeline is assumed to be installed in an open trench with screened and compacted native backfill except at locations where the pipe crosses existing or new utilities or conduits larger than 3-inches in diameter, where the backfill is aggregate base course on both sides of the intersecting pipe.

1.3. DESIGN CRITERIA – GREENBUSH BOOSTER STATION

The discharge of the RO Water Treatment Plant requires that approximately 715 gpm be delivered to Greenbush Draw. The alignment determined by WestLand and Clear Creek makes a gravity discharge unfeasible, and instead a booster station concept is proposed.

The proposed Greenbush Booster Station will consist of three short-set vertical turbine can pumps which will draw from a small reservoir at the RO Water Treatment Plant. These pumps will be designed to deliver approximately 400 gpm each, and will operate either one or two at a time in parallel depending on the water level of the RO discharge reservoir.

The booster station will not be designed to run two pumps at a time. The control programming for the booster pumps will rotate pumps such that all pumps run equally, but will never allow three pumps to run at once. All electrical equipment and the pipeline are sized for a maximum of two pumps running simultaneously.

This booster station will pump to a concrete standpipe open to the atmosphere. This standpipe will then drain through gravity to the Greenbush Draw discharge.

1.3.1. Total Dynamic Head Calculation

A hydraulic computer model for a pipeline between Greenbush Booster Station and pipeline string was created in WaterCAD V8.i. The anticipated booster flow rate was entered into the model using inflow junctions which input a specified flow rate regardless of junction pressure. Model iterations were performed to determine pipe sizes per the pipeline design criteria.

The Greenbush Booster Station is higher in elevation than the proposed standpipe, therefore, a pressure sustaining valve was added to standpipe inlet to ensure that the pumps are pumping against pressure and do not flow from gravity. This pressure sustaining valve was set to maintain at least 40 psi (92 ft of head) at the inlet to the standpipe

The TDH for the booster station was calculated as the sum of the static head from the pump station to its delivery location at the standpipe, the head necessary to allow flow through the pressure sustaining valve at the inlet to the RO Water Treatment Plant, and the head losses incurred by pumping the water through the manifold and 16-inch transmission pipe. The TDH was calculated as follows:

Table 1.3.1. TDH Estimates - Alternative 2

Pump Station	Static Head from Pump Station to Pressure Sustaining HW Elevation	Pipeline Losses (ft)	Assumed Manifold Losses (ft)	THD (Initial)
Greenbush Booster Station	17	65	20	102

1.4. DESIGN CRITERIA – 480 VOLT WELL POWER SYSTEM

Each well will be served 480 volt, 3 phase, 4 wire power from a dedicated pad mounted transformer near each well site. The source of power will be from the mine's high voltage distribution system described elsewhere in this report. The 480 volt service will be fed underground directly to a fused main disconnect switch. The size of each well service will be rated 200 amperes. No provisions for power metering of the service will be made as is typically required when obtaining power from a utility company.

Electrical and control equipment will be mounted on a steel equipment rack which will incorporate sheathing on the rear and on a top structure to provide shade. At all sites, power from the main disconnect switch will feed to an overhead wireway on and through power terminal blocks in the wireway to each piece of equipment using 480 volt power.

A high capacity surge protection unit will be connected to the incoming 480 volt system to provide surge protection for electrical equipment. A single phase, 480-120/240 volt, 10kVA mini-power distribution center will be provided at each well to supply 120/240 volt power to miscellaneous loads including lighting, receptacles and control equipment.

An Allen-Bradley SMC Flex electronic soft start control panel with fused power disconnect switch and bypass contactor will be provided for well pump control. Air conditioning will not be provided for the panel as minimal heat will be generated due to the use of the bypass contactor. Detailed well control features are described elsewhere in this report.

Each well will be provided with power factor correction capacitors to address poor power factor conditions. These capacitors will prevent penalties from being charged by the utility company by reducing the capacity of the facilities the utility company would have to provide to serve a poor power factor load. The capacitors will be installed on the line side of the electronic soft start controllers as placing them on the load side, where they would only be connected when the well runs, is not recommended due to the soft start electronics. A contactor will be provided that will connect the capacitors only when the well pump is running.

All electrical panels will be lockable. Electrical equipment will be rated NEMA 3R where located outdoors.

1.5. DESIGN CRITERIA – WELL CONTROL SYSTEM

Well pumps will utilize electronic soft start controllers with bypass contactors. Well controls will be interfaced with a Programmable Logic Controller (PLC) control panel described in more detail elsewhere in this report. A hand-off remote switch on the front of the well control panel will allow for either local manual control of the well or fully automated control via the PLC system. A green "Run" pilot light, red "High Pressure Cutoff" alarm pilot light, high pressure cutoff reset pushbutton and an elapsed run time meter will also be provided on the front of the well control panel behind a lockable door.

Each well will have a high discharge pressure switch located on the discharge piping to shut the well pump off on high pressure conditions. This switch will be connected to a time delay relay in the well control panel which will latch on when a high pressure condition is monitored for the set time. Normally the time setting will be zero to provide instant shutdown of the well on high pressure. However, if high pressure surges are present on starting of the well, a small time delay can be set to allow such disturbances to pass. If this high pressure shutdown function trips the well pump off, the operator will need to press the reset pushbutton on the front of the control panel before the well pump can be restarted.

The PLC panel, described elsewhere in this report, will provide 3-wire control of the well pump when operating in the "Remote" control mode. In this configuration, the PLC panel provides two relay contact outputs to the well control panel. A normally open contact will pulse closed to start the well pump, and the well controls will latch on via a normally closed contact from the PLC panel. The well pump is stopped by pulsing the normally closed contact open.

The wells will not be provided with anti-reverse ratchets. The 777 relay, described below, will prevent rapid restarting of a pump upon stopping so that the pump cannot restart while it is spinning backwards due to the falling water column in the well. No provisions will be made for automatic control of well pump lineshaft lubrication. The operator will need to manually control and monitor the flow of lubricant.

The well pumps controls will incorporate a Symcom 777 power monitoring relay that provides several safety features including low and high voltage, loss of phase, over and undercurrent, and restart time delay to prevent starting during pump backspin after stopping. The PLC panel will monitor well pump motor parameters such as voltage and amperage via RS-232 communication connection to the 777 relay.

A magnetic flow meter will be installed on the discharge of each well. The PLC panel will monitor the flow meter and will shut down the well pump if a flow rate that is too low is detected to provide failure to pump protection, and will shut down the well pump if a flow rate that is too high is detected to provide discharge line break protection. Reverse flow detection from the flow meter will provide a well discharge check valve failure alarm. A totalizer pulse will also be sent to the PLC panel to provide a total flow value.

Each well will be provided with a well water level transmitter to allow monitoring of well level via the PLC/telemetry system

1.6. WELL PLC AND INSTRUMENTATION EQUIPMENT

A new PLC panel will be installed at each well site. These panels will utilize Allen-Bradley CompactLogix programmable logic controllers to provide control and monitoring functions. PLC panels at each well site will also incorporate an operator interface display panel to allow an operator to monitor system operation and provide manual control input at the panel. This display may be omitted at some of the well sites where a display panel is provided at a nearby well site that can easily be accessed by operators.

The programmable controllers will communicate using spread spectrum radios. The PLC panel will be in a 48"H x 36"W x 16"D NEMA 4/12 rated enclosure with internal light, lockable door and will be provided with an APC uninterruptable power supply. The operator interface display panel, where provided, will be located on a swing out door behind the exterior door to protect the display from the elements and to prevent exposure of the operator to energized components when the exterior door is open.

1.7. 480 VOLT BOOSTER PUMPING STATION POWER SYSTEM

Each booster pumping station will be served 480 volt, 3 phase, 4 wire power from a dedicated pad mounted transformer near each site. The source of power will be from the mine's high voltage distribution system described elsewhere in this report. The 480 volt service will be fed underground directly to a fused main disconnect switch. The size of each service will be rated 200 amperes. No provisions for power metering of the service will be made as is typically required when obtaining power from a utility company.

Electrical and control equipment will be mounted on a steel equipment rack which will incorporate sheathing on the rear and on a top structure to provide shade. At all sites, power from the main disconnect switch will feed to an overhead wireway on and through power terminal blocks in the wireway to each piece of equipment using 480 volt power.

A high capacity surge protection unit will be connected to the incoming 480 volt system to provide surge protection for electrical equipment. A single phase, 480-120/240 volt, 10kVA mini-power distribution center will be provided at each well to supply 120/240 volt power to miscellaneous loads including lighting, receptacles and control equipment.

An Allen-Bradley SMC Flex electronic soft start control panel with fused power disconnect switch and bypass contactor will be provided for booster pump control. Air conditioning will not be provided for the panel as minimal heat will be generated due to the use of the bypass contactor. Detailed well control features are described elsewhere in this report.

Each booster pump will be provided with power factor correction capacitors to address poor power factor conditions. These capacitors will prevent penalties from being charged by the utility company by reducing the capacity of the facilities the utility company would have to provide to serve a poor power factor load. The capacitors will be installed on the line side of the electronic soft start controllers as placing them on the load side, where they would only be connected when the well runs, is not recommended due to the soft start electronics. A contactor will be provided that will connect the capacitors only when the well pump is running.

All electrical panels will be lockable. Electrical equipment will be rated NEMA 3R where located outdoors.

1.8. BOOSTER STATION PLC AND INSTRUMENTATION EQUIPMENT

A PLC panel will be installed at each Booster Pumping Station. This panel will utilize an Allen-Bradley CompactLogix programmable logic controller to provide control and monitoring functions. The PLC panel will also incorporate an operator interface display panel to allow an operator to monitor system operation and provide manual control input at the panel.

The programmable controller will communicate via spread spectrum radio. A central computer located at the mine's offices can be added to allow operators to monitor and control the system from that location. This central computer would also provide alarms and storage of data such as flows and well levels.

The PLC panel will be in a 48"H x 36"W x 16"D NEMA 4/12 rated enclosure with internal light, lockable door and will be provided with an APC uninterruptable power supply. The operator interface display panel will be located on a swing out door behind the exterior door to protect the display from the elements and to prevent exposure of the operator to energized components when the exterior door is open.

Each booster pump will have a high discharge pressure switch located on the discharge piping to shut the pump off on high pressure conditions. This switch will be connected to a time delay relay in the pump control panel which will latch on when a high pressure condition is monitored for the set time. Normally the time setting will be zero to provide instant shutdown of the pump on high pressure. However, if high pressure surges are present of starting of the pump or other condition, a small time delay can be set to allow such disturbances to pass without tripping the pump off. If this high pressure shutdown function trips the pump off, the operator will need to press the reset pushbutton on the front of the control panel before the pump can be restarted.

A pressure transmitter will be installed on the common discharge line of the booster pumps. This pressure signal will provide for general monitoring of the pumping system operation, and can be used to provide backup high and low pressure alarms.

A magnetic flow meter will be installed on the common discharge line of the booster pumps to measure the combined flow of all booster pumps. This flow rate will be monitored by the PLC. The flow rate signal will be used to provide a shut down a booster pump if a pump is started and an appropriate increase in flow rate is not detected within a set time to provide failure to pump protection. It will also be used to shut down all pumps if an excessive flow rate is detected for a given number of pumps operating, and will shut down the well pump if a flow rate that is too high is detected to provide discharge line break protection. Reverse flow detection from the flow meter will provide a pump discharge check valve failure alarm. A totalizer pulse will also be sent to the PLC panel to provide a total flow value.

Reservoir level will be monitored by a pressure sensing level transmitter located on a port low on the side of the reservoir. This level signal will provide for general monitoring of the reservoir operation, will provide control of the booster pumps (as described elsewhere in this report), and will provide high and low level alarms. Two float type level switches will be suspended in the reservoir to provide High-High and Low-Low level backup alarms. A Low-Low level alarm will cause shutdown of all booster pumps to

prevent running pumps without water. A High-High alarm can be used to turn off wells supplying the reservoir to prevent overflowing the reservoir.

Level in the hydropneumatic tank on the discharge of the booster pumps will be monitored by analog float type level sensor manufactured by K-Tek. These units will also have level displays that are visible from a large distance for operator convenience. The level signal will provide for general monitoring of the tank operation, will provide start/stop control of an air compressor to maintain a desired level in the tank, and will provide high and low level alarms. Pressure switches on the tanks will be used to prevent the air compressor from over-pressuring the tanks.

1.9. MEDIUM VOLTAGE ELECTRICAL DISTRIBUTION

The electrical distribution system for Alternative 2 begins with a 12.47 kV tap just east of the intersection of West Purdy Lane and Naco Highway. Due to the close proximity of the four wells, Greenbush Booster Station, and RO Water Treatment Plant, a private line was selected.

A new tap pole will be installed adjacent to the existing APS 12.47 kV power line, which runs east-west along the north side of Purdy Lane. The first pole structure north of the tap pole will contain a group operated air break switch which will allow FMI to manually isolate the new private pole line for maintenance and safety purposes. In addition to the air break switch, this pole is equipped with a primary meter, which will serve as the centralized metering location for the entire well field.

The new private pole line, designed for this effort, will operate at 12.47 kV and utilizes standard APS 12.47 kV wooden pole structures. Due to the low voltage requirements at each of the well locations a pole mounted transformer (12.47 kV to 480 V) will be used which will keep the equipment off the ground and protected. The only exception to this can be found at the Greenbush Booster Station and RO Water Treatment Plant which due to the higher power demand requires a pad mounted transformer. Transformers are protected at each location with fuses.

After a preliminary review of project, APS will require line improvements in order to support the power requirements of the project. APS estimates two 3-phase voltage regulators may need to be added or upgraded.

2. CAPITAL COSTS

Capital costs included in this memorandum are those expenditures required to construct the civil, mechanical, and electrical components of the following:

- Wells FFS-1, FFS-2, FFS-3, FFS-4;
- The treated effluent main;
- The Greenbush Booster Station;
- The pressure sustaining valve at the RO Water Treatment Plant;

- The well field mains;
- The access road grading required to access these sites;
- The medium voltage transmission lines supplying electrical power to the wells, booster station, water treatment plant; and
- Contingency costs to account for uncertainties and unforeseeable elements involving increased costs associated with the normal execution of a project. The contingency is not intended to cover project scope change or design allowance, which is a separate line item.

The capital costs included in this memorandum do not include:

- The RO Water Treatment Plant and all associated storage and process equipment.
- The construction of the evaporation pond.

3. ANNUAL COSTS

3.1. PERSONNEL SALARIES

3.1.1. Wellfield and Pipeline Maintenance

Repair and maintenance of the wellfield, pipelines, and booster station is assumed to be provided by one half-time employee (20 hours per week for 52 weeks per year). It is estimated that this employee will be paid at $45 per hour.

3.1.2. Wellfield Monitoring

Wellfield monitoring is assumed to be provided by one quarter-time employee (10 hours per week for 52 weeks per year). This employee was assumed to be paid at $45 per hour.

3.1.3. Electrician

Repair and maintenance of the associated electrical equipment is assumed to be provided by one half-time electrician (20 hours per week for 52 weeks per year). This employee was assumed to be paid at $45 per hour.

3.2. ENERGY COSTS

The cost of energy supply is based upon WestLand's understanding of the current rate agreement between APS and Copper Queen Branch. The rate paid by Copper Queen consists of two major factors, the Coincident demand charge and the Energy charge. The fixed-rate customer charge was assumed to be of several orders of magnitude lower than these charges, and was not considered in this estimation. Because the pumps are designed to work nearly continuously, the demand charge and energy charge can be approximated by a single increased energy charge. This result simplifies the comparison between differing options for feasibility.

3.2.1. Wells – Mitigation and New Inceptor

Energy Charge

The Energy charge of $0.08 cents per kWh was determined based upon review of the most probable rate structures provided by Arizona Public Service (APS).

Equation 3.2.1-1

$$Power\ (kW) = \frac{(TDH) \times (Flow)}{(3960)(\eta_{pump})(\eta_{motor})} \times 0.746 \frac{\$}{kWh} \times hours \times \%\ of\ time\ operational$$

The TDH for each well was calculated as the sum of the static head from the water surface of the well to the well head, the static head from the well head to its delivery location plus the additional head added by the pressure sustaining valve at the RO Water Treatment Plant, and the head losses incurred by pumping the water through the column pipe and distribution pipes. The static head from the well head to the delivery location and the head losses from pumping were assumed to remain constant during the course of the project life. The static head from the water surface in the well to the land surface was assumed to change over time. The values of this initial and final dynamic water depth were provided by Clear Creek. The following example shows calculations for determining the Initial and Final TDH for Well FFS-1

Example 3.2.1a

Step 1 $Initial\ TDH = \text{Head Losses} + \text{Static Head} = 39\text{ft} + (56 + 235)\text{ft} = 330\text{ft}$

Step 2 $Future\ TDH = \text{Head Losses} + \text{Static Head} = 39\text{ft} + (56 + 279)\text{ft} = 374\text{ft}$

Table 1.1.2 shows the head losses assumed for each well, the initial and future water depths, the static head from well head to pressure sustaining valve hydraulic grade, and the Initial and Future TDH.

Total Dynamic Head

The TDH for each well for each year during the life of the Project was determined by adding the head losses, column losses, the static head from the well to the pressure sustaining valve to the depth of dynamic pumping elevation provided for each year by Clear Creek, and an average value for each five year period was determined.

For convenience, the flow and TDH for each well in each time period were multiplied together to provide the numerator for ***Equation 3.2.1a***, and rounded to the nearest thousand. These values are shown in ***Table 3.2.1b.***

Table 3.2.1a shows the estimated TDH for each time period over the course of the project.

Table 3.2.1a. Estimated TDH (ft)

Well Name	Years					
	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045
FS-1	343	359	365	370	372	374
FS-2	331	346	351	355	357	358
FS-3	347	356	361	363	366	368
FS-4	328	339	345	349	350	351

Table 3.2.1b. TDH *Flow

Well Name	Years					
	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045
FS-1	82,320	86,040	87,480	88,680	89,280	89,640
FS-2	132,400	138,200	140,400	141,800	142,600	143,000
FS-3	34,650	35,600	36,050	36,300	36,600	36,750
FS-4	32,750	33,900	34,500	34,850	34,950	35,050
Σ=	**282,120**	**293,740**	**298,430**	**301,630**	**303,430**	**304,440**

*The wells were assumed to operate 95 percent of the time.

Example 3.2.1b shows the calculations for determining the annual energy cost from years 2015-2020.

Example 3.2.1b

Step 1 $$Energy\ Charge = \frac{\Sigma\,(TDH\ \times Flow)}{(3960)(\eta_{pump})(\eta_{motor})} \times 0.746 \times \frac{\$}{kWh} \times hours \times \%\ of\ time\ operational$$

Step 2 $$Energy\ Charge = \frac{282{,}120}{(3960)(0.85)(0.93)} \times 0.746 \times \$0.08 \times 24 \times 365 \times 0.95 \approx \$44{,}760$$

The annual energy cost listed in the cost estimate is the average for the well field over the entire course of the project.

3.2.2. Greenbush Booster Station

The following assumptions and parameters were used to determine the energy charge associated with the Greenbush Booster Station:

Flow: The flow for energy charge calculations was 715 gpm.
TDH: The TDH for the Greenbush Booster Station was assumed to be 100 ft.
η_{pump}: The efficiency of the pump was assumed to be 85 percent.
η_{motor}: The efficiency of the motor was assumed to be 93 percent.

3.3. EQUIPMENT ANNUAL MAINTENANCE

3.3.1. Vertical Turbine Pump Annual Maintenance

General maintenance costs for vertical turbine line shaft well pumps include the costs of replenishing oil reservoirs and replacement of incidental leaking parts or site piping. The cost for these incidental parts and equipment is highly variable and dependent on random factors. A local pump vendor provided an estimated cost for general maintenance of $3,500 per vertical turbine line shaft pump per year.

Submersible pumps were assumed to require no annual maintenance.

3.3.2. Motor Annual Maintenance

The general maintenance cost for motors was assumed to be four percent of the initial motor cost per year. This covers the replacement of minor parts and occasional more significant expenses. This motor maintenance does not apply to submersible pumps.

3.3.3. Transmission Main Annual Maintenance

Annual maintenance of the overhead distribution system was assumed to be three percent of the initial cost of installation, which computes to $9,321. This includes replacement of downed transmission lines, storm-damaged equipment, and lightning arrestors.

4. PERIODIC COSTS

Periodic costs were determined based upon information provided by vendors and from discussion with owners and operators of similar existing systems. These costs were not included as a part of the annual costs, but will require significant capital expenditures over the course of the project. ***Table 4a*** details the estimated schedule for replacement and rehabilitation of mechanical equipment. ***Table 4b*** details the estimated schedule of electrical equipment replacement.

Sections 4.1 through 4.6 detail the assumptions used to develop the repair and replacement schedules.

Table 4a- Mechanical Equipment Repair Schedule

Equipment	Cost per Unit	Frequency (years)	Notes
Submersible Pump	$39,200	5 to 8	Replacement
Vertical Turbine Pump - Line Shaft	$45,000	5 to 8	Rehabilitation
Vertical Turbine Pump - Booster Can	$9,600	5 to 8	Rehabilitation
Vertical Turbine Motor	$7,000	5	Rehabilitation
Well Cleaning and Redevelopment	$9,000	5 to 8	Rehabilitation
Vertical Turbine Pump - Line Shaft	$62,000	15 to 25	Replacement
Vertical Turbine Pump - Booster Can	$16,000	15 to 25	Replacement
Vertical Turbine Motor	$20,000	20	Replacement

Table 4b. Site Electrical Repair Schedule

Equipment	Cost per Unit	Replace Frequency, years
Transformer	$25,000	25
Rack	$5,500	25
Power Center	$11,000	25
Disconnect Switch	$25,000	20
Starter Panel	$65,000	20
PLC Panel	$5,000	20
Power Factor Capacitor	$6,000	20
Wire/Cable	$15,000	20

4.1. SUBMERSIBLE PUMPS

Pump and attached motor are assumed to require replacement every five to eight years due to their continuous operation. It is also estimated that approximately five percent of the column pipe will require replacement during this pipe replacement. This replacement cost does not include drilling or casing replacement. It is assumed that the cost of removal of this well pump and replacement with a new well pump will cost $10,000. The total cost of replacing the submersible pumps is therefore assumed to be $39,200 per well every five to eight years.

4.2. VERTICAL TURBINE PUMPS – LINE SHAFT

Rehabilitation and replacement of the vertical turbine line shaft pump equipment was assumed to be performed every five to eight years. This rehabilitation was assumed to consist of removal of the pump and column pipe from the well, brushing and bailing the casing, transportation of the pump to an offsite pump maintenance facility, replacement of any worn or damaged parts, transportation back to the site, and reinstallation of the pump. This estimate assumes the following based upon conversations with a local pump vendor:

Pulling a pump and shipping it offsite was assumed to cost approximately $10,000.

The costs associated with the repair and rehabilitation can vary widely depending on field conditions and by the depth of the installation. To estimate this cost, the repair and rehabilitation cost was estimated at ten percent of the initial construction costs of the column pipe, tube, and shaft plus sixty percent of the capital cost of the pump for refurbishment. This cost was considered slightly conservative to reflect the possibility that some items may require significant repair or replacement during the life of the equipment. The total cost of this rehabilitation is assumed to be $45,000 per well every five to eight years.

The vertical turbine line shaft pumps are assumed to require total replacement every 15 to 25 years, with a total cost per pump of $62,000 per well. This includes 10 percent of the column pipe, tube, and shaft, and one-hundred percent of the pump.

4.3. WELL CLEANING AND REDEVELOPMENT

Each well is assumed to undergo cleaning and redevelopment every time the pump is pulled for rehabilitation. This is anticipated to happen every five to eight years for each well depending on the pump performance. The amount of time and treatment required for each well will vary depending on conditions encountered during operation of the well. WestLand assumed the following for determination of well costs. These estimates were provided with assistance from a representative of a local well drilling and outfitting company.

Each well will be provided with a pre-and post-cleaning video survey to visually inspect well conditions. This amounts to approximately $1,700 per operational well every five to eight years.

Brushing and bailing costs $215 per hour and is expected to take approximately 30 hours per well. This averages out to $6,500 per operational well every five to eight years.

Acid treatment, bio-fouling treatment, liner installation, and/ or swedge patching may be needed on some wells at some time in the future. A cost of $800 per operational well every five to eight years was added to account for the possibility of one or more of these treatments being necessary.

The total cost of well cleaning and redevelopment is $9,000 per well every five to eight years.

4.4. MOTOR REHABILITATION AND REPLACEMENT

Motor rehabilitation was assumed to be performed every five years based upon the expected bearing life. This rehabilitation is assumed to include new bearings and rewinding, and is assumed to cost approximately 35 percent of the original motor cost, or $3,500 per motor other than those for the submersible pumps. The total cost for motor rehabilitation is $7,000 every five years. These motors will require replacement every 20, for $20,000 total.

4.5. VERTICAL TURBINE PUMPS – BOOSTER CAN

The booster can pumps were assumed to require rehabilitation every five to eight years. This cost is assumed to be approximately sixty percent of the total cost of the pumps, or $9,600 per pump. The pumps are assumed to be completely replaced after 15 to 25 years for an assumed cost of $16,000 per pump.

FIGURES

Label	Nominal Pipe Size (in)	Length (ft)
P-1	8	400
P-2	4	225
P-3	4	2,350
P-4	10	550
P-5a	12	22
P-5b	12	8
P-6	6	1,350
P-7	6	2,060
TE-1	10	12,725
TE-2	10	2,335

Well FS-1
240 gpm
EL= 4670

Evaporation Pond

Pressure Sustaining Valve
EL= 4630
HW EL= 4722

Well FS-4
100 gpm
EL= 4645

Well FS-2
400 gpm
EL= 4635

Greenbush Booster Station
715 gpm ±
EL=4635

Well FS-3
100 gpm
EL= 4620

San Jose Water Treatment Plant

Pressure Sustaining Valve
EL= 4585
HW EL= 4677

Proposed Standpipe
EL=4580

Outlet to Greenbush Draw
EL= 4530

P-1 P-2 P-3 P-4 P-5a P-5b P-6 P-7 TE-1 TE-2

4700 4680 4660 4640 4620

N

0 500 1,000 Feet

Legend

- Property Boundary
- Existing Water
- Existing Electric
- Existing Fiber Optic
- Existing Gas
- Existing Sewer
- Discharge Main
- Effluent Main
- Proposed Well Site
- Proposed Standpipe
- Proposed Pressure Sustaining Valve
- Proposed Booster Station

NOTE: ALL LINEWORK IS ILLUSTRATIVE AND INTENDED ONLY TO SHOW APPROXIMATE LOCATION

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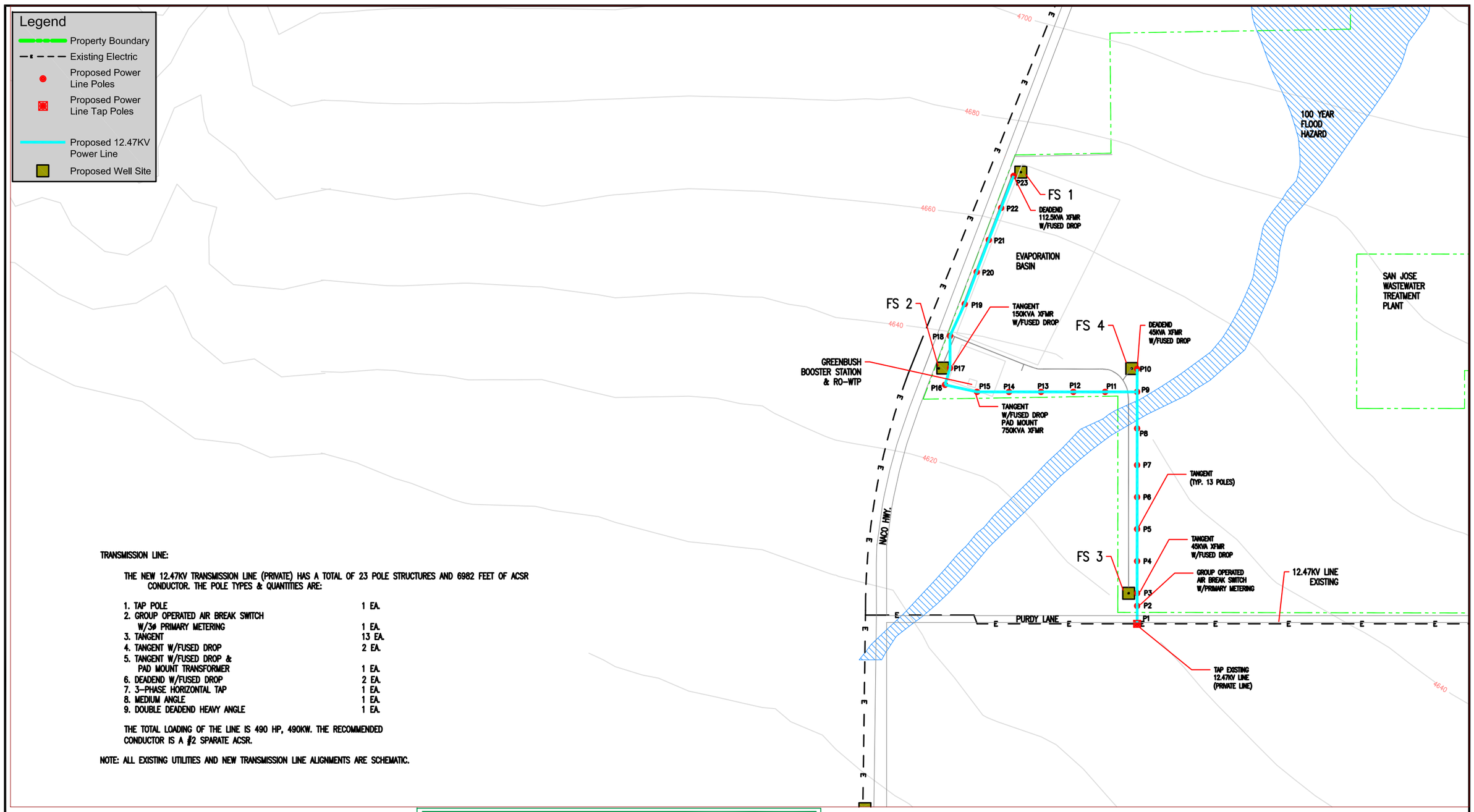
FIGURE 1
ALTERNATIVE 2
FMI COPPER QUEEN BRANCH
WATER TREATMENT
July 10, 2013



TRANSMISSION LINE:

THE NEW 12.47KV TRANSMISSION LINE (PRIVATE) HAS A TOTAL OF 23 POLE STRUCTURES AND 6982 FEET OF ACSR CONDUCTOR. THE POLE TYPES & QUANTITIES ARE:

1. TAP POLE	1 EA.
2. GROUP OPERATED AIR BREAK SWITCH W/3ø PRIMARY METERING	1 EA.
3. TANGENT	13 EA.
4. TANGENT W/FUSED DROP	2 EA.
5. TANGENT W/FUSED DROP & PAD MOUNT TRANSFORMER	1 EA.
6. DEADEND W/FUSED DROP	2 EA.
7. 3-PHASE HORIZONTAL TAP	1 EA.
8. MEDIUM ANGLE	1 EA.
9. DOUBLE DEADEND HEAVY ANGLE	1 EA.

THE TOTAL LOADING OF THE LINE IS 490 HP, 490KW. THE RECOMMENDED CONDUCTOR IS A #2 SPARATE ACSR.

NOTE: ALL EXISTING UTILITIES AND NEW TRANSMISSION LINE ALIGNMENTS ARE SCHEMATIC.

REVISIONS	NO	DATE	BY	DESCRIPTION
	A	05.02.13	FEH	ISSUED FOR REVIEW & COMMENT
	B	05.06.13	FEH	ADD TAP CALLOUT, RE-ISSUE FOR FINAL REVIEW
	C	06.10.13	FEH	REVISED PER CLIENT COMMENTS

Hanlon Engineering & Architecture, inc.

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N

0 500 1,000 Feet

FIGURE 2
ALTERNATIVE 2
FMI COPPER QUEEN BRANCH

PLUME STABILIZATION WITH WATER TREATMENT

APRIL 19, 2013

ATTACHMENT 1

CAPITAL COSTS

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

Site:	**Copper Queen Branch**	**Description: FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	**Naco, AZ**	
Phase:	**Feasibility Study (-30% to +50%)**	
Base Year	**2013**	
Date:	**6/24/2013**	

ALTERNATIVE 2 - CAPITAL AND ANNUAL COSTS

COST TYPE	TOTAL COST
Capital Cost - Civil and Mechanical	$3,593,021
Capital Cost - Electrical Transmission	$484,135
Capital Cost - Site Electrical	$1,088,973
ALTERNATIVE 2 CAPITAL COSTS	**$4,681,994**
ANNUAL OPERATIONS AND MAINTENANCE	**$214,388**

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

Site:	Copper Queen Branch	Description:	**FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ		
Phase:	Feasibility Study (-30% to +30%)		
Base Year	2013		
Date:	6/24/2013		

CIVIL AND MECHANICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
DIRECT COSTS					
WELLSITES - Mechanical					
Well Driller Mobilization	1	LS	$20,000	$20,000	
Well Drilling Costs	2,190	LF	$45	$98,550	
8-inch Casing for 100 gpm Wells	1,265	LF	$75	$94,875	Assuming Stainless Steel Casing
10-inch Casing for 240 and 400 gpm Wells	925	LF	$95	$87,875	Assuming Stainless Steel Casing
Column Pipe for 100 gpm Well	650	LF	$135	$87,750	Assuming Stainless Steel Column Pipe
Column Pipe for 240 gpm Well	380	LF	$200	$76,000	Assuming Stainless Steel Column Pipe
Column Pipe for 400 gpm Well	340	LF	$250	$85,000	Assuming Stainless Steel Column Pipe
Submersible Pump Assembly - 15 HP	2	EA	$22,000	$44,000	Includes Pump, Motor, Cable, Discharge Head
Vertical Turbine Pump Assembly - 30 HP	1	EA	$32,000	$32,000	Includes Pump, Motor, Discharge Head
Vertical Turbine Pump Assembly- 50 HP	1	EA	$37,000	$37,000	Includes Pump, Motor, Discharge Head
Sounding Tube	4	EA	$800	$3,200	1-1/4" PVC for well transmitter
4-inch welded steel manifold	2	EA	$5,000	$10,000	Incl. spool pieces, gauges, fittings, and appurt.
6-inch welded steel manifold	1	EA	$6,300	$6,300	Incl. spool pieces, gauges, fittings, and appurt.
8-inch welded steel manifold	1	EA	$11,000	$11,000	Incl. spool pieces, gauges, fittings, and appurt.
4-inch Pressure Release Valve	4	EA	$4,000	$16,000	
Well Service Air Release Valve	4	EA	$1,050	$4,200	1-inch
4-inch Silent Globe Check Valve	2	EA	$880	$1,760	
6-inch Silent Globe Check Valve	1	EA	$1,350	$1,350	
6-inch Silent Globe Check Valve	1	EA	$1,350	$1,350	
4-inch Resilient Wedge Gate Valve	2	EA	$790	$1,580	
6-inch Resilient Wedge Gate Valve	1	EA	$1,350	$1,350	
8-inch Resilient Wedge Gate Valve	1	EA	$1,800	$1,800	
12-inch Pressure Sustaining Valve	2	EA	$18,000	$36,000	At inlet to RO Water Treatment Plant
SUBTOTAL				$758,940	

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

CIVIL AND MECHANICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
WELLSITES - Civil					
Concrete for pump pedestal and pipe supports	12	CY	$833	$9,996	3 cubic yards per well site
Fine grading to set finished grade	4	LS	$3,500	$14,000	
Landscaping and Irrigation	1	LS	$5,000	$5,000	
Site Gravel	4	EA	$2,600	$10,400	
Chainlink fence around well site	4	EA	$20,000	$80,000	400' LF of 6' fence with 3 strand barb-wire
SUBTOTAL				$119,396	
GREENBUSH BOOSTER STATION - Mechanical					
Booster Can Pump Assembly - 20 HP	3	EA	$16,000	$48,000	Includes Pump, Can, Discharge Head
Booster Pump Motor - 20 HP	3	EA	$14,000	$42,000	
12-inch welded steel manifold	1	LS	$11,000	$11,000	Incl. spool pieces, gauges, fittings, and appurt.
4-inch Pressure Release Valve	1	EA	$4,000	$4,000	
12-inch Silent Globe Check Valve	1	EA	$4,000	$4,000	
12-inch Knife Gate Valve	1	EA	$4,500	$4,500	
12-inch Resilient Wedge Gate Valve	1	EA	$5,000	$5,000	
Concrete Foundation - Pumps	1	LS	$5,000	$5,000	
5,000 Gallon Hydropneumatic Tank	1	EA	$120,000	$120,000	
SUBTOTAL				$243,500	
GREENBUSH BOOSTER STATION - Civil					
Concrete for pump pedestal and pipe supports	2	CY	$833	$1,666	
Fine grading to set finished grade	1	LS	$3,500	$3,500	
Concrete footings for 5000 gallon Hydro-Tank	1	EA	$3,000	$3,000	
Site Gravel	1	EA	$2,600	$2,600	
Concrete Foundation for Pump Station	1	EA	$16,000	$16,000	
Concrete Containment pad for Transformer	1	EA	$6,500	$6,500	
Concrete Standpipe	1	LS	$15,000	$15,000	
SUBTOTAL				$48,266	

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

CIVIL AND MECHANICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Pipelines					
4-inch PE 4710, DR 13.5, IPS	2,575	LF	$8	$20,291	
6-inch PE 4710, DR 13.5, IPS	3,150	LF	$11	$35,368	
8-inch PE 4710, DR 13.5, IPS	400	LF	$16	$6,224	
10-inch PE 4710, DR 13.5, IPS	15,885	LF	$21	$339,907	
12-inch PE 4710, DR 13.5, IPS	30	LF	$28	$842	
Trenching for Underground Installation	22,040	LF	$17	$374,680	
SUBTOTAL				$777,313	
Access Road Construction					
Clearing and Grubbing-Unpaved	8.1	Acre	$1,000	$8,096	
Road Construction-Unpaved	352,640	Sq. Ft	$1	$352,640	
Clearing and Grubbing-Paved	0.2	Acre	$1,000	$230	
Road Construction-Paved	8,000	Sq. Ft	$5	$40,000	
SUBTOTAL				$400,965	
SUBTOTAL-DIRECT COSTS				$2,348,380	
INDIRECT COSTS					
Prime Contractor Contingencies			15.0%	$352,257	
Prime Contractor Profit			10.0%	$234,838	
Engineering			8.0%	$187,870	
Construction Management			12.0%	$281,806	
Legal, Permitting, and administration5			8.0%	$187,870	
SUBTOTAL-INDIRECT COSTS				$1,244,641	
TOTAL COSTS - MECHANICAL AND CIVIL				$3,593,021	

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

Site:	Copper Queen Branch	Description:	**FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ		
Phase:	Feasibility Study (-30% to +30%)		
Base Year	2013		
Date:	6/24/2013		

SITE ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
DIRECT COSTS					
SITE ELECTRICAL - Wellsites					
Rack for electrical equipment	4	EA	$5,500	$22,000	
Disconnect Switch - 200A	4	EA	$14,600	$58,400	
Fuses - 200A RK-1	12	EA	$230	$2,760	
Well Starter Panel	4	EA	$40,000	$160,000	
Mini-Power Center - 10kVA	4	EA	$11,000	$44,000	
Service Surge Protector	4	EA	$2,500	$10,000	
Power Factor Capacitors	4	EA	$2,500	$10,000	
Telemetry Panel	4	EA	$38,000	$152,000	
Well Level Transmitter	4	EA	$2,500	$10,000	
High Discharge Pressure Switch	4	EA	$600	$2,400	
#14AWG XHHW-2 Wire	32	CLF	$60	$1,905	
#12AWG XHHW-2 Wire	24	CLF	$77	$1,841	
#8AWG XHHW-2 Wire	8	CLF	$129	$1,030	
#2AWG XHHW-2 Wire	12	CLF	$359	$4,306	
#1/0AWG XHHW-2 Wire	0	CLF	$494	$0	
#4/0AWG XHHW-2 Wire	0	CLF	$905	$0	
#250MCM XHHW-2 Wire	16	CLF	$1,049	$16,786	
#300MCM XHHW-2 Wire	0	CLF	$1,523	$0	
#400MCM XHHW-2 Wire	0	CLF	$2,465	$0	
#500MCM XHHW-2 Wire	0	CLF	$2,098	$0	

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

SITE ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
1" PVC Conduit	1,600	LF	$7	$10,464	
2-1/2" PVC Conduit	400	LF	$18	$7,276	
4" PVC Conduit	800	LF	$25	$20,128	
Trenching and Backfill	1,000	LF	$8	$7,800	
SUBTOTAL				$543,095	
SITE ELECTRICAL- Greenbush Booster Station					
Rack for electrical equipment	16	LF	$300	$4,800	
Disconnect Switch - 200A	1	EA	$14,600	$14,600	
Fuses - 200A RK-1	3	EA	$230	$690	
Pump Starter Panel	3	EA	$37,000	$111,000	
Mini-Power Center - 10kVA	1	EA	$11,000	$11,000	
Service Surge Protector	1	EA	$2,500	$2,500	
Power Factor Capacitors	3	EA	$2,500	$7,500	
Air Compressor Starter	1	EA	$14,600	$14,600	
Site Lighting	1	LS	$6,000	$6,000	
#14AWG XHHW-2 Wire	50	CLF	$60	$2,977	
#12AWG XHHW-2 Wire	20	CLF	$77	$1,534	
#8AWG XHHW-2 Wire	12	CLF	$129	$1,544	
#2AWG XHHW-2 Wire	0	CLF	$359	$0	
#1/0AWG XHHW-2 Wire	0	CLF	$494	$0	
#4/0AWG XHHW-2 Wire	0	CLF	$905	$0	
#250MCM XHHW-2 Wire	4	CLF	$1,049	$4,196	
1" PVC Conduit	1,500	LF	$7	$9,810	
2-1/2" PVC Conduit	300	LF	$18	$5,457	
4" PVC Conduit	200	LF	$25	$5,032	
Trenching and Backfill	600	LF	$8	$4,680	
SUBTOTAL				$207,921	
SUBTOTAL-DIRECT COSTS				$751,016	

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

SITE ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
INDIRECT COSTS					
Prime Contractor Contingencies			15.0%	$112,652	
Prime Contractor Profit			10.0%	$75,102	
Engineering			8.0%	$60,081	
Construction Management			12.0%	$90,122	
SUBTOTAL-INDIRECT COSTS				$337,957	
TOTAL COSTS - Site Electrical				$1,088,973	

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

Site:	Copper Queen Branch	Description: **FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ	
Phase:	Feasibility Study (-30% to +30%)	
Base Year	2013	
Date:	6/24/2013	

ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
DIRECT COSTS					
Private Power Line					
12.47 kV Transmission Line (336 ACSR Conductor)	6,982	LF	$2.15	$15,024	(336 ACSR Conductor)
TAP Pole	1	EA	$3,025	$3,025	
Group Operated Air Break Switch w 3Ø Primary Metering	1	EA	$14,040	$14,040	w/ 3Ø Phase Metering
Voltage Regulator, 3 Phase, Pole Mounted	2	EA	$55,843	$111,686	
Tangent Pole	13	EA	$4,220.00	$54,860	
Tangent Pole w/ Fused Drop & 45 kVA Transformer	1	EA	$11,140	$11,140	
Tangent Pole w/ Fuse Drop & pad mount 750 kVA Transformer	1	EA	$20,740	$20,740	
Pad Mount Containment Slab	1	EA	$2,739.63	$2,740	
Tangent Pole w/ Fused Drop & 150 kVA Transformer	1	EA	$15,640	$15,640	
Dead End Pole w/ Fused Drop & 45 kVA Transformer	1	EA	$13,440	$13,440	
Dead End Pole w/ Fused Drop & 112.5 kVA Transformer	1	EA	$16,140.00	$16,140	
TAP Pole Horizontal Tap, 3 Phase	1	EA	$6,605	$6,605	
Medium Angle Pole	1	LS	$6,040	$6,040	
Double Dead End Heavy Angle Pole	1	EA	$8,750	$8,750	
SUBTOTAL				$299,869	
SUBTOTAL-DIRECT COSTS				$299,869	

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
INDIRECT COSTS - Total Construction Costs					
Construction Indirects			15.0%	$11,626	15% of direct field Costs Labor and
Freight and Transportation			6.0%	$7,992	6% of Plant Equipment Dollars
Contractor Fee (OH & P)			15.0%	$25,000	15% of labor, bulk material, and
SUBTOTAL				$44,618	
SUBTOTAL -INDIRECT COSTS - Total Construction Costs (TCC)				$344,487	
Sales Tax			4.615%	$15,898	(Cochise Co. @ 65% of 7.1%)
Engineering			12.5%	$43,061	
SUBTOTAL				$58,959	
SUBTOTAL -INDIRECT COSTS - Total Project Cost				$403,446	
Contingency			20.0%	$80,689	20% of Total Project Cost
TOTAL COSTS - ELECTRICAL TRANSMISSION				$484,135	

Attachment 1
WATER TREATMENT OPTION

ALTERNATIVE 2

Site: Copper Queen Branch	Description: **FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location: Naco, AZ	
Phase: Feasibility Study (-30% to +30%)	
Base Year 2013	
Date: 6/24/2013	

OPERATIONS AND MAINTENANCE COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Personnel - SALARY					
FMI Water System Maintenance Personnel	50.0%	EA	$ 93,600	$ 46,800	Percent of Full-Time $45/hr employee
Wellfield Monitoring	25.0%	EA	$ 93,600	$ 23,400	Percent of Full-Time $45/hr employee
Electrician	50.0%	EA	$ 93,600	$ 46,800	Percent of Full-Time $45/hr employee
				$ 117,000	
ENERGY COSTS					
Well field	589,500	kWh	$ 0.08	$ 47,160	Demand Charge Included
Greenbush Booster Station	208,500	kWh	$ 0.08	$ 16,680	Demand Charge Included
				$63,840	
Equipment Maintenance					
Vertical Turbine Line Shaft Pump Maintenance	2	EA	$ 500	$ 1,000	$500 per well per year general equipment
Booster Can Pump Maintenance	3	EA	$ 500	$ 1,500	5% of pipeline costs per year
Motor Maintenance	4.0%	Pcnt.	$ 50,000	$ 2,000	4% of Motor Equipment Costs
Transmission Main Maintenance	3.0%	Pcnt.	$ 484,135	$ 14,524	Replacement of damaged equipment
				$ 19,024	
Electrical Equipment Repair and Replacement					
Transmission Repair	3.0%	Pcnt.	$ 484,135	$ 14,524	
				$ 14,524	
TOTAL ANNUAL COSTS - OPERATIONS AND MAINTENANCE				$ 214,388	

APPENDIX F.2

DESIGN BASIS MEMORANDUM AND BUDGETARY COST ESTIMATE FOR FMI COPPER QUEEN BRANCH MITIGATION ALTERNATIVE NO.3

MEMORANDUM

EXPIRES 9/30/2013

Prepared for: James R. Norris, R.G., CLEAR CREEK ASSOCIATES

Prepared by: Mark Taylor, P.E., WestLand Resources, Inc.

Date: July 11, 2013

CC: Erik Christenson, E.I.T., Westland Resources, Inc.

Project No.: **DESIGN BASIS MEMO AND BUDGETARY COST ESTIMATE FOR FMI COPPER QUEEN BRANCH MITIGATION ALTERNATIVE 3 WESTLAND JOB NO. 260.17 01 01**

EXECUTIVE SUMMARY

WestLand Resources, Inc. (WestLand) was retained by Clear Creek Associates (Clear Creek) to construct conceptual designs for the wellfield, transmission piping, electrical transmission, radio-telemetry coordination, and low-voltage equipment; and to provide feasibility-level cost estimates for distinct alternatives to mitigate a groundwater sulfate plume.

These cost estimates include both initial capital costs, and annual operations and maintenance (O&M) costs of the alternatives. This memorandum was prepared to demonstrate the analysis used to prepare the conceptual designs, as well as list the assumptions made in determining a budgetary cost. Cost estimates for equipment and materials are based upon manufacturers' quotes, governmental agency cost estimation recommendations, and on prices observed from similar projects completed by WestLand, Richard Canney Engineering (RCE), and Hanlon Engineering (Hanlon). Estimated major equipment replacement schedules not included in the annual O&M are provided to assist FMI to estimate and plan for future capital expenditures.

Alternative 3 is comprised of 4 wells designed and located by Clear Creek to stabilize the sulfate plume and prevent further expansion. These wells pump elevated sulfate groundwater through a collection pipeline system to a 2.5 million gallon (MG) storage pond, which serves as temporary storage for a land application system (LAS).

The LAS was designed by Cascade Earth Sciences (CES) for crop production and the costs associated with the LAS are not considered as a part of this memorandum, with the exception of providing power service to the pivot point location junction boxes, the location of which were provided by CES.

The Alternative 3 Mitigation Wellfield, including well locations, collection pipeline locations, and reservoir delivery location are shown in ***Figure 1.*** A feasibility cost estimate for the portions of the project contained within this memo is included as ***Attachment 1.***

1. DESIGN BASIS

1.1. WELL DESIGN

The new mitigation well field will consist of four new wells. All well locations and flow rates were set by Clear Creek and are intended to accomplish the groundwater mitigation objective per groundwater modeling results.

1.1.1. Well Overview

All new wells 100 gpm or less will be equipped with submersible pumps. All new wells greater than 100 gpm will be vertical turbine line shaft pumps. Well site design will be typical per the American Water Works Association (AWWA) A100 unless otherwise specified. Typical site manifolds will include a check valve, well service air release valve, flow meter, isolation valve, and a pressure relief valve.

1.1.2. Column Pipe and Casing Selection

WestLand's cost estimate assumes stainless steel is used for all well components in contact with groundwater. The elevated sulfate levels in the groundwater create a solution that is corrosive to carbon steels, limiting their expected life cycle. The increased initial expense of 304 stainless steel casing is likely to be counterbalanced by its longer expected life due to increased corrosion resistance.

The depth of drilling was determined to be 40 feet (ft) below bedrock as determined by Clear Creek. A 304 stainless steel casing will be installed along the entire depth of drilling, with well screen installed as designed by Clear Creek. The column pipe length was determined to be approximately 100 ft below the dynamic pumping water surface level at maximum drawdown.

Well column pipe was designed to maintain a velocity between 3.0 feet per second (fps) and approximately 5.25 fps. This velocity is sufficient to prevent sand in the water column from settling out and clogging the pump bowls, but slow enough to prevent excessive head loss due to friction losses in the column pipe.

The casing size was determined to be a minimum of 2-inches in diameter greater than the likely nominal bowl size of the submersible pump, rounded up to the nearest common pipe diameter. The estimated borehole diameter is approximately 16-inches in diameter. ***Table 1.1.2*** lists the size of the well components in Alternative 3:

Table 1.1.2. Well Column Pipe Sizing

Well ID	Flow (gpm)	Column Size	Column Velocity	Nominal Bowl Size	Casing Size	Borehole Size
FS-1	300	6	3.83	8	10	16
FS-2	400	6	5.11	8	10	16
FS-2*	100	3	4.54	5	8	16
FS-4*	100	3	4.54	5	8	16

*denotes a submersible pump

1.1.3. Total Dynamic Head Calculation

The Total Dynamic Head (TDH) is the total equivalent height that the groundwater is to be pumped, and is a measurement of the pressure head added to the groundwater by the pump. Well TDH is the sum of the static head and the head losses, and the units are in feet. The static head is the difference in elevation between the groundwater surface level and the pressure sustaining valve high water elevation. The head losses are the loss of energy due to friction of the water against the pipe, column pipe, valves, and bends.

Estimated pumping water levels for initial and future conditions of Alternative 3 were provided by Clear Creek. ***Table 1.1.3*** shows the initial and final dynamic pumping depths, which is a portion of the static head. The remainder of the static head is the difference in elevation between the well discharge and the inlet to the 2.5 MG pond. Because several of the mitigation well sites are higher in elevation than the inlet to the 2.5 MG pond, a pressure sustaining valve was added to the inlet of this pond to ensure that the well pumps are pumping against pressure and do not flow from gravity. This prevents the pipeline from draining to the tank when the well pumps are shut off. For hydraulic calculations, this pressure sustaining valve was set to maintain at least 40 pounds per square inch (psi) (92 ft of static head) at the inlet to the 2.5 MG pond. Hydraulically, this has the effect of adding 92 ft to the static head required to supply water to the pond.

A hydraulic computer model for the Alternative 3 Well Field and the well collection pipeline string was created in WaterCAD V8i to determine TDH. An AutoCAD base was used to trace the proposed pipeline alignments, and approximate elevations at junctions and reservoirs were entered into the model. The anticipated well flow rates were entered into the model using inflow junctions which input a specified flow rate regardless of junction pressure. Model iterations were performed to determine pipe sizes per the pipeline design criteria. This model was then used to determine well head pressures. Preliminary Well pumps and motors sizes were selected using the calculated discharge pressures at the specified flow rate.

The TDH for each well was calculated as the sum of the static head from the water surface of the well to the well head, the static head from the well head to its delivery location, the head necessary to allow flow through the pressure sustaining valve at the inlet to the 2.5 MG pond, and the head losses incurred by pumping the water through the column pipe and distribution pipes.

The initial well head pressure tabulation is shown in ***Table 1.1.3.*** All estimated dynamic pumping levels were determined by Clear Creek.

Table 1.1.3. Total Dynamic Head Estimates-Alternative 3

Well ID	Static Head from Reservoir to Pressure Sustaining HW Elevation (ft)	Pipeline and Column Losses (ft)	Initial Dynamic Pumping Depth (ft)	Final Dynamic Pumping Depth (ft)	Initial Total Dynamic Head (ft)	Final Total Dynamic Head (ft)
FS-1	56	53	235	279	344	388
FS-2	93	39	200	238	332	370
FS-3	108	40	184	211	332	359
FS-4	85	24	206	238	315	347

1.1.4. Horsepower Calculation

The new well field will be equipped for initial conditions with some provisions for future projected conditions. Calculated horsepower (HP) is determined by the following equation, with an assumed pump efficiency (η_{pump}) of 85 percent.

Equation 1.1.4

$$Power\ (HP) = \frac{(Final\ TDH) \times (Flow)}{(3960)(\eta_{pump})}$$

The Motor HP column in ***Table 1.1.4*** will be used to size the pump, motor, starter, other onsite 480V electrical equipment, wiring and conduit, including the transformer.

Well TDH values tabulated in ***Table 1.1.3*** and HP's calculated using those TDH's are subject to change pending the new information, including well pump tests which will be done after the wells are drilled. All values shown are per the best available information known to date.

Table 1.1.4. Well HP and Column Pipe

Well ID	Flow (gpm)	TDH (Final)	Calculated HP	Motor HP
FS-1	300	388	28	40
FS-2	400	370	44	50
FS-2	100	359	11	15
FS-4	100	347	10	15

1.2. PIPELINE DESIGN

1.2.1. Pipeline Sizing

In Alternative 3, the Mitigation Well Field collection pipelines are arranged as shown in ***Figure 1.*** The total pipe lengths required for the pipelines in Alternative 3 are shown in ***Table 1.2.1***.

Table 1.2.1. Pipe Table-WaterCAD v8

Label	Nominal Pipe Size (in)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Head Loss (ft)	Length (ft)
P-1	6	5.35	300	4.28	24.61	2,295
P-2	8	6.96	400	3.37	10.03	1,980
P-3	10	8.68	799	3.80	8.04	1,650
P-4a	12	10.29	900	3.47	0.27	80
P-4b	12	10.29	900	3.47	0.03	8
P-5	6	5.35	200	2.86	0.91	180
P-6	4	3.63	100	3.09	18.55	2015
P-7	4	3.63	100	3.09	1.91	210

The Mitigation Well Field collection pipelines are sized to maintain a head loss gradient of less than 3 ft of head loss per 1,000 ft of pipe (using a Hazen-Williams coefficient of 150), and ideally maintain velocities less than 5 fps.

1.2.2. Pipeline Materials

Pipe material for all well transmission pipelines will be DR 11 HDPE 4710. DR 11 pipe has a thick wall which allows the pipe to be more self-supporting and durable. Additionally, the pipe has a pressure rating of 202 psi, which is de-rated to 131 psi (65 percent of working pressure for a test temperature of 140 degrees Fahrenheit) when laid at grade and exposed to the sun (Plastic Pipe Institute, TR-3, 2010).

1.2.3. Pipeline Installation Methods

New pipeline will be installed below ground in all locations as requested by FMI personnel. All below ground pipe will be installed at a 4-foot minimum depth with tracer wire and magnetic tape. The pipeline is assumed to be installed in an open trench with screened and compacted native backfill except at locations where the pipe crosses existing or new utilities or conduits larger than 3-inches in diameter, where the backfill is aggregate base course on both sides of the intersecting pipe.

1.3. DESIGN CRITERIA – 480 VOLT WELL POWER SYSTEM

Each well will be served 480 volt, 3 phase, 4 wire power from a dedicated pad mounted transformer near each well site. The source of power will be from the mine's high voltage distribution system described elsewhere in this report. The 480 volt service will be fed underground directly to a fused main disconnect switch. The size of each well service will be rated 200 amperes. No provisions for power metering of the service will be made as is typically required when obtaining power from a utility company.

Electrical and control equipment will be mounted on a steel equipment rack which will incorporate sheathing on the rear and on a top structure to provide shade. At all sites, power from the main disconnect switch will feed to an overhead wireway on and through power terminal blocks in the wireway to each piece of equipment using 480 volt power.

A high capacity surge protection unit will be connected to the incoming 480 volt system to provide surge protection for electrical equipment. A single phase, 480-120/240 volt, 10kVA mini-power distribution center will be provided at each well to supply 120/240 volt power to miscellaneous loads including lighting, receptacles and control equipment.

An Allen-Bradley SMC Flex electronic soft start control panel with fused power disconnect switch and bypass contactor will be provided for well pump control. Air conditioning will not be provided for the panel as minimal heat will be generated due to the use of the bypass contactor. Detailed well control features are described elsewhere in this report.

Each well will be provided with power factor correction capacitors to address poor power factor conditions. These capacitors will prevent penalties from being charged by the utility company by reducing the capacity of the facilities the utility company would have to provide to serve a poor power factor load. The capacitors will be installed on the line side of the electronic soft start controllers as placing them on the load side, where they would only be connected when the well runs, is not recommended due to the soft start electronics. A contactor will be provided that will connect the capacitors only when the well pump is running.

All electrical panels will be lockable. Electrical equipment will be rated NEMA 3R where located outdoors.

1.4. DESIGN CRITERIA – WELL CONTROL SYSTEM

Well pumps will utilize electronic soft start controllers with bypass contactors. Well controls will be interfaced with a Programmable Logic Controller (PLC) control panel described in more detail elsewhere in this report. A hand-off remote switch on the front of the well control panel will allow for either local manual control of the well or fully automated control via the PLC system. A green "Run" pilot light, red "High Pressure Cutoff" alarm pilot light, high pressure cutoff reset pushbutton and an elapsed run time meter will also be provided on the front of the well control panel behind a lockable door.

Each well will have a high discharge pressure switch located on the discharge piping to shut the well pump off on high pressure conditions. This switch will be connected to a time delay relay in the well control panel which will latch on when a high pressure condition is monitored for the set time. Normally the time setting will be 0 to provide instant shutdown of the well on high pressure. However, if high pressure surges are present on starting of the well, a small time delay can be set to allow such disturbances to pass. If this high pressure shutdown function trips the well pump off, the operator will need to press the reset pushbutton on the front of the control panel before the well pump can be restarted.

The PLC panel, described elsewhere in this report, will provide 3-wire control of the well pump when operating in the "Remote" control mode. In this configuration, the PLC panel provides two relay contact outputs to the well control panel. A normally open contact will pulse closed to start the well pump, and the well controls will latch on via a normally closed contact from the PLC panel. The well pump is stopped by pulsing the normally closed contact open.

The wells will not be provided with anti-reverse ratchets. The 777 relay, described below, will prevent rapid restarting of a pump upon stopping so that the pump cannot restart while it is spinning backwards due to the falling water column in the well. No provisions will be made for automatic control of well pump lineshaft lubrication. The operator will need to manually control and monitor the flow of lubricant.

The well pumps controls will incorporate a Symcom 777 power monitoring relay that provides several safety features including low and high voltage, loss of phase, over and undercurrent, and restart time delay to prevent starting during pump backspin after stopping. The PLC panel will monitor well pump motor parameters such as voltage and amperage via RS-232 communication connection to the 777 relay.

A magnetic flow meter will be installed on the discharge of each well. The PLC panel will monitor the flow meter and will shut down the well pump if a flow rate that is too low is detected to provide failure to pump protection, and will shut down the well pump if a flow rate that is too high is detected to provide discharge line break protection. Reverse flow detection from the flow meter will provide a well discharge check valve failure alarm. A totalizer pulse will also be sent to the PLC panel to provide a total flow value.

Each well will be provided with a well water level transmitter to allow monitoring of well level via the PLC/telemetry system

1.5. WELL PLC AND INSTRUMENTATION EQUIPMENT

A new PLC panel will be installed at each well site. These panels will utilize Allen-Bradley CompactLogix programmable logic controllers to provide control and monitoring functions. PLC panels at each well site will also incorporate an operator interface display panel to allow an operator to monitor system operation and provide manual control input at the panel. This display may be omitted at some of the well sites where a display panel is provided at a nearby well site that can easily be accessed by operators.

The programmable controllers will communicate using spread spectrum radios. The PLC panel will be in a 48"H x 36"W x 16"D NEMA 4/12 rated enclosure with internal light, lockable door and will be provided with an APC uninterruptable power supply. The operator interface display panel, where provided, will be located on a swing out door behind the exterior door to protect the display from the elements and to prevent exposure of the operator to energized components when the exterior door is open.

1.6. MEDIUM VOLTAGE ELECTRICAL DISTRIBUTION

The electrical distribution system for Alternative 3 begins with a 12.47 kV tap just east of the intersection of West Purdy Lane and Naco Highway. Due to the close proximity of the three wells, Land Application infrastructure, and six pivots, a private line was selected for the new infrastructure located on FMI property.

A new tap pole will be installed adjacent to the existing APS 12.47 kV power line, which runs east-west along the north side of Purdy Lane. The first pole structure north of the tap pole will contain a group operated air break switch which will allow FMI to manually isolate the new private pole line for maintenance and safety purposes. In addition to the air break switch, this pole is equipped with a primary meter, which will serve as the centralized metering location for the entire well field.

The new private pole line will operate at 12.47 kV and utilize standard APS 12.47 kV wooden pole structures. Due to the low voltage requirements at each of the well locations, a pole mounted transformer (12.47 kV to 480 V) will be used to keep the equipment off the ground and protected. The only exception to this can be found at the Land Application Infrastructure, which due to the higher power demand, requires a pad mounted transformer. Transformers are protected at each location with fuses.

In addition to supplying power to the well stations and Land Application infrastructure, the private 12.47 kV power line will also provide power to six irrigation pivots. Each irrigation pivot will have a centralized junction box in which a pole mounted transformer, with fused drop, will supply 480 V power.

To power Alternative 3's FS 2 well, located west of Naco highway, a public power line was designed due to its remote nature and location on private Non-FMI owned land. A tapping pole adjacent to the existing 12.47 kV power line that runs north-south along the west side of Naco highway will be the start of the private pole line. At the termination point of this pole line, the well site, HEA envisions a fuse cut out, pole mounted transformer and secondary metering.

After a preliminary review of project, APS will require line improvements in order to support the power requirements of the project. APS estimates two 3-phase voltage regulators may need to be added or upgraded.

2. CAPITAL COSTS

Capital Costs included in this Memorandum are those expenditures required to construct the civil, mechanical, and electrical components of the following:

- Wells FFS-1, FFS-2, FFS-3, FFS-4;
- The pressure sustaining valve at the 2.5 million gallon pond;
- The wellfield mains;
- The road grading for site access, which is assumed to follow the discharge pipeline alignments and are 16 ft in width;
- The medium voltage transmission lines supplying electrical power to the wells, and LAS booster station;
- Site electrical equipment involved in control and operation;
- Contingency costs to account for uncertainties and unforeseeable elements involving increased costs associated with the normal execution of a project;
- Contractor profit;
- Detailed engineering design;
- Construction Management; and
- Legal, permitting, and administration.

The Capital Costs included in this Memorandum do not include:

- Costs associated with the 2.5 MG pond, the LAS booster Pump Station, LAS piping, and the pivot systems.

3. ANNUAL COSTS

3.1. PERSONNEL SALARY

3.1.1. Wellfield and Pipeline Maintenance

Repair and maintenance of the wellfield, pipelines, and booster station is assumed to be provided by one half-time employee (20 hours per week for 52 weeks per year). It is estimated that this employee will be paid at $45 per hour.

3.1.2. Wellfield Monitoring

Wellfield monitoring is assumed to be provided by one quarter-time employee (10 hours per week for 52 weeks per year). This employee was assumed to be paid at $45 per hour.

3.1.3. Electrician

Repair and maintenance of the associated electrical equipment is assumed to be provided by one half-time electrician (20 hours per week for 52 weeks per year). This employee was assumed to be paid at $45 per hour.

3.2. ENERGY COSTS

The cost of energy supply is based upon WestLand's understanding of the current rate agreement between Arizona Public Service (APS) and Copper Queen Branch. The rate paid by Copper Queen consists of two major factors, the Coincident demand charge and the Energy charge. The fixed-rate customer charge was assumed to be of several orders of magnitude lower than these charges, and was not considered in this estimation. Because the pumps are designed to work nearly continuously, the demand charge and energy charge can be approximated by a single increased energy charge. This result simplifies the comparison between differing options for feasibility.

3.2.1. Well Energy Charge

Energy Charge

The Energy charge of $0.08 cents per kWh was determined based upon review of the most probable rate structures provided by APS.

Equation 3.2.1a

$$Power\ (kW) = \frac{(TDH) \times (Flow)}{(3960)(\eta_{pump})(\eta_{motor})} \times 0.746 \frac{\$}{kWh} \times hours \times \%\ of\ time\ operational$$

The TDH for each well was calculated as the sum of the static head from the water surface of the well to the well head, the static head from the well head to its delivery location plus the additional head added by the pressure sustaining valve at the 2.5 MG pond, and the head losses incurred by pumping the water through the column pipe and distribution pipes. The static head from the well head to the delivery location and the head losses from pumping were assumed to remain constant during the course of the project life. The static head from the water surface in the well to the land surface was assumed to change over time. The values of this initial and final dynamic water depth were provided by Clear Creek. The following example shows calculations for determining the Initial and Final TDH for Well FFS-1

Example 3.2.1a

Step 1 $Initial\ TDH = \text{Head Losses} + \text{Static Head} = 39\text{ft} + (56 + 235)\text{ft} = 330\text{ft}$

Step 2 $Future\ TDH = \text{Head Losses} + \text{Static Head} = 39\text{ft} + (56 + 279)\text{ft} = 374\text{ft}$

Table 1.1.3 shows the head losses assumed for each well, the initial and future water depths, the static head from well head to pressure sustaining valve hydraulic grade, and the Initial and Future TDH.

Total Dynamic Head

The TDH for each well for each year during the life of the Project was determined by adding the head losses, column losses, the static head from the well to the pressure sustaining valve to the depth of dynamic pumping elevation provided for each year by Clear Creek, and an average value for each five year period was determined.

For convenience, the flow and TDH for each well in each time period were multiplied together to provide the numerator for ***Equation 3.2.1a***, and rounded to the nearest thousand. These values are shown in ***Table 3.2.1b.***

Table 3.2.1a shows the estimated TDH for each time period over the course of the project.

Table 3.2.1a. Estimated TDH (ft)

Well Name	Years					
	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045
FS-1	357	373	379	384	386	388
FS-2	343	358	363	367	369	370
FS-3	339	348	353	355	358	360
FS-4	324	335	341	345	346	347

Table 3.2.1b. TDH *Flow

Well Name	Years					
	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045
FS-1	85,680	89,400	90,840	92,040	92,640	93,000
FS-2	137,200	143,000	145,200	146,600	147,400	147,800
FS-3	33,850	34,800	35,250	35,500	35,800	35,950
FS-4	32,350	33,500	34,100	34,450	34,550	34,650
	289,080	**300,700**	**305,390**	**308,590**	**310,390**	**311,400**

*The wells were assumed to operate 95 percent of the time.

Example 3.4.1b shows the calculations for determining the annual energy cost from years 2015-2020.

Example 3.2.1b

Step 1 $$Energy\ Charge = \frac{\Sigma\,(TDH\ \times Flow)}{(3960)(\eta_{pump})(\eta_{motor})} \times 0.746 \times \frac{\$}{kWh} \times hours \times \%\ of\ time\ operational$$

Step 2 $$Energy\ Charge = \frac{289{,}080}{(3960)(0.85)(0.93)} \times 0.746 \times \$0.08 \times 24 \times 365 \times 0.95 \approx \$45{,}865$$

The annual energy cost listed in the cost estimate is the average for the well field over the entire course of the project.

3.3. EQUIPMENT ANNUAL MAINTENANCE

3.3.1. Vertical Turbine Pump Annual Maintenance

General maintenance costs for vertical turbine line shaft well pumps include the costs of replenishing oil reservoirs and replacement of incidental leaking parts or site piping. The cost for these incidental parts and equipment is highly variable and dependent on random factors. A local pump vendor provided an estimated cost for general maintenance of $3,500 per vertical turbine line shaft pump per year.

Submersible pumps were assumed to require no annual maintenance.

3.3.2. Motor Annual Maintenance

The general maintenance cost for motors was assumed to be four percent of the initial motor cost per year. This covers the replacement of minor parts and occasional more significant expenses. This motor maintenance does not apply to submersible pumps.

3.3.3. Transmission Main Annual Maintenance

Annual maintenance of the overhead distribution system was assumed to be three percent of the initial cost of installation, which computes to $14,575. This includes replacement of downed transmission lines, storm-damaged equipment, and lightning arrestors.

4. PERIODIC COSTS

Periodic costs were determined based upon information provided by vendors and from discussion with owners and operators of similar existing systems. These costs were not included as a part of the annual costs, but will require significant capital expenditures over the course of the project. ***Table 4a*** details the estimated schedule for replacement and rehabilitation of mechanical equipment. ***Table 4b*** details the estimated schedule of electrical equipment replacement.

Sections 4.1 through 4.6 detail the assumptions used to develop the repair and replacement schedules.

Table 4a. Mechanical Equipment Repair Schedule

Equipment	Cost per Unit	Frequency (years)	Notes
Submersible Pump	$39,200	5 to 8	Replacement
Vertical Turbine Pump - Line Shaft	$45,000	5 to 8	Rehabilitation
Vertical Turbine Pump - Booster Can	$9,600	5 to 8	Rehabilitation
Vertical Turbine Motor	$7,000	5	Rehabilitation
Well Cleaning and Redevelopment	$9,000	5 to 8	Rehabilitation
Vertical Turbine Pump - Line Shaft	$62,000	15 to 25	Replacement
Vertical Turbine Pump - Booster Can	$16,000	15 to 25	Replacement
Vertical Turbine Motor	$20,000	20	Replacement

Table 4b. Site Electrical Repair Schedule

Equipment	Cost per Unit	Replace Frequency, years
Transformer	$25,000	25
Rack	$5,500	25
Power Center	$11,000	25
Disconnect Switch	$25,000	20
Starter Panel	$65,000	20
PLC Panel	$5,000	20
Power Factor Capacitor	$6,000	20
Wire/Cable	$15,000	20

4.1. SUBMERSIBLE PUMPS

Pump and attached motor are assumed to require replacement every five to eight years due to their continuous operation. It is also estimated that approximately five percent of the column pipe will require replacement during this pipe replacement. This replacement cost does not include drilling or casing replacement. It is assumed that the cost of removal of this well pump and replacement with a new well pump will cost $10,000. The total cost of replacing the submersible pumps is therefore assumed to be $39,200 per well every five to eight years.

4.2. VERTICAL TURBINE PUMPS – LINE SHAFT

Rehabilitation and replacement of the vertical turbine line shaft pump equipment was assumed to be performed every five to eight years. This rehabilitation was assumed to consist of removal of the pump and column pipe from the well, brushing and bailing the casing, transportation of the pump to an offsite pump maintenance facility, replacement of any worn or damaged parts, transportation back to the site, and reinstallation of the pump. This estimate assumes the following based upon conversations with a local pump vendor:

Pulling a pump and shipping it offsite was assumed to cost approximately $10,000.

The costs associated with the repair and rehabilitation can vary widely depending on field conditions and by the depth of the installation. To estimate this cost, the repair and rehabilitation cost was estimated at 10 percent of the initial construction costs of the column pipe, tube, and shaft plus 60 percent of the capital cost of the pump for refurbishment. This cost was considered slightly conservative to reflect the possibility that some items may require significant repair or replacement during the life of the equipment. The total cost of this rehabilitation is assumed to be $45,000 per well every five to eight years.

The vertical turbine line shaft pumps are assumed to require total replacement every 15 to 25 years, with a total cost per pump of $62,000 per well. This includes 10 percent of the column pipe, tube, and shaft, and 100 percent of the pump.

4.3. WELL CLEANING AND REDEVELOPMENT

Each well is assumed to undergo cleaning and redevelopment every time the pump is pulled for rehabilitation. This is anticipated to happen every five to eight years for each well depending on the pump performance. The amount of time and treatment required for each well will vary depending on conditions encountered during operation of the well. WestLand assumed the following for determination of well costs. These estimates were provided with assistance from a representative of a local well drilling and outfitting company.

Each well will be provided with a pre-and post-cleaning video survey to visually inspect well conditions. This amounts to approximately $1,700 per operational well every five to eight years.

Brushing and bailing costs $215 per hour and is expected to take approximately 30 hours per well. This averages out to $6,500 per operational well every five to eight years.

Acid treatment, bio-fouling treatment, liner installation, and/ or swedge patching may be needed on some wells at some time in the future. A cost of $800 per operational well every five to eight years was added to account for the possibility of one or more of these treatments being necessary.

The total cost of well cleaning and redevelopment is $9,000 per well every five to eight years.

4.4. MOTOR REHABILITATION AND REPLACEMENT

Motor rehabilitation was assumed to be performed every five years based upon the expected bearing life. This rehabilitation is assumed to include new bearings and rewinding, and is assumed to cost approximately 35 percent of the original motor cost, or $3,500 per motor other than those for the submersible pumps. The cost for motor rehabilitation is $7,000 every five years. These motors will require replacement every 20 years, at a cost of $20,000 each.

FIGURES

Label	Nominal Pipe Size (in)	Length (ft)
P-1	6	2295
P-2	8	1980
P-3	10	1,650
P-4a	12	80
P-4b	12	8
P-5	6	180
P-6	4	2015
P-7	4	210

* All Pipe HDPE 4710, DR11 IPS

Well FS-1
300 gpm
EL= 4670

Well FS-2
400 gpm
EL= 4635

Well FS-3
100 gpm
EL= 4620

Well FS-4
100 gpm
EL= 4645

Land Application
2.5 MG Reservoir
(By Others)

Pressure Sustaining
Valve
EL= 4630
HW EL= 4722

P-1
P-2
P-3
P-4a
P-4b
P-5
P-6
P-7

San Jose
Wastewater
Treatment Plant

Borrow Pit

4700
4680
4660
4640
4620
4740
4720

Legend

- Property Boundary
- Existing Water
- Existing Electric
- Existing Fiber Optic
- Existing Gas
- Existing Sewer
- Discharge Main
- Proposed Well Site
- Proposed Pressure Sustaining Valve

N

0 500 1,000 Feet

WestLand Resources, Inc.
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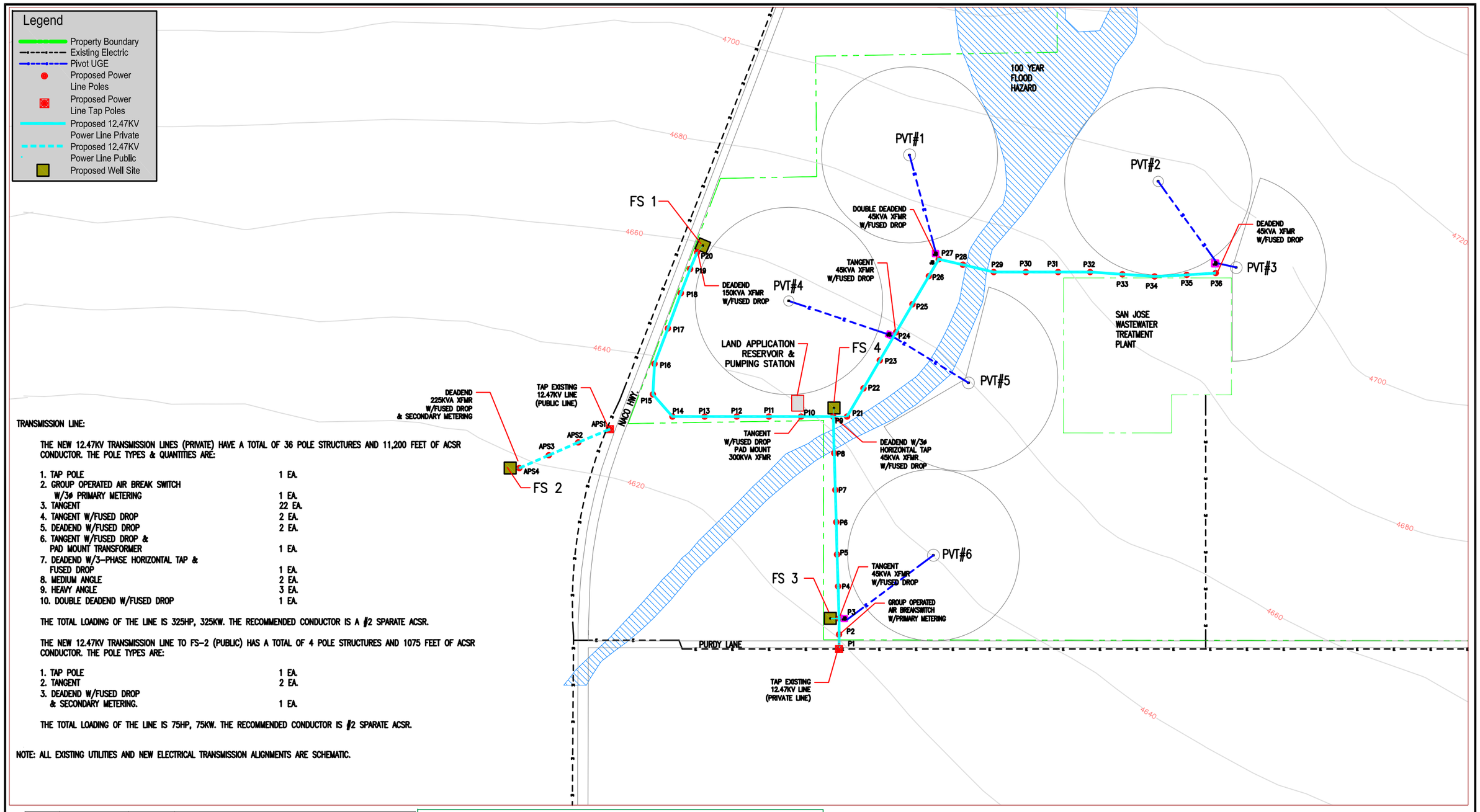
Tucson, Arizona 85712 (520) 206-9585

FIGURE 1
ALTERNATIVE 3
FMI COPPER QUEEN BRANCH

PLUME STABILIZATION AND LAND APPLICATION

May 10, 2013



TRANSMISSION LINE:

THE NEW 12.47KV TRANSMISSION LINES (PRIVATE) HAVE A TOTAL OF 36 POLE STRUCTURES AND 11,200 FEET OF ACSR CONDUCTOR. THE POLE TYPES & QUANTITIES ARE:

1. TAP POLE	1 EA.
2. GROUP OPERATED AIR BREAK SWITCH W/3Ø PRIMARY METERING	1 EA.
3. TANGENT	22 EA.
4. TANGENT W/FUSED DROP	2 EA.
5. DEADEND W/FUSED DROP	2 EA.
6. TANGENT W/FUSED DROP & PAD MOUNT TRANSFORMER	1 EA.
7. DEADEND W/3-PHASE HORIZONTAL TAP & FUSED DROP	1 EA.
8. MEDIUM ANGLE	2 EA.
9. HEAVY ANGLE	3 EA.
10. DOUBLE DEADEND W/FUSED DROP	1 EA.

THE TOTAL LOADING OF THE LINE IS 325HP, 325KW. THE RECOMMENDED CONDUCTOR IS A #2 SPARATE ACSR.

THE NEW 12.47KV TRANSMISSION LINE TO FS-2 (PUBLIC) HAS A TOTAL OF 4 POLE STRUCTURES AND 1075 FEET OF ACSR CONDUCTOR. THE POLE TYPES ARE:

1. TAP POLE	1 EA.
2. TANGENT	2 EA.
3. DEADEND W/FUSED DROP & SECONDARY METERING.	1 EA.

THE TOTAL LOADING OF THE LINE IS 75HP, 75KW. THE RECOMMENDED CONDUCTOR IS #2 SPARATE ACSR.

NOTE: ALL EXISTING UTILITIES AND NEW ELECTRICAL TRANSMISSION ALIGNMENTS ARE SCHEMATIC.

REVISIONS NO	DATE	BY	DESCRIPTION
A	05.02.13	FEH	ISSUED FOR REVIEW & COMMENT
B	05.06.13	FEH	ADD TAP CALLOUT, RE-ISSUE FOR FINAL REVIEW
C	05.09.13	FEH	REVISED PER CURRENT ALT. #3 LAYOUT
D	06.10.13	FEH	REVISED PER CLIENT COMMENTS

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ELKO, NEVADA 89801
(775) 778-0787

N

0 500 1,000 Feet

FIGURE 2
ALTERNATIVE 3
FMI COPPER QUEEN BRANCH

PLUME STABILIZATION AND LAND APPLICATION

APRIL 19, 2013

ATTACHMENT 1

COST ESTIMATES

Attachment 1
LAND APPLICATION OPTION

ALTERNATIVE 3

Site:	**Copper Queen Branch**	**Description: FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	**Naco, AZ**	
Phase:	**Feasibility Study (-30% to +50%)**	
Base Year	**2013**	
Date:	**6/24/2013**	

ALTERNATIVE 3 - CAPITAL AND ANNUAL COSTS

COST TYPE	TOTAL COST
Capital Cost - Civil and Mechanical	$2,509,394
Capital Cost - Electrical Transmission	$655,564
Capital Cost - Site Electrical	$629,721
ALTERNATIVE 2 CAPITAL COSTS	**$3,794,679**
ANNUAL OPERATIONS AND MAINTENANCE	**$257,080**

Attachment 1
LAND APPLICATION OPTION

ALTERNATIVE 3

Site:	Copper Queen Branch	Description:	**FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ		
Phase:	Feasibility Study (-30% to +30%)		
Base Year	2013		
Date:	6/24/2013		

CIVIL AND MECHANICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
DIRECT COSTS					
WELLSITES - Mechanical					
Drilling and Reaming	2,110	LF	$125	$263,750	
8-inch Casing - Screen	600	LF	$200	$120,000	Assumes 304 Stainless Steel
8-inch Casing - Blank	800	LF	$150	$120,000	Assumes 304 Stainless Steel
10-inch Casing - Screen	300	LF	$210	$63,000	Assumes 304 Stainless Steel
10-inch Casing - Blank	400	LF	$175	$70,000	Assumes 304 Stainless Steel
12-inch Casing - Screen	300	LF	$250	$75,000	Assumes 304 Stainless Steel
12-inch Casing - Blank	400	LF	$210	$84,000	Assumes 304 Stainless Steel
Tube and Shaft for 300 and 400 gpm wells	700	LF	$45	$31,500	Assumes 304 Stainless Steel
Column Pipe for 100 gpm Wells (submersible)	700	LF	$80	$56,000	Assumes 304 Stainless Steel
Column Pipe for 300 gpm Well	350	LF	$180	$63,000	Assumes 304 Stainless Steel
Column Pipe for 400 gpm Well	350	LF	$230	$80,500	Assumes 304 Stainless Steel
Submersible Pump Assembly - 15 HP	2	EA	$22,000	$44,000	Includes Pump, Motor, Cable, Discharge Head
Vertical Turbine Pump Assembly - 30 HP	1	EA	$32,000	$32,000	Includes Pump, Motor, Discharge Head
Vertical Turbine Pump Assembly- 50 HP	1	EA	$37,000	$37,000	Includes Pump, Motor, Discharge Head
Sounding Tube	4	EA	$800	$3,200	1-1/4" PVC for well transmitter
4-inch welded steel manifold	2	EA	$5,000	$10,000	Incl. spool pieces, gauges, fittings, and appurt.
6-inch welded steel manifold	1	EA	$6,300	$6,300	Incl. spool pieces, gauges, fittings, and appurt.
8-inch welded steel manifold	1	EA	$11,000	$11,000	Incl. spool pieces, gauges, fittings, and appurt.
4-inch Pressure Release Valve	4	EA	$4,000	$16,000	
Well Service Air Release Valve	4	EA	$1,050	$4,200	1-inch
4-inch Silent Globe Check Valve	2	EA	$880	$1,760	
8-inch Resilient Wedge Gate Valve	1	EA	$1,800	$1,800	
4-inch PE 4710, DR 13.5, IPS	3,125	LF	$8	$24,625	
6-inch PE 4710, DR 13.5, IPS	2,475	LF	$11	$1,760	

Attachment 1
LAND APPLICATION OPTION

ALTERNATIVE 3

CIVIL AND MECHANICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
8-inch PE 4710, DR 13.5, IPS	1,980	LF	$16	$30,809	
10-inch PE 4710, DR 13.5, IPS	1,650	LF	$21	$35,307	
12-inch PE 4710, DR 13.5, IPS	88	LF	$28	$2,470	
Trenching for Underground Installation	9,318	LF	$17	$158,406	
SUBTOTAL				$1,447,387	
Access Road Construction					
Clearing and Grubbing-Unpaved	3.4	Acre	$1,000	$3,423	
Road Construction-Unpaved	149,088	Sq. Ft	$1	$149,088	
Clearing and Grubbing-Paved	0.2	Acre	$1,000	$230	
Road Construction-Paved	8,000	Sq. Ft	$5	$40,000	
SUBTOTAL				$192,740	
SUBTOTAL-DIRECT COSTS				$1,640,127	
INDIRECT COSTS					
Prime Contractor Contingencies			15.0%	$246,019	
Prime Contractor Profit			10.0%	$164,013	
Engineering			8.0%	$131,210	
Construction Management			12.0%	$196,815	
Legal, Permitting, and administration			8.0%	$131,210	
SUBTOTAL-INDIRECT COSTS				$869,267	
TOTAL COSTS - MECHANICAL AND CIVIL				$2,509,394	

Attachment 1
LAND APPLICATION OPTION

ALTERNATIVE 3

Site:	Copper Queen Branch	Description:	**FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ		
Phase:	Feasibility Study (-30% to +30%)		
Base Year	2013		
Date:	6/24/2013		

SITE ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
DIRECT COSTS					
SITE ELECTRICAL - Wellsites					
Rack for electrical equipment	4	EA	$5,500	$22,000	
Disconnect Switch - 400A	4	EA	$14,600	$58,400	
Fuses - 400A RK-1	12	EA	$230	$2,760	
Well Starter Panel	4	EA	$45,000	$180,000	
Mini-Power Center - 10kVA	4	EA	$11,000	$44,000	
Service Surge Protector	4	EA	$2,500	$10,000	
#14AWG XHHW-2 Wire	32	CLF	$60	$1,905	
#12AWG XHHW-2 Wire	24	CLF	$77	$1,841	
#8AWG XHHW-2 Wire	8	CLF	$129	$1,030	
#2AWG XHHW-2 Wire	8	CLF	$359	$2,870	
#1/0AWG XHHW-2 Wire	8	CLF	$494	$3,952	
#4/0AWG XHHW-2 Wire	5	CLF	$905	$4,653	
#250MCM XHHW-2 Wire	17	CLF	$1,049	$17,985	
#300MCM XHHW-2 Wire	3	CLF	$1,523	$3,917	
#400MCM XHHW-2 Wire	3	CLF	$2,465	$6,339	
#500MCM XHHW-2 Wire	11	CLF	$2,098	$23,377	
1" PVC Conduit	1,600	LF	$7	$10,464	
2-1/2" PVC Conduit	400	LF	$18	$7,276	
4" PVC Conduit	943	LF	$25	$23,722	
Trenching and Backfill	1,000	LF	$8	$7,800	
SUBTOTAL				$434,290	

Attachment 1
LAND APPLICATION OPTION

ALTERNATIVE 3

SITE ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
SUBTOTAL-DIRECT COSTS				$434,290	
INDIRECT COSTS					
Prime Contractor Contingencies			15.0%	$65,144	
Prime Contractor Profit			10.0%	$43,429	
Engineering			8.0%	$34,743	
Construction Management			12.0%	$52,115	
SUBTOTAL-INDIRECT COSTS				$195,431	
TOTAL COSTS - Site Electrical				$629,721	

Attachment 1
LAND APPLICATION OPTION

ALTERNATIVE 3

Site:	Copper Queen Branch	Description: **FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ	
Phase:	Feasibility Study (-30% to +30%)	
Base Year	2013	
Date:	6/24/2013	

ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
DIRECT COSTS					
Private Power Line					
12.47 kV Transmission Line (336 ACSR Conductor)	11,200	LF	$2.15	$24,100	
TAP Pole	1	EA	$3,025	$3,025	
Group Operated Air Break Switch w/ 3Ø Primary Metering	1	EA	$14,040	$14,040	
Voltage Regulator, 3 Phase, Pole Mounted	2	EA	$55,842.50	$111,685	
Tangent Pole	22	EA	$4,220	$92,840	
Tangent Pole w/ Fused Drop & 45 kVA Transformer	2	EA	$11,140	$22,280	
Dead End Pole w/ Fused Drop & 45 kVA Transformer	1	EA	$13,440	$13,440	
Dead End Pole w/ Fused Drop & 150 kVA Transformer	1	EA	$17,940	$17,940	
Tangent Pole w/ Fused Drop & pad mount 300 kVA Transformer	1	EA	$16,240	$16,240	
Pad Mount Containment Slab	1	LS	$2,740	$2,740	
Dead End Pole Horizontal Tap w/ Fused Drop & 45 kVA Transformer	1	EA	$12,005	$12,005	
Medium Angle Pole	2	EA	$6,040	$12,080	
Heavy Angle Pole	3	EA	$6,040	$18,120	
Double Dead End Pole w/ Fused Transfer Drop & 45 kVA Transformer	1	EA	$14,040	$14,040	
SUBTOTAL				$374,574	

Attachment 1
LAND APPLICATION OPTION

ALTERNATIVE 3

ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Public Power Line					
12.47 kV Transmission Line (336 ACSR Conductor)	1,075	LF	$2.15	$2,313	
Tap Pole	1	EA	$3,025	$3,025	
Tangent Pole	2	EA	$4,220	$8,440	
Dead End Pole w/ Fused Drop, 225 kVA Transformer & Secondary Metering	1	EA	$23,040	$23,040	
SUBTOTAL				$36,818	
SUBTOTAL-DIRECT COSTS				$411,393	
INDIRECT COSTS - Total Construction Costs					
Construction Indirects			4.2%	$17,203	15% of direct field costs
Freight and Transportation			2.2%	$9,108	6% of Plant Equipment Dollars
Contractor Fee (OH & P)			9.5%	$38,939	15% of labor, bulk material, eqmt
SUBTOTAL				$65,250	
SUBTOTAL -INDIRECT COSTS - Total Construction Costs (TCC)				$476,643	
Sales Tax			4.615%	$21,997	(Cochise Co. @ 65% of 7.1%)
Engineering			10.0%	$47,664	8% of Total Constructed Costs
SUBTOTAL				$69,661	
SUBTOTAL -INDIRECT COSTS - Total Project Cost				$546,304	
Contingency			20.0%	$109,261	20% of Total Project Cost
TOTAL COSTS - ELECTRICAL TRANSMISSION				$655,564	

Attachment 1
LAND APPLICATION OPTION

ALTERNATIVE 3

Site: Copper Queen Branch	Description: **FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location: Naco, AZ	
Phase: Feasibility Study (-30% to +30%)	
Base Year 2013	
Date: 6/24/2013	

OPERATIONS AND MAINTENANCE COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Personnel - SALARY					
FMI Water System Maintenance Personnel	50.0%	EA	$ 93,600	$ 46,800	Percent of Full-Time $45/hr employee
Wellfield Monitoring	25.0%	EA	$ 93,600	$ 23,400	Percent of Full-Time $45/hr employee
Electrician	50.0%	EA	$ 93,600	$ 46,800	Percent of Full-Time $45/hr employee
				$ 117,000	
ENERGY COSTS					
Well field	603,500	kWh	$ 0.08	$ 48,280	Estimated Demand Charge Included
				$ 48,280	
Equipment Maintenance					
Vertical Turbine Line Shaft Pump Maintenance	2	EA	$ 500	$ 1,000	$500 per well per year general equipment
Motor Maintenance	4.0%	Pcnt.	$ 20,000	$ 800	4% of Motor Equipment Costs
Transmission Main Maintenance	3.0%	Pcnt.	$ 1,000,000	$ 30,000	Replacement of damaged equipment
				$ 31,800	
Electrical Equipment Repair and Replacement					
Transmission Repair	3.0%	Pcnt.	$ 2,000,000	$ 60,000	
				$ 60,000	
TOTAL ANNUAL COSTS - OPERATIONS AND MAINTENANCE				$ 257,080	

APPENDIX F.3

DESIGN BASIS MEMORANDUM AND BUDGETARY COST ESTIMATE FOR FMI COPPER QUEEN BRANCH MITIGATION ALTERNATIVE NO.4

MEMORANDUM

Prepared for: James R. Norris, R.G., Clear Creek Associates

Prepared by: Mark F. Taylor, P.E., WestLand Resources, Inc.

Date: July 11, 2013

CC: Erik Christenson, E.I.T., WestLand Resources, Inc.

Project No.: **DESIGN BASIS MEMO AND BUDGETARY COST ESTIMATE FOR FMI COPPER QUEEN BRANCH MITIGATION ALTERNATIVE 4 WESTLAND JOB NO. 260.17 01 01**

EXECUTIVE SUMMARY

WestLand Resources, Inc. was retained by Clear Creek Associates (Clear Creek) to construct conceptual designs for the wellfield, transmission piping, electrical transmission, radio-telemetry coordination, and low-voltage equipment; and to provide feasibility-level cost estimates for distinct alternatives to mitigate a groundwater sulfate plume.

These cost estimates include both initial capital costs, and annual operations and maintenance (O&M) costs of the alternatives. This memorandum was prepared to demonstrate the analysis used to prepare the conceptual designs, as well as list the assumptions made in determining a budgetary cost. Cost estimates for equipment and materials are based upon manufacturers' quotes, governmental agency cost estimation recommendations, and on prices observed from similar projects completed by WestLand, Richard Canney Engineering (RCE), and Hanlon Engineering (Hanlon). Estimated major equipment replacement schedules not included in the annual O&M are provided to assist FMI to estimate and plan for future capital expenditures.

Alternative 4 is comprised of ten wells designed and located by Clear Creek to decrease the extent of the plume over time. These wells pump elevated sulfate groundwater through a collection pipeline system to a 2.5 million gallon (MG) storage pond, which serves as temporary storage for both a land application system (LAS) and a water treatment plant where the groundwater is treated through a reverse osmosis (RO) system to separate the groundwater into low-sulfate effluent and high-sulfate brine.

The LAS was designed by Cascade Earth Sciences (CES) for crop production and the costs associated with the LAS are not considered as a part of this memorandum, with the exception of providing power service to the pivot point location junction boxes, the location of which were provided by CES.

The cost estimates and concept design for the water treatment plant were prepared by MWH and described in a memorandum entitled *Bisbee Arizona Copper Queen Mine Groundwater Treatment/Management Alternative.* This RO system is intended to separate the groundwater from the

wells into low-sulfate effluent and high-sulfate brine. The low-sulfate treated water is to be pumped at a rate of approximately 1,400 gallons per minute (gpm) via the five-pump Greenbush Booster Station to be discharged into Greenbush Draw at a location west of Naco, Arizona. The high sulfate brine is pumped to an evaporation pond for disposal.

The Alternative 4 Mitigation Wellfield, including well locations, collection pipeline locations, treated discharge piping, standpipe, and reservoir delivery location are shown in ***Figure 1.*** A feasibility cost estimate for the portions of the project contained within this memo is included as ***Attachment 1.***

1. DESIGN BASIS

1.1. WELL DESIGN

The new mitigation well field will consist of 10 new wells. All well locations and flow rates were set by Clear Creek and are intended to accomplish the groundwater mitigation objective per groundwater modeling results.

1.1.1. Well Overview

All new wells 100 gpm or less will be equipped with submersible pumps. All new wells greater than 100 gpm will be vertical turbine line shaft pumps. Well site design will be typical per the American Water Works Association (AWWA) A100 unless otherwise specified. Typical site manifolds will include a check valve, well service air release valve, flow meter, isolation valve, and a pressure relief valve.

1.1.2. Column Pipe and Casing Selection

WestLand's cost estimate assumes stainless steel is used for all well components in contact with groundwater. The elevated sulfate levels in the groundwater create a solution that is corrosive to carbon steels, limiting their expected life cycle. The increased initial expense of 304 stainless steel casing is likely to be counterbalanced by its longer expected life due to increased corrosion resistance.

The depth of drilling was determined to be 40 feet (ft) below bedrock as determined by Clear Creek. A 304 stainless steel casing and well screen will be installed as designed by Clear Creek. The column pipe length was determined to be approximately 100 ft below the dynamic pumping water surface level at maximum drawdown.

Well column pipe was designed to maintain a velocity between 3.0 feet per second (fps) and approximately 5.25 fps. This velocity is sufficient to prevent sand in the water column from settling out and clogging the pump bowls, but slow enough to prevent excessive head loss due to friction losses in the column pipe.

The casing size was determined to be a minimum of 2-inches in diameter greater than the likely nominal bowl size of the submersible pump, rounded up to the nearest common pipe diameter. The estimated

borehole diameter is approximately 16-inches in diameter. ***Table 1.1.2*** lists the size of the well components in Alternative 4:

Table 1.1.2. Well Column Pipe Sizing

Well ID	Flow (gpm)	Column Size (in.)	Column Velocity (in.)	Nominal Bowl Size (in.)	Casing Size (in.)	Borehole Size (in.)
PR-0*	100	3	4.54	5	8	16
PR-1	250	6	3.43	8	10	16
PR-2	400	6	5.11	8	10	16
PR-3	400	6	5.11	8	10	16
PR-4	400	6	5.11	8	10	16
PR-5	250	6	3.43	8	10	16
PR-6	400	6	5.11	8	10	16
PR-7	400	6	5.11	8	10	16
PR-8	200	5	3.89	8	10	16
PR-9	150	4	5.11	6	8	16

*denotes a submersible pump

1.1.3. Total Dynamic Head Calculation

The Total Dynamic Head (TDH) is the total equivalent height that the groundwater is to be pumped, and is a measurement of the pressure head added to the groundwater by the pump. Well TDH is the sum of the static head and the head losses, and the units are in feet. The static head is the difference in elevation between the groundwater surface level and the pressure sustaining valve high water elevation. The head losses are the loss of energy due to friction of the water against the pipe, column pipe, valves, and bends.

Estimated pumping water levels for initial and future conditions of Alternative 4 were provided by Clear Creek. ***Table 1.1.3*** shows the initial and final dynamic pumping depths, which is a portion of the static head. The remainder of the static head is the difference in elevation between the well discharge and the inlet to the 2.5 MG pond. Because several of the mitigation well sites are higher in elevation than the inlet to the 2.5 MG pond, a pressure sustaining valve was added to the inlet of this pond to ensure that the well pumps are pumping against pressure and do not flow from gravity. This prevents the pipeline from draining to the tank when the well pumps are shut off. For hydraulic calculations, this pressure sustaining valve was set to maintain at least 40 pounds per square inch (psi) (92 ft of static head) at the inlet to the treatment plant. Hydraulically, this has the effect of adding 92 ft to the static head required to supply water to the pond.

A hydraulic computer model for the Alternative 4 Well Field and the well collection pipeline string was created in WaterCAD V8i to determine TDH. An AutoCAD base was used to trace the proposed pipeline alignments, and approximate elevations at junctions and reservoirs were entered into the model. The anticipated well flow rates were entered into the model using inflow junctions which input a specified flow rate regardless of junction pressure. Model iterations were performed to determine pipe sizes per the

pipeline design criteria. This model was then used to determine well head pressures. Preliminary Well pumps and motors sizes were selected using the calculated discharge pressures at the specified flow rate.

The TDH for each well was calculated as the sum of the static head from the water surface of the well to the well head, the static head from the well head to its delivery location, the head necessary to allow flow through the pressure sustaining valve at the inlet to the 2.5 MG pond, and the head losses incurred by pumping the water through the column pipe and distribution pipes.

The initial well head pressure tabulation is shown in ***Table 1.1.3.*** All estimated dynamic pumping levels were determined by Clear Creek.

Table 1.1.3. Total Dynamic Head Estimates-Alternative 4

Well ID	Static Head from Reservoir to Pressure Sustaining HW Elevation (ft)	Pipeline and Column Losses (ft)	Initial Dynamic Pumping Depth (ft)	Final Dynamic Pumping Depth (ft)	Initial Total Dynamic Head (ft)	Final Total Dynamic Head (ft)
PR-0	2	86	280	364	368	452
PR-1	32	70	250	345	352	447
PR-2	47	38	237	341	322	426
PR-3	82	30	204	298	316	410
PR-4	72	27	214	319	313	418
PR-5	22	49	261	372	332	443
PR-6	47	33	237	357	317	437
PR-7	92	29	195	288	316	409
PR-8	104	42	184	253	330	399
PR-9	102	82	184	257	368	441

1.1.4. Horsepower Calculation

The new well field will be equipped for initial conditions with some provisions for future projected conditions. Calculated horsepower (HP) is determined by the following equation, with an assumed pump efficiency (η_{pump}) of 85 percent.

Equation 1.1.4

$$Power\ (HP) = \frac{(Final\ TDH) \times (Flow)}{(3960)(\eta_{pump})}$$

The Motor HP column in ***Table 1.1.4*** will be used to size the pump, motor, starter, other onsite 480V electrical equipment, wiring and conduit, including the transformer.

Well TDH values tabulated in ***Table 1.1.3*** and HP's calculated using those TDH's are subject to change pending the new information, including well pump tests which will be done after the wells are drilled. All values shown are per the best available information known to date.

Table 1.1.4. Well HP and Column Pipe

Well ID	Flow (gpm)	Final TDH (ft)	Calculated HP	Motor HP
PR-0	100	457	14	20
PR-1	250	448	33	40
PR-2	400	422	50	60
PR-3	400	415	49	60
PR-4	400	422	50	60
PR-5	250	440	33	40
PR-6	400	434	52	60
PR-7	400	403	48	60
PR-8	200	389	23	30
PR-9	150	446	20	25

1.2. PIPELINE DESIGN

1.2.1. Pipeline Sizing

In Alternative 4, the Mitigation Well Field collection pipelines are arranged as shown in ***Figure 1.*** The total pipe lengths required for the pipelines in Alternative 4 are shown in ***Table 1.2.1***.

Table 1.2.1. Pipe Table-WaterCAD v8

Label	Nominal Pipe Size (in)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Head Loss (ft)	Length (ft)
P-1	4	3.63	100	3.09	17.04	1,850
P-2	6	5.35	250	3.57	0.88	115
P-3	6	5.35	350	5.00	31.62	2,215
P-4	6	5.35	250	3.57	13.27	1,735
P-5	16	12.90	1,950	4.79	4.41	935.
P-6	8	6.96	400	3.37	3.23	640
P-7	8	6.96	400	3.37	0.81	160
P-8	8	6.96	550	4.63	3.84	420
P-9	4	3.59	150	4.75	52.93	2,570
P-10	4	5.35	200	2.86	14.44	2,855
P-11	8	6.96	600	5.06	4.74	440

Table 1.2.1. Pipe Table-WaterCAD v8

Label	Nominal Pipe Size (in)	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Head Loss (ft)	Length (ft)
P-12	8	6.96	400	3.37	0.87	170
P-13	12	10.29	1,000	3.86	2.32	565
P-14	8	6.96	400	3.37	4.10	810
P-15	16	12.92	1,400	3.43	4.92	1,943
P-16	20	16.15	2,950	4.62	0.32	95
P-17	20	16.15	2,950	4.62	0.01	2
P-18	12	10.29	1,000	3.86	5.22	1,270
P-19	8	6.96	400	3.37	0.50	100
P-20	12	10.29	750	2.89	1.85	765
TE-1	16	12.92	3,426	8.38	50.00	2,890
TE-2	16	12.92	1,400	3.43	42.06	12,750
TE-3	16	12.92	1,400	3.43	0.03	9

The Mitigation Well Field collection pipelines are sized to maintain a head loss gradient of less than 3 ft of head loss per 1,000 ft of pipe (using a Hazen-Williams coefficient of 150), and ideally maintain velocities less than 5 fps.

1.2.2. Pipeline Material

Pipe material for all well transmission pipelines will be DR 11 HDPE 4710. DR 11 pipe has a thick wall which allows the pipe to be more self-supporting and durable. Additionally, the pipe has a pressure rating of 202 psi, which is de-rated to 131 psi (65 percent of working pressure for a test temperature of 140 degrees Fahrenheit) when laid at grade and exposed to the sun (Plastic Pipe Institute, TR-3, 2010).

1.2.3. Pipeline Installation Methods

New pipeline will be installed below ground in all locations as requested by FMI personnel. All below ground pipe will be installed at a 4-foot minimum depth with tracer wire and magnetic tape. The pipeline is assumed to be installed in an open trench with screened and compacted native backfill except at locations where the pipe crosses existing or new utilities or conduits larger than 3-inch in diameter, where the backfill is aggregate base course on both sides of the intersecting pipe.

1.3. DESIGN CRITERIA – GREENBUSH BOOSTER STATION

The discharge of the RO Water Treatment Plant requires that approximately 1,400 gpm be delivered to Greenbush Draw. The alignment determined by WestLand and Clear Creek makes a gravity discharge unfeasible, and instead a booster station concept is proposed.

The proposed Greenbush Booster Station will consist of five short-set vertical turbine can pumps which will draw from a small reservoir at the RO Water Treatment Plant. These pumps will be designed to deliver approximately 350 gpm each, and will operate either four at a time in parallel depending on the water level of the RO discharge reservoir.

The booster station will not be designed to run five pumps at a time. The control programming for the booster pumps will rotate pumps such that all pumps run equally, but will never allow five pumps to run at once. All electrical equipment and the pipeline are sized for a maximum of four pumps running simultaneously.

This booster station will pump to a concrete standpipe open to the atmosphere. This standpipe will then drain through gravity to the Greenbush Draw discharge.

1.3.1. Total Dynamic Head Calculation

A hydraulic computer model for a pipeline between Greenbush Booster Station and pipeline string was created in WaterCAD V8.i. The anticipated booster flow rate was entered into the model using inflow junctions which input a specified flow rate regardless of junction pressure. Model iterations were performed to determine pipe sizes per the pipeline design criteria.

The Greenbush Booster Station is higher in elevation than the proposed standpipe, therefore, a pressure sustaining valve was added to standpipe inlet to ensure that the pumps are pumping against pressure and do not flow from gravity. This pressure sustaining valve was set to maintain at least 40 psi (92 ft of head) at the inlet to the standpipe

The TDH for the booster station was calculated as the sum of the static head from the pump station to its delivery location at the standpipe, the head necessary to allow flow through the pressure sustaining valve at the inlet to the RO Water Treatment Plant, and the head losses incurred by pumping the water through the manifold and 16-inch transmission pipe. The TDH was calculated as follows:

Table 1.3.1. TDH Estimates-Alternative 4

Pump Station	Static Head from Pump Station to Pressure Sustaining HW Elevation	Pipeline Losses (ft)	Assumed Manifold Losses (ft)	THD (Initial)
Greenbush Booster Station	37	42	20	99

1.4. DESIGN CRITERIA – 480 VOLT WELL POWER SYSTEM

Each well will be served 480 volt, 3 phase, 4 wire power from a dedicated pad mounted transformer near each well site. The source of power will be from the mine's high voltage distribution system described elsewhere in this report. The 480 volt service will be fed underground directly to a fused main disconnect

switch. The size of each well service will be rated 200 amperes. No provisions for power metering of the service will be made as is typically required when obtaining power from a utility company.

Electrical and control equipment will be mounted on a steel equipment rack which will incorporate sheathing on the rear and on a top structure to provide shade. At all sites, power from the main disconnect switch will feed to an overhead wireway on and through power terminal blocks in the wireway to each piece of equipment using 480 volt power.

A high capacity surge protection unit will be connected to the incoming 480 volt system to provide surge protection for electrical equipment. A single phase, 480-120/240 volt, 10kVA mini-power distribution center will be provided at each well to supply 120/240 volt power to miscellaneous loads including lighting, receptacles and control equipment.

An Allen-Bradley SMC Flex electronic soft start control panel with fused power disconnect switch and bypass contactor will be provided for well pump control. Air conditioning will not be provided for the panel as minimal heat will be generated due to the use of the bypass contactor. Detailed well control features are described elsewhere in this report.

Each well will be provided with power factor correction capacitors to address poor power factor conditions. These capacitors will prevent penalties from being charged by the utility company by reducing the capacity of the facilities the utility company would have to provide to serve a poor power factor load. The capacitors will be installed on the line side of the electronic soft start controllers as placing them on the load side, where they would only be connected when the well runs, is not recommended due to the soft start electronics. A contactor will be provided that will connect the capacitors only when the well pump is running.

All electrical panels will be lockable. Electrical equipment will be rated NEMA 3R where located outdoors.

1.5. DESIGN CRITERIA – WELL CONTROL SYSTEM

Well pumps will utilize electronic soft start controllers with bypass contactors. Well controls will be interfaced with a Programmable Logic Controller (PLC) control panel described in more detail elsewhere in this report. A hand-off remote switch on the front of the well control panel will allow for either local manual control of the well or fully automated control via the PLC system. A green "Run" pilot light, red "High Pressure Cutoff" alarm pilot light, high pressure cutoff reset pushbutton and an elapsed run time meter will also be provided on the front of the well control panel behind a lockable door.

Each well will have a high discharge pressure switch located on the discharge piping to shut the well pump off on high pressure conditions. This switch will be connected to a time delay relay in the well control panel which will latch on when a high pressure condition is monitored for the set time. Normally the time setting will be zero to provide instant shutdown of the well on high pressure. However, if high pressure surges are present on starting of the well, a small time delay can be set to allow such

disturbances to pass. If this high pressure shutdown function trips the well pump off, the operator will need to press the reset pushbutton on the front of the control panel before the well pump can be restarted.

The PLC panel, described elsewhere in this report, will provide 3-wire control of the well pump when operating in the "Remote" control mode. In this configuration, the PLC panel provides two relay contact outputs to the well control panel. A normally open contact will pulse closed to start the well pump, and the well controls will latch on via a normally closed contact from the PLC panel. The well pump is stopped by pulsing the normally closed contact open.

The wells will not be provided with anti-reverse ratchets. The 777 relay, described below, will prevent rapid restarting of a pump upon stopping so that the pump cannot restart while it is spinning backwards due to the falling water column in the well. No provisions will be made for automatic control of well pump lineshaft lubrication. The operator will need to manually control and monitor the flow of lubricant.

The well pumps controls will incorporate a Symcom 777 power monitoring relay that provides several safety features including low and high voltage, loss of phase, over and undercurrent, and restart time delay to prevent starting during pump backspin after stopping. The PLC panel will monitor well pump motor parameters such as voltage and amperage via RS-232 communication connection to the 777 relay.

A magnetic flow meter will be installed on the discharge of each well. The PLC panel will monitor the flow meter and will shut down the well pump if a flow rate that is too low is detected to provide failure to pump protection, and will shut down the well pump if a flow rate that is too high is detected to provide discharge line break protection. Reverse flow detection from the flow meter will provide a well discharge check valve failure alarm. A totalizer pulse will also be sent to the PLC panel to provide a total flow value.

Each well will be provided with a well water level transmitter to allow monitoring of well level via the PLC/telemetry system

1.6. WELL PLC AND INSTRUMENTATION EQUIPMENT

A new PLC panel will be installed at each well site. These panels will utilize Allen-Bradley CompactLogix programmable logic controllers to provide control and monitoring functions. PLC panels at each well site will also incorporate an operator interface display panel to allow an operator to monitor system operation and provide manual control input at the panel. This display may be omitted at some of the well sites where a display panel is provided at a nearby well site that can easily be accessed by operators.

The programmable controllers will communicate using spread spectrum radios. The PLC panel will be in a 48"H x 36"W x 16"D NEMA 4/12 rated enclosure with internal light, lockable door and will be provided with an APC uninterruptable power supply. The operator interface display panel, where provided, will be located on a swing out door behind the exterior door to protect the display from the elements and to prevent exposure of the operator to energized components when the exterior door is open.

1.7. 480 VOLT BOOSTER PUMPING STATION POWER SYSTEM

Each booster pumping station will be served 480 volt, 3 phase, 4 wire power from a dedicated pad mounted transformer near each site. The source of power will be from the mine's high voltage distribution system described elsewhere in this report. The 480 volt service will be fed underground directly to a fused main disconnect switch. The size of each service will be rated 200 amperes. No provisions for power metering of the service will be made as is typically required when obtaining power from a utility company.

Electrical and control equipment will be mounted on a steel equipment rack which will incorporate sheathing on the rear and on a top structure to provide shade. At all sites, power from the main disconnect switch will feed to an overhead wireway on and through power terminal blocks in the wireway to each piece of equipment using 480 volt power.

A high capacity surge protection unit will be connected to the incoming 480 volt system to provide surge protection for electrical equipment. A single phase, 480-120/240 volt, 10kVA mini-power distribution center will be provided at each well to supply 120/240 volt power to miscellaneous loads including lighting, receptacles and control equipment.

An Allen-Bradley SMC Flex electronic soft start control panel with fused power disconnect switch and bypass contactor will be provided for booster pump control. Air conditioning will not be provided for the panel as minimal heat will be generated due to the use of the bypass contactor. Detailed well control features are described elsewhere in this report.

Each booster pump will be provided with power factor correction capacitors to address poor power factor conditions. These capacitors will prevent penalties from being charged by the utility company by reducing the capacity of the facilities the utility company would have to provide to serve a poor power factor load. The capacitors will be installed on the line side of the electronic soft start controllers as placing them on the load side, where they would only be connected when the well runs, is not recommended due to the soft start electronics. A contactor will be provided that will connect the capacitors only when the well pump is running.

All electrical panels will be lockable. Electrical equipment will be rated NEMA 3R where located outdoors.

1.8. BOOSTER STATION PLC AND INSTRUMENTATION EQUIPMENT

A new PLC panel will be installed at each Booster Pumping Station. This panel will utilize an Allen-Bradley CompactLogix programmable logic controller to provide control and monitoring functions. The PLC panel will also incorporate an operator interface display panel to allow an operator to monitor system operation and provide manual control input at the panel.

The programmable controller will communicate via spread spectrum radio. A central computer located at the mine's offices can be added to allow operators to monitor and control the system from that location. This central computer would also provide alarms and storage of data such as flows and well levels.

The PLC panel will be in a 48"H x 36"W x 16"D NEMA 4/12 rated enclosure with internal light, lockable door and will be provided with an APC uninterruptable power supply. The operator interface display panel will be located on a swing out door behind the exterior door to protect the display from the elements and to prevent exposure of the operator to energized components when the exterior door is open.

Each booster pump will have a high discharge pressure switch located on the discharge piping to shut the pump off on high pressure conditions. This switch will be connected to a time delay relay in the pump control panel which will latch on when a high pressure condition is monitored for the set time. Normally the time setting will be zero to provide instant shutdown of the pump on high pressure. However, if high pressure surges are present of starting of the pump or other condition, a small time delay can be set to allow such disturbances to pass without tripping the pump off. If this high pressure shutdown function trips the pump off, the operator will need to press the reset pushbutton on the front of the control panel before the pump can be restarted.

A pressure transmitter will be installed on the common discharge line of the booster pumps. This pressure signal will provide for general monitoring of the pumping system operation, and can be used to provide backup high and low pressure alarms.

A magnetic flow meter will be installed on the common discharge line of the booster pumps to measure the combined flow of all booster pumps. This flow rate will be monitored by the PLC. The flow rate signal will be used to provide a shut down a booster pump if a pump is started and an appropriate increase in flow rate is not detected within a set time to provide failure to pump protection. It will also be used to shut down all pumps if an excessive flow rate is detected for a given number of pumps operating, and will shut down the well pump if a flow rate that is too high is detected to provide discharge line break protection. Reverse flow detection from the flow meter will provide a pump discharge check valve failure alarm. A totalizer pulse will also be sent to the PLC panel to provide a total flow value.

Reservoir level will be monitored by a pressure sensing level transmitter located on a port low on the side of the reservoir. This level signal will provide for general monitoring of the reservoir operation, will provide control of the booster pumps (as described elsewhere in this report), and will provide high and low level alarms. Two float type level switches will be suspended in the reservoir to provide High-High and Low-Low level backup alarms. A Low-Low level alarm will cause shutdown of all booster pumps to prevent running pumps without water. A High-High alarm can be used to turn off wells supplying the reservoir to prevent overflowing the reservoir.

Level in the hydropneumatic tank on the discharge of the booster pumps will be monitored by analog float type level sensor manufactured by K-Tek. This unit will also have level displays that are visible from a large distance for operator convenience. The level signal will provide for general monitoring of the tank operation, will provide start/stop control of an air compressor to maintain a desired level in the tank,

and will provide high and low level alarms. Pressure switches on the tanks will be used to prevent the air compressor from over-pressuring the tanks.

1.9. MEDIUM VOLTAGE ELECTRICAL DISTRIBUTION

The electrical distribution system for Alternative 4 begins with a 12.47 kV tap north of the intersection of West Purdy Lane and Naco Highway. Due to the close proximity of the eight wells, Land Application Booster, Greenbush Booster, RO Water Treatment Plant, and six pivots, a private line was selected for the new infrastructure located on FMI's property.

A new tapping pole will be installed adjacent to the existing APS 12.47 kV power line, which runs north-south along the west side of Naco Highway. The first pole structure east of the tapping pole will contain a group operated air break switch which will allow FMI to manually isolate the new private pole line for maintenance and safety purposes. In addition to the air break switch, this pole is equipped with a primary meter, which will serve as the centralized metering location for the entire private system.

The new private pole line will operate at 12.47 kV and utilizes standard APS 12.47 kV wooden pole structures. Due to the low voltage requirements at each of the well locations, a pole mounted transformer (12.47 kV to 480 V) will be used to keep the equipment off the ground and protected. The only exception to this can be found at the Land Application Booster, Greenbush Booster, RO Water Treatment Plant, and the PR-7 well, which due to the higher power demand requires a pad mounted transformer. Transformers are protected at each location with fuses.

In addition to supplying power to the well stations and booster/treatment plant infrastructure, the private 12.47 kV power line will also provide power to six irrigation pivots. Each irrigation pivot will have a centralized junction box in which a pole mounted transformer will supply 480 V power.

Because Alternative 4 has many satellite infrastructure locations it becomes cost prohibitive to run the private power line to each well / irrigation pivot not powered by the above mentioned private line. As such, public APS service drop are designed to provide power to five irrigation pivots located along Purdy lane. In addition to the pivots, well PR-9, also located along Purdy lane, requires a public service drop. Each of these drops will have a fused cutout, pole mounted transformer, and secondary meter.

To power Alternative 4's PR-8 well, located west of Naco highway, a public power line was designed due to its remote nature and location (Private Non-FMI owned land). A tap pole adjacent to the existing 12.47 kV power line that runs north-south along the west side of Naco highway will be the start of the private pole line. At the termination point of this pole line, the well site, HEA envisions a fused cutout, pole mounted transformer and secondary metering.

After a preliminary review of project, APS will require line improvements in order to support the power requirements of the project. APS estimates two 3-phase voltage regulators may need to be added or upgraded.

2. CAPITAL COSTS

Capital Costs included in this Memorandum are those expenditures required to construct the civil, mechanical, and electrical components of the following:

- Wells PR-0 to 9;
- The pressure sustaining valves at the 2.5 MG Pond and standpipe;
- The wellfield mains;
- The road grading for site access, which is assumed to follow the discharge pipeline alignments and are 16 ft in width;
- The medium voltage transmission lines supplying electrical power to the wells, and LAS booster station;
- Site electrical equipment involved in control and operation;
- Contingency costs to account for uncertainties and unforeseeable elements involving increased costs associated with the normal execution of a project;
- Contractor profit;
- Detailed engineering design;
- Construction management; and
- Legal, permitting, and administration.

The Capital Costs included in this Memorandum do not include:

- Costs associated with the 2.5 MG pond, the LAS booster pump station, LAS piping, and the pivot systems.
- Costs associated with the RO Water Treatment Plant, other than the Greenbush Booster Station.

3. ANNUAL COSTS

3.1. PERSONNEL SALARIES

3.1.1. Wellfield and Pipeline Maintenance

Repair and maintenance of the wellfield, pipelines, and booster station is assumed to be provided by one half-time employee (20 hours per week for 52 weeks per year). It is estimated that this employee will be paid at $45 per hour.

3.1.2. Wellfield Monitoring

Wellfield monitoring is assumed to be provided by one quarter-time employee (10 hours per week for 52 weeks per year). This employee was assumed to be paid at $45 per hour.

3.1.3. Electrician

Repair and maintenance of the associated electrical equipment is assumed to be provided by one half-time electrician (20 hours per week for 52 weeks per year). This employee was assumed to be paid at $45 per hour.

3.2. ENERGY COSTS

The cost of energy supply is based upon WestLand's understanding of the current rate agreement between APS and Copper Queen Branch. The rate paid by Copper Queen consists of two major factors, the Coincident demand charge and the Energy charge. The fixed-rate customer charge was assumed to be of several orders of magnitude lower than these charges, and was not considered in this estimation. Because the pumps are designed to work nearly continuously, the demand charge and energy charge can be approximated by a single increased energy charge. This result simplifies the comparison between differing options for feasibility.

3.2.1. Well Energy Charge

The Energy charge of $0.08 cents per kWh was determined based upon review of the most probable rate structures provided by APS.

Equation 3.2.1a

$$Power\ (kW) = \frac{(TDH) \times (Flow)}{(3960)(\eta_{pump})(\eta_{motor})} \times 0.746 \frac{\$}{kWh} \times hours \times \%\ of\ time\ operational$$

The TDH for each well was calculated as the sum of the static head from the water surface of the well to the well head, the static head from the well head to its delivery location plus the additional head added by the pressure sustaining valve at the RO water treatment facility, and the head losses incurred by pumping the water through the column pipe and distribution pipes. The static head from the well head to the delivery location and the head losses from pumping were assumed to remain constant during the course of the project life. The static head from the water surface in the well to the land surface was assumed to change over time. The values of this initial and final dynamic water depth were provided by Clear Creek. The following example shows calculations for determining the Initial and Final TDH for Well PR-0.

Example 3.2.1a

Step 1 $Initial\ TDH = \text{Head Losses} + \text{Static Head} = 91\text{ft} + (2 + 280)\text{ft} = 353\text{ ft}$

Step 2 $Future\ TDH = \text{Head Losses} + \text{Static Head} = 91\text{ft} + (2 + 364)\text{ft} = 457\text{ ft}$

Table 1.1.3 shows the head losses assumed for each well, the initial and future water depths, the static head from well head to pressure sustaining valve hydraulic grade, and the Initial and Future TDH.

Total Dynamic Head

The TDH for each well for each year during the life of the Project was determined by adding the head losses, column losses, the static head from the well to the pressure sustaining valve to the depth of dynamic pumping elevation provided for each year by Clear Creek, and an average value for each five year period was determined.

For convenience, the flow and TDH for each well in each time period were multiplied together to provide the numerator for ***Equation 3.2.1a***, and rounded to the nearest thousand. These values are shown in ***Table 3.2.1b.***

Table 3.2.1a shows the estimated TDH for each time period over the course of the project.

Table 3.2.1a. Estimated TDH (ft)

Well Name	Years					
	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045
PR-0	391	419	435	444	450	455
PR-1	376	408	424	434	442	447
PR-2	344	381	398	408	415	420
PR-3	344	377	393	403	409	414
PR-4	343	380	397	407	414	420
PR-5	356	393	411	423	431	437
PR-6	345	387	405	417	425	431
PR-7	334	366	381	391	397	401
PR-8	335	358	370	377	383	388
PR-9	389	414	427	435	441	445

Table 3.2.1b. TDH *Flow

Well Name	Years					
	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045
PR-0	39,100	41,850	43,450	44,400	45,000	45,500
PR-1	93,875	102,000	105,875	108,375	110,375	111,625
PR-2	137,600	152,200	159,000	163,200	166,000	168,000
PR-3	137,600	150,800	157,200	161,000	163,600	165,400
PR-4	137,200	151,800	158,600	162,800	165,600	167,800
PR-5	88,875	98,250	102,750	105,625	107,625	109,250
PR-6	138,000	154,800	162,000	166,800	170,000	172,400
PR-7	133,400	146,400	152,400	156,200	158,600	160,400
PR-8	66,900	71,500	74,000	75,300	76,500	77,500
PR-9	58,275	62,025	64,050	65,175	66,075	66,675
Σ=	**1,030,825**	**1,131,625**	**1,179,325**	**1,208,875**	**1,229,375**	**1,244,550**

*The wells were assumed to operate 95 percent of the time.

Example 3.2.1b shows the calculations for determining the annual energy cost from years 2015-2020.

Example 3.2.1b

Step 1 $$Energy\ Charge = \frac{\Sigma\ (TDH\ \times Flow)}{(3960)(\eta_{pump})(\eta_{motor})} \times 0.746 \times \frac{\$}{kWh}\ \times hours \times \%\ of\ time\ operational$$

Step 2 $$Energy\ Charge = \frac{1{,}030{,}825}{(3960)(0.85)(0.93)} \times 0.746 \times \$0.08 \times 24 \times 365 \times 0.95 \approx \$163{,}548$$

The annual energy cost listed in the cost estimate is the average for the well field over the entire course of the project.

3.2.2. Greenbush Booster Station

The following assumptions and parameters were used to determine the energy charge associated with the Greenbush Booster Station:

Flow: The flow for energy charge calculations was 1,400 gpm.
TDH: The TDH for the Greenbush Booster Station was assumed to be 100 ft.
η_{pump}: The efficiency of the pump was assumed to be 85 percent.
η_{motor}: The efficiency of the motor was assumed to be 93 percent.

3.3. EQUIPMENT ANNUAL MAINTENANCE

3.3.1. Vertical Turbine Pump Annual Maintenance

General maintenance costs for vertical turbine line shaft well pumps include the costs of replenishing oil reservoirs and replacement of incidental leaking parts or site piping. The cost for these incidental parts and equipment is highly variable and dependent on random factors. A local pump vendor provided an estimated cost for general maintenance of $3,500 per vertical turbine line shaft pump per year.

Submersible pumps were assumed to require no annual maintenance.

3.3.2. Motor Annual Maintenance

The general maintenance cost for motors was assumed to be four percent of the initial motor cost per year. This covers the replacement of minor parts and occasional more significant expenses. This motor maintenance does not apply to submersible pumps.

3.3.3. Transmission Main Annual Maintenance

Annual maintenance of the overhead distribution system was assumed to be three percent of the initial cost of installation, which computes to $27,057. This includes replacement of downed transmission lines, storm-damaged equipment, and lightning arrestors.

4. PERIODIC COSTS

Periodic costs were determined based upon information provided by vendors and from discussion with owners and operators of similar existing systems. These costs were not included as a part of the annual costs, but will require significant capital expenditures over the course of the project. ***Table 4a*** details the estimated schedule for replacement and rehabilitation of mechanical equipment. ***Table 4b*** details the estimated schedule of electrical equipment replacement.

Sections 4.1-4.6 detail the assumptions used to develop the repair and replacement schedules.

Table 4a- Mechanical Equipment Repair Schedule

Equipment	Cost per Unit	Frequency (years)	Notes
Submersible Pump	$39,200	5 to 8	Replacement
Vertical Turbine Pump - Line Shaft	$45,000	5 to 8	Rehabilitation
Vertical Turbine Pump - Booster Can	$9,600	5 to 8	Rehabilitation
Vertical Turbine Motor	$7,000	5	Rehabilitation
Well Cleaning and Redevelopment	$9,000	5 to 8	Rehabilitation
Vertical Turbine Pump - Line Shaft	$62,000	15 to 25	Replacement
Vertical Turbine Pump - Booster Can	$16,000	15 to 25	Replacement
Vertical Turbine Motor	$20,000	20	Replacement

Table 4b. Site Electrical Repair Schedule

Equipment	Cost per Unit	Replace Frequency, years
Transformer	$25,000	25
Rack	$5,500	25
Power Center	$11,000	25
Disconnect Switch	$25,000	20
Starter Panel	$65,000	20
PLC Panel	$5,000	20
Power Factor Capacitor	$6,000	20
Wire/Cable	$15,000	20

4.1. SUBMERSIBLE PUMPS

Pump and attached motor are assumed to require replacement every five to eight years due to their continuous operation. It is also estimated that approximately five percent of the column pipe will require replacement during this pipe replacement. This replacement cost does not include drilling or casing replacement. It is assumed that the cost of removal of this well pump and replacement with a new well

pump will cost $10,000. The total cost of replacing the submersible pumps is therefore assumed to be $39,200 per well every five to eight years.

4.2. VERTICAL TURBINE PUMPS – LINE SHAFT

Rehabilitation and replacement of the vertical turbine line shaft pump equipment was assumed to be performed every five to eight years. This rehabilitation was assumed to consist of removal of the pump and column pipe from the well, brushing and bailing the casing, transportation of the pump to an offsite pump maintenance facility, replacement of any worn or damaged parts, transportation back to the site, and reinstallation of the pump. This estimate assumes the following based upon conversations with a local pump vendor:

Pulling a pump and shipping it offsite was assumed to cost approximately $10,000.

The costs associated with the repair and rehabilitation can vary widely depending on field conditions and by the depth of the installation. To estimate this cost, the repair and rehabilitation cost was estimated at ten percent of the initial construction costs of the column pipe, tube, and shaft plus 60 percent of the capital cost of the pump for refurbishment. This cost was considered slightly conservative to reflect the possibility that some items may require significant repair or replacement during the life of the equipment. The total cost of this rehabilitation is assumed to be $45,000 per well every five to eight years.

The vertical turbine line shaft pumps are assumed to require total replacement every fifteen to twenty-five years, with a total cost per pump of $62,000 per well. This includes 10 percent of the column pipe, tube, and shaft, and 100 percent of the pump.

4.3. WELL CLEANING AND REDEVELOPMENT

Each well is assumed to undergo cleaning and redevelopment every time the pump is pulled for rehabilitation. This is anticipated to happen every five to eight years for each well depending on the pump performance. The amount of time and treatment required for each well will vary depending on conditions encountered during operation of the well. WestLand assumed the following for determination of well costs. These estimates were provided with assistance from a representative of a local well drilling and outfitting company.

Each well will be provided with a pre-and post-cleaning video survey to visually inspect well conditions. This amounts to approximately $1,700 per operational well every five to eight years.

Brushing and bailing costs $215 per hour and is expected to take approximately 30 hours per well. This averages out to $6,500 per operational well every five to eight years.

Acid treatment, bio-fouling treatment, liner installation, and/ or swedge patching may be needed on some wells at some time in the future. A cost of $800 per operational well every five to eight years was added to account for the possibility of one or more of these treatments being necessary.

The total cost of well cleaning and redevelopment is $9,000 per well every five to eight years.

4.4. MOTOR REHABILITATION AND REPLACEMENT

Motor rehabilitation was assumed to be performed every five years based upon the expected bearing life. This rehabilitation is assumed to include new bearings and rewinding, and is assumed to cost approximately 35 percent of the original motor cost, or $3,500 per motor other than those for the submersible pumps. The cost for motor rehabilitation is $7,000 every five years. These motors will require replacement every 20 years, at a cost of $20,000 each

4.5. VERTICAL TURBINE PUMPS – BOOSTER CAN

The booster can pumps were assumed to require rehabilitation every five to eight years. This cost is assumed to be approximately 60 percent of the total cost of the pumps, or $9,600 per pump. The pumps are assumed to be completely replaced after 15 to 25 years for an assumed cost of $16,000 per pump.

FIGURES

Label	Nominal Pipe Size (in)	Length (ft)
P-1	4	1,850
P-2	6	115
P-3	6	2,215
P-4	6	1,735
P-5	16	935
P-6	8	640
P-7	8	160
P-8	8	420
P-9	4	2,570
P-10	4	2,855
P-11	68	440
P-12	8	170
P-13	12	565
P-14	8	810
P-15	816	1,943
P-16	20	95
P-17	20	2
P-18	12	1,270
P-19	8	100
P-20	12	765
TE-1	16	2,890
TE-2	16	12,750

* All Pipe HDPE 4710, DR11 IPS

Well PR 6
400 gpm
EL= 4675

Well PR 5
250 gpm
EL= 4700

Well PR 0
100 gpm
EL= 4720

Well PR 2
400 gpm
EL= 4675

Well PR 4
400 gpm
EL= 4650

Pressure Sustaining Valve
EL= 4630
HW EL= 4722

Evaporation Pond

P-6
P-4
P-18
P-19
P-1
P-2
P-14
P-13
P-11
P-15
P-8
P-7
P-20
P-3

Greenbush Booster Station
1400 gpm ±
EL=4635

San Jose Wastewater Treatment Plant

Well PR 1
250 gpm
EL= 4690

P-12
P-10
P-5
P-16
P-5

Well PR 8
200 gpm
EL= 4618

Well PR 7
400 gpm
EL= 4630

2.5 Million Gallon Pond

Well PR 3
400 gpm
EL= 4640

Borrow Pit

Proposed Standpipe
EL=4580

Pressure Sustaining Valve
EL= 4585
HW EL= 4677

P-9

TE-1

TE-2

Well PR 9
150 gpm
EL= 4620

Outlet to Greenbush Draw
EL= 4530

4700
4680
4660
4640
4620
4600

Legend

- Property Boundary
- Existing Water
- Existing Electric
- Existing Fiber Optic
- Existing Gas
- Existing Sewer
- Discharge Main
- Effluent Main
- Proposed Well Site
- Proposed Standpipe
- Proposed Pressure Sustaining Valve
- Proposed Booster Station

N

0 500 1,000 Feet

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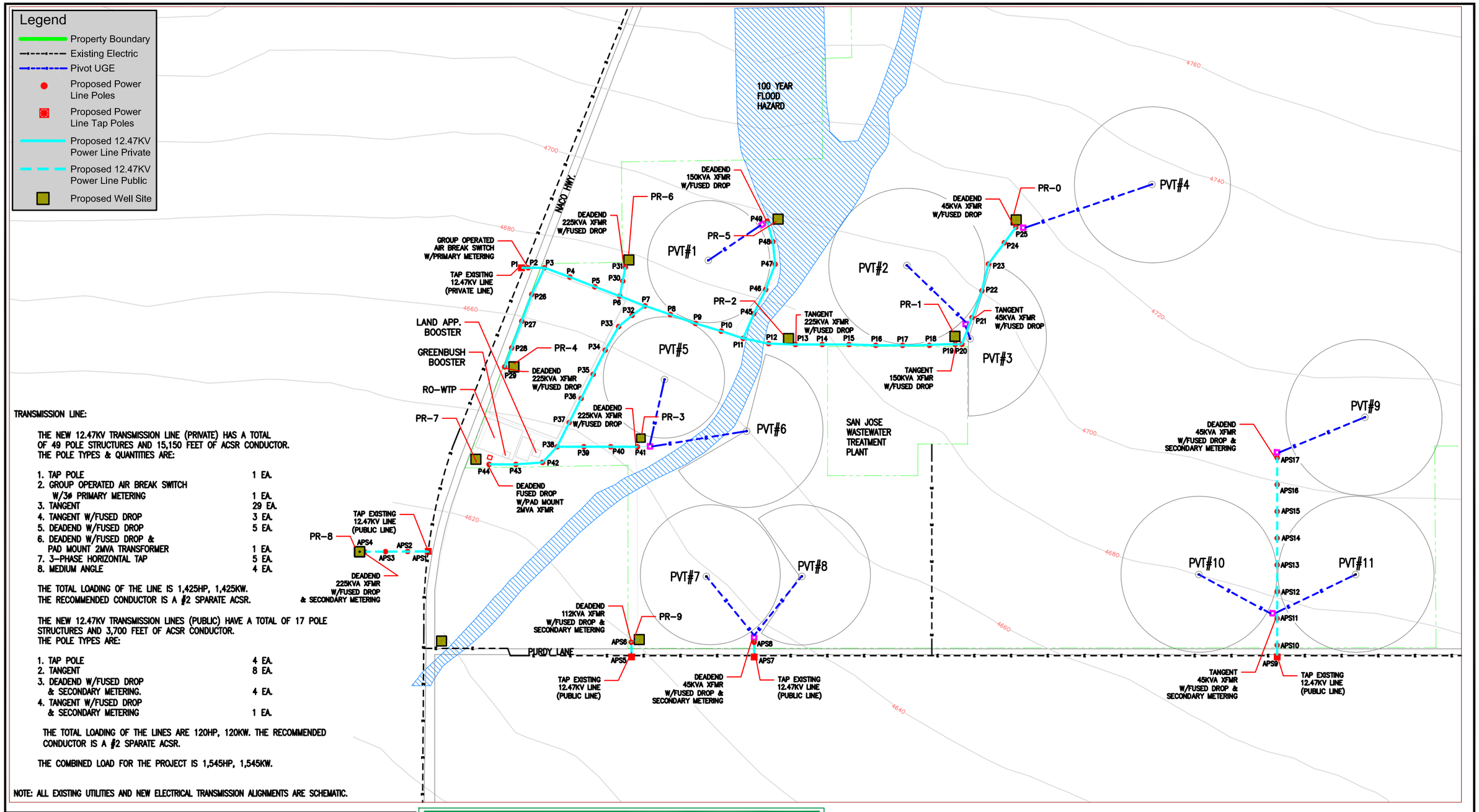
NOTE: ALL LINEWORK IS ILLUSTRATIVE AND INTENDED ONLY TO SHOW APPROXIMATE LOCATION

FIGURE 1
ALTERNATIVE 4
FMI COPPER QUEEN BRANCH

PLUME REDUCTION, LAND APPLICATION AND WATER TREATMENT

May 10, 2013



TRANSMISSION LINE:

THE NEW 12.47KV TRANSMISSION LINE (PRIVATE) HAS A TOTAL OF 49 POLE STRUCTURES AND 15,150 FEET OF ACSR CONDUCTOR. THE POLE TYPES & QUANTITIES ARE:

1. TAP POLE	1 EA.
2. GROUP OPERATED AIR BREAK SWITCH W/3ø PRIMARY METERING	1 EA.
3. TANGENT	29 EA.
4. TANGENT W/FUSED DROP	3 EA.
5. DEADEND W/FUSED DROP	5 EA.
6. DEADEND W/FUSED DROP & PAD MOUNT 2MVA TRANSFORMER	1 EA.
7. 3-PHASE HORIZONTAL TAP	5 EA.
8. MEDIUM ANGLE	4 EA.

THE TOTAL LOADING OF THE LINE IS 1,425HP, 1,425KW.
THE RECOMMENDED CONDUCTOR IS A #2 SPARATE ACSR.

THE NEW 12.47KV TRANSMISSION LINES (PUBLIC) HAVE A TOTAL OF 17 POLE STRUCTURES AND 3,700 FEET OF ACSR CONDUCTOR.
THE POLE TYPES ARE:

1. TAP POLE	4 EA.
2. TANGENT	8 EA.
3. DEADEND W/FUSED DROP & SECONDARY METERING.	4 EA.
4. TANGENT W/FUSED DROP & SECONDARY METERING	1 EA.

THE TOTAL LOADING OF THE LINES ARE 120HP, 120KW. THE RECOMMENDED CONDUCTOR IS A #2 SPARATE ACSR.

THE COMBINED LOAD FOR THE PROJECT IS 1,545HP, 1,545KW.

NOTE: ALL EXISTING UTILITIES AND NEW ELECTRICAL TRANSMISSION ALIGNMENTS ARE SCHEMATIC.

REVISIONS

NO	DATE	BY	DESCRIPTION
A	05.03.13	FEH	ISSUED FOR REVIEW & COMMENT
B	05.06.13	FEH	ADD TAP CALLOUT, RE-ISSUE FOR FINAL REVIEW
C	05.07.13	FEH	REVISED FOR WELL CHANGES, ISSUE FOR REVIEW
D	06.10.13	BKG	REVISED PER CLIENT COMMENTS

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N

0 600 1,200 Feet

FIGURE 2
ALTERNATIVE 4
FMI COPPER QUEEN BRANCH

PLUME REDUCTION, LAND APPLICATION AND WATER TREATMENT

APRIL 19, 2013

ATTACHMENT 1

COST ESTIMATES

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

Site:	**Copper Queen Branch**	**Description: FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	**Naco, AZ**	
Phase:	**Feasibility Study (-30% to +50%)**	
Base Year	**2013**	
Date:	**6/24/2013**	

ALTERNATIVE 4 - CAPITAL AND ANNUAL COSTS

COST TYPE	TOTAL COST
Capital Cost - Civil and Mechanical	$9,937,614
Capital Cost - Electrical Transmission	$1,072,225
Capital Cost - Site Electrical	$1,078,954
ALTERNATIVE 4 CAPITAL COSTS	**$12,088,793**
ANNUAL OPERATIONS AND MAINTENANCE	**$392,214**

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

Site:	Copper Queen Branch	Description:	**FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ		
Phase:	Feasibility Study (-30% to +30%)		
Base Year	2013		
Date:	6/24/2013		

CIVIL AND MECHANICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
DIRECT COSTS					
WELLSITES - Mechanical					
Well Driller Mobilization	1	LS	$20,000	$20,000	
Well Drilling Costs	5,125	LF	$45	$230,625	
8-inch Casing for 100-150 gpm Wells	1,175	LF	$75	$88,125	Assuming Stainless Steel Casing
10-inch Casing for 200 to 400 gpm Wells	3,950	LF	$95	$375,250	Assuming Stainless Steel Casing
Column Pipe for 100 gpm Well	470	LF	$135	$63,450	Assuming Stainless Steel Column Pipe
Column Pipe for 150 gpm Well	360	LF	$175	$63,000	Assuming Stainless Steel Column Pipe
Column Pipe for 200 gpm Well	355	LF	$200	$71,000	Assuming Stainless Steel Column Pipe
Column Pipe for 250-400 gpm Well	2,100	LF	$250	$525,000	Assuming Stainless Steel Column Pipe
Submersible Pump Assembly - 20 HP	1	EA	$26,000	$26,000	Includes Pump, Motor, Cable, Discharge Head
Vertical Turbine Pump Assembly - 25 HP	1	EA	$29,000	$29,000	Includes Pump, Motor, Discharge Head
Vertical Turbine Pump Assembly - 30 HP	1	EA	$32,000	$32,000	Includes Pump, Motor, Discharge Head
Vertical Turbine Pump Assembly - 40 HP	2	EA	$35,000	$70,000	Includes Pump, Motor, Discharge Head
Vertical Turbine Pump Assembly- 60 HP	5	EA	$40,000	$200,000	Includes Pump, Motor, Discharge Head
Sounding Tube	4	EA	$800	$3,200	1-1/4" PVC for well transmitter
4-inch welded steel manifold	2	EA	$5,000	$10,000	Incl. spool pieces, gauges, fittings, and appurt.
6-inch welded steel manifold	2	EA	$6,300	$12,600	Incl. spool pieces, gauges, fittings, and appurt.
8-inch welded steel manifold	6	EA	$11,000	$66,000	Incl. spool pieces, gauges, fittings, and appurt.
4-inch Pressure Release Valve	10	EA	$4,000	$40,000	
Well Service Air Release Valve	10	EA	$1,050	$10,500	1-inch
4-inch Silent Globe Check Valve	2	EA	$880	$1,760	
6-inch Silent Globe Check Valve	2	EA	$1,350	$2,700	
6-inch Silent Globe Check Valve	6	EA	$1,350	$8,100	
4-inch Resilient Wedge Gate Valve	2	EA	$790	$1,580	
6-inch Resilient Wedge Gate Valve	2	EA	$1,350	$2,700	

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

CIVIL AND MECHANICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
8-inch Resilient Wedge Gate Valve	6	EA	$1,800	$10,800	
12-inch Pressure Sustaining Valve	2	EA	$18,000	$36,000	At inlet to RO Water Treatment Plant
SUBTOTAL				$1,999,390	
WELLSITES - Civil					
Concrete for pump pedestal and pipe supports	30	CY	$833	$24,990	3 cubic yards per well site
Fine grading to set finished grade	10	LS	$3,500	$35,000	
Landscaping and Irrigation	1	LS	$20,000	$20,000	
Site Gravel	10	EA	$2,600	$26,000	
Chainlink fence around well site	10	EA	$20,000	$200,000	400' LF of 6' fence with 3 strand barb-wire
SUBTOTAL				$305,990	
GREENBUSH BOOSTER STATION - Mechanical					
Booster Can Pump Assembly - 20 HP	5	EA	$16,000	$80,000	Includes Pump, Can, Discharge Head
Booster Pump Motor - 20 HP	5	EA	$14,000	$70,000	
16-inch welded steel manifold	1	LS	$20,000	$20,000	Incl. spool pieces, gauges, fittings, and appurt.
8-inch Pressure Release Valve	1	EA	$5,500	$5,500	
16-inch Silent Globe Check Valve	1	EA	$6,000	$6,000	
16-inch Knife Gate Valve	1	EA	$6,500	$6,500	
16-inch Resilient Wedge Gate Valve	1	EA	$7,500	$7,500	
8-inch Silent Globe Check Valve	5	EA	$3,100	$15,500	
8-inch Knife Gate Valve	5	EA	$3,500	$17,500	
8-inch Resilient Wedge Gate Valve	5	EA	$4,000	$20,000	
Concrete Foundation - Pumps	1	LS	$5,000	$5,000	
5,000 Gallon Hydropneumatic Tank	1	EA	$120,000	$120,000	
SUBTOTAL				$373,500	
GREENBUSH BOOSTER STATION - Civil					
Concrete for pump pedestal and pipe supports	2	CY	$833	$1,666	
Fine grading to set finished grade	1	LS	$3,500	$3,500	
Concrete footings for 5000 gallon Hydro-Tank	1	EA	$3,000	$3,000	
Site Gravel	1	EA	$2,600	$2,600	

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

CIVIL AND MECHANICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Concrete Foundation for Pump Station	1	EA	$16,000	$16,000	
Concrete Containment pad for Transformer	1	EA	$6,500	$6,500	
Concrete Standpipe	1	LS	$15,000	$15,000	
SUBTOTAL				$48,266	
Pipelines					
4-inch PE 4710, DR 11, IPS	5,030	LF	$7	$36,885	
6-inch PE 4710, DR 11, IPS	5,995	LF	$10	$60,250	
8-inch PE 4710, DR 11, IPS	3,435	LF	$14	$46,560	
12-inch PE 4710, DR 11, IPS	2,030	LF	$24	$48,101	
16-inch PE 4710, DR 11, IPS	18,042	LF	$34	$621,394	
20-inch PE 4710, DR 13.5, IPS	160	LF	$51	$8,159	
Trenching for Underground Installation	34,692	LF	$17	$589,764	
SUBTOTAL				$1,411,113	
Access Road Construction					
Clearing and Grubbing-Unpaved	7.1	Acre	$1,000	$7,115	
Road Construction-Unpaved	555,072	Sq. Ft	$1	$555,072	
Clearing and Grubbing-Paved	0.2	Acre	$1,000	$230	
Road Construction-Paved	8,000	Sq. Ft	$5	$40,000	
SUBTOTAL				$602,416	
SUBTOTAL-DIRECT COSTS				$4,740,676	
INDIRECT COSTS					
Prime Contractor Contingencies			15.0%	$711,101	
Prime Contractor Profit			10.0%	$474,068	

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

CIVIL AND MECHANICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Engineering			8.0%	$379,254	
Construction Management			12.0%	$568,881	
Legal, Permitting, and administration5			8.0%	$379,254	
SUBTOTAL-INDIRECT COSTS				$2,512,558	
TOTAL COSTS - MECHANICAL AND CIVIL				$9,937,614	

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

Site:	Copper Queen Branch	Description:	**FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ		
Phase:	Feasibility Study (-30% to +30%)		
Base Year	2013		
Date:	6/24/2013		

SITE ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
DIRECT COSTS					
SITE ELECTRICAL - Wellsites					
Rack for electrical equipment	10	EA	$5,500	$55,000	
Disconnect Switch - 400A	10	EA	$14,600	$146,000	
Fuses - 400A RK-1	30	EA	$230	$6,900	
Well Starter Panel	10	EA	$45,000	$450,000	
Mini-Power Center - 10kVA	10	EA	$11,000	$110,000	
Service Surge Protector	10	EA	$2,500	$25,000	
#14AWG XHHW-2 Wire	80	CLF	$60	$4,763	
#12AWG XHHW-2 Wire	60	CLF	$77	$4,602	
#8AWG XHHW-2 Wire	20	CLF	$129	$2,574	
#2AWG XHHW-2 Wire	20	CLF	$359	$7,176	
#1/0AWG XHHW-2 Wire	20	CLF	$494	$9,880	
#4/0AWG XHHW-2 Wire	13	CLF	$905	$11,633	
#250MCM XHHW-2 Wire	43	CLF	$1,049	$44,961	
#300MCM XHHW-2 Wire	6	CLF	$1,523	$9,791	
#400MCM XHHW-2 Wire	6	CLF	$2,465	$15,848	
#500MCM XHHW-2 Wire	28	CLF	$2,098	$58,442	
1" PVC Conduit	4,000	LF	$7	$26,160	
2-1/2" PVC Conduit	1,000	LF	$18	$18,190	
4" PVC Conduit	2,357	LF	$25	$59,306	
Trenching and Backfill	2,500	LF	$8	$19,500	
SUBTOTAL				$703,129	
SITE ELECTRICAL- Greenbush Booster Station					
Rack for electrical equipment	16	LF	$300	$4,800	

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

SITE ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Air Compressor Starter	1	EA	$14,600	$9,100	
Site Lighting	1	LS	$6,000	$6,000	
#14AWG XHHW-2 Wire	50	CLF	$60	$2,977	
#12AWG XHHW-2 Wire	20	CLF	$77	$1,534	
#8AWG XHHW-2 Wire	2	CLF	$129	$257	
1" PVC Conduit	1,500	LF	$7	$9,810	
2-1/2" PVC Conduit	100	LF	$18	$1,819	
4" PVC Conduit	0	LF	$25	$0	
Trenching and Backfill	600	LF	$8	$4,680	
SUBTOTAL				$40,977	
SUBTOTAL-DIRECT COSTS				$744,106	
INDIRECT COSTS					
Prime Contractor Contingencies			15.0%	$111,616	
Prime Contractor Profit			10.0%	$74,411	
Engineering			8.0%	$59,528	
Construction Management			12.0%	$89,293	
SUBTOTAL-INDIRECT COSTS				$334,848	
TOTAL COSTS - Site Electrical				$1,078,954	

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

Site:	Copper Queen Branch	Description:	**FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ		
Phase:	Feasibility Study (-30% to +30%)		
Base Year	2013		
Date:	6/24/2013		

ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
DIRECT COSTS					
Private Power Line					
12.47 kV Transmisstion Line (336 ACSR Conductor)	15,150	LF	$2.15	$32,599	(336 ACSR Conductor)
TAP Pole	1	EA	$3,025	$3,025	
Group Operated Air Break Switch w/ 3Ø Primary Metering	1	EA	$14,040	$14,040	w/ 3Ø Phase Metering
Voltage Regulator, 3 Phase, Pole Mounted	2	EA	$55,843	$111,685	w/ 3Ø Phase Metering
Tangent Pole	29	EA	$4,220	$122,380	
Tangent Pole w/ Fused Drop & 45 kVA Transformer	1	EA	$11,140	$11,140	
Tangent Pole w/ Fused Drop & 150 kVA Transformer	1	EA	$15,640	$15,640	
Tangent Pole w/ Fused Drop & 225 kVA Transformer	1	EA	$20,740	$20,740	
Dead End Pole w/ Fused Drop & 45 kVATransformer	1	EA	$13,440	$13,440	
Dead End Pole w/ Fused Drop & 150 kVA Transformer	1	EA	$17,940	$17,940	
Dead End Pole w/ Fused Drop & 225 kVA Transformer	3	EA	$21,507	$64,521	
Tangent Pole w/ Fused Drop & pad mount 2 MVA Transformer	1	EA	$73,040	$73,040	
Pad Mount Containment Slab	1	LS	$3,685.42	$3,685	
TP8D Pole Horizontal Tap	5	EA	$6,605	$33,025	
TP8 Pole (Medium Angle)	4	EA	$6,040	$24,160	
SUBTOTAL				$561,060	
Public Power Line					
12.47 kV Transmission Line (336 ACSR Conductor)	3,700	LF	$2.15	$7,961	(336 ACSR Conductor)
TAP Pole	4	EA	$3,025	$12,100	
Tangent Pole	8	EA	$4,220	$33,760	

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

ELECTRICAL CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Tangent Pole w/ Fused Drop, 45 kVATransformer & Secondary Metering	1	EA	$11,140	$11,140	
Dead End Pole w/ Fused Drop, 45 kVA Transformer & Secondary Metering	2	EA	$12,290	$24,580	
Dead End Pole w/ Fused Drop, 115 kV Transformer & Secondary Metering	1	EA	$16,140	$16,140	
TPD8-DE Pole w/ Fused Drop, 225 kV Transformer & Secondary Metering	1	EA	$23,040	$23,040	
SUBTOTAL				$128,721	
SUBTOTAL-DIRECT COSTS				$689,782	
INDIRECT COSTS - Total Construction Costs					
Construction Indirects			3.7%	$25,768	15% of direct field Costs Labor and Construction Equipment)
Freight and Transportation			2.5%	$17,058	6% of Plant Equipment Dollars
Contractor Fee (OH & P)			8.8%	$60,822	15% of labor, bulk material, and construction equipment
SUBTOTAL				$103,649	
SUBTOTAL -INDIRECT COSTS - Total Construction Costs (TCC)				$793,431	
Sales Tax			4.615%	$36,616	(Cochise Co. @ 65% of 7.1%)
Engineering			8.0%	$63,474	8% of Total Constructed Costs
SUBTOTAL				$100,091	
SUBTOTAL -INDIRECT COSTS - Total Project Cost				$893,521	
Contingency			20.0%	$178,704	20% of Total Project Cost
TOTAL COSTS - ELECTRICAL TRANSMISSION				$1,072,225	

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

Site:	Copper Queen Branch	Description:	**FEASIBILITY STUDY FOR MITIGATION ORDER P-121-07**
Location:	Naco, AZ		
Phase:	Feasibility Study (-30% to +30%)		
Base Year	2013		
Date:	6/24/2013		

OPERATIONS AND MAINTENANCE COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Personnel - SALARY					
FMI Water System Maintenance Personnel	50.0%	EA	$ 93,600	$ 46,800	Percent of Full-Time $45/hr employee
Wellfield Monitoring	25.0%	EA	$ 93,600	$ 23,400	Percent of Full-Time $45/hr employee
Electrician	50.0%	EA	$ 93,600	$ 46,800	Percent of Full-Time $45/hr employee
				$ 117,000	
ENERGY COSTS					
Well field	2,327,500	kWh	$ 0.08	$ 186,200	Demand Charge Included
Greenbush Booster Station	208,500	kWh	$ 0.08	$ 16,680	Demand Charge Included
				$202,880	
Equipment Maintenance					
Vertical Turbine Line Shaft Pump Maintenance	9	EA	$ 500	$ 4,500	$500 per well per year general equipment
Booster Can Pump Maintenance	3	EA	$ 500	$ 1,500	5% of pipeline costs per year
Motor Maintenance	4.0%	Pcnt.	$ 50,000	$ 2,000	4% of Motor Equipment Costs
Transmission Main Maintenance	3.0%	Pcnt.	$ 1,072,225	$ 32,167	Replacement of damaged equipment
				$ 40,167	

Attachment 1
WATER TREATMENT AND LAND APPLICATION OPTION

ALTERNATIVE 4

OPERATIONS AND MAINTENANCE COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Electrical Equipment Repair and Replacement					
Transmission Repair	3.0%	Pcnt.	$ 1,072,225	$ 32,167	
				$ 32,167	
TOTAL ANNUAL COSTS - OPERATIONS AND MAINTENANCE				$ 392,214	

APPENDIX G

NUMERICAL MODEL UPDATE DATA AND RESULTS

APPENDIX G

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APPENDIX G.1

GROUNDWATER FLOW AND TRANSPORT MODEL UPDATE

TECHNICAL MEMORANDUM

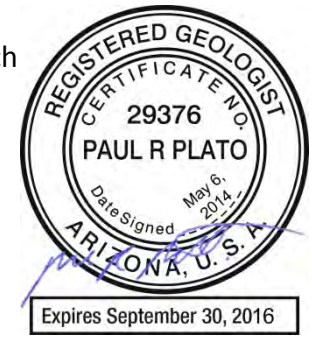
CLEAR CREEK ASSOCIATES

To: Robert Quintanar - Freeport-McMoRan Corporation, Copper Queen Branch

From: Paul Plato, R.G. and James Norris, R.G. - Clear Creek Associates

Subject: Groundwater Flow and Transport Model Update

Date: May 6, 2014



1 INTRODUCTION

This technical memorandum describes modifications to the groundwater flow and sulfate transport model reported in the Aquifer Characterization Report (ACR) (Clear Creek Associates, 2010). The modifications were undertaken to update model pumping and recharge specifications, water level and sulfate target data, and geologic structure in the western portion of the model. Figure 1 shows the model domain south of Bisbee, Arizona.

The numerical model, called the RSET Model in the ACR because it is a revision of an earlier model developed by SET (1998), covers an area of nearly 60 square miles and encompasses the sulfate plume (Figure 1). Hydro Geo Chem (HGC) adapted the SET model to simulate development of the sulfate plume from 1905 through 2008, as reported in the initial version of the ACR (HGC, 2009). Clear Creek added water level and sulfate targets to the model, and conducted additional calibration, as reported in the final version of the ACR (Clear Creek Associates, 2010). The numerical model has been updated through 2012 for the Feasibility Study (FS) for drinking water supplies that may be affected in the future. The updated model was recalibrated through 2012, with updated pumping and recharge stresses and other enhancements, including the incorporation of a fault that was incorporated into the model as a low-flow barrier.

The groundwater flow and sulfate transport model was originally developed by Savci Environmental Technologies (SET) to study the migration of the sulfate plume in the vicinity of the Concentrator Tailing Storage Area (SET, 1998). HGC modified the model and updated it through 2008 for the sulfate fate and transport study conducted for Mitigation Order on Consent Order P-121-07 (HGC, 2009). Clear Creek Associates subsequently modified the model to address technical comments by Arizona Department of Environmental Quality (ADEQ) (ADEQ, 2010) and reported the results in the revised ACR (Clear Creek Associates, 2010). The model update reported herein achieves the following objectives:

- Updated the water level target data set, groundwater pumping specifications, and recharge with data for 2009, 2010, 2011 and 2012;
- Revised the model structure in the area of the Ladd Ranch wells, west of the Arizona Water Company wellfield where additional groundwater level data have been collected. This area is characterized by a large change in water levels and

hydraulic gradient, which required modifying the conceptual model and the model structure near Ladd Ranch to more accurately represent observed water levels in this area.

- Completed recalibration of the groundwater model following the modifications and updating of the model stresses through 2011;
- Completed simulations of future sulfate fate and transport using the updated model including simulation of mitigation actions; and,
- Prepared a technical memorandum documenting the model changes, recalibration results and projections, to be used for the FS.

2 MODEL MODIFICATIONS

Model modifications included the addition of water level and sulfate targets for calibration, updates to pumpage for large pumpers, changes in hydraulic properties, evaluation of model-wide recharge rates and updates to boundary conditions. The changes that were implemented are discussed in the following sections.

2.1 New Model Targets

Since the development of the groundwater model prepared by SET in 1998 and its update by HGC for the ACR, many new model targets for water levels and sulfate concentrations have been added. The updated model completed by HGC included 252 water level targets, covering 1905 through 2008. The water level database used for this model update now contains 4,837 water levels, and is updated through October 2012. These data include water levels from driller's reports from ADWR records, ADWR Groundwater Site Inventory (GWSI) database, water levels collected during the aquifer characterization study and other data collected historically during mine operations. Of these water level data, 2,512 measurements fall within the model domain and thus can be used as model targets. Figure 2 illustrates the updated water level targets used to update and re-calibrate the model. Ultimately, water levels outside of the model domain were also considered in the model to better define the water levels in the model area. Water level data from outside the model domain were also used in setting boundary head values and refining the conceptual model.

2.1.1 Wells in Naco Sonora

Water level data for the Naco, Sonora side of the model were updated based on a site visit conducted during 2008 by HGC.[1] Additional depth to water information was available for wells UN-1 and UN-5 from a published water system upgrade proposal (BECC, 1996). Figure 3 shows the well locations in Naco, Sonora, including approximate water level elevations. Depth to water was available for wells UN-1 and UN-5. Due to confusion between well names EN-05 and UN-05, the target level for UN-5 was incorrectly located at EN-05. The well database was updated to reflect GPS coordinates from the HGC site visit, and the estimated depths to water for the Ejido Naco agricultural wells (EN-01, EN-02, EN-03, EN-05 and EN-06) were also added to the database. Well elevations were derived from a digital elevation model (DEM) from the Servicio Geológico Mexicano, (H12-B34 Naco), which were used to calculate water level elevations. Figure 3 shows the well locations in Naco, Sonora, including approximate water level elevations.

2.1.2 Sulfate Target Update

Additional water quality sample results for sulfate collected since 2008 have been added to the water quality database, and now include 2,609 values through October 2012. Of these, 1,789 are non-duplicate samples within the model domain that were integrated into the model as targets. Figure 4 illustrates the location of sulfate targets for the model.

2.2 Model Pumping Update

Well pumpage was updated based upon the available reported pumpage data. Data were identified to update pumpage from Arizona Water Company wells, Naco Water Company wells[2], Turquoise Valley golf course wells and Naco (Sonora) municipal pumping. Other wells, which are private domestic or stock watering wells, have been continued at previous (2008) rates. Figure 5 illustrates the wells with updated pumpage.

2.2.1 Arizona Water Company

Clear Creek downloaded the annual reports submitted by Arizona Water Company to the Arizona Corporation Commission (ACC) for 2008, 2009, 2010 and 2011, which includes monthly pumping rates. These reports list monthly pumping for each of the subsidiary water systems

[1] Additional estimated water levels were provided by Naco, Sonora water utility staff during the visit and interview which were not included in the previous groundwater flow model as targets. Due to the limited information available, these data were added to the updated model for use as targets.

[2] Annual pumpage data were provided by Naco Water Company for 2011 in an email communication to Jim Norris from Keith Dojaquez on February 6, 2012. Monthly pumpage was not provided.

managed and operated by Arizona Water Company. The results for the Bisbee operations are as follows:

Table 1: Pumpage from AWC (thousands gallons)

Month	2008 Gallons Pumped	2009 Gallons Pumped	2010 Gallons Pumped	2011 Gallons Pumped
January	24825.6	23664.7	21838.1	26379.6
February	24257.5	23034.3	18718.4	29478.2
March	31508.5	30197.5	22704.0	32279.6
April	34074.2	30006.5	27310.0	35707.3
May	34292.6	36839.2	37976.1	44351.2
June	42457.8	34117.9	41452.2	42332.5
July	31354.3	31304.4	34044.1	39896.2
August	26799.5	33334.8	30392.2	32743.1
September	31294.7	28367.5	29268.6	30490.5
October	31919.9	26020.5	31122.2	26687.2
November	23779.1	26554.0	25766.7	25572.6
December	27013.4	22207.5	24264.8	21984.5
Total	363577.1	345648.8	344857.4	387902.5
Total (acre-feet)	**1115.8**	**1060.8**	**1058.3**	**1190.4**

Pumpage rates for each well were estimated using the percentage pumped by each well based on data for 2007. These percentages were used for estimating individual well pumping rates for 2008-2012.

2.2.2 Naco Water Company

Clear Creek downloaded the annual reports submitted by Naco Water Company (NWC) to the ACC for 2008, 2009, 2010 and 2011 (and also received 2011 rates directly from NWC). These reports list monthly pumping for each of the subsidiary water systems managed and operated by Naco Water Company. The NWC system has three separate subsidiary systems, and each is reported separately to the ACC, each serving a portion of the Town of Naco, Arizona (and Bisbee Junction area). The overall results for the NWC operations are as follows:

Table 2 – Naco Water Company Pumpage 2008 through 2011

Water System	Well	Percentage	Annualized 2008 GPM	Annualized 2009 GPM	Annualized 2010 GPM	Annualized 2011 GPM*
02-112	55-551849 (NWC-04)	100%	7.7	7.4	11.4	8.0
02-024	55-575700 (NWC-06)	69%	35.3	31.7	25.6	40.0
	55-562944 (NWC-02)	31%	15.6	14.0	11.3	17.6
02-133	55-203321 (NWC-03)	100%	0.9	1.0	0.9	0.8
	Total		59.5	54.1	49.3	66.5

Water System	Well	Percentage	2008 Total Gallons (1000s)	2009 Total Gallons (1000s)	2010 Total Gallons (1000s)	2011 Total Gallons (1000s)*
02-112	55-551849 (NWC-04)	100%	4065.0	3909.0	5991.0	4210.0
02-024	55-575700 (NWC-06)	69%	18567.0	16657.4	13480.5	21042.2
	55-562944 (NWC-02)	31%	8182.0	7340.6	5940.5	9272.8
02-133	55-203321 (NWC-03)	100%	493.0	523.0	496.0	427.0
	Total		31307.0	28430.0	25908.0	34952.0

System 02-112 serves the Bisbee Junction Area

System 02-024 serves the Townsite of Naco, Arizona

* 55-203321 was discontinued in 2011, and pumpage from 2011 onward will be split between 55-575700 and 55-562944

Pumpage rates for each well were assigned based upon the pumpage for each service area:

- Water System 02-112 is served by well 55-551849 (NWC-4);
- Water System 02-024 is served by wells 55-575700 (NWC-6 - 69%) and well 55-562944 (NWC-2R - 31%); and,
- Water System 02-133 was served by well 55-203321 (NWC-3R) through 2010, and is now served from Water System 02-024.

The split for water system 02-024 is based upon the reported production rates for these wells: 182 gpm for 55-575700 and 80 gpm for well 55-562944. Well 55-203321 has been discontinued after 2010, and Water System 02-133 is now interconnected with Water System 02-024. After 2010, pumpage demand is assigned equally to NWC-2R and NWC-6.

2.2.3 Turquoise Valley Golf Course

Turquoise Valley, Inc. (TVI, who operates Turquoise Valley Golf Course) provided pumpage information provided total pumpage for 2008, 2009 and 2010. The values were provided in an email communication to Jim Norris from Pete Campbell (February 7, 2012), and were as follows: 421.2 AF in 2008, 416.87 AF in 2009 and 392.3 AF in 2010. The 2011 pumping was unavailable. It was also noted that the distribution of pumpage by well was approximately the same as previous years, and the breakdown from 2007 was used to distribute the pumpage by well. Pumpage increased from 2007 to 2008.

It was noted that the three TVI pumping wells simulated in the groundwater model were mislocated slightly (in the well database only) due to confusion over which well was the south well. The well database has been corrected for this model update, based upon photos and information from a previous site visit by Clear Creek Associates staff. The original well locations in the model were correct, and the database has been adjusted.

2.2.4 Naco, Sonora Municipal Pumpage

In 1996, the town of Naco, Sonora applied for a grant to upgrade the water system from the Border Environmental Cooperation Commission (BECC, 1996). The BECC (and its sister agency in the United States the North American Development Bank) was formed as part of the North American Free Trade Agreement to facilitate trans-national environmental cooperation. The grant was to upgrade the water system by adding additional water storage capability to provide better system performance. To justify the expense, the submitted abstract for the project (BECC, 1996) summarizes the water demand and operations for the Naco water system, including well information for wells UN-2 and UN-3. It also provides population statistics and per capita demand estimates. Table 3 summarizes the population growth estimates which covered the period from 1996 to 2015, and assumed a per capita water use of 66 gallons per

Table 3 - Naco, Sonora Municipal Pumpage February 2012 Update

			Population and Demand Estimates from 2008 Rates and Population Estimate																		
Category	**Old**	**Percent**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
GPCD			138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138	138
Residents		1.05%	5733	5793	5854	5916	5978	6041	6105	6169	6234	6299	6365	6432	6500	6568	6638	6707	6778	6849	6921	6994
Demand			793,154	801,498	809,930	818,450	827,061	835,761	844,553	853,438	862,416	871,489	880,657	889,922	899,283	908,744	918,304	927,964	937,727	947,592	957,560	967,634
Commercial/Industrial	0% Increase		13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696	13,696
Daily Gallons Pumped			**806,850**	**815,194**	**823,626**	**832,146**	**840,757**	**849,457**	**858,249**	**867,134**	**876,112**	**885,185**	**894,353**	**903,618**	**912,979**	**922,440**	**932,000**	**941,660**	**951,423**	**961,288**	**971,256**	**981,330**

			Gallon Per Minute Rates for Each Well																		
UN-1 (abandoned)	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UN-2	0.5	0.36	280.2	283.1	286.0	288.9	291.9	295.0	298.0	301.1	304.2	221.3	223.6	225.9	228.2	230.6	233.0	235.4	237.9	240.3	242.8	245.3
UN-3	0.4	0.24	224.1	226.4	228.8	231.2	233.5	236.0	238.4	240.9	243.4	147.5	149.1	150.6	152.2	153.7	155.3	156.9	158.6	160.2	161.9	163.6
UN-4	0.1	0.16	56.0	56.6	57.2	57.8	58.4	59.0	59.6	60.2	60.8	98.4	99.4	100.4	101.4	102.5	103.6	104.6	105.7	106.8	107.9	109.0
UN-5	0	0.24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	147.5	149.1	150.6	152.2	153.7	155.3	156.9	158.6	160.2	161.9	163.6
	1.00	1.00	560.3	566.1	572.0	577.9	583.9	589.9	596.0	602.2	608.4	614.7	621.1	627.5	634.0	640.6	647.2	653.9	660.7	667.6	674.5	681.5

Percentages based upon OOMPAS Operator Estimates of Per Well Pumpage Rates

Well	Percent	l/s	gpd
UN-1 (abandoned)	0.0000	0	-
UN-2	0.3514	26	593,436.1
UN-3	0.2432	18	410,840.4
UN-4	0.1622	12	273,893.6
UN-5	0.2432	18	410,840.4

74	1,689,010	The individual rates add up to 74 L/s (way too high)
40	912,979	40 L/s was reported as system average which is 912,979 gpd

NOTES:

Personal communication with HGC in 2008 estimated 40 l/s (635 gpm) average system pumping from operator (OOMAPAS)
Population in Naco, Sonora in 1996 was estimated as 5,733, and commercial and industrial use as 13,696 gallons per day (BECC, 1996)
As of 2008, the population was estimated as 6,500 people, which implies a growth rate of 1.052% per year
138 gallons per capita per day (GPCD) is estimated to account for 2008 reported population (6,500) and reported pumpage (40 l/s)
Individual well average pumping was 74 l/s (1,030 gpm) from OOMAPAS director for Naco (too high)
UN-5 drilled in 2005, greater than 100 meters deep.

day (gpcd). This value appears to be too low, since the calculated demands appear to be much less than the reported system operational pumpage.

In October 2008, HGC conducted an interview with the municipal water system operators in Naco, Sonora (Organismo Operador Municipal de Agua Potable, Alcantarillado y Saneamiento de Naco, Sonora OOMAPAS-Naco). The staff provided basic information about the system, including individual pumping rates for each well, and overall system flow rates were also discussed. The information provided appears to accurately reflect individual well pumping rates, but does not appear to include well pumping duty cycle estimates for the system or individual wells. The system pumping rate should take this factor into account, so the value provided (635 gallons per minute) is likely to accurately represent the system's overall pumpage.

Individual well pumping rates can then be estimated based upon reported individual well production rates. The volume pumped is scaled based upon projected population changes, but uses 2008 rates as a basis for projection. To achieve the population growth (from 5,733 in 1996) which reaches 6,500 people in 2008, 1.052% population growth (per year) was estimated. The required rate to achieve this overall 2008 pumping rate (635 gpm) is 138 gpcd. This is higher than the 75 gpcd for the Naco Water Company, assuming an overall population of 907 (2007 census estimate), and 25 million gallons served in 2008. It could result from significant system water losses or un-represented deliveries.

Table 3 estimates per well pumpage rates using the pumpage distribution percentages listed on the left which approximately match the rates discussed with the system operator. Rates are scaled for each year based on population growth. Commercial and industrial usage is left unchanged through the period presented. Well UN-5 was drilled in 2005, and percentages of pumping after 2005 reflect the percentages assigned in the original ACR groundwater model. Rates from the model are also displayed in Table 3, and appear to be higher than the new estimates.

2.2.5 Ejido Naco Agricultural Irrigation

Figures 6 through 12 display the available aerial photographs from Google Earth compared with the current extent of agricultural irrigation (see Ejido Naco Irrigated Lands layer on Figures 6 through 12). The approximate extent of the agricultural irrigation was digitized from the May 23, 2011 aerial photograph, including lands that appear to have been irrigated historically. The photographs prior to April 29, 2004 do not cover the southernmost lands which have been irrigated. However, the underlying aerial photograph (see Figures 6-8) for the southernmost area does not show irrigation. The date of the photograph has been determined as January 15, 1999. This indicates that some lands came into production between 1999 and 2004. However, based on the photographs, the amount of expansion of the Ejido Naco irrigated lands since 1992 has been small, with new lands apparently added by 2004. Overall, the amount of Ejido

irrigated acreage within the model domain has not changed dramatically. Because the changes have primarily occurred in the southernmost part of the irrigated area, some of the added acreage is not within the model domain. For this reason, no changes in pumping rates were made, based on the limited changes observed.

2.3 Modifications of Hydraulic Parameters

Based on additional water levels from the Ladd Ranch, it was clear that a significant discontinuity in the regional water levels occurs in this area. This location is near a projected fault, La Bellota fault, which may impact groundwater flow conditions in the basin fill aquifer. This fault has not been physically identified, but is a logical inference, based upon the structural and water level conditions in the area. Figure 13 illustrates the proposed location of this fault, assuming it represents the basin-bounding fault separating the Mule Mountains from the San Pedro Valley. The presence of a fault is interpreted as the cause of the significant water level difference observed between adjacent wells on the Ladd Ranch property.

2.3.1 Water Levels at Ladd Ranch

The Ladd Ranch is located to the northwest of Naco, Arizona (Figure 14) and has several wells for which water levels have been measured historically. At the main house site, 2 wells (Ladd 976 and Ladd 538) have been measured, both of which are within the model domain. Ladd 976 is a shallow well with a depth of 150 feet, which had a reported depth to water of 97 feet in 1950 when it was drilled. The depth to water in this well increased from 103.7 feet in 1969 to 108 feet by November 1985, when it was last measured (both by USGS). In 1990, Ladd 976 was listed as obstructed and it has not been measured since then. The approximate land surface elevation is 4,535 feet above mean sea level (feet AMSL), based on Google Earth location. This implies that the water level elevations are 4,438 feet AMSL and 4,427 feet AMSL for the two measurements listed.

Well Ladd 538 was drilled in July 1982, and is screened from 177 to 277 feet. When completed, this well had a depth to water of 177 feet. The wellhead measuring point has been surveyed by CQB, and is listed as 4,527.05 feet AMSL. The depth to water has recently been measured as 276.58 feet in September 2011. This implies that the water level elevation has declined from 4,350 feet AMSL to 4,250 feet AMSL from 1982 to 2011. This suggests that the Ladd 538 well has historically had a water level elevation of 88 to 188 feet lower than Ladd 976 although these wells are estimated to be only 300 feet apart.

Although the 88 to 188 foot difference in water levels for Ladd 976 and Ladd 538 may be explained by local hydrologic factors such as perched conditions, regional water level measurements suggest a regional factor may be the cause. Water levels at the Ladd 837 (Figure

13) west of Ladd 976 and Ladd 538 have ranged from 4,230 feet AMSL in 1988 to 4,162 feet AMSL in 1999[3]. The water level elevation for September 2011 was measured as 4,207 feet AMSL. A review of data in the ADWR GWSI database indicates that this value (approximately 4,200 feet) is consistent with water levels further to the west. Water levels to the east of Ladd 976 and Ladd 538 are higher than 4,420 feet, and display a shallow hydraulic gradient between the wells in the vicinity of Naco Highway and the Ladd 976 and 538 wells. Figure 13 also illustrates water levels east of the Ladd Ranch and north of Naco, Arizona. The water level elevations do not increase significantly to the east, indicating a relatively flat hydraulic gradient.

Based on these data, the hydraulic gradient near the Ladd 976 and Ladd 538 wells must increase dramatically to account for the lower water levels at the Ladd 837 Well, and to the west. It is assumed that the water levels in the basin fill sediments are continuous from the CQB groundwater model area into the San Pedro Valley to the west. This assumption is consistent with the regional groundwater model for the Upper San Pedro Valley prepared by the USGS (Pool and Dickinson, 2007). To account for this abrupt change in water levels, it is assumed that a fault extends into the basin fill sediments, causing a zone of low hydraulic conductivity. This phenomenon has been observed in alluvial sediments which are disturbed by faulting, where the horizontal continuity is broken[4]. Alternatively, it is also possible that significantly shallower bedrock is present on the eastern side of this proposed fault, which causes the sharp change in hydraulic gradient due to the transition from lower to higher transmissivity (change in basin fill thickness).

2.3.2 Implementation of the Fault Zone

Figure 15 illustrates the model cross section showing the approximate location of the Black Gap Fault and La Bellota Fault. Figure 15 also shows the measured data at BMO-2008-6B and Ladd 837 Well. These data clearly show the significant difference in water levels that occur in this short distance between these wells. The implementation of this fault in the groundwater flow model required creating a long and narrow, steep-dipping vertical zone of very low hydraulic conductivity in the basin fill model layer (Layer 1), and lower conductivities extending into Layers 2 through 4 (Figures 16, 17). For Layer 1, the hydraulic conductivity was set at 0.0098 feet per day (ft/d), based on model calibration (0.003 meters per day [m/d]). For Layers 2 through 4, the implementation is similar to the approach for the Black Gap Fault (Figure 17). The hydraulic conductivity value for layers 2 through 4 along the fault zone is 0.0492 ft/d (0.015

[3]The Ladd State Well is outside of the western model boundary.

[4] An example of this is the Algodones Fault in the Yuma, Arizona area (Hill, 1993) which disrupts the alluvial sediments causing a steep hydraulic gradient of up to 50 feet over the narrow zone. Another example is along Pantano Wash on the eastern side of the Tucson Basin, where a fault causes 200 feet of head change in less than one mile (Davidson, 1973 and ADWR GWSI, 2013).

m/d) and is identical to the value used on the Black Gap Fault (same zone number). A lower hydraulic conductivity zone was not implemented in Layer 1 for the Black Gap Fault because Layer 1 is unsaturated to the east of the fault zone.

It should be noted that the depth to bedrock changes that would be associated with this fault-zone are not simulated, since no data are available to address the issue. For this reason, the hydraulic characteristics of the fault zone were implemented to achieve the hydraulic gradient observed to the east of the fault area. The basin fill may be thinner than is simulated, which would also possibly contribute to lower transmissivity values in the fault area. Essentially, the fault acts as a "dam", causing the hydraulic gradient to be very flat to the east. Figure 18 displays a transmissivity map for Layer 1 of the model. As evident the dam acts as a low transmissivity barrier to flow. The highest transmissivity values are generally along the axis of the plume, and in the Naco area.

2.4 Update of Boundary Conditions

The implementation of a low permeability feature in the western portion of the model domain required that the boundary heads be updated to match the change in water levels across the fault. The heads also had to be lowered on the western boundary of the model to honor the regional water levels to the west of the model domain. Boundary heads on the western side of the model have been reset to match water levels at the Ladd 837 well, and other wells to the west of the model domain. In general, individual boundary heads cells were set to represent water levels in nearby wells over time, and then a uniform gradient was set between these individual head values derived from nearby wells. The head difference across the La Bellota fault was also maintained in the boundary heads. Heads are set to the same values in each model layer, since there is inadequate information to separately characterize the heads in each layer.

The groundwater flow model's eastern and southern borders are also constant head boundary conditions, which can be adjusted through the simulation stress periods to reflect regional water level changes over time. Implementation of time varying constant head boundaries for the updated model differs from the model reported in the ACR in which head boundaries were not changed over the simulation. An evaluation of individual water levels from the water level database near these boundaries was used to adjust the heads to reflect regional water level changes over the simulation period.

Figure 19 illustrates the boundary conditions for the updated groundwater model. The implementation of the fault resulted in some cells in Layer 1 becoming unsaturated in the southwest corner of the model domain. These constant heads were "turned off" in Layer 1, and are noted in pink.

2.5 Temporal Discretization

To improve the model's numerical stability, the original stress periods and time steps were refined with additional stress periods and time steps in the updated model. The updated model has 35 stress periods covering the period from 1905 to 2012. The model presented in the ACR simulated the period from 1905 to 2008, with 18 stress periods. Table 4 lists the updated stress periods and time steps. It also includes the simulation period for the evaluation of mitigation actions for the FS.

2.6 Transient Model Calibration

Calibration of the hydraulic conductivity values focused on Layer 1, since sulfate migration primarily occurs in the basin fill. The transient phase of the groundwater model was the focus of this recalibration effort, but the steady state model was ultimately modified to address issues identified during the calibration process. A combination of Parameter ESTimation (PEST) (Doherty, 2010) automated calibration (using flow and transport targets) and manual calibration techniques were implemented. Changes were made to both specific yield and porosity to improve the model calibration. One of the issues previously noted was the high porosity in model Layer 1, which limited the transport of sulfate during the model calibration by Savci and HGC. The new calibrated specific yield for layer 1 ranges from 0.22 to 0.23 in the plume area, and the porosity ranges from 0.24 to 0.28 in the plume area.

Table 4 - Updated Model Stress Periods and Time Steps

Stress Period	Start	End	Period Length	No. Time Steps	Time Step Multiplier	Old Stress Period	Time Step Length	Cumulative Time
1	1/1/1905	12/31/1909	1826	20	1	1	91.30	1826
2	1/1/1910	12/31/1914	1826	20	1	1	91.30	3652
3	1/1/1915	12/31/1919	1826	20	1	1	91.30	5478
4	1/1/1920	12/31/1924	1827	20	1	1	91.35	7305
5	1/1/1925	12/31/1929	1826	20	1	1	91.30	9131
6	1/1/1930	12/31/1939	3652	40	1	2	91.30	12783
7	1/1/1940	12/31/1949	3653	40	1	2	91.33	16436
8	1/1/1950	12/31/1953	1461	16	1	2	91.31	17897
9	1/1/1954	12/31/1955	730	8	1	3	91.25	18627
10	1/1/1956	12/31/1960	1827	20	1	3	91.35	20454
11	1/1/1961	12/31/1965	1826	20	1	4	91.30	22280
12	1/1/1966	12/31/1966	365	4	1	4	91.25	22645
13	1/1/1967	12/31/1967	365	4	1	4	91.25	23010
14	1/1/1968	12/31/1968	366	4	1	4	91.50	23376
15	1/1/1969	12/31/1973	1826	20	1	4	91.30	25202
16	1/1/1974	12/31/1974	365	4	1	4	91.25	25567
17	1/1/1975	12/31/1984	3653	40	1	5	91.33	29220
18	1/1/1985	12/31/1986	730	8	1	6	91.25	29950
19	1/1/1987	12/31/1991	1826	20	1	7	91.30	31776
20	1/1/1992	12/31/1997	2192	24	1	7	91.33	33968
21	1/1/1998	12/31/1998	365	4	1	8	91.25	34333
22	1/1/1999	12/31/1999	365	4	1	9	91.25	34698
23	1/1/2000	12/31/2000	366	4	1	10	91.50	35064
24	1/1/2001	12/31/2001	365	4	1	11	91.25	35429
25	1/1/2002	12/31/2002	365	4	1	12	91.25	35794
26	1/1/2003	12/31/2003	365	4	1	13	91.25	36159
27	1/1/2004	12/31/2004	366	4	1	14	91.50	36525
28	1/1/2005	12/31/2005	365	4	1	15	91.25	36890
29	1/1/2006	12/31/2006	365	4	1	16	91.25	37255
30	1/1/2007	12/31/2007	365	4	1	17	91.25	37620
31	1/1/2008	12/31/2008	366	4	1	18	91.50	37986
32	1/1/2009	12/31/2009	365	4	1	19	91.25	38351
33	1/1/2010	12/31/2010	365	4	1	20	91.25	38716
34	1/1/2011	12/31/2011	365	4	1	21	91.25	39081
35	1/1/2012	12/31/2012	366	4	1	22	91.50	39447
36	1/1/2013	12/31/2013	365	4	1	23	91.25	39812
37	1/1/2014	12/31/2014	365	4	1	24	91.25	40177
38	1/1/2015	12/31/2015	365	4	1	25	91.25	40542
39	1/1/2016	12/31/2020	1827	20	1	26	91.35	42369
40	1/1/2021	12/31/2025	1826	20	1	27	91.30	44195
41	1/1/2026	12/31/2030	1826	20	1	28	91.30	46021
42	1/1/2031	12/31/2035	1826	20	1	29	91.30	47847
43	1/1/2036	12/31/2040	1827	20	1	30	91.35	49674
44	1/1/2041	12/31/2045	1826	20	1	31	91.30	51500
45	1/1/2046	12/31/2050	1826	20	1	32	91.30	53326
46	1/1/2051	12/31/2055	1826	20	1	33	91.30	55152
47	1/1/2056	12/31/2060	1827	20	1	34	91.35	56979
48	1/1/2061	12/31/2065	1826	20	1	35	91.30	58805
49	1/1/2066	12/31/2070	1826	20	1	36	91.30	60631
50	1/1/2071	12/31/2075	1826	20	1	37	91.30	62457
51	1/1/2076	12/31/2080	1827	20	1	38	91.35	64284
52	1/1/2081	12/31/2085	1826	20	1	39	91.30	66110
53	1/1/2086	12/31/2090	1826	20	1	40	91.30	67936
54	1/1/2091	12/31/2095	1826	20	1	41	91.30	69762
55	1/1/2096	12/31/2100	1826	20	1	42	91.30	71588
56	1/1/2101	12/31/2105	1826	20	1	43	91.30	73414
57	1/1/2106	12/31/2110	1826	20	1	44	91.30	75240
58	1/1/2111	12/31/2115	1826	20	1	45	91.30	77066
59	1/1/2116	12/31/2120	1827	20	1	46	91.35	78893
60	1/1/2121	12/31/2125	1826	20	1	47	91.30	80719

Hydraulic conductivity changes were focused on layer 1, and a slight anisotropy was introduced to address observed southward transport of sulfate. Additionally, the hydraulic conductivity of zone 2 (Figure 16) was raised from the calibrated value of 5.3 ft/d (1.6 m/d) to 14.8 ft/d (4.5 m/d) for the final simulations. This change had a negative impact on the model calibration, but was implemented because hydraulic gradient and aquifer testing data in the area indicated that the value of 14.8 ft/d is closer to measured values. The impact of this change is that sulfate is transported further to the west.

Recharge rates for the Warren Irrigation area were adjusted slightly as part of the calibration process, but ultimately the rates remained the same as previously used. No change in the concentration of recharged water was implemented, with the value of 250 milligrams per liter (mg/l) assumed.

One issue noted during the calibration process was that the model had heads for Layer 1 that were consistently 5 to 20 meters too low in the Purdy Lane and Naco area. This problem was traced back to the original steady state model, which also has heads which are too low in this area. Starting heads were raised in the steady state model by 10 meters uniformly, and the implementation of the western fault zone improved the calibration. Figure 20 illustrates the comparison of 2011 measured water levels with the model simulated levels for Layer 1 and Layer 2. The residuals for 2011 are also posted, and generally the plume area heads are within 10 feet of measured values, with the model lower than the measured values. Figure 21 illustrates a comparison between the observed heads and simulated water levels, while Table 5 shows the statistics for the flow model. The overall root-mean-square (RMS) error has declined to 6.95%[5]. The statistics for the model calibration presented in the ACR had an RMS error of 11.3%.

[5] It should be noted that some water levels were not included, particularly pumping levels at the production wells since they are not representative of regional conditions simulated in the flow model.

Table 5 – Flow Model Calibration Statistics

Statistical Parameter	Current Model	ACR Model[6]
Residual Mean (m)	-1.28	1.68
Abs. Res. Mean (m)	9.75	11.79
Res. Std. Dev (m).	20.21	22.36
Sum of Squares (m^2)	991,125.45	126,753.10
RMS Error (m)	20.25	28.58
Min. Residual (m)	-181.40	-153.24
Max. Residual (m)	867.05	44.91
Number of Observations	2417	252
Range Observations (m)	291.37	197.78
Scaled Std. Dev.	0.0694	0.1131
Scaled Abs. Mean	0.0334	0.0596
Scaled RMS	6.95%	11.34%

It should be noted that the contours of measured heads and simulated heads presented in Figure 20 do not match as well as would be desired. Heads are consistently 8 to 10 feet too low in the western area of the sulfate plume. This is partly a result of the changes implemented for Zone 2, which caused a decline in water levels east of Naco Highway. This change was implemented to better match observed hydraulic gradients between the sulfate plume and the AWC well field. However, the overall model statistics are reasonably good, and transport of sulfate matches fairly well, as will be discussed in Section 2.6.

[6] Statistics presented here are for All Targets used in the HGC model. A separate presentation of Targets Used in Calibration is presented in the ACR.

2.7 Flow Model Calibration Results by Layer

Table 6 shows a comparison of statistics for model simulated heads by model layer. Based on these results, the model is well calibrated for the basin fill aquifer (Layer 1), with overall RMS error of 3.61%. The calibration for the bedrock units (Layers 2-4) is not as good, with overall error rates from 11 to 19%. A number of factors contribute to these differences, including areas with anomalously low water levels (see ACR report for details) and other local effects of fracture dominated flow in the bedrock layers.

Table 6 – Flow Model Calibration Statistics by Model Layer

Head Statistics	Overall	Layer 1	Layers 2-3	Layers 2-4	Layer 4
Residual Mean	-1.28	1.69	1.13	-4.77	-24.02
Absolute Residual Mean	9.74	4.25	12.04	16.22	29.89
Residual Std. Deviation	20.21	7.62	18.73	28.27	42.17
Sum of Squares	990964.9	79683.6	298910.8	911281.3	612370.5
RMS Error	20.25	7.81	18.76	28.67	48.53
Min. Residual	-181.40	-143.76	-89.21	-181.40	-181.40
Max. Residual	67.05	46.10	67.05	67.05	28.81
Number of Observations	2417	1308	849	1109	260
Range in Observations	291.37	216.23	164.65	258.57	258.57
Scaled Residual Std. Deviation	0.0694	0.0352	0.1138	0.1093	0.1631
Scaled Absolute Residual Mean	0.0334	0.0196	0.0731	0.0627	0.1156
Scaled RMS Error	6.95%	3.61%	11.40%	11.09%	18.77%
Scaled Residual Mean	-0.0044	0.0078	0.0068	-0.0184	-0.0929

2.8 Transport Model Results

Because the purpose of the groundwater model is to evaluate the transport of sulfate in the basin fill sediments, the sulfate concentration targets were also used as a key factor to calibrate

the model. PEST and manual calibration techniques were used with the sulfate targets to improve calibration. Table 7 illustrates the overall model statistics for the transport model. The RMS error is improved to 11.7% from 16.1% in the ACR.

Table 7 – Transport Model Calibration Statistics

Statistical Parameter	Current Model	ACR Model
Residual Mean (mg/l)	18.79	7.5
Abs. Res. Mean (mg/l)	168.63	200.1
Res. Std. Dev. (mg/l)	345.48	442.1
Sum of Squares	212,001,770.32	46,139,395.2
RMS Error	345.99	442.06
Min. Residual (mg/l)	-2124.49	-1317.1
Max. Residual (mg/l)	1501.00	2753.0
Number of Observations	1771	241
Range in Observations (mg/l)	2960	2747.4
Scaled Std. Dev.	0.1167	0.1609
Scaled Abs. Mean	0.0570	0.056
Scaled RMS	11.69%	16.09%

Figure 22 illustrates the comparison of 2011 measured and simulated sulfate concentrations for the sulfate plume area. Generally the contours have a good match with measured values although the model overestimates the western extent of the 250 mg/L sulfate concentration contour. Figure 23 presents a scatterplot of measured sulfate compared to model simulated values.

2.9 Transport Model Calibration Results by Layer

Table 8 shows a comparison of statistics for sulfate concentrations by model layer. Based on these results, the model is well calibrated for the basin fill aquifer (Layer 1), with overall RMS error of 10%. The calibration for the bedrock units (Layers 2-4) is not as good, with overall error rates from 9 to 23%. As noted, a number of factors contribute to these differences, particularly local variability due to fracture dominated flow in the bedrock units.

Table 8 – Transport Model Calibration Statistics by Model Layer

Sulfate Statistics	Overall	Layer 1	Layers 2-3	Layers 2-4	Layer 4
Residual Mean	18.79	-10.88	67.69	66.39	62.63
Absoluate Residual Mean	168.63	149.35	231.81	199.56	106.47
Residual Std. Deviation	345.48	296.79	460.17	407.24	182.59
Sum of Squares	212001770.3	96229091.8	109251926.8	115772678.5	6520751.7
RMS Error	345.99	296.99	465.12	412.62	193.03
Min. Residual	-2124.49	-1316.68	-2124.49	-2124.49	-755.85
Max. Residual	1501.00	1501.00	1187.86	1187.86	906.24
Number of Observations	1771	1091	505	680	175
Range in Observations	2960.0	2960.0	1940.0	2210.0	2198.8
Scaled Residual Std. Deviatior	0.1167	0.1003	0.2372	0.1843	0.0830
Scaled Absolute Residual Mea	0.0570	0.0505	0.1195	0.0903	0.0484
Scaled RMS Error	11.69%	10.03%	23.98%	18.67%	8.78%
Scaled Residual Mean	0.0063	-0.0037	0.0349	0.0300	0.0285

2.10 Conclusion

Based on these results, the groundwater flow and transport model is suitable for use in predicting changes in water levels, groundwater flow rates and directions, and sulfate migration in the basin fill for different potential mitigation alternatives. The current groundwater flow and transport model has an improved overall match with water level and sulfate concentrations. The improved head match is a significant improvement, and the lower porosity values (from the ACR model) also indicate a significant improvement. It must be noted that the inclusion of a western fault zone does cause a “dam” effect. Because the exact nature of this hydraulic feature is unknown, this must be considered as a source of uncertainty for projection simulations. However, the water levels measured in the area of the Ladd Ranch wells clearly indicate that a change in hydraulic conditions is present.

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- Table 7 – Transport Model Calibration Statistics
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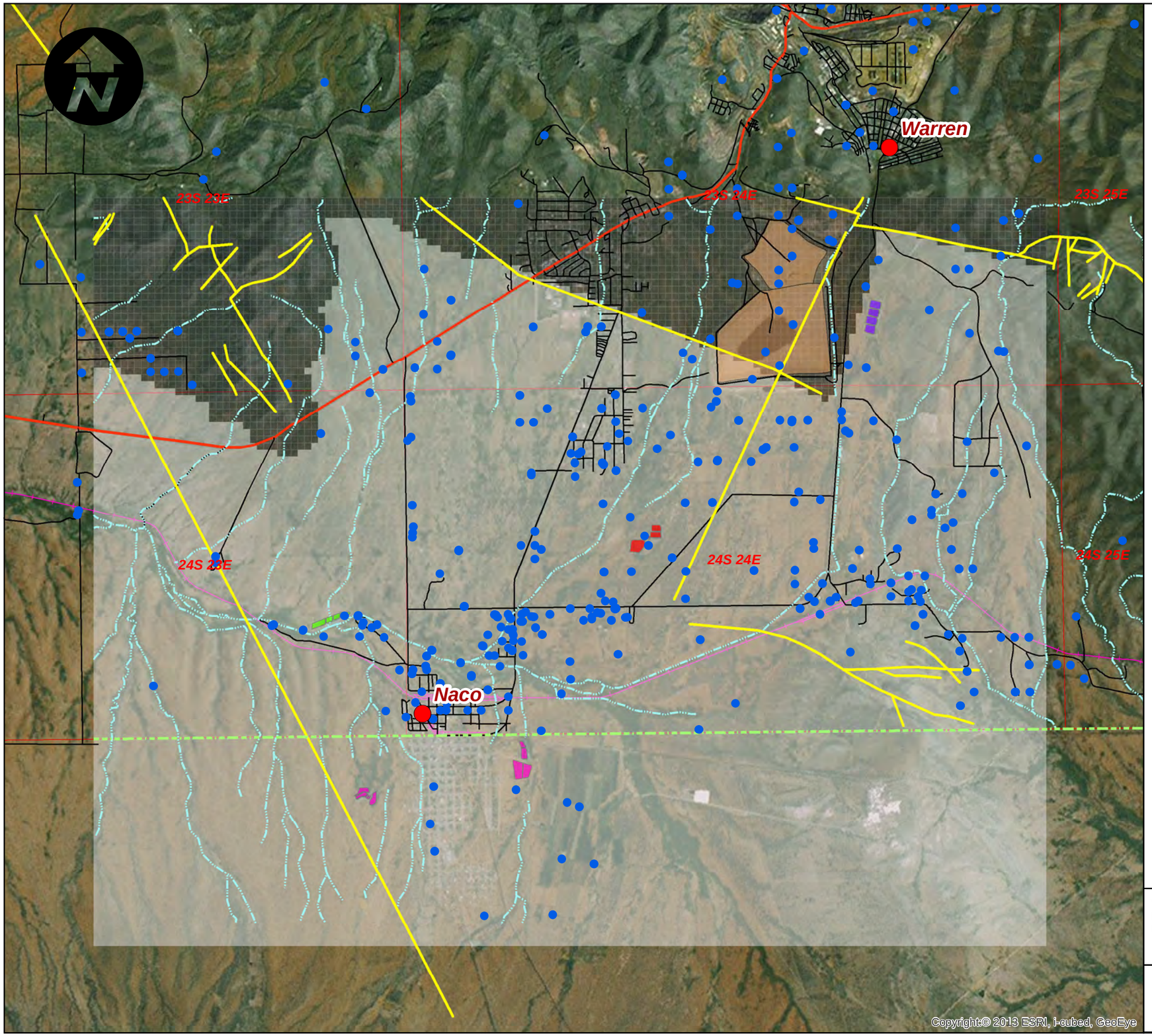
Freeport-McMoran Corporation
Copper Queen Branch



Explanation

- Wells in Database
- Stream Drainage
- Mexico/USA Border
- Faults

Roads

- US,State,County Hwys
- Major Arterials
- Streets
- San Jose WWTP
- Warren WWTP
- Naco Sonora WWTP
- Naco Sanitary District WWTP
- North and South Tailing Impoundments
- Active Cells (Layer 4)
- No Flow Cells (Layer 4)

0 0.25 0.5 1 1.5 2 2.5 3 3.5 Miles

Version: 3
By: PRP
Date: July 35, 2013

6155 East Indian School Road
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Scottsdale, Arizona 85251
(480) 659-7131 Fax: (480) 659-7143

CLEAR CREEK ASSOCIATES

Model Domain

Figure 1

Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Count of Water Levels

Number of Measurements

- 1 - 5
- 6 - 10
- 11 - 25
- 26 - 100
- 101 - 292
- US-Mexico Borrder

Active

- No-Flow
- Active
- North and South Tailings Impoundments

0 0.25 0.5 1 1.5 2 2.5 3 Miles

Version: 2
By: PRP
Date: July 25, 2013

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Suite 200
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CLEAR CREEK ASSOCIATES

Updated Target Dataset
Count of Water Level Measurements

Figure 2

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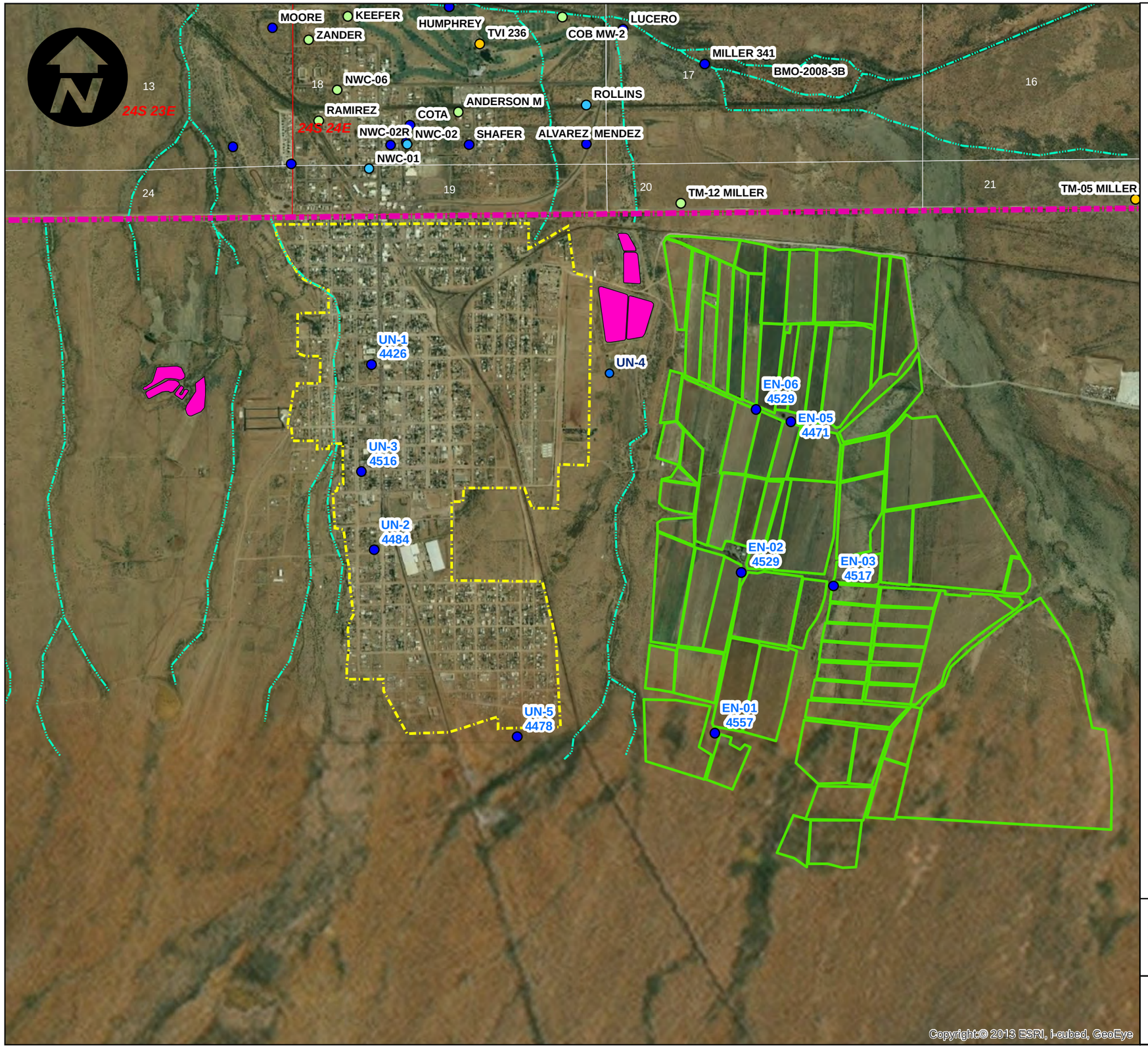

Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Count of Water Levels

Number of Measurements

- 1 - 5
- 6 - 10
- 11 - 25
- 26 - 100
- 101 - 292
- US-Mexico Borrder
- Stream Drainages
- Naco, Sonora Town Boundary
- Ejido Naco Irrigated Lands
- Naco Sonora WWTP

NOTES:
EN wells are Ejido Naco irrigation wells.
UN wells are municpal wells for Naco, Sonora
Naco, Sonora Boundary from AMEC, 2010.

0 0.25 0.5 1 Miles

Version: 2
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Date: July 25, 2013

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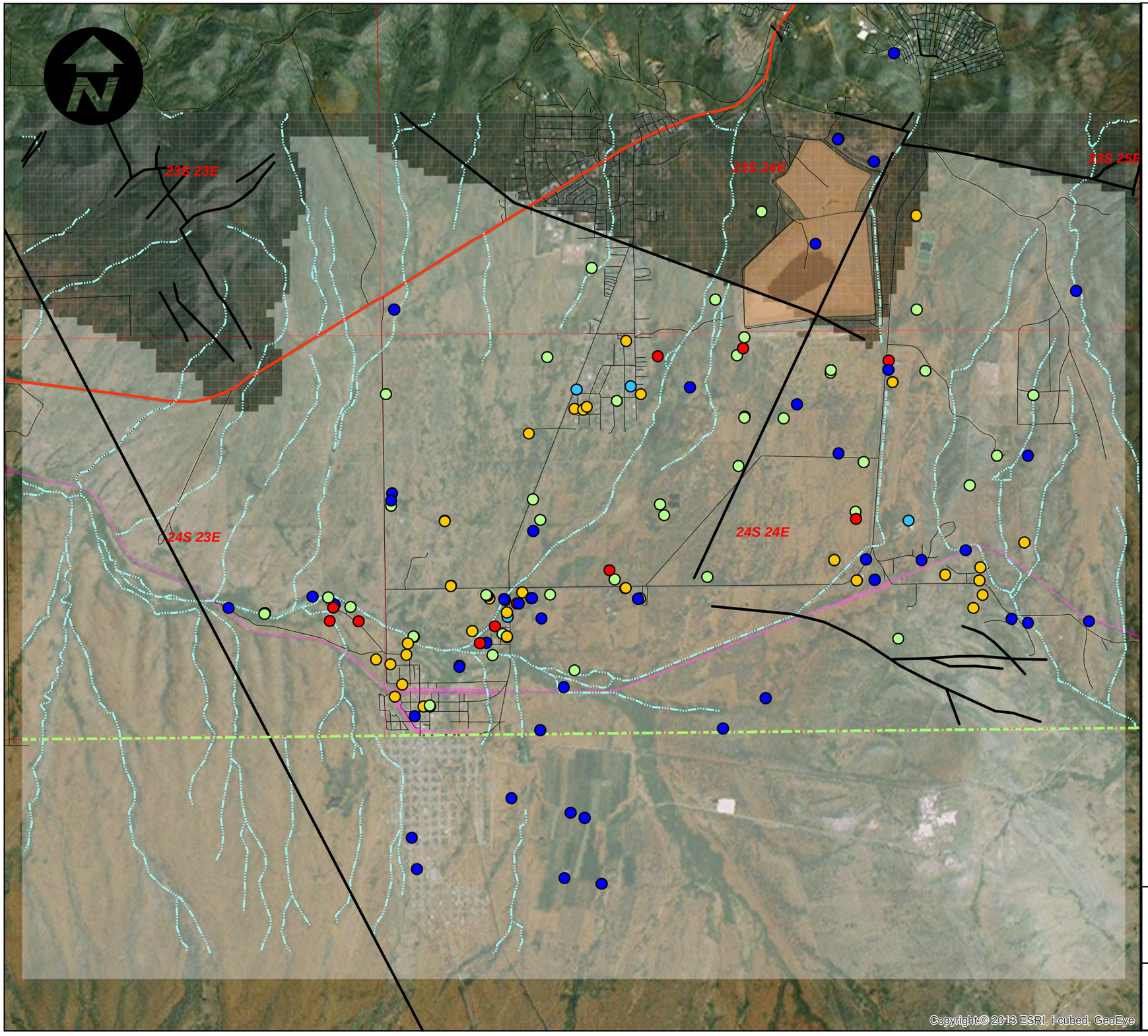
CLEAR CREEK ASSOCIATES

Ejido Naco Irrigation and Municipal Wellfield Naco, Sonora

Figure 3

Freeport-McMoran Corporation
Copper Queen Branch



Explanation

Count of Sulfate Targets

Sample Count

- 1 - 5
- 6 - 10
- 11 - 20
- 21 - 30
- 31 - 82
- Mexico/USA Border
- Faults
- Stream Drainages
- North and South Tailings Impoundments
- Active Cells (Layer 4)
- No Flow Cells (Layer 4)

0 0.25 0.5 1 1.5 2 2.5 3 Miles

Version: 2
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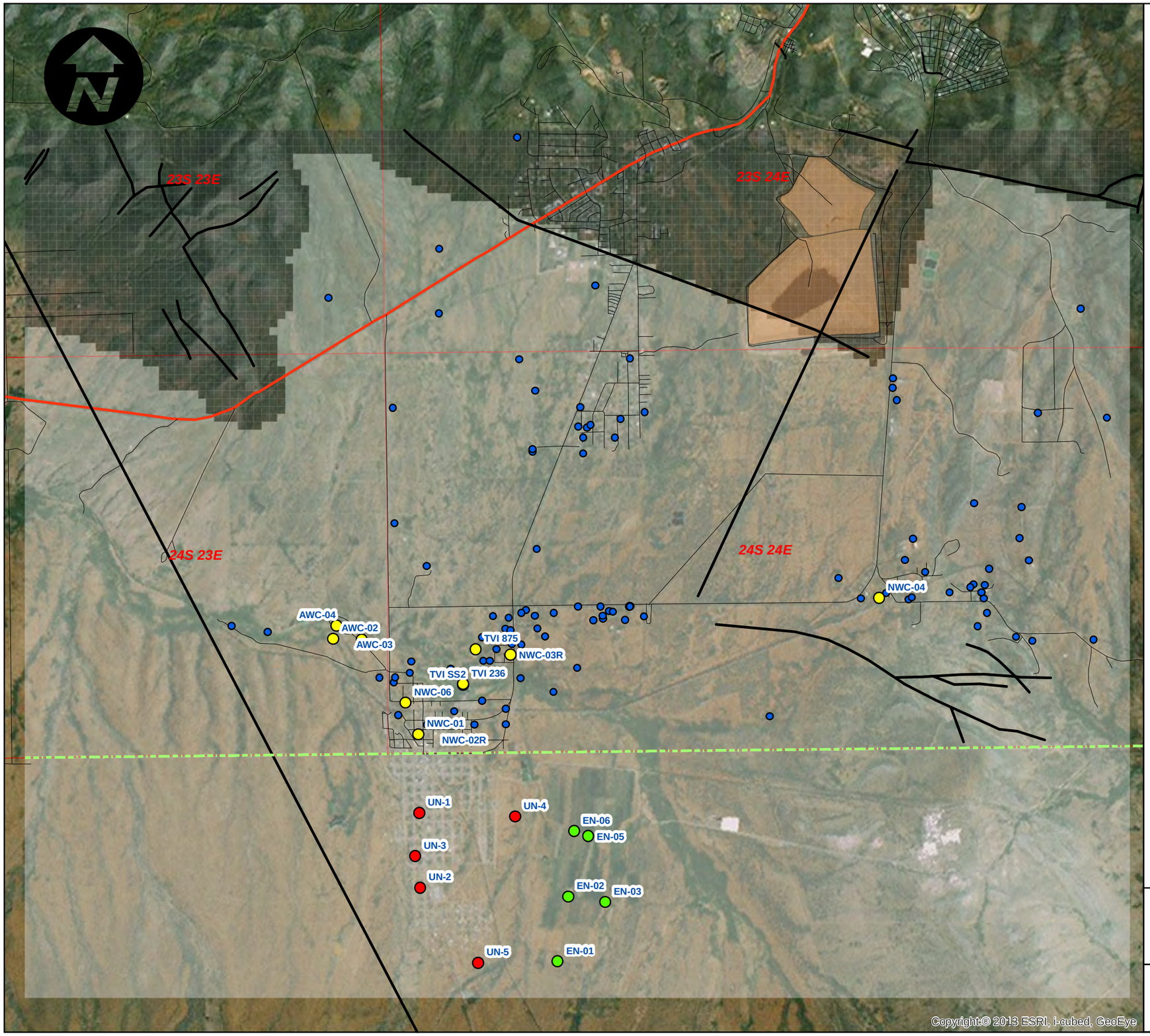
Count of Updated Sulfate Targets Through October 2012

Figure 4



Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Updated Pumping rates for Model

- Not Updated

Pumping Rate Status

- Values Updated for 1998 to 2010
- Values Updated for 2008 to 2011
- Rates Re-Evaluated with no Changes
- Mexico/USA Border
- Faults
- North and South Tailings Impoundments
- Active Cells (Layer 4)
- No Flow Cells (Layer 4)

0 0.25 0.5 1 1.5 2 2.5 3 Miles

Version: 3
By: PRP
Date: July 25, 2013

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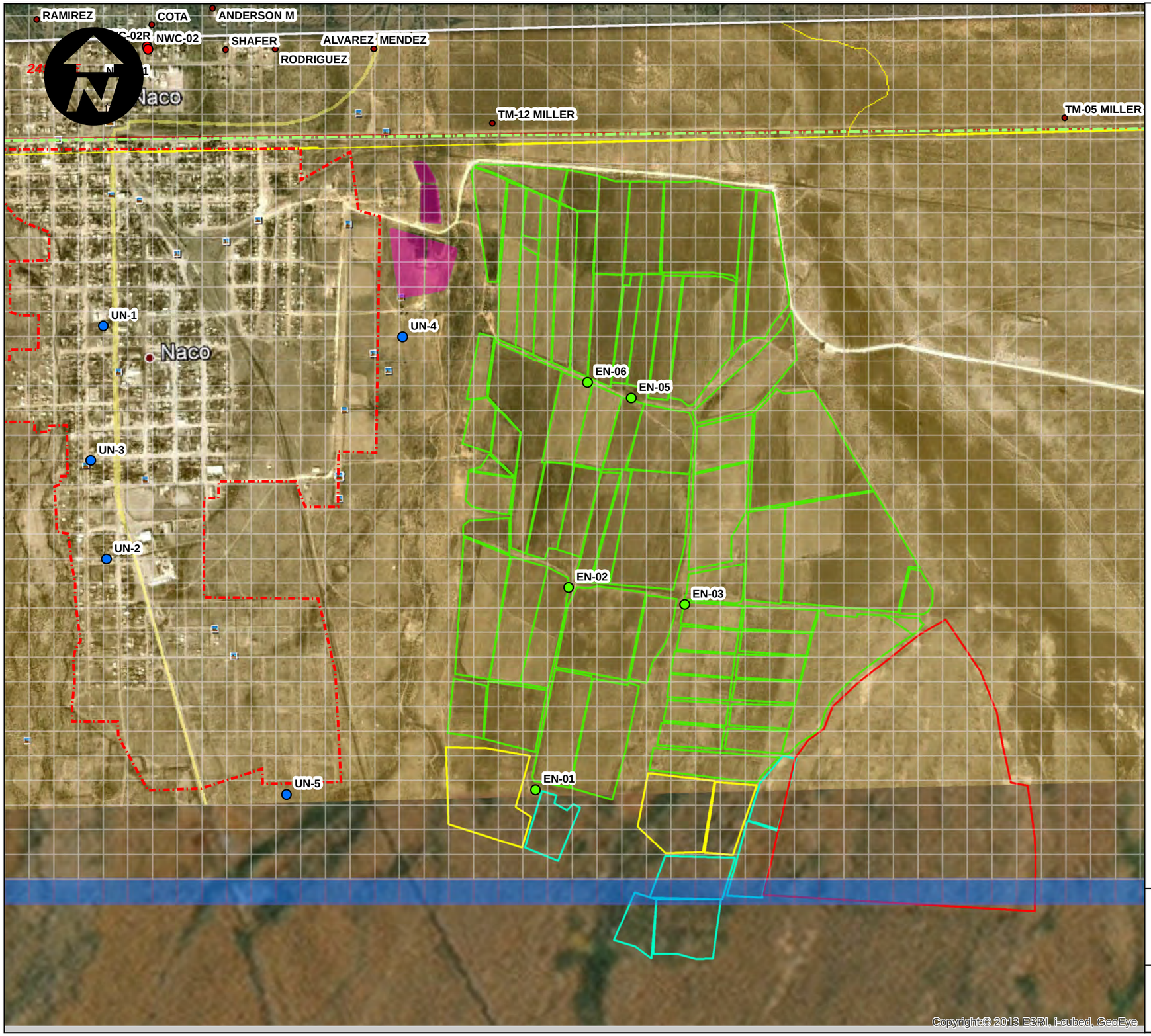
CLEAR CREEK ASSOCIATES

Wells with Updated Pumping Rates 2008 to 2011

Figure 5



Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Well Database
- Other Wells

Owner
- NACO WATER COMPANY
- OOMAPAS-NACO
- EJIDO NACO
- Mexico/USA Border

Area
- Naco, Sonora Town Boundary

Model Domain

Type
- Active Cell
- Constant Head
- No Flow

Ejido Naco Irrigated Lands

Type
- Cleared Land
- Irrigated 1992-2011
- Irrigated 1996-2011
- Irrigated 2004-2011
- Naco Sonora WWTP

Notes:
The aerial photographs prior to 2004 do not show the far southern Ejido Naco lands. However, the underlying aerial photograph does not show irrigation. This photo is dated January 15, 1999, indicating that the lands came into production between 1999 and 2004.

0 0.1 0.2 0.4 0.6 0.8 1 Miles

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By: PRP
Date: July 25, 2013

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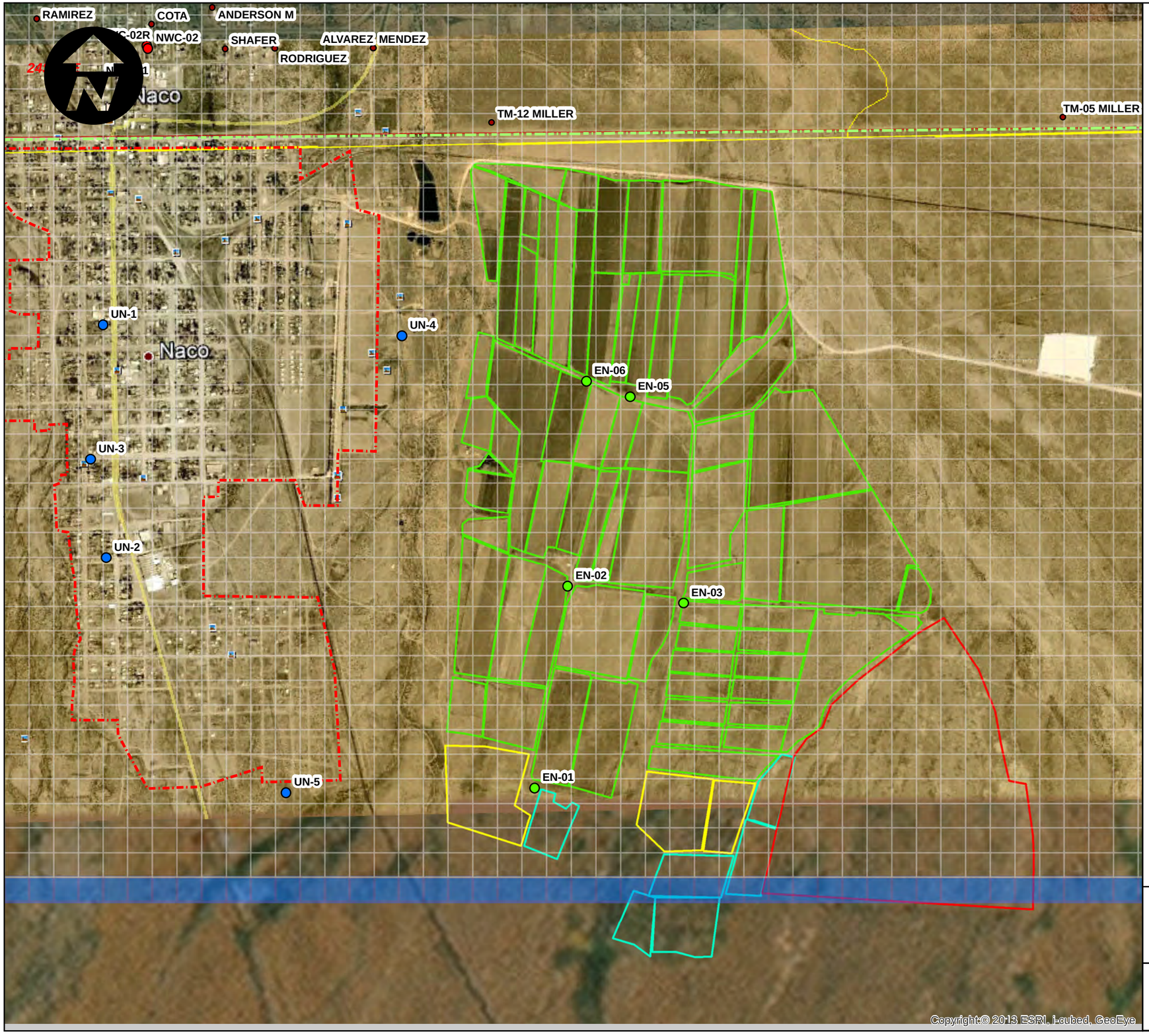
CLEAR CREEK ASSOCIATES

Ejido Naco
Agricultural Irrigation
Aerial Photograph 10/16/1992

Figure 6



Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Well Database

- Other Wells

Owner

- NACO WATER COMPANY
- OOMAPAS-NACO
- EJIDO NACO
- Mexico/USA Border

Area

- Naco, Sonora Town Boundary

Model Domain

Type

- Active Cell
- Constant Head
- No Flow

Ejido Naco Irrigated Lands

Type

- Cleared Land
- Irrigated 1992-2011
- Irrigated 1996-2011
- Irrigated 2004-2011

Notes:
The aerial photographs prior to 2004 do not show the far southern Ejido Naco lands. However, the underlying aerial photograph does not show irrigation. This photo is dated January 15, 1999, indicating that the lands came into production between 1999 and 2004.

0 0.1 0.2 0.4 0.6 0.8 1 Miles

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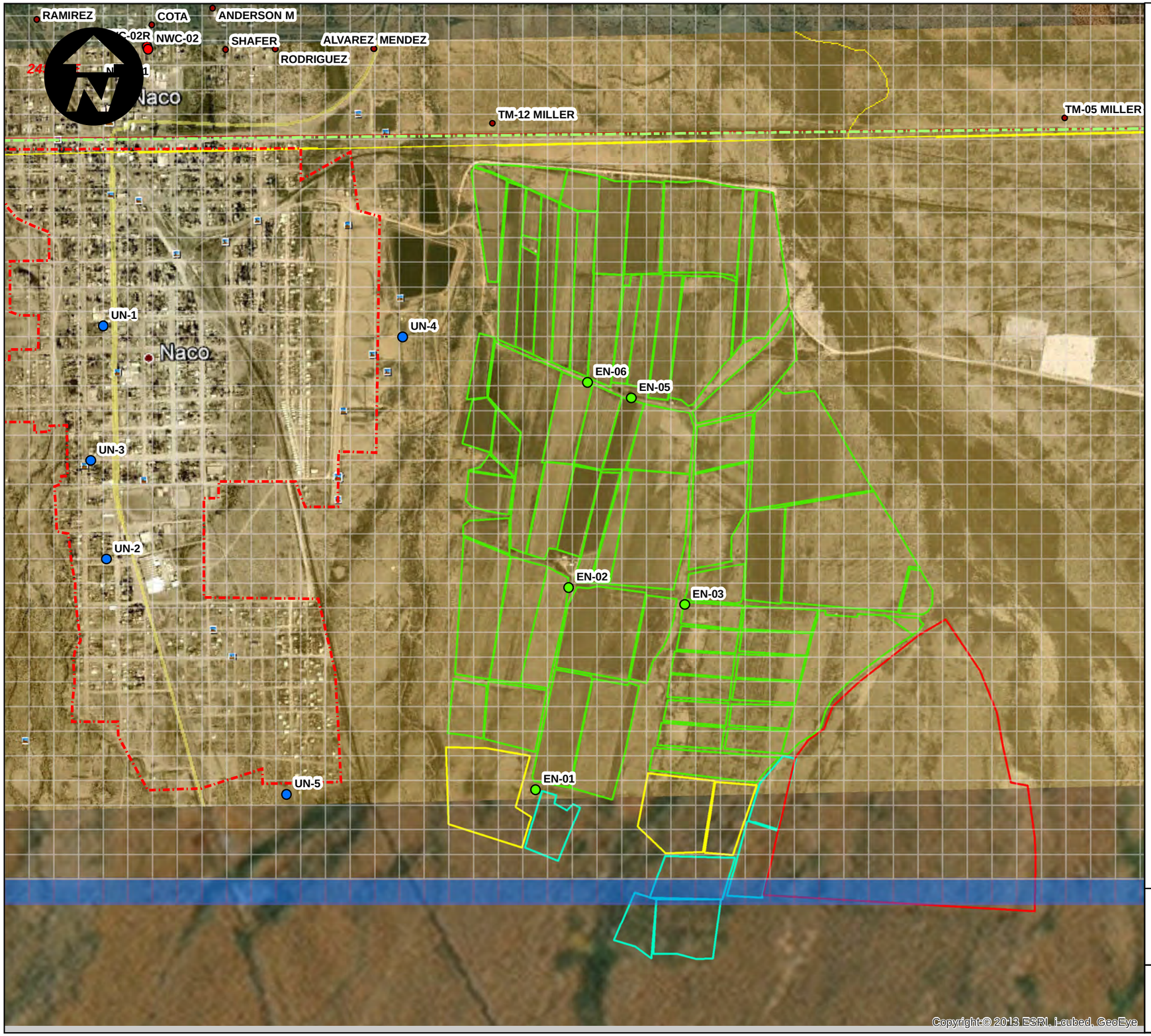
Ejido Naco
Agricultural Irrigation
Aerial Photograph 5/31/1996

Figure 7



Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Well Database

- Other Wells

Owner

- NACO WATER COMPANY
- OOMAPAS-NACO
- EJIDO NACO
- Mexico/USA Border

Area

- Naco, Sonora Town Boundary

Model Domain

Type

- Active Cell
- Constant Head
- No Flow

Ejido Naco Irrigated Lands

Type

- Cleared Land
- Irrigated 1992-2011
- Irrigated 1996-2011
- Irrigated 2004-2011

Notes:
The aerial photographs prior to 2004 do not show the far southern Ejido Naco lands. However, the underlying aerial photograph does not show irrigation. This photo is dated January 15, 1999, indicataing that the lands came into production between 1999 and 2004.

0 0.1 0.2 0.4 0.6 0.8 1 Miles

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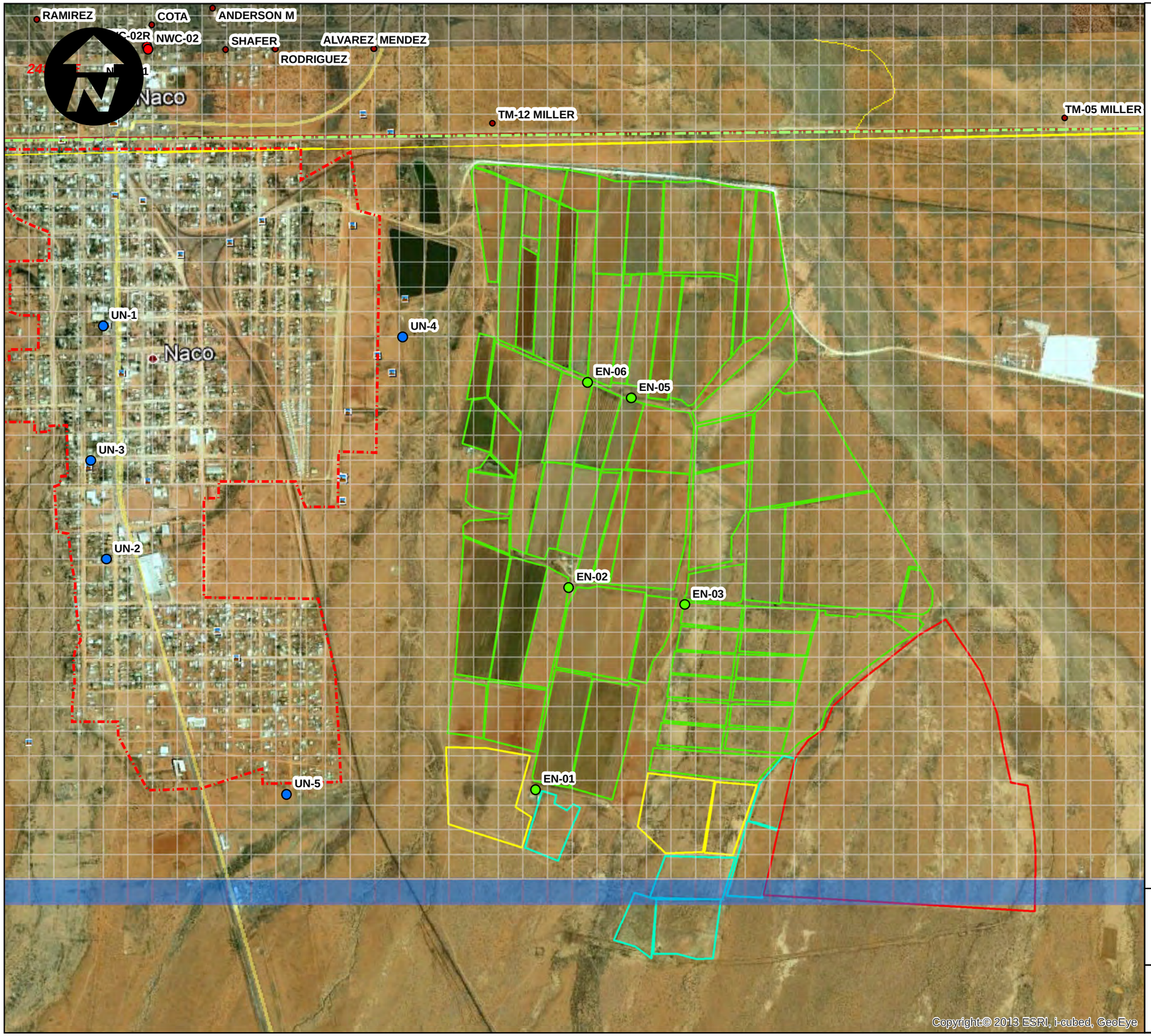
Ejido Naco
Agricultural Irrigation
Aerial Photograph 9/14/2003

Figure 8



Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Well Database

- Other Wells

Owner

- NACO WATER COMPANY
- OOMAPAS-NACO
- EJIDO NACO
- Mexico/USA Border

Area

- Naco, Sonora Town Boundary

Model Domain

Type

- Active Cell
- Constant Head
- No Flow

Ejido Naco Irrigated Lands

Type

- Cleared Land
- Irrigated 1992-2011
- Irrigated 1996-2011
- Irrigated 2004-2011

0 0.1 0.2 0.4 0.6 0.8 1 Miles

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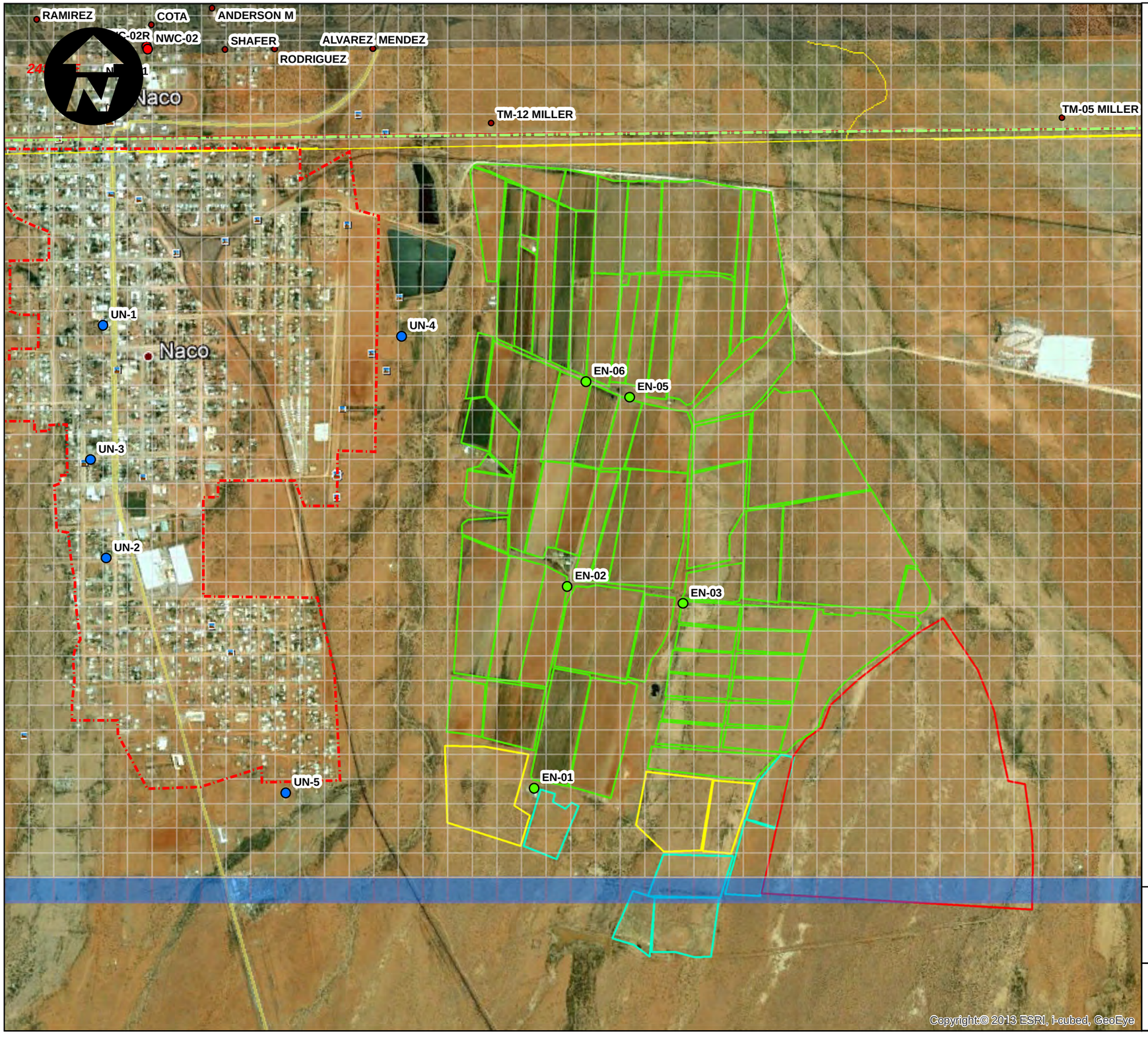
CLEAR CREEK ASSOCIATES

Ejido Naco
Agricultural Irrigation
Aerial Photograph 4/29/2004

Figure 9



Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Well Database

- Other Wells

Owner

- NACO WATER COMPANY
- OOMAPAS-NACO
- EJIDO NACO
- Mexico/USA Border

Area

- Naco, Sonora Town Boundary

Model Domain

Type

- Active Cell
- Constant Head
- No Flow

Ejido Naco Irrigated Lands

Type

- Cleared Land
- Irrigated 1992-2011
- Irrigated 1996-2011
- Irrigated 2004-2011

0 0.1 0.2 0.4 0.6 0.8 1 Miles

Version: 2
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Date: July 25, 2013

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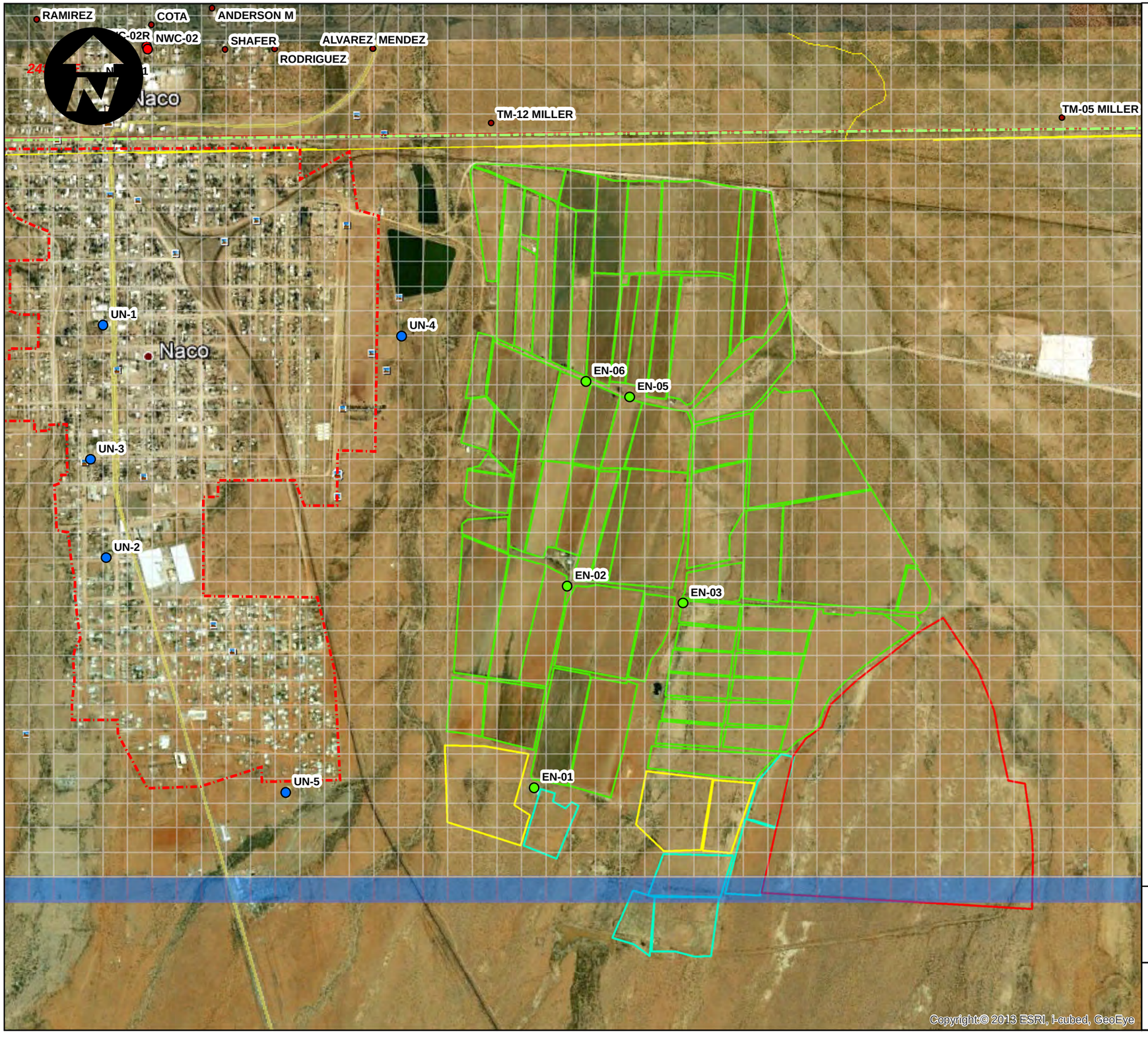
Ejido Naco
Agricultural Irrigation
Aerial Photograph 7/21/2006

Figure 10



Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Well Database

- Other Wells

Owner

- NACO WATER COMPANY
- OOMAPAS-NACO
- EJIDO NACO
- Mexico/USA Border

Area

- Naco, Sonora Town Boundary

Model Domain

Type

- Active Cell
- Constant Head
- No Flow

Ejido Naco Irrigated Lands

Type

- Cleared Land
- Irrigated 1992-2011
- Irrigated 1996-2011
- Irrigated 2004-2011

0 0.1 0.2 0.4 0.6 0.8 1 Miles

Version: 2
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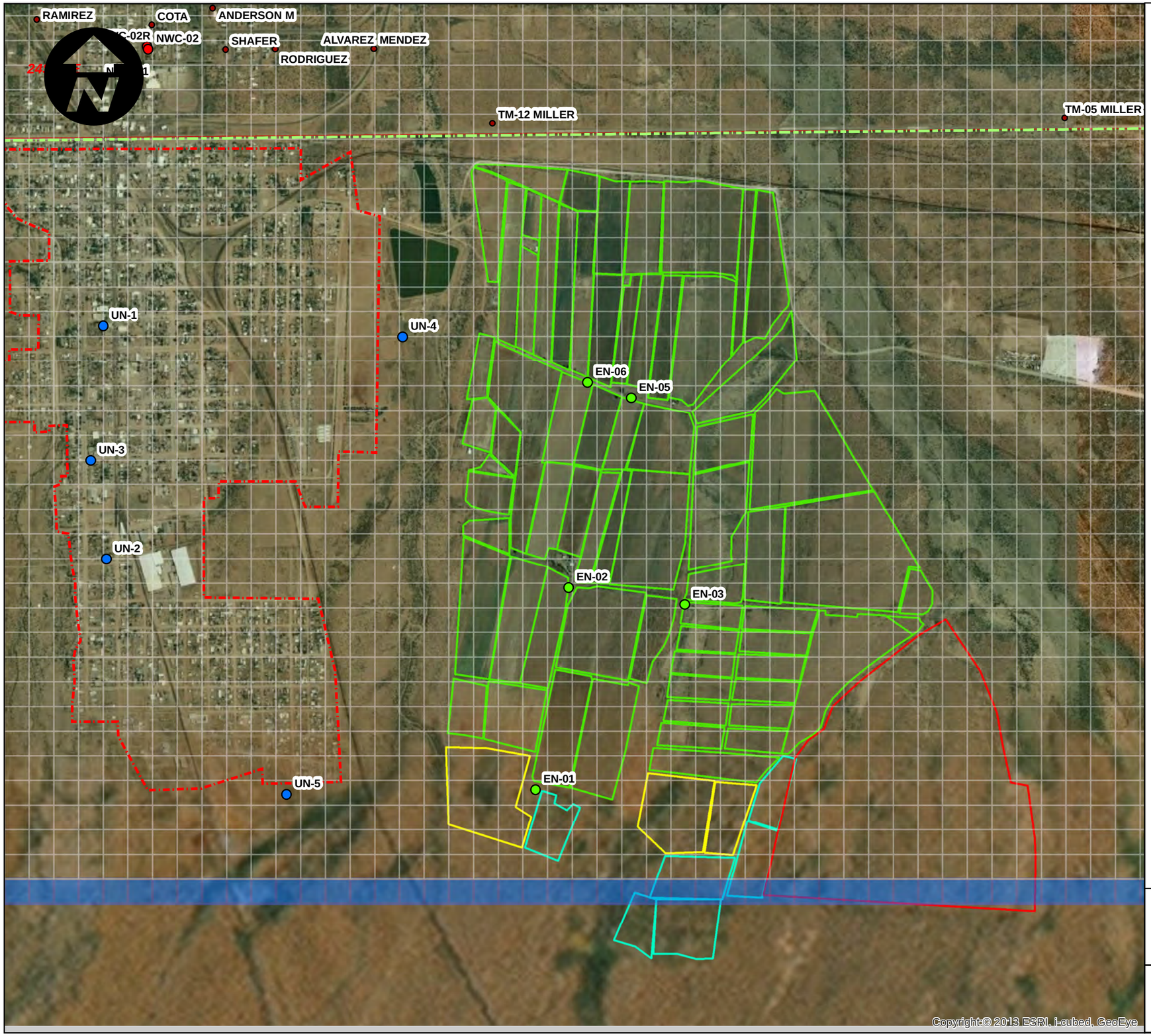
Ejido Naco
Agricultural Irrigation
Aerial Photograph 6/7/2007

Figure 11



Freeport-McMoran Corporation
Copper Queen Branch

Explanation

Well Database

- Other Wells

Owner

- NACO WATER COMPANY
- OOMAPAS-NACO
- EJIDO NACO
- Mexico/USA Border

Area

- Naco, Sonora Town Boundary

Model Domain

Type

- Active Cell
- Constant Head
- No Flow

Ejido Naco Irrigated Lands

Type

- Cleared Land
- Irrigated 1992-2011
- Irrigated 1996-2011
- Irrigated 2004-2011

0 0.1 0.2 0.4 0.6 0.8 1 Miles

Version: 2
By: PRP
Date: July 25, 2013

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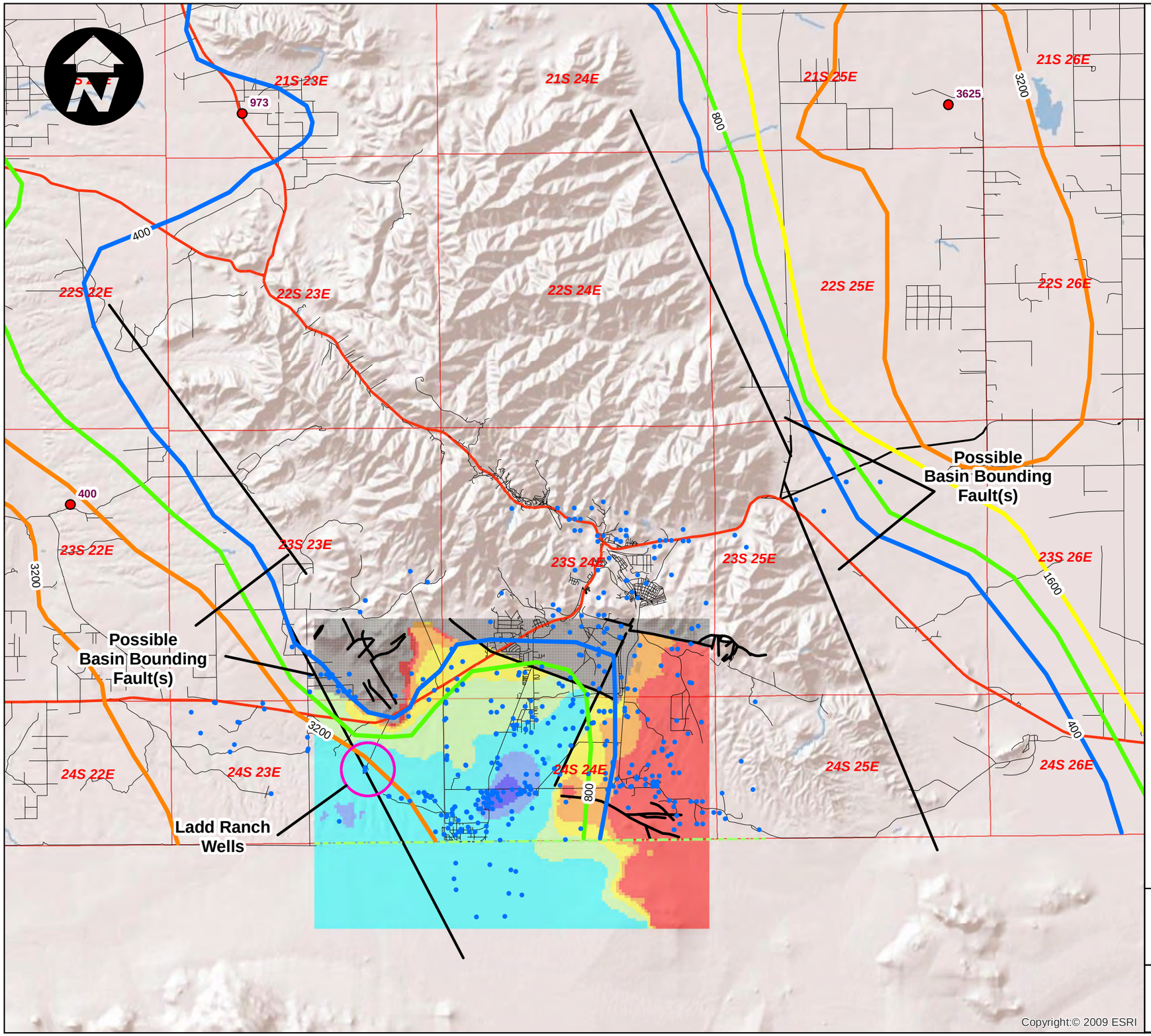
Ejido Naco
Agricultural Irrigation
Aerial Photograph 5/23/2011

Figure 12

Freeport-McMoran Corporation
Copper Queen Branch



Explanation

- Boreholes that Define Bedrock
- Wells in Database

Regional Depth to Bedrock

Depth (feet)

- 400
- 800
- 1600
- 3200
- 4800
- Mexico/USA Border
- Faults

Layer 1 - Basin Fill Thickness

(feet)

- 33 - 50
- 51 - 100
- 101 - 200
- 201 - 300
- 301 - 500
- 501 - 600
- 601 - 656
- No Flow Cells (Layer 4)

0 1 2 4 6 8 Miles

Version: 2
By: PRP
Date: July 25, 2013

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Possible Basin-Bounding Fault Zones

Figure 13

Freeport-McMoran Corporation
Copper Queen Branch

Explanation

- September 2011 Water Levels
- LADD 976 Measurement from 1985
- Wells in Database

Faults

- Mapped
- Inferred
- Stream Drainages

ASLD Grazing Allotments

- Other Ranches

Name

- SAN JOSE (LADD)
- Active Cells (Layer 4)
- No Flow Cells (Layer 4)

Version: 2
By: PRP
Date: July 25, 2013

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Ladd Ranch Water Levels and Possible Basin-Bounding Fault Zones

Figure 14

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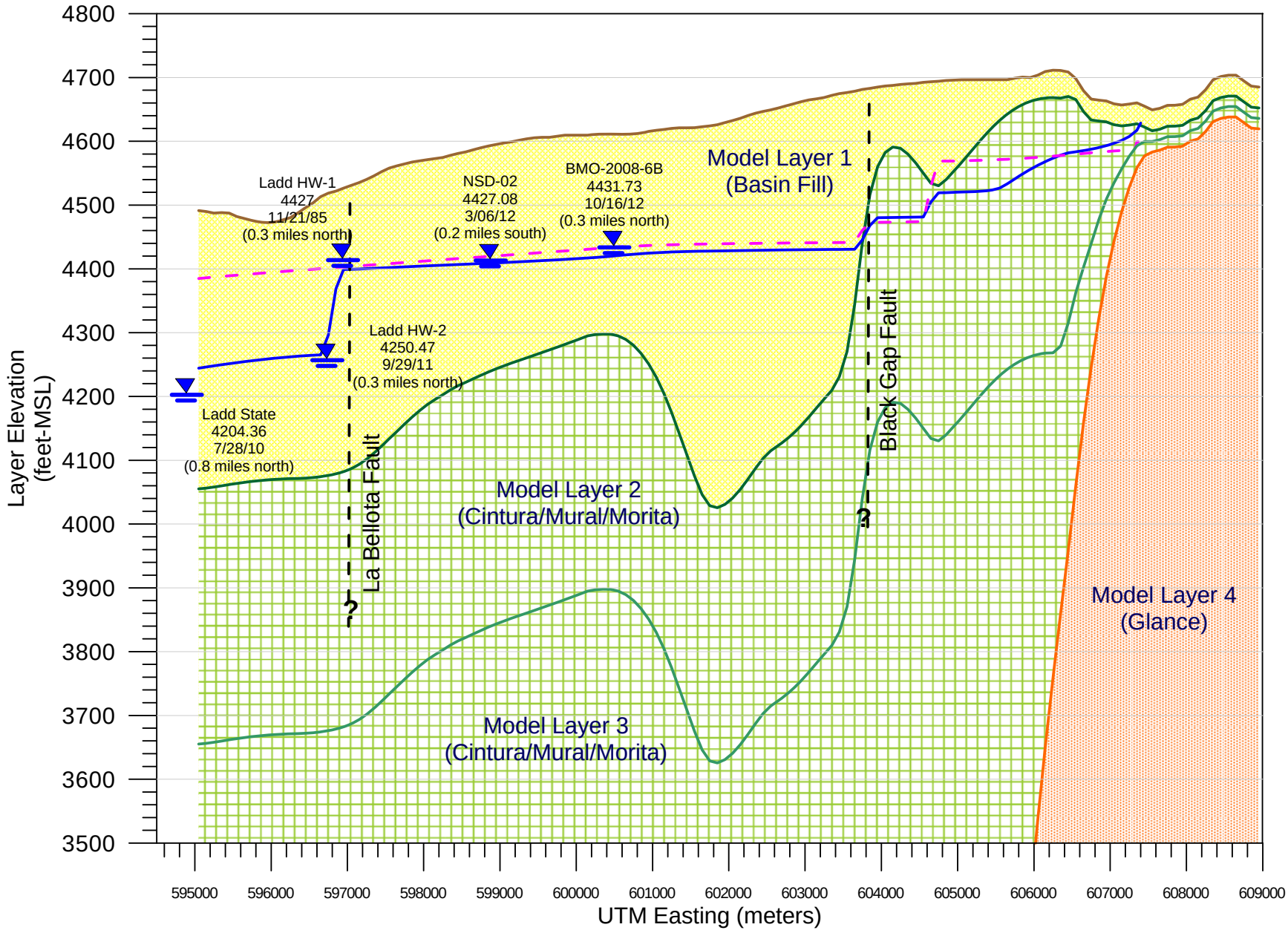

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Comparison of Model Simulated Water Levels for the HGC and CCA Models Cross Section Along Model Row 56

Approved	Date	Author	Date	File Name	Figure
JRN	07/24/13	PRP	07/24/13	Fig F2 Deatiled Model Simulation Cross Section.grf	15

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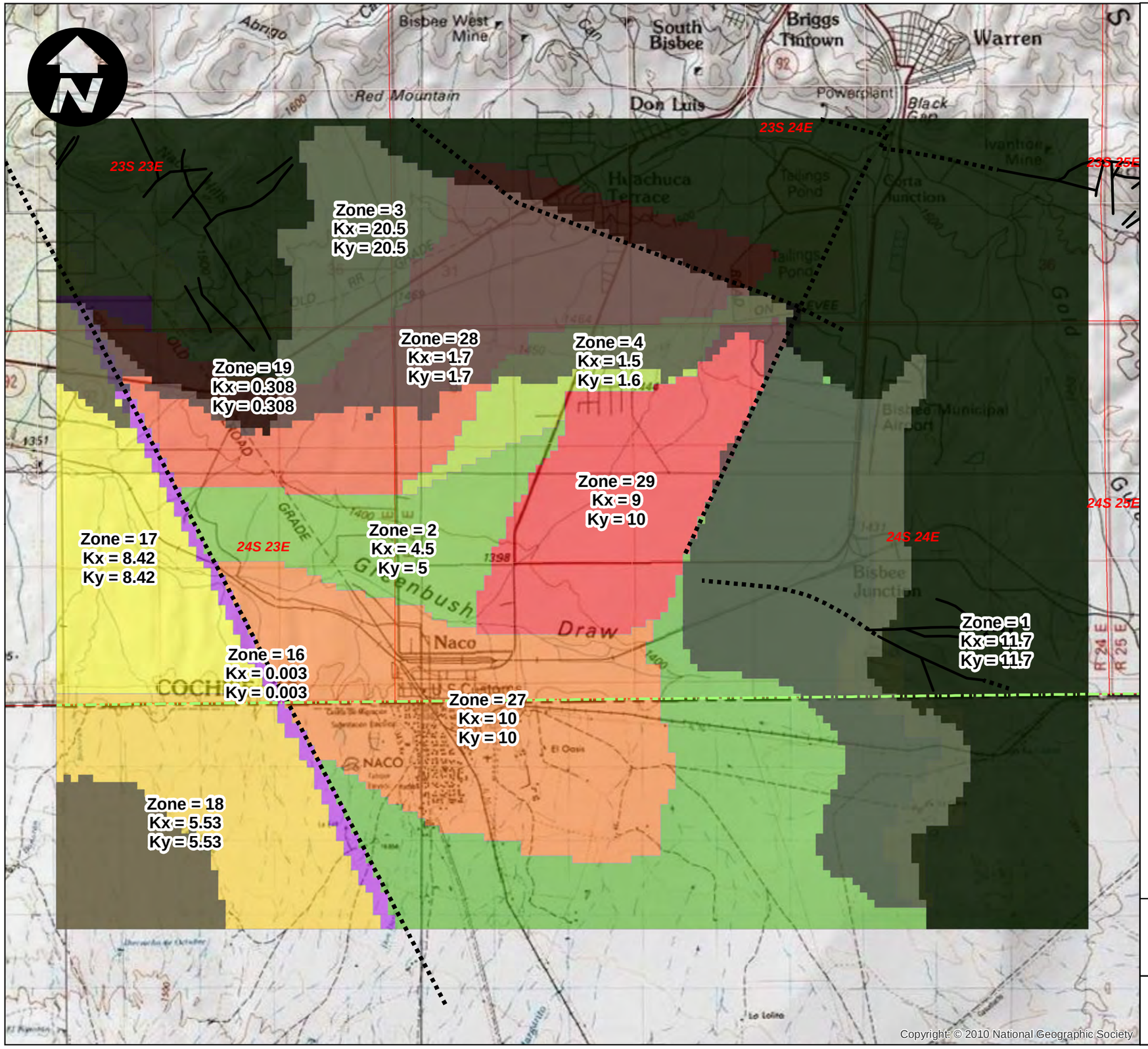
Copper Queen Branch



Legend

Faults

- Fault Mapped
- Fault Inferred
- Basin Fill Not Simulated
- Basin Fill Unsaturated

Layer 1 Calibrated Hydraulic Conductivity

Hydraulic Conductivity (m/d)

- 1
- 2
- 3
- 4
- 16
- 17
- 18
- 19
- 27
- 28
- 29

0 0.25 0.5 1 1.5 2 2.5 3 Miles

Version: 2
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Calibrated Hydraulic Conductivity Layer 1

Figure 16

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Copper Queen Branch

Legend

- Faults
- No-Flow Cells (Layer 2)
- 2012 Dry Cells (Layer 2)

Layer 2 Calibrated Haydraulic Conductivities

Hydraulic Conductivity (m/d)

- 0.001 - 0.023
- 0.024 - 0.068
- 0.069 - 0.400
- 0.401 - 1.500
- 1.501 - 11.700

0 0.25 0.5 1 1.5 2 2.5 3 Miles

Zone = 1
Kh = 11.7

Zone = 6
Kh = 0.4

Zone = 10
Kh = 0.015

Zone = 7
Kh = 0.05

Zone = 8
Kh = 0.006

Zone = 9
Kh = 0.24

Zone = 11
Kh = 0.0226

Zone = 22
Kh = 0.253

Zone = 5
Kh = 1.5

Zone = 23
Kh = 0.0013

Zone = 24
Kh = 0.321

Zone = 10
Kh = 0.015

Zone = 25
Kh = 0.0677

23S 24E

23S 25E

24S 24E

24S 25E

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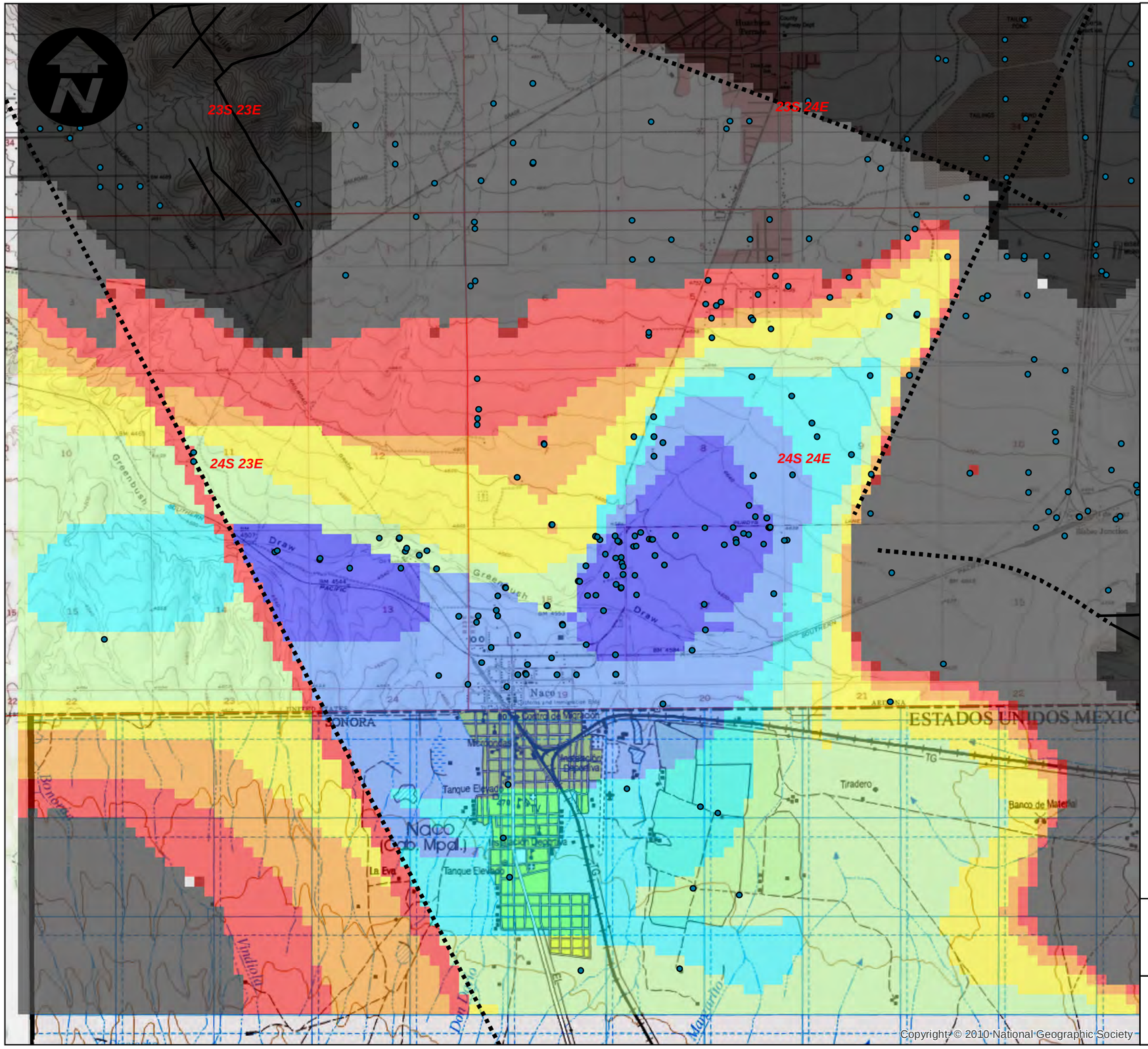
Calibrated Hydraulic Conductivity Layer 2

Figure 17



Freeport-McMoran Corporation
Copper Queen Branch

Legend

- Wells

Faults

- Fault Mapped
- Fault Inferred

Layer 1 Transmissivity (ft2/day)

- 0 - 1000
- 1001 - 2000
- 2001 - 4000
- 4001 - 6000
- 6001 - 8000
- 8001 - 10000
- 10001 - 14555
- Basin Fill Not Simulated
- Basin Fill Unsaturated

0 0.25 0.5 1 1.5 2 Miles

Version: 1
By: PRP
Date: July 25, 2013

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CLEAR CREEK ASSOCIATES

Calibrated Transmissivity Based on Saturated Thickness Layer 1

Figure 18

Freeport-McMoran Corporation
Copper Queen Branch

Legend

- Wells

Faults

- Fault Mapped
- Fault Inferred

Model Boundary Conditions

- Active Cells
- All Layers No Flow
- Bedrock Layers 2-4 Active Only
- Constant Heads Layer 4 Only
- Constant Heads Layers 2-4
- Constant Heads all Layers
- Only Layer 4 Active

0 0.25 0.5 1 1.5 2 2.5 Miles

Version: 1
By: PRP
Date: July 25, 2013

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Groundwater Model
Boundary Conditions
Final Calibrated Model

Figure 19

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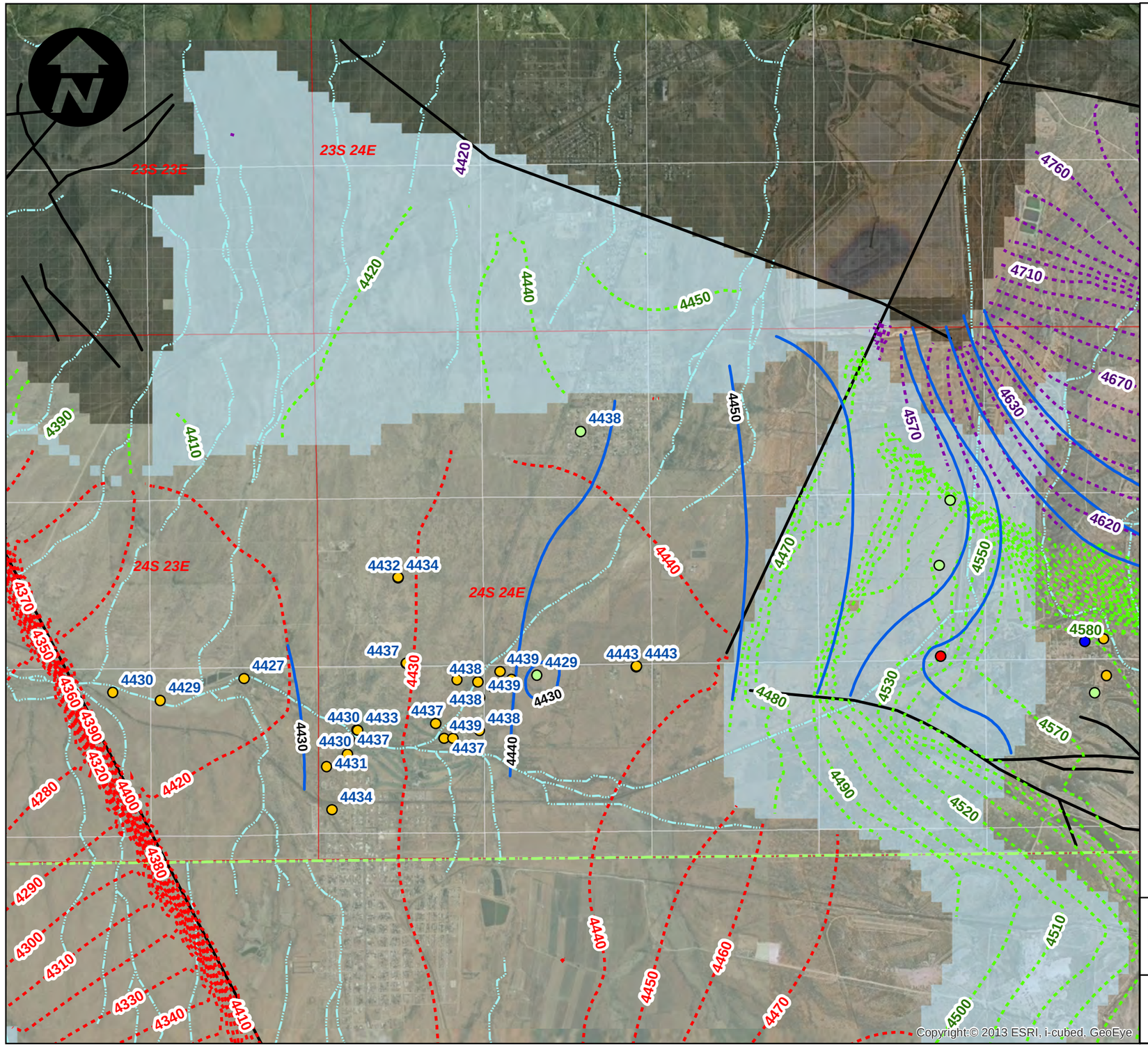

Freeport-McMoran Corporation
Copper Queen Branch

Legend

Water Levels Q4 2011

Residual (feet)

- -169.0 - -100.0
- -99.9 - -50.0
- -49.9 - 0.0
- 0.1 - 50.0
- 50.1 - 53.4

Measured Water Level Contours - Q4 2011

- (feet-MSL)
- Layer 1 Simulated Heads Q4 2011
- Layers 2-3 Simulated Heads Q4 2011
- Layer 4 Simulated Heads Q4 2011
- US/Mexico Border
- Faults
- Streams
- Layer 1 Dry
- Active Cells
- No Flow

0 0.25 0.5 1 1.5 2 Miles

Version: 3
By: PRP
Date: July 17, 2013

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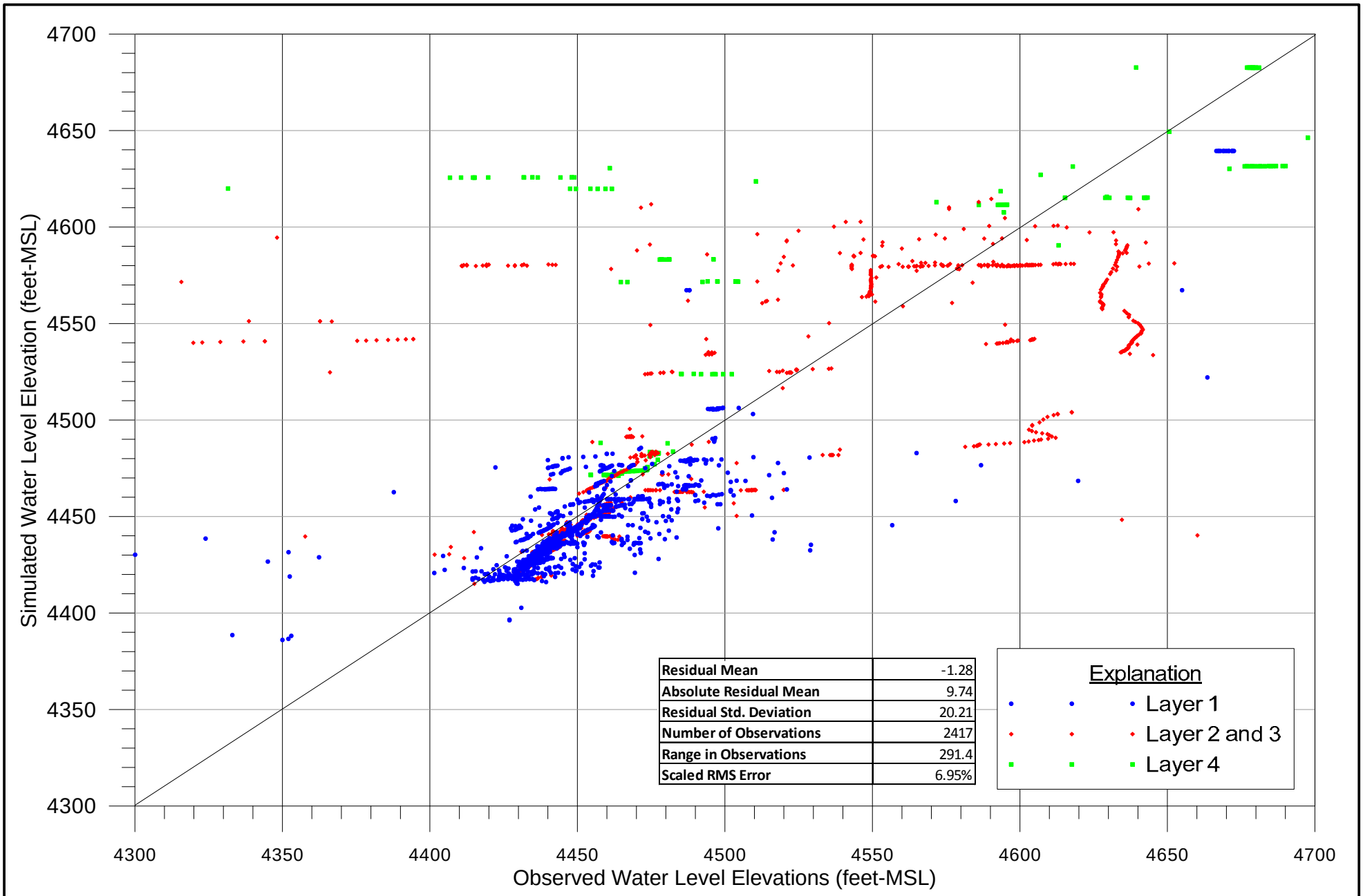
Water Level Contours
Q4 2011
Layer 1 or 2

Figure 20



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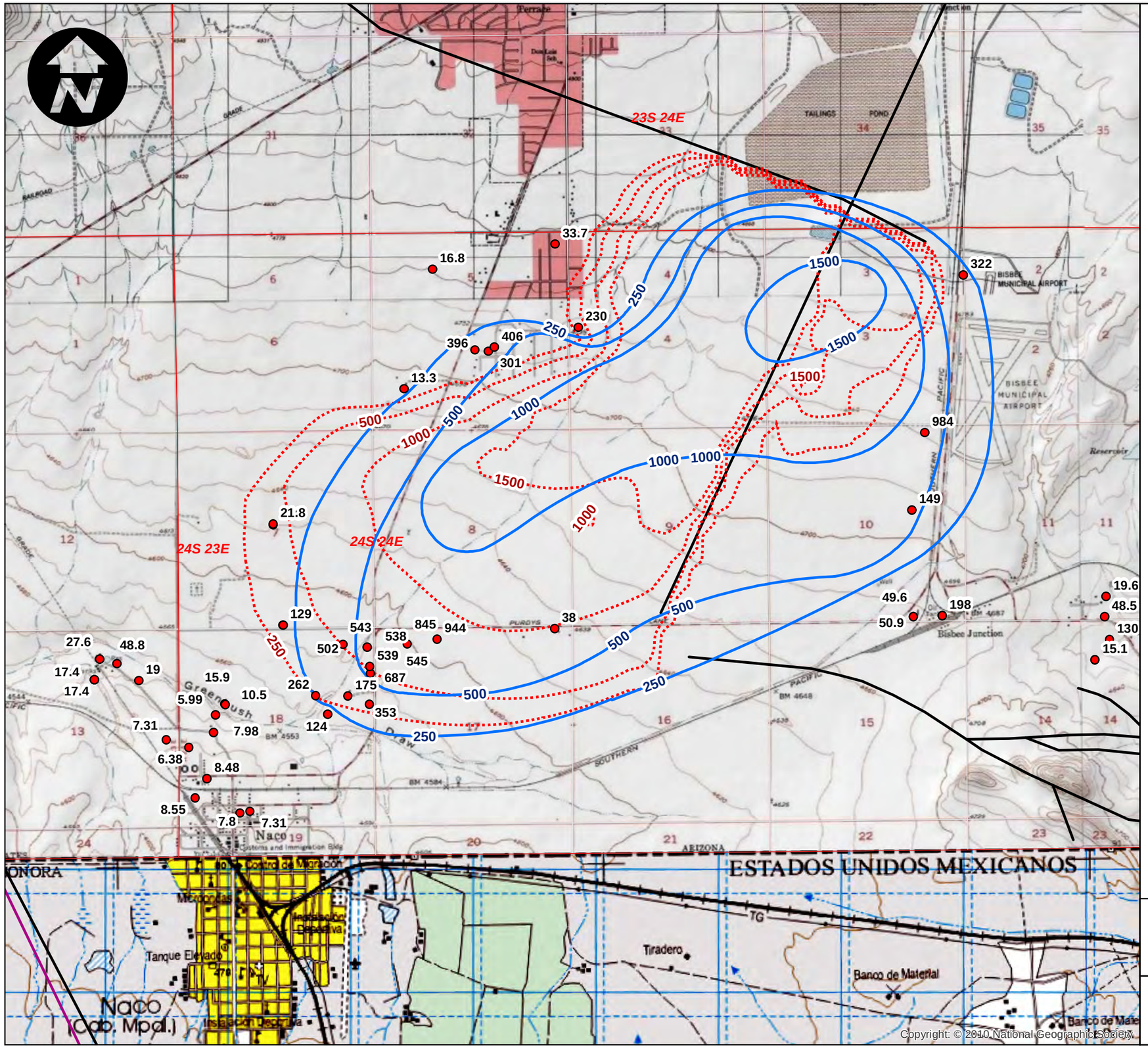
Model Simulated Heads
Compared to Measured Heads
Base Model Calibration
Copper Queen Branch Feasibility Study

FIGURE

21

Freeport-McMoran Corporation
Copper Queen Branch



Legend

- Q4 2011 Measured SO4 Values

Reported 4Q 2011 SO4 Contours

- Reported 4Q 2011 SO4 Contours

Simulated 4Q 2011 SO4 Contours (Layer 1)

- Simulated 4Q 2011 SO4 Contours (Layer 1)
- Faults

0 0.25 0.5 1 1.5 Miles

Version: 2
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Date: July 25, 2013

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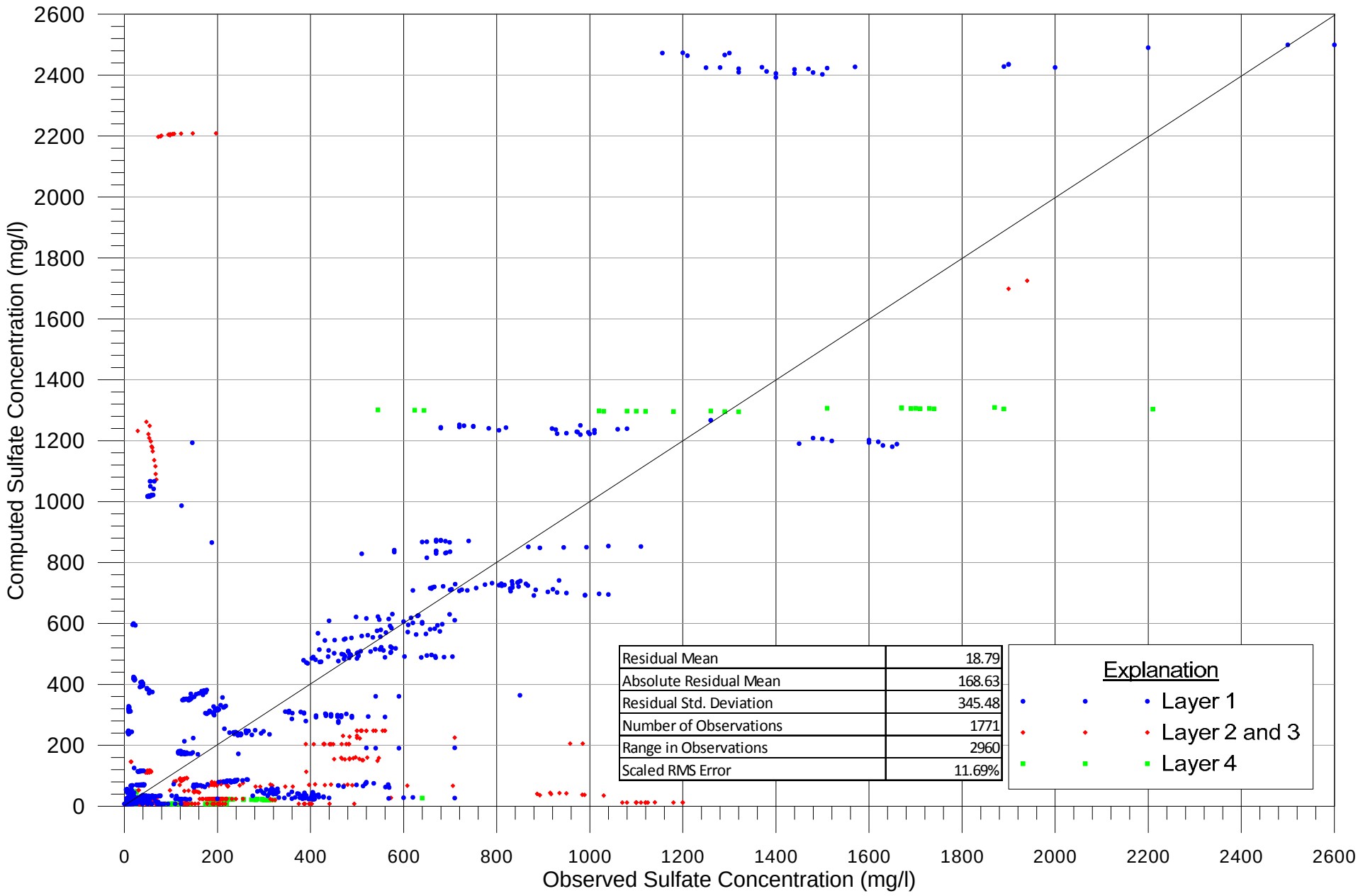
CLEAR CREEK ASSOCIATES

Simulated Sulfate for 2011 Compared to Measured Values

Figure 22



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Model Simulated Sulfate Concentrations Compared to Measured Sulfate Concentrations Base Model Calibration Copper Queen Branch Feasibility Study

FIGURE 23

APPENDIX G.2

WATER LEVEL AND SULFATE CONCENTRATION TARGET DATA

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
214612	D-23-23 36DBB	ACKER	598847.4	3472874.0	4860.00	6/8/2007	37414	740.00	4120.00	1255.78	1219.20	1205.48	4000.00	3955.00	Well 55
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	6/12/1997	33766	157.00	4617.58	1407.44	1411.10	1394.33	4629.58	4574.58	Well 55
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	7/1/1997	33785	156.95	4617.63	1407.45	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	10/10/1997	33886	161.80	4612.78	1405.98	1411.10	1394.33	4629.58	4574.58	CQ Database - 021312
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	11/6/1997	33913	161.70	4612.88	1406.01	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	1/5/1998	33973	163.10	4611.48	1405.58	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	5/6/1998	34094	165.20	4609.38	1404.94	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	10/1/1998	34242	166.65	4607.93	1404.50	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	1/25/1999	34358	167.90	4606.68	1404.12	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	6/1/1999	34485	170.40	4604.18	1403.35	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	6/30/1999	34514	170.40	4604.18	1403.35	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	3/1/2000	34759	171.50	4603.08	1403.02	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	6/1/2000	34851	170.50	4604.08	1403.32	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	9/1/2000	34943	169.10	4605.48	1403.75	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	12/1/2000	35034	167.00	4607.58	1404.39	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	2/1/2001	35096	165.20	4609.38	1404.94	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	6/1/2001	35216	164.55	4610.03	1405.14	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	10/1/2001	35338	163.75	4610.83	1405.38	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	2/1/2002	35461	162.45	4612.13	1405.78	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	6/1/2002	35581	165.00	4609.58	1405.00	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	9/1/2002	35673	167.40	4607.18	1404.27	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	11/1/2002	35734	168.20	4606.38	1404.02	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	1/1/2003	35795	169.80	4604.78	1403.54	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	5/1/2003	35915	171.60	4602.98	1402.99	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	8/1/2003	36007	173.05	4601.53	1402.55	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	12/1/2003	36129	177.90	4596.68	1401.07	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	2/1/2004	36191	179.90	4594.68	1400.46	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	5/1/2004	36281	182.70	4591.88	1399.61	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	8/1/2004	36373	185.20	4589.38	1398.84	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	11/1/2004	36465	188.10	4586.48	1397.96	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	2/1/2005	36557	188.40	4586.18	1397.87	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	6/1/2005	36677	188.75	4585.83	1397.76	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	9/1/2005	36769	188.85	4585.73	1397.73	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	11/1/2005	36830	189.20	4585.38	1397.62	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	2/1/2006	36922	190.15	4584.43	1397.33	1411.10	1394.33	4629.58	4574.58	FMICQB
562555	D-23-24 03CCC	TM-41	604839.6	3471299.4	4774.58	5/1/2006	37011	193.10	4581.48	1396.44	1411.10	1394.33	4629.58	4574.58	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	6/13/1997	33767	186.00	4480.67	1365.71	1367.54	1349.25	4486.67	4426.67	Well 55
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	7/1/1997	33785	194.93	4471.74	1362.99	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	10/10/1997	33886	190.42	4476.25	1364.36	1367.54	1349.25	4486.67	4426.67	CQ Database - 021312
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	11/6/1997	33913	196.78	4469.89	1362.42	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	1/5/1998	33973	196.98	4469.69	1362.36	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	5/6/1998	34094	191.95	4474.72	1363.89	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	10/10/1998	34251	196.40	4470.27	1362.54	1367.54	1349.25	4486.67	4426.67	CQ Database - 021312
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	1/25/1999	34358	193.50	4473.17	1363.42	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	6/1/1999	34485	196.30	4470.37	1362.57	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	6/30/1999	34514	196.30	4470.37	1362.57	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	3/1/2000	34759	197.10	4469.57	1362.32	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	6/1/2000	34851	198.10	4468.57	1362.02	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	9/1/2000	34943	198.65	4468.02	1361.85	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	12/1/2000	35034	199.00	4467.67	1361.75	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	2/1/2001	35096	199.30	4467.37	1361.65	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	6/1/2001	35216	199.95	4466.72	1361.46	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	10/1/2001	35338	200.85	4465.82	1361.18	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	2/1/2002	35461	201.45	4465.22	1361.00	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	6/1/2002	35581	202.35	4464.32	1360.72	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	9/1/2002	35673	202.80	4463.87	1360.59	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	11/1/2002	35734	203.00	4463.67	1360.53	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	1/1/2003	35795	203.10	4463.57	1360.50	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	5/1/2003	35915	203.70	4462.97	1360.31	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	8/1/2003	36007	204.10	4462.57	1360.19	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	12/1/2003	36129	204.80	4461.87	1359.98	1367.54	1349.25	4486.67	4426.67	FMICQB

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	2/1/2004	36191	205.10	4461.57	1359.89	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	5/1/2004	36281	205.60	4461.07	1359.73	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	8/1/2004	36373	205.95	4460.72	1359.63	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	11/1/2004	36465	206.15	4460.52	1359.57	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	2/1/2005	36557	206.30	4460.37	1359.52	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	6/1/2005	36677	206.70	4459.97	1359.40	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	9/1/2005	36769	207.00	4459.67	1359.31	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	11/1/2005	36830	207.60	4459.07	1359.12	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	2/1/2006	36922	208.00	4458.67	1359.00	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	5/1/2006	37011	208.40	4458.27	1358.88	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	8/1/2006	37103	208.90	4457.77	1358.73	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	11/1/2006	37195	209.35	4457.32	1358.59	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	2/1/2007	37287	209.60	4457.07	1358.51	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	6/1/2007	37407	209.90	4456.77	1358.42	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	9/28/2007	37526	210.25	4456.42	1358.32	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	12/1/2007	37590	210.65	4456.02	1358.19	1367.54	1349.25	4486.67	4426.67	FMICQB
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	3/5/2008	37685	211.04	4455.63	1358.08	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	5/22/2008	37763	210.98	4455.69	1358.09	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	8/6/2008	37839	211.55	4455.12	1357.92	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	11/6/2008	37931	207.05	4459.62	1359.29	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	2/18/2009	38035	212.31	4454.36	1357.69	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	5/7/2009	38113	212.37	4454.30	1357.67	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	8/18/2009	38216	212.77	4453.90	1357.55	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	11/3/2009	38293	213.05	4453.62	1357.46	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	2/24/2010	38406	213.36	4453.31	1357.37	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	4/19/2010	38460	213.51	4453.16	1357.32	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	7/2/2010	38534	213.52	4453.15	1357.32	1367.54	1349.25	4486.67	4426.67	2010 Q3 CQB Groundwater Tables.xls
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	7/7/2010	38539	213.52	4453.15	1357.32	1367.54	1349.25	4486.67	4426.67	CQ Database - 021312
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	7/12/2011	38909	214.62	4452.05	1356.98	1367.54	1349.25	4486.67	4426.67	CCA Q4 2011 Monitoring Report
562554	D-23-24 10CBC	TM-42	603698.3	3469104.9	4666.67	7/11/2012	39274	216.10	4450.57	1356.53	1367.54	1349.25	4486.67	4426.67	2012 Q4 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	1/22/2009	38008	155.28	4536.12	1382.61	1386.96	1368.98	4550.40	4491.40	2010 Q3 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	4/9/2009	38085	156.15	4535.25	1382.34	1386.96	1368.98	4550.40	4491.40	2010 Q3 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	7/9/2009	38176	161.61	4529.79	1380.68	1386.96	1368.98	4550.40	4491.40	2010 Q3 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	10/6/2009	38265	167.20	4524.20	1378.98	1386.96	1368.98	4550.40	4491.40	2010 Q3 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	1/21/2010	38372	166.92	4524.48	1379.06	1386.96	1368.98	4550.40	4491.40	2010 Q3 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	4/20/2010	38461	167.11	4524.29	1379.00	1386.96	1368.98	4550.40	4491.40	2010 Q3 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	7/20/2010	38552	171.78	4519.62	1377.58	1386.96	1368.98	4550.40	4491.40	2010 Q3 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	10/18/2010	38642	176.39	4515.01	1376.18	1386.96	1368.98	4550.40	4491.40	CQ Database - 021312
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	7/14/2011	38911	173.78	4517.62	1376.97	1386.96	1368.98	4550.40	4491.40	CCA Q4 2011 Monitoring Report
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	8/25/2011	38953	172.89	4518.51	1377.24	1386.96	1368.98	4550.40	4491.40	CCA Q4 2011 Monitoring Report
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	2/6/2012	39118	169.09	4522.31	1378.40	1386.96	1368.98	4550.40	4491.40	2012 Q4 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	2/29/2012	39141	169.32	4522.08	1378.33	1386.96	1368.98	4550.40	4491.40	2012 Q4 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	3/15/2012	39156	169.64	4521.76	1378.23	1386.96	1368.98	4550.40	4491.40	2012 Q4 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	4/12/2012	39184	168.85	4522.55	1378.47	1386.96	1368.98	4550.40	4491.40	2012 Q4 CQB Groundwater Tables.xls
076413	D-23-24 10CDB	PANAGAKOS	605311.7	3469321.0	4691.40	7/9/2012	39272	170.38	4521.02	1378.01	1386.96	1368.98	4550.40	4491.40	2012 Q4 CQB Groundwater Tables.xls
570012	D-23-24 25CCC	COB WL A	607673.3	3473952.0	4975.85	8/31/1998	34211	118.00	4857.85	1480.67	1483.72	1471.53	4867.85	4827.85	Well 55
526268	D-23-24 25CCD		607870.3	3473953.0	4959.12	11/15/1989	31000	40.00	4919.12	1499.35	1499.35	1481.06	4919.12	4859.12	Well 55
557742	D-23-24 31BAD	SILVESTRI	600251.4	3473493.0	4911.19	7/10/1996	33429	251.00	4660.19	1420.43	1393.30	1381.11	4571.19	4531.19	Well 55
1002	D-23-24 31CCC		599662.0	3472012.3	4781.00	3/29/1970	23829	126.00	4655.00	1418.84	1396.29	1335.33	4581.00	4381.00	WELL 35
1002	D-23-24 31CCC		599662.0	3472012.3	4781.00	12/4/1990	31384	294.00	4487.00	1367.64	1396.29	1335.33	4581.00	4381.00	ADWR (GWSI)
1002	D-23-24 31CCC		599662.0	3472012.3	4781.00	12/5/2001	35403	293.00	4488.00	1367.94	1396.29	1335.33	4581.00	4381.00	ADWR (GWSI)
1002	D-23-24 31CCC		599662.0	3472012.3	4781.00	11/28/2006	37222	293.00	4488.00	1367.94	1396.29	1335.33	4581.00	4381.00	ADWR (GWSI)
211345	D-23-24 31CCC	SRC	599722.5	3472503.3	4810.12	2/6/2007	37292	395.00	4415.12	1345.73	1208.57	1171.99	3965.12	3845.12	Well 55
211345	D-23-24 31CCC	SRC	599722.5	3472503.3	4810.12	4/23/2008	37734	541.10	4269.02	1301.20	1208.57	1171.99	3965.12	3845.12	CQ Database - 021312
211345	D-23-24 31CCC	SRC	599722.5	3472503.3	4810.12	8/5/2008	37838	543.70	4266.42	1300.40	1208.57	1171.99	3965.12	3845.12	CQ Database - 021312
211345	D-23-24 31CCC	SRC	599722.5	3472503.3	4810.12	2/26/2009	38043	543.83	4266.29	1300.37	1208.57	1171.99	3965.12	3845.12	CQ Database - 021312
211345	D-23-24 31CCC	SRC	599722.5	3472503.3	4810.12	6/25/2010	38527	540.30	4269.82	1301.44	1208.57	1171.99	3965.12	3845.12	CQ Database - 021312
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	10/11/2006	37174	613.00	4243.30	1293.36	1278.73	1242.15	4195.30	4075.30	Well 55
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	4/22/2008	37733	606.55	4249.75	1295.32	1278.73	1242.15	4195.30	4075.30	2010 Q3 CQB Groundwater Tables.xls
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	8/5/2008	37838	605.86	4250.44	1295.53	1278.73	1242.15	4195.30	4075.30	2010 Q3 CQB Groundwater Tables.xls
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	10/20/2008	37914	604.88	4251.42	1295.83	1278.73	1242.15	4195.30	4075.30	CQ Database - 021312

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	10/28/2008	37922	604.88	4251.42	1295.83	1278.73	1242.15	4195.30	4075.30	2010 Q3 CQB Groundwater Tables.xls
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	2/11/2009	38028	603.91	4252.39	1296.13	1278.73	1242.15	4195.30	4075.30	CQ Database - 021312
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	2/19/2009	38036	603.91	4252.39	1296.13	1278.73	1242.15	4195.30	4075.30	2010 Q3 CQB Groundwater Tables.xls
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	4/28/2009	38104	603.70	4252.60	1296.19	1278.73	1242.15	4195.30	4075.30	2010 Q3 CQB Groundwater Tables.xls
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	8/19/2009	38217	602.66	4253.64	1296.51	1278.73	1242.15	4195.30	4075.30	2010 Q3 CQB Groundwater Tables.xls
212268	D-23-24 32ACD	BURKE	602230.1	3473029.8	4856.30	3/2/2010	38412	602.66	4253.64	1296.51	1278.73	1242.15	4195.30	4075.30	CQ Database - 021312
525143	D-23-24 33DBC	TM-27	603668.6	3472719.0	4840.66	9/5/1989	30929	304.00	4536.66	1382.77	1382.16	1363.57	4534.66	4473.66	Well 55
525143	D-23-24 33DBC	TM-27	603668.6	3472719.0	4840.66	10/1/1989	30955	302.15	4538.51	1383.34	1382.16	1363.57	4534.66	4473.66	WMC-WAPP
525143	D-23-24 33DBC	TM-27	603668.6	3472719.0	4840.66	10/22/1989	30976	307.50	4533.16	1381.71	1382.16	1363.57	4534.66	4473.66	CQ Database - 021312
525143	D-23-24 33DBC	TM-27	603668.6	3472719.0	4840.66	11/7/1989	30992	304.49	4536.17	1382.62	1382.16	1363.57	4534.66	4473.66	WMC-WAPP
525143	D-23-24 33DBC	TM-27	603668.6	3472719.0	4840.66	1/1/1990	31047	304.40	4536.26	1382.65	1382.16	1363.57	4534.66	4473.66	WMC-WAPP
525143	D-23-24 33DBC	TM-27	603668.6	3472719.0	4840.66	4/1/1990	31137	305.00	4535.66	1382.47	1382.16	1363.57	4534.66	4473.66	WMC-WAPP
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	8/7/2008	37840	577.00	4267.67	1300.79	1278.54	1248.06	4194.67	4094.67	Well 55
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	8/22/2008	37855	577.76	4266.91	1300.55	1278.54	1248.06	4194.67	4094.67	2010 Q3 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	11/12/2008	37937	576.80	4267.87	1300.85	1278.54	1248.06	4194.67	4094.67	2010 Q3 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	2/26/2009	38043	575.91	4268.76	1301.12	1278.54	1248.06	4194.67	4094.67	2010 Q3 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	4/8/2009	38084	575.46	4269.21	1301.26	1278.54	1248.06	4194.67	4094.67	2010 Q3 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	4/28/2009	38104	575.46	4269.21	1301.26	1278.54	1248.06	4194.67	4094.67	CQ Database - 021312
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	8/12/2009	38210	574.84	4269.83	1301.44	1278.54	1248.06	4194.67	4094.67	2010 Q3 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	11/9/2009	38299	573.41	4271.26	1301.88	1278.54	1248.06	4194.67	4094.67	2010 Q3 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	3/1/2010	38411	573.68	4270.99	1301.80	1278.54	1248.06	4194.67	4094.67	2010 Q3 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	4/9/2010	38450	573.56	4271.11	1301.83	1278.54	1248.06	4194.67	4094.67	2010 Q3 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	7/1/2010	38533	572.97	4271.70	1302.01	1278.54	1248.06	4194.67	4094.67	2010 Q3 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	2/10/2011	38757	571.61	4273.06	1302.43	1278.54	1248.06	4194.67	4094.67	CQ Database - 021312
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	7/22/2011	38919	571.20	4273.47	1302.55	1278.54	1248.06	4194.67	4094.67	CCA Q4 2011 Monitoring Report
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	1/31/2012	39112	569.83	4274.84	1302.97	1278.54	1248.06	4194.67	4094.67	2012 Q4 CQB Groundwater Tables.xls
909434	D-23-24 33DCA	BMO-2008-11G	603801.0	3472626.5	4844.67	8/14/2012	39308	569.70	4274.97	1303.01	1278.54	1248.06	4194.67	4094.67	2012 Q4 CQB Groundwater Tables.xls
805326	D-23-24 34CCD	805326	604681.9	3472329.0	4814.57	10/23/1954	18193	151.00	4663.57	1421.46	1406.52	1254.12	4614.57	4114.57	Well 55
525139	D-23-24 35ADB	TM-35	607285.8	3473348.0	4898.88	9/6/1989	30930	260.99	4637.89	1413.63	1417.28	1398.69	4649.88	4588.88	WMC-WAPP
525139	D-23-24 35ADB	TM-35	607285.8	3473348.0	4898.88	10/3/1989	30957	260.00	4638.88	1413.93	1417.28	1398.69	4649.88	4588.88	Well 55
525139	D-23-24 35ADB	TM-35	607285.8	3473348.0	4898.88	10/22/1989	30976	260.40	4638.48	1413.81	1417.28	1398.69	4649.88	4588.88	CQ Database - 021312
525139	D-23-24 35ADB	TM-35	607285.8	3473348.0	4898.88	11/6/1989	30991	260.09	4638.79	1413.90	1417.28	1398.69	4649.88	4588.88	WMC-WAPP
525139	D-23-24 35ADB	TM-35	607285.8	3473348.0	4898.88	1/1/1990	31047	260.65	4638.23	1413.73	1417.28	1398.69	4649.88	4588.88	WMC-WAPP
525139	D-23-24 35ADB	TM-35	607285.8	3473348.0	4898.88	4/1/1990	31137	260.55	4638.33	1413.76	1417.28	1398.69	4649.88	4588.88	WMC-WAPP
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	7/22/2002	35632	102.00	4730.06	1441.72	1445.38	1427.09	4742.06	4682.06	Well 55
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	2/22/2008	37673	56.50	4775.56	1455.59	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	5/20/2008	37761	57.50	4774.56	1455.29	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	7/30/2008	37832	58.64	4773.42	1454.94	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	10/23/2008	37917	58.76	4773.30	1454.90	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	2/12/2009	38029	58.89	4773.17	1454.86	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	4/23/2009	38099	59.73	4772.33	1454.61	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	7/22/2009	38189	61.27	4770.79	1454.14	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	10/22/2009	38281	62.82	4769.24	1453.66	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	3/3/2010	38413	65.24	4766.82	1452.93	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	4/26/2010	38467	66.13	4765.93	1452.66	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	7/13/2010	38545	67.52	4764.54	1452.23	1445.38	1427.09	4742.06	4682.06	2010 Q3 CQB Groundwater Tables.xls
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	7/14/2011	38911	73.86	4758.20	1450.30	1445.38	1427.09	4742.06	4682.06	CCA Q4 2011 Monitoring Report
593116	D-23-24 35CBD	COB WL	606357.5	3472502.0	4832.06	7/12/2012	39275	78.85	4753.21	1448.78	1445.38	1427.09	4742.06	4682.06	2012 Q4 CQB Groundwater Tables.xls
525142	D-23-24 35CCB	TM-28	606097.7	3472542.0	4813.27	8/4/1989	30897	59.00	4754.27	1449.10	1450.32	1424.41	4758.27	4673.27	Well 55
525142	D-23-24 35CCB	TM-28	606097.7	3472542.0	4813.27	9/6/1989	30930	64.57	4748.70	1447.40	1450.32	1424.41	4758.27	4673.27	WMC-WAPP
525142	D-23-24 35CCB	TM-28	606097.7	3472542.0	4813.27	10/22/1989	30976	62.15	4751.12	1448.14	1450.32	1424.41	4758.27	4673.27	CQ Database - 021312
525142	D-23-24 35CCB	TM-28	606097.7	3472542.0	4813.27	11/6/1989	30991	62.68	4750.59	1447.98	1450.32	1424.41	4758.27	4673.27	WMC-WAPP
525142	D-23-24 35CCB	TM-28	606097.7	3472542.0	4813.27	1/1/1990	31047	63.40	4749.87	1447.76	1450.32	1424.41	4758.27	4673.27	WMC-WAPP
525142	D-23-24 35CCB	TM-28	606097.7	3472542.0	4813.27	4/1/1990	31137	64.65	4748.62	1447.38	1450.32	1424.41	4758.27	4673.27	WMC-WAPP
561144	D-23-24 36CAD		608301.1	3472749.0	4847.08	3/6/1997	33668	180.00	4667.08	1422.53	1419.48	1407.29	4657.08	4617.08	Well 55
624535	D-23-24 36CAD	POWER	608379.4	3472738.9	4840.37	1/1/1967	22646	25.00	4815.37	1467.72	1457.06	1445.17	4780.37	4741.37	Well 55
624535	D-23-24 36CAD	POWER	608379.4	3472738.9	4840.37	7/21/1967	22847	25.00	4815.37	1467.72	1457.06	1445.17	4780.37	4741.37	WELL 35
624535	D-23-24 36CAD	POWER	608379.4	3472738.9	4840.37	1/15/1978	26678	30.00	4810.37	1466.20	1457.06	1445.17	4780.37	4741.37	Well 55
624535	D-23-24 36CAD	POWER	608379.4	3472738.9	4840.37	11/22/1985	29546	20.00	4820.37	1469.25	1457.06	1445.17	4780.37	4741.37	Littin 1987
624535	D-23-24 36CAD	POWER	608379.4	3472738.9	4840.37	2/12/2008	37663	42.30	4798.07	1462.45	1457.06	1445.17	4780.37	4741.37	CQ Database - 021312
624535	D-23-24 36CAD	POWER	608379.4	3472738.9	4840.37	7/22/2008	37824	42.82	4797.55	1462.29	1457.06	1445.17	4780.37	4741.37	CQ Database - 021312

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
624535	D-23-24 36CAD	POWER	608379.4	3472738.9	4840.37	3/3/2009	38048	44.31	4796.06	1461.84	1457.06	1445.17	4780.37	4741.37	CQ Database - 021312
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	2/13/2008	37664	26.50	4690.09	1429.54	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	5/14/2008	37755	30.69	4685.90	1428.26	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	7/24/2008	37826	32.06	4684.53	1427.84	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	10/16/2008	37910	27.53	4689.06	1429.23	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	1/20/2009	38006	29.77	4686.82	1428.54	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	4/7/2009	38083	31.47	4685.12	1428.02	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	7/8/2009	38175	33.61	4682.98	1427.37	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	10/5/2009	38264	35.12	4681.47	1426.91	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	1/21/2010	38372	36.64	4679.95	1426.45	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	4/21/2010	38462	38.06	4678.53	1426.02	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	7/19/2010	38551	39.67	4676.92	1425.53	1346.18	1285.22	4416.59	4216.59	2010 Q3 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	1/18/2011	38734	35.06	4681.53	1426.93	1346.18	1285.22	4416.59	4216.59	CQ Database - 021312
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	7/12/2011	38909	39.32	4677.27	1425.63	1346.18	1285.22	4416.59	4216.59	CCA Q4 2011 Monitoring Report
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	2/3/2012	39115	37.86	4678.73	1426.08	1346.18	1285.22	4416.59	4216.59	2012 Q4 CQB Groundwater Tables.xls
3	D-23-25 18DBD	SWAN	607378.5	3470648.3	4716.59	7/10/2012	39273	40.39	4676.20	1425.31	1346.18	1285.22	4416.59	4216.59	2012 Q4 CQB Groundwater Tables.xls
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	7/19/1982	28324	177.00	4350.05	1325.90	1325.90	1295.42	4350.05	4250.05	Well 55
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	11/21/1985	29545	175.00	4352.05	1326.50	1325.90	1295.42	4350.05	4250.05	Littin 1987
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	12/6/1990	31386	174.00	4353.05	1326.81	1325.90	1295.42	4350.05	4250.05	ADWR (GWSI)
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	1/28/1998	33996	194.00	4333.05	1320.71	1325.90	1295.42	4350.05	4250.05	ADWR (GWSI)
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	11/28/2001	35396	241.00	4286.05	1306.39	1325.90	1295.42	4350.05	4250.05	ADWR (GWSI)
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	2/9/2010	38391	253.10	4273.95	1302.70	1325.90	1295.42	4350.05	4250.05	Ladd Q3 2011.xls
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	4/28/2010	38469	253.83	4273.22	1302.48	1325.90	1295.42	4350.05	4250.05	Ladd Q3 2011.xls
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	7/28/2010	38560	254.05	4273.00	1302.41	1325.90	1295.42	4350.05	4250.05	CQ Database - 021312
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	12/8/2010	38693	252.87	4274.18	1302.77	1325.90	1295.42	4350.05	4250.05	CQ Database - 021312
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	6/24/2011	38891	288.00	4239.05	1292.06	1325.90	1295.42	4350.05	4250.05	Ladd Q3 2011.xls
503538	D-24-23 11CAB	Ladd HW-2	596790.7	3469638.6	4527.05	9/29/2011	38988	276.58	4250.47	1295.54	1325.90	1295.42	4350.05	4250.05	Ladd Q3 2011.xls
642976	D-24-23 11CBA	Ladd HW-1	596790.0	3469727.9	4535.00	1/1/1950	16437	97.00	4438.00	1352.70	1351.79	1336.55	4435.00	4385.00	Well 55
642976	D-24-23 11CBA	Ladd HW-1	596790.0	3469727.9	4535.00	9/19/1969	23638	104.00	4431.00	1350.57	1351.79	1336.55	4435.00	4385.00	USGS (GWSI)
642976	D-24-23 11CBA	Ladd HW-1	596790.0	3469727.9	4535.00	9/22/1977	26563	108.00	4427.00	1349.35	1351.79	1336.55	4435.00	4385.00	USGS (GWSI)
642976	D-24-23 11CBA	Ladd HW-1	596790.0	3469727.9	4535.00	11/21/1985	29545	108.00	4427.00	1349.35	1351.79	1336.55	4435.00	4385.00	Littin 1987
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	4/20/2007	37365	106.00	4432.63	1351.07	1358.08	1301.38	4455.63	4269.63	Well 55
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	2/28/2008	37679	120.84	4417.79	1346.54	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	5/20/2008	37761	125.00	4413.63	1345.27	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	7/30/2008	37832	118.50	4420.13	1347.26	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	10/23/2008	37917	117.93	4420.70	1347.43	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	2/12/2009	38029	110.91	4427.72	1349.57	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	4/23/2009	38099	125.13	4413.50	1345.23	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	7/22/2009	38189	124.09	4414.54	1345.55	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	10/22/2009	38281	118.03	4420.60	1347.40	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	3/3/2010	38413	120.14	4418.49	1346.76	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	4/26/2010	38467	123.12	4415.51	1345.85	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	7/13/2010	38545	128.60	4410.03	1344.18	1358.08	1301.38	4455.63	4269.63	2010 Q3 CQB Groundwater Tables.xls
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	7/14/2011	38911	132.41	4406.22	1343.02	1358.08	1301.38	4455.63	4269.63	CCA Q4 2011 Monitoring Report
906823	D-24-23 13AAC	COB MW-3	599169.3	3468726.1	4538.63	7/12/2012	39275	133.89	4404.74	1342.56	1358.08	1301.38	4455.63	4269.63	2012 Q4 CQB Groundwater Tables.xls
218671	D-24-23 13ABB		598887.9	3468857.0	4522.50	1/27/2009	38013	170.00	4352.50	1326.64	1303.78	1285.49	4277.50	4217.50	Well 55
527587	D-24-23 13ABB	NSD-02	598884.4	3468847.3	4531.38	5/12/1990	31178	85.00	4446.38	1355.26	1358.30	1346.11	4456.38	4416.38	Well 55
527587	D-24-23 13ABB	NSD-02	598884.4	3468847.3	4531.38	10/7/2009	38266	101.17	4430.21	1350.33	1358.30	1346.11	4456.38	4416.38	2010 Q3 CQB Groundwater Tables.xls
527587	D-24-23 13ABB	NSD-02	598884.4	3468847.3	4531.38	3/16/2010	38426	99.43	4431.95	1350.86	1358.30	1346.11	4456.38	4416.38	2010 Q3 CQB Groundwater Tables.xls
527587	D-24-23 13ABB	NSD-02	598884.4	3468847.3	4531.38	5/25/2010	38496	101.63	4429.75	1350.19	1358.30	1346.11	4456.38	4416.38	2010 Q3 CQB Groundwater Tables.xls
527587	D-24-23 13ABB	NSD-02	598884.4	3468847.3	4531.38	8/25/2010	38588	102.38	4429.00	1349.96	1358.30	1346.11	4456.38	4416.38	2010 Q3 CQB Groundwater Tables.xls
527587	D-24-23 13ABB	NSD-02	598884.4	3468847.3	4531.38	6/17/2011	38884	109.29	4422.09	1347.85	1358.30	1346.11	4456.38	4416.38	CCA Q4 2011 Monitoring Report
527587	D-24-23 13ABB	NSD-02	598884.4	3468847.3	4531.38	12/7/2011	39057	104.41	4426.97	1349.34	1358.30	1346.11	4456.38	4416.38	CCA Q4 2011 Monitoring Report
527587	D-24-23 13ABB	NSD-02	598884.4	3468847.3	4531.38	3/6/2012	39147	104.30	4427.08	1349.37	1358.30	1346.11	4456.38	4416.38	2012 Q4 CQB Groundwater Tables.xls
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	1/1/1955	18263	100.00	4447.64	1355.64	1355.64	1320.59	4447.64	4332.64	Well 55
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	1/21/1957	19014	85.00	4462.64	1360.21	1355.64	1320.59	4447.64	4332.64	FMICQB
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	6/1/1967	22797	140.00	4407.64	1343.45	1355.64	1320.59	4447.64	4332.64	USGS (GWSI)
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	9/1/1977	26542	90.50	4457.14	1358.54	1355.64	1320.59	4447.64	4332.64	FMICQB
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	11/21/1985	29545	91.60	4456.04	1358.20	1355.64	1320.59	4447.64	4332.64	Littin 1987
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	12/4/1990	31384	90.10	4457.54	1358.66	1355.64	1320.59	4447.64	4332.64	FMICQB
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/1995	33146	109.14	4438.50	1352.85	1355.64	1320.59	4447.64	4332.64	Approximate-Data points read from hydrograph.

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/1996	33329	111.14	4436.50	1352.25	1355.64	1320.59	4447.64	4332.64	Approximate-Data points read from hydrograph.
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/1996	33512	110.14	4437.50	1352.55	1355.64	1320.59	4447.64	4332.64	Approximate-Data points read from hydrograph.
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/1997	33694	112.40	4435.24	1351.86	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/1997	33877	113.00	4434.64	1351.68	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	1/28/1998	33996	99.20	4448.44	1355.88	1355.64	1320.59	4447.64	4332.64	FMICQB
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/1998	34059	92.50	4455.14	1357.93	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/1998	34242	113.00	4434.64	1351.68	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/1999	34424	125.00	4422.64	1348.02	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/1999	34607	93.00	4454.64	1357.77	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	12/15/1999	34682	104.00	4443.64	1354.42	1355.64	1320.59	4447.64	4332.64	ADWR (GWSI)
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/2000	34790	97.00	4450.64	1356.56	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/2000	34973	111.00	4436.64	1352.29	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/2001	35155	121.00	4426.64	1349.24	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/2001	35338	116.00	4431.64	1350.76	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	12/4/2001	35402	115.30	4432.34	1350.98	1355.64	1320.59	4447.64	4332.64	FMICQB
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/2002	35520	112.50	4435.14	1351.83	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/2002	35703	116.00	4431.64	1350.76	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/2003	35885	124.00	4423.64	1348.33	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/2003	36068	128.00	4419.64	1347.11	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/2004	36251	117.50	4430.14	1350.31	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/2004	36434	129.00	4418.64	1346.80	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/2005	36616	122.50	4425.14	1348.78	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/2005	36799	123.50	4424.14	1348.48	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/2006	36981	120.00	4427.64	1349.54	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/2006	37164	120.00	4427.64	1349.54	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	11/30/2006	37224	109.00	4438.64	1352.90	1355.64	1320.59	4447.64	4332.64	ADWR (GWSI)
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/2007	37346	123.00	4424.64	1348.63	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/1/2007	37529	117.00	4430.64	1350.46	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/1/2008	37712	116.00	4431.64	1350.76	1355.64	1320.59	4447.64	4332.64	
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/8/2008	37719	116.00	4431.64	1350.76	1355.64	1320.59	4447.64	4332.64	2010 Q3 CQB Groundwater Tables.xls
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	8/27/2008	37860	121.12	4426.52	1349.20	1355.64	1320.59	4447.64	4332.64	2010 Q3 CQB Groundwater Tables.xls
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/23/2008	37917	115.00	4432.64	1351.07	1355.64	1320.59	4447.64	4332.64	2010 Q3 CQB Groundwater Tables.xls
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/22/2009	38098	118.00	4429.64	1350.15	1355.64	1320.59	4447.64	4332.64	2010 Q3 CQB Groundwater Tables.xls
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/9/2009	38268	117.00	4430.64	1350.46	1355.64	1320.59	4447.64	4332.64	2010 Q3 CQB Groundwater Tables.xls
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	10/31/2009	38290	117.00	4430.64	1350.46	1355.64	1320.59	4447.64	4332.64	CQ Database - 021312
616586	D-24-23 13ABC	AWC-02	598907.1	3468549.4	4547.64	4/23/2010	38464	119.00	4428.64	1349.85	1355.64	1320.59	4447.64	4332.64	2010 Q3 CQB Groundwater Tables.xls
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	10/1/2002	35703	111.00	4431.51	1350.72	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	4/1/2003	35885	117.00	4425.51	1348.90	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	10/1/2003	36068	116.50	4426.01	1349.05	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	4/1/2004	36251	121.00	4421.51	1347.68	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	10/1/2004	36434	137.50	4405.01	1342.65	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	4/1/2005	36616	119.00	4423.51	1348.29	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	10/1/2005	36799	127.00	4415.51	1345.85	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	4/1/2006	36981	114.00	4428.51	1349.81	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	10/1/2006	37164	128.00	4414.51	1345.54	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	4/1/2007	37346	116.50	4426.01	1349.05	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	10/1/2007	37529	269.00	4273.51	1302.57	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	4/1/2008	37712	284.00	4258.51	1297.99	1334.87	1030.07	4379.51	3379.51	
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	4/8/2008	37719	284.00	4258.51	1297.99	1334.87	1030.07	4379.51	3379.51	2010 Q3 CQB Groundwater Tables.xls
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	8/27/2008	37860	299.65	4242.86	1293.22	1334.87	1030.07	4379.51	3379.51	2010 Q3 CQB Groundwater Tables.xls
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	10/23/2008	37917	284.00	4258.51	1297.99	1334.87	1030.07	4379.51	3379.51	2010 Q3 CQB Groundwater Tables.xls
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	4/22/2009	38098	286.00	4256.51	1297.38	1334.87	1030.07	4379.51	3379.51	2010 Q3 CQB Groundwater Tables.xls
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	6/3/2009	38140	125.00	4417.51	1346.46	1334.87	1030.07	4379.51	3379.51	2010 Q3 CQB Groundwater Tables.xls
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	10/9/2009	38268	289.00	4253.51	1296.47	1334.87	1030.07	4379.51	3379.51	2010 Q3 CQB Groundwater Tables.xls
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	10/31/2009	38290	289.00	4253.51	1296.47	1334.87	1030.07	4379.51	3379.51	CQ Database - 021312
590620	D-24-23 13ABD	AWC-05	599269.3	3468541.6	4542.51	4/23/2010	38464	278.00	4264.51	1299.82	1334.87	1030.07	4379.51	3379.51	2010 Q3 CQB Groundwater Tables.xls
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	7/20/1956	18829	108.00	4431.52	1350.73	1358.35	1301.65	4456.52	4270.52	Well 55
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	6/1/1967	22797	135.00	4404.52	1342.50	1358.35	1301.65	4456.52	4270.52	USGS (GWSI)
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	3/20/1968	23090	90.40	4449.12	1356.09	1358.35	1301.65	4456.52	4270.52	FMICQB
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	2/19/1986	29635	89.80	4449.72	1356.27	1358.35	1301.65	4456.52	4270.52	FMICQB
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	5/18/1988	30454	163.00	4376.52	1333.96	1358.35	1301.65	4456.52	4270.52	FMICQB

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	12/4/1990	31384	310.00	4229.52	1289.16	1358.35	1301.65	4456.52	4270.52	ADWR (GWSI)
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/1993	32233	82.02	4457.50	1358.65	1358.35	1301.65	4456.52	4270.52	Approximate-Data points read from hydrograph.
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/1994	32598	99.02	4440.50	1353.46	1358.35	1301.65	4456.52	4270.52	Approximate-Data points read from hydrograph.
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/1994	32781	104.02	4435.50	1351.94	1358.35	1301.65	4456.52	4270.52	Approximate-Data points read from hydrograph.
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/1995	32963	95.02	4444.50	1354.68	1358.35	1301.65	4456.52	4270.52	Approximate-Data points read from hydrograph.
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/1995	33146	128.02	4411.50	1344.63	1358.35	1301.65	4456.52	4270.52	Approximate-Data points read from hydrograph.
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/1996	33329	107.52	4432.00	1350.87	1358.35	1301.65	4456.52	4270.52	Approximate-Data points read from hydrograph.
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/1996	33512	108.52	4431.00	1350.57	1358.35	1301.65	4456.52	4270.52	Approximate-Data points read from hydrograph.
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/1997	33694	110.50	4429.02	1349.97	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/1997	33877	109.00	4430.52	1350.42	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/1998	34059	110.00	4429.52	1350.12	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/1998	34242	111.00	4428.52	1349.81	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/1999	34424	104.00	4435.52	1351.95	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/1999	34607	97.00	4442.52	1354.08	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	12/15/1999	34682	112.70	4426.82	1349.29	1358.35	1301.65	4456.52	4270.52	ADWR (GWSI)
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/2000	34790	88.00	4451.52	1356.82	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/2000	34973	88.00	4451.52	1356.82	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	2/26/2001	35121	100.40	4439.12	1353.04	1358.35	1301.65	4456.52	4270.52	FMICQB
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/2001	35155	105.00	4434.52	1351.64	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/2001	35338	110.00	4429.52	1350.12	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/2002	35520	110.00	4429.52	1350.12	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/2002	35703	116.00	4423.52	1348.29	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/2003	35885	116.50	4423.02	1348.14	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/2003	36068	118.50	4421.02	1347.53	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/2004	36251	118.00	4421.52	1347.68	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/2004	36434	121.00	4418.52	1346.76	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/2005	36616	119.00	4420.52	1347.37	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/2005	36799	121.00	4418.52	1346.76	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/2006	36981	120.00	4419.52	1347.07	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/2006	37164	121.50	4418.02	1346.61	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	11/30/2006	37224	120.00	4419.52	1347.07	1358.35	1301.65	4456.52	4270.52	ADWR (GWSI)
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/2007	37346	111.00	4428.52	1349.81	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/1/2007	37529	116.00	4423.52	1348.29	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/1/2008	37712	112.00	4427.52	1349.51	1358.35	1301.65	4456.52	4270.52	
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/8/2008	37719	112.00	4427.52	1349.51	1358.35	1301.65	4456.52	4270.52	2010 Q3 CQB Groundwater Tables.xls
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	8/27/2008	37860	119.40	4420.12	1347.25	1358.35	1301.65	4456.52	4270.52	2010 Q3 CQB Groundwater Tables.xls
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/23/2008	37917	106.00	4433.52	1351.34	1358.35	1301.65	4456.52	4270.52	2010 Q3 CQB Groundwater Tables.xls
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/22/2009	38098	114.00	4425.52	1348.90	1358.35	1301.65	4456.52	4270.52	2010 Q3 CQB Groundwater Tables.xls
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/9/2009	38268	116.00	4423.52	1348.29	1358.35	1301.65	4456.52	4270.52	2010 Q3 CQB Groundwater Tables.xls
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	10/31/2009	38290	116.00	4423.52	1348.29	1358.35	1301.65	4456.52	4270.52	CQ Database - 021312
616585	D-24-23 13ABD	AWC-03	599091.1	3468680.2	4539.52	4/23/2010	38464	116.00	4423.52	1348.29	1358.35	1301.65	4456.52	4270.52	2010 Q3 CQB Groundwater Tables.xls
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	1/1/1959	19724	337.00	4203.48	1281.22	1351.63	1326.94	4434.48	4353.48	Well 55
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	9/22/1977	26563	166.00	4374.48	1333.34	1351.63	1326.94	4434.48	4353.48	FMICQB
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	2/19/1986	29635	85.20	4455.28	1357.97	1351.63	1326.94	4434.48	4353.48	FMICQB
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	12/4/1990	31384	95.10	4445.38	1354.95	1351.63	1326.94	4434.48	4353.48	FMICQB
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/1993	32233	70.98	4469.50	1362.30	1351.63	1326.94	4434.48	4353.48	Approximate-Data points read from hydrograph.
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/1994	32598	96.98	4443.50	1354.38	1351.63	1326.94	4434.48	4353.48	Approximate-Data points read from hydrograph.
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/1994	32781	99.48	4441.00	1353.62	1351.63	1326.94	4434.48	4353.48	Approximate-Data points read from hydrograph.
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/1995	32963	138.98	4401.50	1341.58	1351.63	1326.94	4434.48	4353.48	Approximate-Data points read from hydrograph.
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/1995	33146	102.48	4438.00	1352.70	1351.63	1326.94	4434.48	4353.48	Approximate-Data points read from hydrograph.
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/1996	33329	105.48	4435.00	1351.79	1351.63	1326.94	4434.48	4353.48	Approximate-Data points read from hydrograph.
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/1996	33512	107.48	4433.00	1351.18	1351.63	1326.94	4434.48	4353.48	Approximate-Data points read from hydrograph.
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/1997	33694	118.40	4422.08	1347.85	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/1997	33877	108.60	4431.88	1350.84	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	1/28/1998	33996	103.90	4436.58	1352.27	1351.63	1326.94	4434.48	4353.48	FMICQB
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/1998	34059	107.50	4432.98	1351.17	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/1998	34242	112.00	4428.48	1349.80	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/1999	34424	100.00	4440.48	1353.46	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/1999	34607	85.00	4455.48	1358.03	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	12/15/1999	34682	107.20	4433.28	1351.26	1351.63	1326.94	4434.48	4353.48	ADWR (GWSI)
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/2000	34790	98.00	4442.48	1354.07	1351.63	1326.94	4434.48	4353.48	

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/2000	34973	108.00	4432.48	1351.02	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/2001	35155	125.00	4415.48	1345.84	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/2001	35338	126.00	4414.48	1345.53	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	12/4/2001	35402	115.50	4424.98	1348.73	1351.63	1326.94	4434.48	4353.48	FMICQB
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/2002	35520	119.00	4421.48	1347.67	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/2002	35703	119.00	4421.48	1347.67	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/2003	35885	116.75	4423.73	1348.35	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/2003	36068	126.00	4414.48	1345.53	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/2004	36251	114.50	4425.98	1349.04	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/2004	36434	114.50	4425.98	1349.04	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/2005	36616	113.00	4427.48	1349.50	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/2005	36799	116.00	4424.48	1348.58	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/2006	36981	114.00	4426.48	1349.19	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/2006	37164	115.50	4424.98	1348.73	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	11/30/2006	37224	119.00	4421.48	1347.67	1351.63	1326.94	4434.48	4353.48	ADWR (GWSI)
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/2007	37346	124.00	4416.48	1346.14	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/1/2007	37529	108.00	4432.48	1351.02	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/1/2008	37712	108.00	4432.48	1351.02	1351.63	1326.94	4434.48	4353.48	
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/8/2008	37719	108.00	4432.48	1351.02	1351.63	1326.94	4434.48	4353.48	2010 Q3 CQB Groundwater Tables.xls
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	8/18/2008	37851	112.56	4427.92	1349.63	1351.63	1326.94	4434.48	4353.48	2010 Q3 CQB Groundwater Tables.xls
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/23/2008	37917	111.31	4429.17	1350.01	1351.63	1326.94	4434.48	4353.48	2010 Q3 CQB Groundwater Tables.xls
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/22/2009	38098	110.00	4430.48	1350.41	1351.63	1326.94	4434.48	4353.48	2010 Q3 CQB Groundwater Tables.xls
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/9/2009	38268	110.00	4430.48	1350.41	1351.63	1326.94	4434.48	4353.48	2010 Q3 CQB Groundwater Tables.xls
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	10/31/2009	38290	110.00	4430.48	1350.41	1351.63	1326.94	4434.48	4353.48	CQ Database - 021312
616584	D-24-23 13ACB	AWC-04	598949.7	3468717.5	4540.48	4/23/2010	38464	109.00	4431.48	1350.72	1351.63	1326.94	4434.48	4353.48	2010 Q3 CQB Groundwater Tables.xls
086091	D-24-23 13BAA	WESTERN LANDSCAPE	598685.9	3468855.0	4533.30	12/3/1980	27731	100.00	4433.30	1351.27	1351.27	1303.72	4433.30	4277.30	Well 55
527586	D-24-23 13BBC	NSD-03	598076.9	3468637.5	4518.28	5/12/1990	31178	67.00	4451.28	1356.75	1360.41	1348.22	4463.28	4423.28	Well 55
527586	D-24-23 13BBC	NSD-03	598076.9	3468637.5	4518.28	10/7/2009	38266	85.62	4432.66	1351.07	1360.41	1348.22	4463.28	4423.28	2010 Q3 CQB Groundwater Tables.xls
527586	D-24-23 13BBC	NSD-03	598076.9	3468637.5	4518.28	3/16/2010	38426	83.51	4434.77	1351.72	1360.41	1348.22	4463.28	4423.28	2010 Q3 CQB Groundwater Tables.xls
527586	D-24-23 13BBC	NSD-03	598076.9	3468637.5	4518.28	5/25/2010	38496	84.49	4433.79	1351.42	1360.41	1348.22	4463.28	4423.28	2010 Q3 CQB Groundwater Tables.xls
527586	D-24-23 13BBC	NSD-03	598076.9	3468637.5	4518.28	8/25/2010	38588	85.70	4432.58	1351.05	1360.41	1348.22	4463.28	4423.28	2010 Q3 CQB Groundwater Tables.xls
527586	D-24-23 13BBC	NSD-03	598076.9	3468637.5	4518.28	6/17/2011	38884	88.76	4429.52	1350.12	1360.41	1348.22	4463.28	4423.28	CCA Q4 2011 Monitoring Report
527586	D-24-23 13BBC	NSD-03	598076.9	3468637.5	4518.28	12/7/2011	39057	89.30	4428.98	1349.95	1360.41	1348.22	4463.28	4423.28	CCA Q4 2011 Monitoring Report
527586	D-24-23 13BBC	NSD-03	598076.9	3468637.5	4518.28	3/6/2012	39147	89.24	4429.04	1349.97	1360.41	1348.22	4463.28	4423.28	2012 Q4 CQB Groundwater Tables.xls
538847	D-24-23 13DAA	MOORE	599494.9	3468060.0	4577.27	4/24/1993	32256	125.00	4452.27	1357.05	1340.29	1328.10	4397.27	4357.27	Well 55
538847	D-24-23 13DAA	MOORE	599494.9	3468060.0	4577.27	1/29/2009	38015	328.00	4249.27	1295.18	1340.29	1328.10	4397.27	4357.27	CQ Database - 021312
218341	D-24-23 13DDC		599293.9	3467453.0	4589.62	9/16/2008	37880	160.00	4429.62	1350.15	1330.34	1312.05	4364.62	4304.62	Well 55
1004	D-24-23 13DDD		599589.3	3467365.4	4600.00	12/6/1990	31386	135.00	4465.00	1360.93	1371.60	1341.12	4500.00	4400.00	ADWR (GWSI)
1004	D-24-23 13DDD		599589.3	3467365.4	4600.00	1/28/1998	33996	148.00	4452.00	1356.97	1371.60	1341.12	4500.00	4400.00	ADWR (GWSI)
1004	D-24-23 13DDD		599589.3	3467365.4	4600.00	12/5/2001	35403	157.00	4443.00	1354.23	1371.60	1341.12	4500.00	4400.00	ADWR (GWSI)
1004	D-24-23 13DDD		599589.3	3467365.4	4600.00	12/5/2006	37229	162.00	4438.00	1352.70	1371.60	1341.12	4500.00	4400.00	ADWR (GWSI)
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	9/19/1969	23638	65.80	4447.60	1355.63	1325.70	1325.39	4349.40	4348.40	Littin 1987
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	9/22/1977	26563	64.00	4449.40	1356.18	1325.70	1325.39	4349.40	4348.40	USGS (GWSI)
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	5/24/1982	28268	65.00	4448.40	1355.87	1325.70	1325.39	4349.40	4348.40	Well 55
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	12/6/1990	31386	64.00	4449.40	1356.18	1325.70	1325.39	4349.40	4348.40	ADWR (GWSI)
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	1/28/1998	33996	71.00	4442.40	1354.04	1325.70	1325.39	4349.40	4348.40	ADWR (GWSI)
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	12/14/1999	34681	74.00	4439.40	1353.13	1325.70	1325.39	4349.40	4348.40	ADWR (GWSI)
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	11/28/2001	35396	79.00	4434.40	1351.61	1325.70	1325.39	4349.40	4348.40	ADWR (GWSI)
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	12/6/2006	37230	78.00	4435.40	1351.91	1325.70	1325.39	4349.40	4348.40	ADWR (GWSI)
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	2/9/2010	38391	74.00	4439.40	1353.13	1325.70	1325.39	4349.40	4348.40	Ladd Q3 2011.xls
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	6/24/2011	38891	84.00	4429.40	1350.08	1325.70	1325.39	4349.40	4348.40	Ladd Q3 2011.xls
642977	D-24-23 14AAB	Old House Well	597619.2	3468714.0	4513.40	9/29/2011	38988	83.62	4429.78	1350.20	1325.70	1325.39	4349.40	4348.40	Ladd Q3 2011.xls
1020	D-24-23-13ABC2	AWC-01	598964.8	3468753.6	4520.00	1/1/1953	17533	83.00	4437.00	1352.40	1377.70	1377.70	4520.00	4520.00	Littin 1987
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	1/20/1989	30701	625.00	4100.44	1249.81	1209.58	1191.29	3968.44	3908.44	Well 55
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	3/1/1989	30741	654.65	4070.79	1240.78	1209.58	1191.29	3968.44	3908.44	FMICQB
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	4/1/1989	30772	591.28	4134.16	1260.09	1209.58	1191.29	3968.44	3908.44	FMICQB
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	5/1/1989	30802	592.00	4133.44	1259.87	1209.58	1191.29	3968.44	3908.44	FMICQB
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	6/1/1989	30833	592.37	4133.07	1259.76	1209.58	1191.29	3968.44	3908.44	FMICQB
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	7/1/1989	30863	592.75	4132.69	1259.64	1209.58	1191.29	3968.44	3908.44	FMICQB
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	8/1/1989	30894	591.35	4134.09	1260.07	1209.58	1191.29	3968.44	3908.44	FMICQB
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	9/1/1989	30925	591.50	4133.94	1260.02	1209.58	1191.29	3968.44	3908.44	FMICQB

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	11/1/1989	30986	591.40	4134.04	1260.06	1209.58	1191.29	3968.44	3908.44	FMICQB
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	11/6/1989	30991	591.45	4133.99	1260.04	1209.58	1191.29	3968.44	3908.44	FMICQB
522817	D-24-24 01CCC	TM-08 SWAN	607769.7	3470649.1	4725.44	4/1/1990	31137	592.23	4133.21	1259.80	1209.58	1191.29	3968.44	3908.44	FMICQB
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	3/3/2000	34761	341.00	4461.05	1359.73	1358.51	1321.93	4457.05	4337.05	Well 55
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	12/5/2001	35403	131.00	4671.05	1423.74	1358.51	1321.93	4457.05	4337.05	ADWR (GWSI)
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	5/13/2008	37754	367.31	4434.74	1351.71	1358.51	1321.93	4457.05	4337.05	2010 Q3 CQB Groundwater Tables.xls
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	8/18/2008	37851	370.24	4431.81	1350.82	1358.51	1321.93	4457.05	4337.05	2010 Q3 CQB Groundwater Tables.xls
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	10/22/2008	37916	353.96	4448.09	1355.78	1358.51	1321.93	4457.05	4337.05	CQ Database - 021312
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	10/23/2008	37917	353.96	4448.09	1355.78	1358.51	1321.93	4457.05	4337.05	2010 Q3 CQB Groundwater Tables.xls
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	1/20/2009	38006	353.07	4448.98	1356.05	1358.51	1321.93	4457.05	4337.05	2010 Q3 CQB Groundwater Tables.xls
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	4/7/2009	38083	357.76	4444.29	1354.62	1358.51	1321.93	4457.05	4337.05	2010 Q3 CQB Groundwater Tables.xls
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	7/8/2009	38175	365.44	4436.61	1352.28	1358.51	1321.93	4457.05	4337.05	2010 Q3 CQB Groundwater Tables.xls
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	10/5/2009	38264	370.11	4431.94	1350.86	1358.51	1321.93	4457.05	4337.05	2010 Q3 CQB Groundwater Tables.xls
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	4/19/2010	38460	382.25	4419.80	1347.16	1358.51	1321.93	4457.05	4337.05	2010 Q3 CQB Groundwater Tables.xls
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	7/12/2010	38544	386.89	4415.16	1345.74	1358.51	1321.93	4457.05	4337.05	CQ Database - 021312
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	7/21/2010	38553	386.89	4415.16	1345.74	1358.51	1321.93	4457.05	4337.05	2010 Q3 CQB Groundwater Tables.xls
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	10/18/2010	38642	387.39	4414.66	1345.59	1358.51	1321.93	4457.05	4337.05	CQ Database - 021312
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	1/19/2011	38735	391.47	4410.58	1344.34	1358.51	1321.93	4457.05	4337.05	CQ Database - 021312
577927	D-24-24 02BBC	BIMA	606001.2	3471852.8	4802.05	4/4/2011	38810	395.22	4406.83	1343.20	1358.51	1321.93	4457.05	4337.05	CQ Database - 021312
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	10/18/1988	30607	90.38	4680.00	1426.46	1415.91	1400.67	4645.38	4595.38	CQ Database - 021312
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	1/17/1989	30698	131.00	4639.38	1414.08	1415.91	1400.67	4645.38	4595.38	Well 55
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	3/10/1989	30750	91.58	4678.80	1426.10	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	3/13/1989	30753	91.58	4678.80	1426.10	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	4/20/1989	30791	92.01	4678.37	1425.97	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	5/23/1989	30824	92.26	4678.12	1425.89	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	6/23/1989	30855	92.68	4677.70	1425.76	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	7/24/1989	30886	93.06	4677.32	1425.65	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	9/6/1989	30930	91.38	4679.00	1426.16	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	10/22/1989	30976	93.38	4677.00	1425.55	1415.91	1400.67	4645.38	4595.38	CQ Database - 021312
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	11/6/1989	30991	89.30	4681.08	1426.79	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	12/1/1989	31016	89.30	4681.08	1426.79	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	1/1/1990	31047	90.55	4679.83	1426.41	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	2/1/1990	31078	90.60	4679.78	1426.40	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
522693	D-24-24 02BCC	TM-04	606104.5	3471539.0	4770.38	3/1/1990	31106	91.20	4679.18	1426.21	1415.91	1400.67	4645.38	4595.38	WMC-WAPP
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	8/9/2008	37842	61.00	4744.10	1446.00	1409.73	1373.15	4625.10	4505.10	Well 55
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	8/27/2008	37860	62.05	4743.05	1445.68	1409.73	1373.15	4625.10	4505.10	2010 Q3 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	11/11/2008	37936	60.95	4744.15	1446.02	1409.73	1373.15	4625.10	4505.10	2010 Q3 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	2/25/2009	38042	61.43	4743.67	1445.87	1409.73	1373.15	4625.10	4505.10	2010 Q3 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	4/28/2009	38104	62.01	4743.09	1445.69	1409.73	1373.15	4625.10	4505.10	2010 Q3 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	8/4/2009	38202	62.96	4742.14	1445.40	1409.73	1373.15	4625.10	4505.10	2010 Q3 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	10/27/2009	38286	63.61	4741.49	1445.21	1409.73	1373.15	4625.10	4505.10	2010 Q3 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	2/17/2010	38399	64.51	4740.59	1444.93	1409.73	1373.15	4625.10	4505.10	2010 Q3 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	4/15/2010	38456	65.05	4740.05	1444.77	1409.73	1373.15	4625.10	4505.10	2010 Q3 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	7/7/2010	38539	65.83	4739.27	1444.53	1409.73	1373.15	4625.10	4505.10	2010 Q3 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	7/12/2011	38909	69.37	4735.73	1443.45	1409.73	1373.15	4625.10	4505.10	CCA Q4 2011 Monitoring Report
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	2/8/2012	39120	70.33	4734.77	1443.16	1409.73	1373.15	4625.10	4505.10	2012 Q4 CQB Groundwater Tables.xls
909474	D-24-24 02BDD	BMO-2008-1G	606467.7	3471723.6	4805.10	8/14/2012	39308	71.73	4733.37	1442.73	1409.73	1373.15	4625.10	4505.10	2012 Q4 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	7/8/2008	37810	296.00	4497.45	1370.82	1388.20	1327.24	4554.45	4354.45	Well 55
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	8/4/2008	37837	299.28	4494.17	1369.82	1388.20	1327.24	4554.45	4354.45	2010 Q3 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	11/5/2008	37930	295.89	4497.56	1370.86	1388.20	1327.24	4554.45	4354.45	2010 Q3 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	2/25/2009	38042	289.84	4503.61	1372.70	1388.20	1327.24	4554.45	4354.45	2010 Q3 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	5/6/2009	38112	289.35	4504.10	1372.85	1388.20	1327.24	4554.45	4354.45	2010 Q3 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	8/11/2009	38209	289.09	4504.36	1372.93	1388.20	1327.24	4554.45	4354.45	2010 Q3 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	11/2/2009	38292	289.77	4503.68	1372.72	1388.20	1327.24	4554.45	4354.45	2010 Q3 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	3/10/2010	38420	289.58	4503.87	1372.78	1388.20	1327.24	4554.45	4354.45	2010 Q3 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	4/7/2010	38448	289.50	4503.95	1372.80	1388.20	1327.24	4554.45	4354.45	2010 Q3 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	7/6/2010	38538	288.93	4504.52	1372.98	1388.20	1327.24	4554.45	4354.45	2010 Q3 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	7/13/2011	38910	301.02	4492.43	1369.29	1388.20	1327.24	4554.45	4354.45	CCA Q4 2011 Monitoring Report
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	2/1/2012	39113	326.51	4466.94	1361.52	1388.20	1327.24	4554.45	4354.45	2012 Q4 CQB Groundwater Tables.xls
909272	D-24-24 03ABC	BMO-2008-10GU	605267.6	3471731.9	4793.45	7/13/2012	39276	328.70	4464.75	1360.86	1388.20	1327.24	4554.45	4354.45	2012 Q4 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	7/28/2008	37830	521.00	4271.21	1301.86	1247.31	1216.83	4092.21	3992.21	Well 55

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	8/20/2008	37853	521.75	4270.46	1301.64	1247.31	1216.83	4092.21	3992.21	2010 Q3 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	11/5/2008	37930	520.50	4271.71	1302.02	1247.31	1216.83	4092.21	3992.21	2010 Q3 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	2/25/2009	38042	516.72	4275.49	1303.17	1247.31	1216.83	4092.21	3992.21	2010 Q3 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	5/12/2009	38118	514.68	4277.53	1303.79	1247.31	1216.83	4092.21	3992.21	2010 Q3 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	8/11/2009	38209	513.23	4278.98	1304.23	1247.31	1216.83	4092.21	3992.21	2010 Q3 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	11/2/2009	38292	509.43	4282.78	1305.39	1247.31	1216.83	4092.21	3992.21	2010 Q3 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	3/4/2010	38414	510.88	4281.33	1304.95	1247.31	1216.83	4092.21	3992.21	2010 Q3 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	4/8/2010	38449	506.31	4285.90	1306.34	1247.31	1216.83	4092.21	3992.21	2010 Q3 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	7/2/2010	38534	511.80	4280.41	1304.67	1247.31	1216.83	4092.21	3992.21	2010 Q3 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	7/13/2011	38910	512.16	4280.05	1304.56	1247.31	1216.83	4092.21	3992.21	CCA Q4 2011 Monitoring Report
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	2/2/2012	39114	511.34	4280.87	1304.81	1247.31	1216.83	4092.21	3992.21	2012 Q4 CQB Groundwater Tables.xls
909435	D-24-24 03ABC	BMO-2008-10GL	605264.1	3471702.0	4792.21	7/13/2012	39276	510.90	4281.31	1304.94	1247.31	1216.83	4092.21	3992.21	2012 Q4 CQB Groundwater Tables.xls
201531	D-24-24 03ADA	SUNBELT	605998.3	3471735.1	4806.52	1/15/2004	36174	296.00	4510.52	1374.81	1373.59	1349.20	4506.52	4426.52	Well 55
201531	D-24-24 03ADA	SUNBELT	605998.3	3471735.1	4806.52	2/6/2008	37657	352.10	4454.42	1357.71	1373.59	1349.20	4506.52	4426.52	2010 Q3 CQB Groundwater Tables.xls
201531	D-24-24 03ADA	SUNBELT	605998.3	3471735.1	4806.52	5/15/2008	37756	358.97	4447.55	1355.61	1373.59	1349.20	4506.52	4426.52	2010 Q3 CQB Groundwater Tables.xls
201531	D-24-24 03ADA	SUNBELT	605998.3	3471735.1	4806.52	10/16/2008	37910	347.00	4459.52	1359.26	1373.59	1349.20	4506.52	4426.52	2010 Q3 CQB Groundwater Tables.xls
201531	D-24-24 03ADA	SUNBELT	605998.3	3471735.1	4806.52	1/21/2009	38007	344.78	4461.74	1359.94	1373.59	1349.20	4506.52	4426.52	2010 Q3 CQB Groundwater Tables.xls
201531	D-24-24 03ADA	SUNBELT	605998.3	3471735.1	4806.52	4/10/2009	38086	349.64	4456.88	1358.46	1373.59	1349.20	4506.52	4426.52	2010 Q3 CQB Groundwater Tables.xls
201531	D-24-24 03ADA	SUNBELT	605998.3	3471735.1	4806.52	7/8/2009	38175	356.99	4449.53	1356.22	1373.59	1349.20	4506.52	4426.52	2010 Q3 CQB Groundwater Tables.xls
525136	D-24-24 03CAB	TM-29B	604891.4	3471328.0	4757.61	8/6/1989	30899	91.00	4666.61	1422.38	1424.21	1399.83	4672.61	4592.61	Well 55
525136	D-24-24 03CAB	TM-29B	604891.4	3471328.0	4757.61	11/6/1989	30991	85.65	4671.96	1424.01	1424.21	1399.83	4672.61	4592.61	WMC-WAPP
525137	D-24-24 03CAB	TM-29A	604891.4	3471328.0	4758.08	8/9/1989	30902	89.00	4669.08	1423.14	1424.35	1399.97	4673.08	4593.08	Well 55
525137	D-24-24 03CAB	TM-29A	604891.4	3471328.0	4758.08	11/6/1989	30991	86.12	4671.96	1424.01	1424.35	1399.97	4673.08	4593.08	WMC-WAPP
525141	D-24-24 03CAB	TM-29	604891.4	3471328.0	4759.63	8/10/1989	30903	89.00	4670.63	1423.61	1424.83	1408.06	4674.63	4619.63	Well 55
525141	D-24-24 03CAB	TM-29	604891.4	3471328.0	4759.63	9/6/1989	30930	92.20	4667.43	1422.63	1424.83	1408.06	4674.63	4619.63	WMC-WAPP
525141	D-24-24 03CAB	TM-29	604891.4	3471328.0	4759.63	10/22/1989	30976	92.35	4667.28	1422.59	1424.83	1408.06	4674.63	4619.63	CQ Database - 021312
525141	D-24-24 03CAB	TM-29	604891.4	3471328.0	4759.63	11/6/1989	30991	87.05	4672.58	1424.20	1424.83	1408.06	4674.63	4619.63	WMC-WAPP
525141	D-24-24 03CAB	TM-29	604891.4	3471328.0	4759.63	12/1/1989	31016	87.60	4672.03	1424.03	1424.83	1408.06	4674.63	4619.63	WMC-WAPP
525141	D-24-24 03CAB	TM-29	604891.4	3471328.0	4759.63	1/1/1990	31047	88.70	4670.93	1423.70	1424.83	1408.06	4674.63	4619.63	WMC-WAPP
525141	D-24-24 03CAB	TM-29	604891.4	3471328.0	4759.63	2/1/1990	31078	89.75	4669.88	1423.38	1424.83	1408.06	4674.63	4619.63	WMC-WAPP
525141	D-24-24 03CAB	TM-29	604891.4	3471328.0	4759.63	3/1/1990	31106	90.65	4668.98	1423.11	1424.83	1408.06	4674.63	4619.63	WMC-WAPP
525141	D-24-24 03CAB	TM-29	604891.4	3471328.0	4759.63	4/1/1990	31137	91.65	4667.98	1422.80	1424.83	1408.06	4674.63	4619.63	WMC-WAPP
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	7/16/2008	37818	286.00	4476.61	1364.47	1248.95	1218.47	4097.61	3997.61	Well 55
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	8/7/2008	37840	287.17	4475.44	1364.11	1248.95	1218.47	4097.61	3997.61	CQ Database - 021312
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	8/8/2008	37841	287.17	4475.44	1364.11	1248.95	1218.47	4097.61	3997.61	2010 Q3 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	11/5/2008	37930	287.65	4474.96	1363.97	1248.95	1218.47	4097.61	3997.61	2010 Q3 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	2/26/2009	38043	285.65	4476.96	1364.58	1248.95	1218.47	4097.61	3997.61	2010 Q3 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	5/12/2009	38118	285.28	4477.33	1364.69	1248.95	1218.47	4097.61	3997.61	2010 Q3 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	8/17/2009	38215	286.09	4476.52	1364.44	1248.95	1218.47	4097.61	3997.61	2010 Q3 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	11/3/2009	38293	286.55	4476.06	1364.30	1248.95	1218.47	4097.61	3997.61	2010 Q3 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	3/4/2010	38414	287.45	4475.16	1364.03	1248.95	1218.47	4097.61	3997.61	2010 Q3 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	4/6/2010	38447	287.81	4474.80	1363.92	1248.95	1218.47	4097.61	3997.61	2010 Q3 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	7/1/2010	38533	288.26	4474.35	1363.78	1248.95	1218.47	4097.61	3997.61	2010 Q3 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	2/10/2011	38757	289.77	4472.84	1363.32	1248.95	1218.47	4097.61	3997.61	CQ Database - 021312
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	5/13/2011	38849	290.47	4472.14	1363.11	1248.95	1218.47	4097.61	3997.61	CQ Database - 021312
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	7/15/2011	38912	290.95	4471.66	1362.96	1248.95	1218.47	4097.61	3997.61	CCA Q4 2011 Monitoring Report
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	2/1/2012	39113	293.44	4469.17	1362.20	1248.95	1218.47	4097.61	3997.61	2012 Q4 CQB Groundwater Tables.xls
909255	D-24-24 03CBD	BMO-2008-9M	604668.7	3471121.7	4762.61	7/12/2012	39275	294.65	4467.96	1361.83	1248.95	1218.47	4097.61	3997.61	2012 Q4 CQB Groundwater Tables.xls
913037	D-24-24 03DCC	WMD2011-3M	605366.9	3470677.4	4746.28	2/2/2012	39114	226.66	4519.62	1377.58	1363.07	1283.82	4472.00	4212.00	2012 Q4 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	9/16/1993	32401	338.45	4496.78	1370.62	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	10/6/1993	32421	339.45	4495.78	1370.31	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	11/23/1993	32469	338.75	4496.48	1370.53	1374.72	1356.43	4510.23	4450.23	CQ Database - 021312
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	1/4/1994	32511	338.85	4496.38	1370.50	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	6/25/1996	33414	346.85	4488.38	1368.06	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	8/22/1996	33472	347.35	4487.88	1367.90	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	9/25/1996	33506	347.55	4487.68	1367.84	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	10/29/1996	33540	347.60	4487.63	1367.83	1374.72	1356.43	4510.23	4450.23	CQ Database - 021312
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	12/19/1996	33591	347.75	4487.48	1367.78	1374.72	1356.43	4510.23	4450.23	CQ Database - 021312
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	1/29/1997	33632	348.05	4487.18	1367.69	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	2/27/1997	33661	348.00	4487.23	1367.71	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	4/16/1997	33709	348.40	4486.83	1367.58	1374.72	1356.43	4510.23	4450.23	FMICQB

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	10/10/1997	33886	341.70	4493.53	1369.63	1374.72	1356.43	4510.23	4450.23	CQ Database - 021312
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	1/5/1998	33973	346.95	4488.28	1368.03	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	6/1/1999	34485	344.05	4491.18	1368.91	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	6/30/1999	34514	344.05	4491.18	1368.91	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	3/1/2000	34759	345.70	4489.53	1368.41	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	6/1/2000	34851	346.55	4488.68	1368.15	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	9/1/2000	34943	347.20	4488.03	1367.95	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	12/1/2000	35034	348.10	4487.13	1367.68	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	2/1/2001	35096	348.20	4487.03	1367.65	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	6/1/2001	35216	348.25	4486.98	1367.63	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	10/1/2001	35338	348.30	4486.93	1367.62	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	2/1/2002	35461	348.35	4486.88	1367.60	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	6/1/2002	35581	348.20	4487.03	1367.65	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	9/1/2002	35673	348.25	4486.98	1367.63	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	11/1/2002	35734	348.30	4486.93	1367.62	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	1/1/2003	35795	348.10	4487.13	1367.68	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	5/1/2003	35915	347.80	4487.43	1367.77	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	8/1/2003	36007	347.40	4487.83	1367.89	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	12/1/2003	36129	347.30	4487.93	1367.92	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	2/1/2004	36191	347.30	4487.93	1367.92	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	5/1/2004	36281	347.35	4487.88	1367.91	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	8/1/2004	36373	347.30	4487.93	1367.92	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	11/1/2004	36465	347.30	4487.93	1367.92	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	2/1/2005	36557	347.60	4487.63	1367.83	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	6/1/2005	36677	347.65	4487.58	1367.81	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	9/1/2005	36769	347.80	4487.43	1367.77	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	11/1/2005	36830	348.00	4487.23	1367.71	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	2/1/2006	36922	348.10	4487.13	1367.68	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	5/1/2006	37011	348.20	4487.03	1367.65	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	8/1/2006	37103	348.30	4486.93	1367.62	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	11/1/2006	37195	348.45	4486.78	1367.57	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	2/1/2007	37287	348.60	4486.63	1367.52	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	6/1/2007	37407	348.70	4486.53	1367.49	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	9/1/2007	37499	348.60	4486.63	1367.52	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	12/1/2007	37590	348.90	4486.33	1367.43	1374.72	1356.43	4510.23	4450.23	FMICQB
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	3/4/2008	37684	348.99	4486.24	1367.41	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	5/23/2008	37764	348.80	4486.43	1367.46	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	8/5/2008	37838	348.66	4486.57	1367.51	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	11/5/2008	37930	348.94	4486.29	1367.42	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	2/20/2009	38037	348.78	4486.45	1367.47	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	5/6/2009	38112	348.73	4486.50	1367.49	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	8/17/2009	38215	348.73	4486.50	1367.49	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	11/4/2009	38294	348.65	4486.58	1367.51	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	3/1/2010	38411	348.84	4486.39	1367.45	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	4/7/2010	38448	348.70	4486.53	1367.49	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	7/6/2010	38538	348.69	4486.54	1367.50	1374.72	1356.43	4510.23	4450.23	2010 Q3 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	7/13/2011	38910	348.67	4486.56	1367.50	1374.72	1356.43	4510.23	4450.23	CCA Q4 2011 Monitoring Report
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	2/1/2012	39113	347.84	4487.39	1367.76	1374.72	1356.43	4510.23	4450.23	2012 Q4 CQB Groundwater Tables.xls
539783	D-24-24 04AAA	BF-01	604169.1	3472151.6	4835.23	8/13/2012	39307	343.95	4491.28	1368.94	1374.72	1356.43	4510.23	4450.23	2012 Q4 CQB Groundwater Tables.xls
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	10/18/1988	30607	292.35	4499.37	1371.41	1375.17	1350.79	4511.72	4431.72	CQ Database - 021312
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	12/14/1988	30664	287.00	4504.72	1373.04	1375.17	1350.79	4511.72	4431.72	Well 55
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	1/27/1989	30708	292.50	4499.22	1371.36	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	2/27/1989	30739	293.40	4498.32	1371.09	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	4/6/1989	30777	294.25	4497.47	1370.83	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	5/1/1989	30802	293.90	4497.82	1370.94	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	6/8/1989	30840	295.75	4495.97	1370.37	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	7/13/1989	30875	296.45	4495.27	1370.16	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	9/6/1989	30930	297.45	4494.27	1369.85	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	10/22/1989	30976	296.85	4494.87	1370.04	1375.17	1350.79	4511.72	4431.72	CQ Database - 021312
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	11/6/1989	30991	294.00	4497.72	1370.91	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	1/1/1990	31047	294.70	4497.02	1370.69	1375.17	1350.79	4511.72	4431.72	WMC-WAPP

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	2/1/1990	31078	295.55	4496.17	1370.43	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	3/1/1990	31106	295.77	4495.95	1370.37	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	11/23/1993	32469	320.15	4471.57	1362.93	1375.17	1350.79	4511.72	4431.72	CQ Database - 021312
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	1/4/1994	32511	320.75	4470.97	1362.75	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	6/25/1996	33414	329.99	4461.73	1359.93	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	8/22/1996	33472	330.44	4461.28	1359.80	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	9/25/1996	33506	330.74	4460.98	1359.71	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	10/29/1996	33540	330.89	4460.83	1359.66	1375.17	1350.79	4511.72	4431.72	CQ Database - 021312
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	12/19/1996	33591	331.29	4460.43	1359.54	1375.17	1350.79	4511.72	4431.72	CQ Database - 021312
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	1/29/1997	33632	331.69	4460.03	1359.42	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	2/27/1997	33661	331.79	4459.93	1359.39	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	4/16/1997	33709	332.34	4459.38	1359.22	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	7/1/1997	33785	333.14	4458.58	1358.97	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	10/10/1997	33886	333.59	4458.13	1358.84	1375.17	1350.79	4511.72	4431.72	CQ Database - 021312
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	11/6/1997	33913	333.79	4457.93	1358.78	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	1/5/1998	33973	334.09	4457.63	1358.69	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	5/6/1998	34094	330.00	4461.72	1359.93	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	10/1/1998	34242	330.50	4461.22	1359.78	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	1/25/1999	34358	331.70	4460.02	1359.41	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	6/1/1999	34485	332.55	4459.17	1359.16	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	6/30/1999	34514	332.55	4459.17	1359.16	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	3/1/2000	34759	332.80	4458.92	1359.08	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	6/1/2000	34851	333.20	4458.52	1358.96	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	9/1/2000	34943	333.45	4458.27	1358.88	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	12/1/2000	35034	333.75	4457.97	1358.79	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	2/1/2001	35096	333.90	4457.82	1358.74	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	6/1/2001	35216	334.15	4457.57	1358.67	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	10/1/2001	35338	334.40	4457.32	1358.59	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	2/1/2002	35461	334.50	4457.22	1358.56	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	6/1/2002	35581	334.70	4457.02	1358.50	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	9/1/2002	35673	334.85	4456.87	1358.45	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	11/1/2002	35734	335.00	4456.72	1358.41	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	1/1/2003	35795	335.05	4456.67	1358.39	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	5/1/2003	35915	335.20	4456.52	1358.35	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	8/1/2003	36007	335.35	4456.37	1358.30	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	12/1/2003	36129	335.50	4456.22	1358.26	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	2/1/2004	36191	335.70	4456.02	1358.19	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	5/1/2004	36281	335.85	4455.87	1358.15	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	8/1/2004	36373	335.95	4455.77	1358.12	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	11/1/2004	36465	336.10	4455.62	1358.07	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	2/1/2005	36557	336.45	4455.27	1357.97	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	6/1/2005	36677	336.80	4454.92	1357.86	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	9/1/2005	36769	337.00	4454.72	1357.80	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	11/1/2005	36830	337.15	4454.57	1357.75	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	2/1/2006	36922	337.60	4454.12	1357.62	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	5/1/2006	37011	338.00	4453.72	1357.49	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522573	D-24-24 04AAC	TM-02	604077.6	3471921.0	4791.72	8/1/2006	37103	338.50	4453.22	1357.34	1375.17	1350.79	4511.72	4431.72	WMC-WAPP
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/10/1989	30722	319.00	4489.43	1368.38	1214.15	1183.67	3983.43	3883.43	Well 55
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/24/1989	30736	323.29	4485.14	1367.07	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	3/3/1989	30743	323.09	4485.34	1367.13	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	10/22/1989	30976	323.09	4485.34	1367.13	1214.15	1183.67	3983.43	3883.43	CQ Database - 021312
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	11/30/1989	31015	316.46	4491.97	1369.15	1214.15	1183.67	3983.43	3883.43	CQ Database - 021312
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	12/1/1989	31016	312.00	4496.43	1370.51	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	1/1/1990	31047	309.00	4499.43	1371.43	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/1/1990	31078	306.10	4502.33	1372.31	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	3/1/1990	31106	311.55	4496.88	1370.65	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	4/1/1990	31137	312.70	4495.73	1370.30	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	11/23/1993	32469	350.53	4457.90	1358.77	1214.15	1183.67	3983.43	3883.43	CQ Database - 021312
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	1/4/1994	32511	327.83	4480.60	1365.69	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	6/25/1996	33414	325.98	4482.45	1366.25	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	8/22/1996	33472	333.78	4474.65	1363.87	1214.15	1183.67	3983.43	3883.43	FMICQB

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	9/25/1996	33506	333.13	4475.30	1364.07	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	10/29/1996	33540	331.83	4476.60	1364.47	1214.15	1183.67	3983.43	3883.43	CQ Database - 021312
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	12/19/1996	33591	330.88	4477.55	1364.76	1214.15	1183.67	3983.43	3883.43	CQ Database - 021312
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	1/29/1997	33632	330.88	4477.55	1364.76	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/27/1997	33661	331.13	4477.30	1364.68	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	4/16/1997	33709	331.83	4476.60	1364.47	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	10/10/1997	33886	333.43	4475.00	1363.98	1214.15	1183.67	3983.43	3883.43	CQ Database - 021312
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	1/5/1998	33973	333.93	4474.50	1363.83	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	5/6/1998	34094	331.15	4477.28	1364.67	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	10/1/1998	34242	332.25	4476.18	1364.34	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	1/25/1999	34358	334.60	4473.83	1363.62	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	6/1/1999	34485	334.80	4473.63	1363.56	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	6/30/1999	34514	334.80	4473.63	1363.56	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	3/1/2000	34759	335.50	4472.93	1363.35	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	6/1/2000	34851	335.20	4473.23	1363.44	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	9/1/2000	34943	335.00	4473.43	1363.50	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	12/1/2000	35034	334.85	4473.58	1363.55	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/1/2001	35096	334.80	4473.63	1363.56	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	6/1/2001	35216	334.80	4473.63	1363.56	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	10/1/2001	35338	334.85	4473.58	1363.55	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/1/2002	35461	334.80	4473.63	1363.56	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	6/1/2002	35581	334.95	4473.48	1363.52	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	9/1/2002	35673	335.20	4473.23	1363.44	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	11/1/2002	35734	335.60	4472.83	1363.32	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	1/1/2003	35795	335.60	4472.83	1363.32	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	5/1/2003	35915	336.15	4472.28	1363.15	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	8/1/2003	36007	337.00	4471.43	1362.89	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	12/1/2003	36129	338.10	4470.33	1362.56	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/1/2004	36191	338.50	4469.93	1362.43	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	5/1/2004	36281	338.95	4469.48	1362.30	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	8/1/2004	36373	339.55	4468.88	1362.11	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	11/1/2004	36465	340.80	4467.63	1361.73	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/1/2005	36557	341.05	4467.38	1361.66	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	6/1/2005	36677	342.40	4466.03	1361.25	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	9/1/2005	36769	343.10	4465.33	1361.03	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	11/1/2005	36830	343.30	4465.13	1360.97	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/1/2006	36922	343.30	4465.13	1360.97	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	5/1/2006	37011	343.30	4465.13	1360.97	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	8/1/2006	37103	344.10	4464.33	1360.73	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	11/1/2006	37195	344.85	4463.58	1360.50	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/1/2007	37287	345.00	4463.43	1360.45	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	6/1/2007	37407	345.90	4462.53	1360.18	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	9/1/2007	37499	346.10	4462.33	1360.12	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	12/1/2007	37590	346.20	4462.23	1360.09	1214.15	1183.67	3983.43	3883.43	FMICQB
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	3/4/2008	37684	346.62	4461.81	1359.96	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	5/23/2008	37764	346.16	4462.27	1360.10	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	8/15/2008	37848	353.91	4454.52	1357.74	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	10/30/2008	37924	349.45	4458.98	1359.10	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/24/2009	38041	348.64	4459.79	1359.34	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	5/6/2009	38112	349.38	4459.05	1359.12	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	8/12/2009	38210	349.13	4459.30	1359.19	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	11/4/2009	38294	348.97	4459.46	1359.24	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	3/10/2010	38420	348.19	4460.24	1359.48	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	4/6/2010	38447	353.86	4454.57	1357.75	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	4/7/2010	38448	353.86	4454.57	1357.75	1214.15	1183.67	3983.43	3883.43	CQ Database - 021312
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	7/6/2010	38538	349.20	4459.23	1359.17	1214.15	1183.67	3983.43	3883.43	2010 Q3 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/10/2011	38757	347.60	4460.83	1359.66	1214.15	1183.67	3983.43	3883.43	CQ Database - 021312
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	7/13/2011	38910	348.14	4460.29	1359.50	1214.15	1183.67	3983.43	3883.43	CCA Q4 2011 Monitoring Report
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	2/2/2012	39114	346.94	4461.49	1359.86	1214.15	1183.67	3983.43	3883.43	2012 Q4 CQB Groundwater Tables.xls
522574	D-24-24 04AAC	TM-02A	604152.1	3472008.8	4808.43	8/13/2012	39307	344.53	4463.90	1360.60	1214.15	1183.67	3983.43	3883.43	2012 Q4 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	5/29/1991	31560	254.00	4481.18	1365.86	1366.47	1348.19	4483.18	4423.18	Well 55

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	2/5/2008	37656	293.29	4441.89	1353.89	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	5/15/2008	37756	293.57	4441.61	1353.80	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	7/30/2008	37832	293.86	4441.32	1353.71	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	10/20/2008	37914	294.18	4441.00	1353.62	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	2/12/2009	38029	294.62	4440.56	1353.48	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	4/21/2009	38097	294.66	4440.52	1353.47	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	8/3/2009	38201	294.98	4440.20	1353.37	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	10/28/2009	38287	295.33	4439.85	1353.27	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	2/1/2010	38383	295.70	4439.48	1353.15	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	4/26/2010	38467	295.96	4439.22	1353.07	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	7/20/2010	38552	296.29	4438.89	1352.97	1366.47	1348.19	4483.18	4423.18	2010 Q3 CQB Groundwater Tables.xls
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	10/20/2010	38644	296.29	4438.89	1352.97	1366.47	1348.19	4483.18	4423.18	CQ Database - 021312
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	4/8/2011	38814	297.20	4437.98	1352.70	1366.47	1348.19	4483.18	4423.18	CQ Database - 021312
531770	D-24-24 04BCC	RUIZ	602857.4	3471424.2	4735.18	4/13/2012	39185	298.47	4436.71	1352.31	1366.47	1348.19	4483.18	4423.18	2012 Q4 CQB Groundwater Tables.xls
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	8/5/1993	32359	275.00	4475.37	1364.09	1367.14	1354.95	4485.37	4445.37	Well 55
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	9/16/1993	32401	281.37	4469.00	1362.15	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	10/6/1993	32421	281.97	4468.40	1361.97	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	11/23/1993	32469	282.37	4468.00	1361.85	1367.14	1354.95	4485.37	4445.37	CQ Database - 021312
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	1/4/1994	32511	282.87	4467.50	1361.69	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	6/25/1996	33414	291.37	4459.00	1359.10	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	8/22/1996	33472	291.92	4458.45	1358.94	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	9/25/1996	33506	292.37	4458.00	1358.80	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	10/29/1996	33540	292.47	4457.90	1358.77	1367.14	1354.95	4485.37	4445.37	CQ Database - 021312
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	12/19/1996	33591	293.02	4457.35	1358.60	1367.14	1354.95	4485.37	4445.37	CQ Database - 021312
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	1/29/1997	33632	293.32	4457.05	1358.51	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	2/27/1997	33661	293.47	4456.90	1358.46	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	4/16/1997	33709	294.02	4456.35	1358.30	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	10/10/1997	33886	293.67	4456.70	1358.40	1367.14	1354.95	4485.37	4445.37	CQ Database - 021312
539786	D-24-24 04BDD	BF-02	603479.9	3471513.0	4750.37	1/5/1998	33973	294.27	4456.10	1358.22	1367.14	1354.95	4485.37	4445.37	WMC-WAPP
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	11/4/2008	37929	300.00	4452.45	1357.11	1113.27	1082.79	3652.45	3552.45	Well 55
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	12/9/2008	37964	299.79	4452.66	1357.17	1113.27	1082.79	3652.45	3552.45	2010 Q3 CQB Groundwater Tables.xls
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	2/19/2009	38036	298.32	4454.13	1357.62	1113.27	1082.79	3652.45	3552.45	2010 Q3 CQB Groundwater Tables.xls
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	5/5/2009	38111	298.27	4454.18	1357.63	1113.27	1082.79	3652.45	3552.45	2010 Q3 CQB Groundwater Tables.xls
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	8/10/2009	38208	298.57	4453.88	1357.54	1113.27	1082.79	3652.45	3552.45	2010 Q3 CQB Groundwater Tables.xls
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	11/5/2009	38295	298.81	4453.64	1357.47	1113.27	1082.79	3652.45	3552.45	2010 Q3 CQB Groundwater Tables.xls
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	3/3/2010	38413	299.18	4453.27	1357.36	1113.27	1082.79	3652.45	3552.45	2010 Q3 CQB Groundwater Tables.xls
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	4/16/2010	38457	299.42	4453.03	1357.28	1113.27	1082.79	3652.45	3552.45	2010 Q3 CQB Groundwater Tables.xls
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	7/1/2010	38533	299.70	4452.75	1357.20	1113.27	1082.79	3652.45	3552.45	2010 Q3 CQB Groundwater Tables.xls
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	1/24/2011	38740	300.46	4451.99	1356.97	1113.27	1082.79	3652.45	3552.45	CQ Database - 021312
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	5/13/2011	38849	301.00	4451.45	1356.80	1113.27	1082.79	3652.45	3552.45	CQ Database - 021312
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	7/15/2011	38912	300.96	4451.49	1356.81	1113.27	1082.79	3652.45	3552.45	CCA Q4 2011 Monitoring Report
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	1/30/2012	39111	301.60	4450.85	1356.62	1113.27	1082.79	3652.45	3552.45	2012 Q4 CQB Groundwater Tables.xls
909711	D-24-24 04DAD	BMO-2008-8M	604167.9	3471127.9	4752.45	7/12/2012	39275	302.45	4450.00	1356.36	1113.27	1082.79	3652.45	3552.45	2012 Q4 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	11/18/2008	37943	298.00	4455.25	1357.96	1336.01	1305.53	4383.25	4283.25	Well 55
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	12/5/2008	37960	297.94	4455.31	1357.98	1336.01	1305.53	4383.25	4283.25	2010 Q3 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	2/19/2009	38036	297.63	4455.62	1358.07	1336.01	1305.53	4383.25	4283.25	2010 Q3 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	5/5/2009	38111	297.37	4455.88	1358.15	1336.01	1305.53	4383.25	4283.25	2010 Q3 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	8/10/2009	38208	297.53	4455.72	1358.10	1336.01	1305.53	4383.25	4283.25	2010 Q3 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	11/9/2009	38299	297.85	4455.40	1358.01	1336.01	1305.53	4383.25	4283.25	2010 Q3 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	3/3/2010	38413	298.37	4454.88	1357.85	1336.01	1305.53	4383.25	4283.25	2010 Q3 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	4/16/2010	38457	298.46	4454.79	1357.82	1336.01	1305.53	4383.25	4283.25	2010 Q3 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	7/1/2010	38533	298.64	4454.61	1357.77	1336.01	1305.53	4383.25	4283.25	2010 Q3 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	2/11/2011	38758	299.56	4453.69	1357.48	1336.01	1305.53	4383.25	4283.25	CQ Database - 021312
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	5/13/2011	38849	299.78	4453.47	1357.42	1336.01	1305.53	4383.25	4283.25	CQ Database - 021312
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	7/15/2011	38912	300.00	4453.25	1357.35	1336.01	1305.53	4383.25	4283.25	CCA Q4 2011 Monitoring Report
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	1/30/2012	39111	300.52	4452.73	1357.19	1336.01	1305.53	4383.25	4283.25	2012 Q4 CQB Groundwater Tables.xls
910097	D-24-24 04DAD	BMO-2008-8B	604171.3	3471141.7	4753.25	7/12/2012	39275	301.15	4452.10	1357.00	1336.01	1305.53	4383.25	4283.25	2012 Q4 CQB Groundwater Tables.xls
623564	D-24-24 05AAA	COOPER	602668.4	3472105.0	4793.00	12/20/1979	27382	254.00	4539.00	1383.49	1374.04	1361.85	4508.00	4468.00	Well 55
623564	D-24-24 05AAA	COOPER	602668.4	3472105.0	4793.00	10/18/2010	38642	158.41	4634.59	1412.62	1374.04	1361.85	4508.00	4468.00	CQ Database - 021312
1005	D-24-24 05AAB		602469.9	3471904.0	4798.00	12/4/1990	31384	294.00	4504.00	1372.82	1370.99	1355.75	4498.00	4448.00	ADWR (GWSI)
1005	D-24-24 05AAB		602469.9	3471904.0	4798.00	12/5/2001	35403	295.00	4503.00	1372.51	1370.99	1355.75	4498.00	4448.00	ADWR (GWSI)

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
1005	D-24-24 05AAB		602469.9	3471904.0	4798.00	12/4/2006	37228	294.00	4504.00	1372.82	1370.99	1355.75	4498.00	4448.00	ADWR (GWSI)
645536	D-24-24 05ACC	BLOMMER	602725.9	3471529.1	4753.69	11/13/1978	26980	244.00	4509.69	1374.55	1374.25	1343.77	4508.69	4408.69	Well 55
645536	D-24-24 05ACC	BLOMMER	602725.9	3471529.1	4753.69	11/21/1985	29545	225.00	4528.69	1380.34	1374.25	1343.77	4508.69	4408.69	Littin 1987
645536	D-24-24 05ACC	BLOMMER	602725.9	3471529.1	4753.69	6/2/1988	30469	254.85	4498.84	1371.25	1374.25	1343.77	4508.69	4408.69	WMC-WAPP
645536	D-24-24 05ACC	BLOMMER	602725.9	3471529.1	4753.69	10/22/2008	37916	300.78	4452.91	1357.25	1374.25	1343.77	4508.69	4408.69	CQ Database - 021312
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	10/18/1988	30607	248.96	4519.97	1377.69	1380.42	1365.18	4528.93	4478.93	CQ Database - 021312
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	11/8/1988	30628	249.00	4519.93	1377.67	1380.42	1365.18	4528.93	4478.93	Well 55
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	1/30/1989	30711	258.51	4510.42	1374.78	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	3/2/1989	30742	258.76	4510.17	1374.70	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	4/7/1989	30778	258.96	4509.97	1374.64	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	5/2/1989	30803	258.46	4510.47	1374.79	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	6/7/1989	30839	259.41	4509.52	1374.50	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	7/14/1989	30876	259.87	4509.06	1374.36	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	9/6/1989	30930	259.96	4508.97	1374.33	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	10/22/1989	30976	259.96	4508.97	1374.33	1380.42	1365.18	4528.93	4478.93	CQ Database - 021312
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	11/6/1989	30991	259.76	4509.17	1374.40	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	12/1/1989	31016	260.50	4508.43	1374.17	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	1/1/1990	31047	261.50	4507.43	1373.86	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	2/1/1990	31078	261.00	4507.93	1374.02	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	3/1/1990	31106	260.95	4507.98	1374.03	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	4/1/1990	31137	263.50	4505.43	1373.26	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	1/25/1994	32532	297.91	4471.02	1362.77	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	6/20/1996	33409	303.81	4465.12	1360.97	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4768.93	6/25/1996	33414	303.81	4465.12	1360.97	1380.42	1365.18	4528.93	4478.93	WMC-WAPP
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4741.18	3/15/2012	39156	279.30	4461.88	1359.98	1380.42	1365.18	4528.93	4478.93	2012 Q4 CQB Groundwater Tables.xls
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4741.18	4/24/2012	39196	279.03	4462.15	1360.06	1380.42	1365.18	4528.93	4478.93	2012 Q4 CQB Groundwater Tables.xls
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4741.18	9/13/2012	39338	278.30	4462.88	1360.29	1380.42	1365.18	4528.93	4478.93	2012 Q4 CQB Groundwater Tables.xls
522696	D-24-24 05BAC	TM-10 USBP	601666.4	3471898.0	4741.18	10/19/2012	39374	277.45	4463.73	1360.54	1380.42	1365.18	4528.93	4478.93	2012 Q4 CQB Groundwater Tables.xls
086775	D-24-24 05BBB	BRINDLEY	601262.7	3472095.0	4779.13	1/1/1981	27760	295.00	4484.13	1366.76	1353.05	1346.95	4439.13	4419.13	Well 55
086775	D-24-24 05BBB	BRINDLEY	601262.7	3472095.0	4779.13	6/21/1988	30488	285.92	4493.21	1369.53	1353.05	1346.95	4439.13	4419.13	WMC-WAPP
606855	D-24-24 05BCA	HULL 855	601467.4	3471697.0	4749.54	1/1/1915	3653	240.00	4509.54	1374.51	1386.70	1325.74	4549.54	4349.54	Well 55
633472	D-24-24 05CC0	BLOMMER	602039.8	3471485.9	4684.62	11/1/1978	26968	244.00	4440.62	1353.50	1351.67	1321.19	4434.62	4334.62	Well 55
633472	D-24-24 05CC0	BLOMMER	602039.8	3471485.9	4684.62	11/19/1985	29543	196.00	4488.62	1368.13	1351.67	1321.19	4434.62	4334.62	Littin 1987
606854	D-24-24 05CCA	HULL 854	601435.9	3470954.1	4693.01	1/1/1915	3653	220.00	4473.01	1363.37	1430.43	1354.23	4693.01	4443.01	Well 55
606854	D-24-24 05CCA	HULL 854	601435.9	3470954.1	4693.01	8/19/1988	30547	209.24	4483.77	1366.65	1430.43	1354.23	4693.01	4443.01	WMC-WAPP
544535	D-24-24 05CCC	WEED	601434.4	3470924.5	4679.11	7/9/1994	32697	226.00	4453.11	1357.31	1340.85	1328.66	4399.11	4359.11	Well 55
544535	D-24-24 05CCC	WEED	601434.4	3470924.5	4679.11	10/20/2008	37914	272.00	4407.11	1343.29	1340.85	1328.66	4399.11	4359.11	CQ Database - 021312
1006	D-24-24 05DAA		602681.0	3470988.4	4725.00	9/22/1977	26563	224.00	4501.00	1371.90	1379.22	1348.74	4525.00	4425.00	USGS (GWSI)
1006	D-24-24 05DAA		602681.0	3470988.4	4725.00	12/5/1990	31385	233.00	4492.00	1369.16	1379.22	1348.74	4525.00	4425.00	ADWR (GWSI)
1006	D-24-24 05DAA		602681.0	3470988.4	4725.00	12/4/2001	35402	265.00	4460.00	1359.41	1379.22	1348.74	4525.00	4425.00	ADWR (GWSI)
1006	D-24-24 05DAA		602681.0	3470988.4	4725.00	12/5/2006	37229	272.00	4453.00	1357.27	1379.22	1348.74	4525.00	4425.00	ADWR (GWSI)
1007	D-24-24 05DAB		602495.2	3471078.9	4725.00	11/2/1970	24047	227.00	4498.00	1370.99	1378.00	1347.52	4521.00	4421.00	
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	12/16/1997	33953	250.00	4483.72	1366.64	1363.59	1345.30	4473.72	4413.72	Well 55
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	2/12/2008	37663	289.47	4444.25	1354.61	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	5/29/2008	37770	288.53	4445.19	1354.89	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	7/31/2008	37833	290.08	4443.64	1354.42	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	10/20/2008	37914	290.15	4443.57	1354.40	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	4/21/2009	38097	290.66	4443.06	1354.24	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	7/20/2009	38187	290.78	4442.94	1354.21	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	10/20/2009	38279	290.52	4443.20	1354.29	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	2/2/2010	38384	291.64	4442.08	1353.95	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	4/23/2010	38464	291.96	4441.76	1353.85	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
565260	D-24-24 05DAB	ENGLUND	602551.3	3471341.3	4733.72	7/20/2010	38552	292.21	4441.51	1353.77	1363.59	1345.30	4473.72	4413.72	2010 Q3 CQB Groundwater Tables.xls
506034	D-24-24 05DAC	JACKSON	602478.7	3471103.0	4723.00	8/16/1983	28717	208.00	4515.00	1376.17	1438.96	1335.33	4721.00	4381.00	Well 55
1000	D-24-24 05DBB	DURAZO	602015.5	3471241.2	4725.00	11/21/1985	29545	221.00	4504.00	1372.82	1363.98	1348.74	4475.00	4425.00	Littin 1987
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	12/4/1990	31384	248.00	4480.53	1365.67	1366.58	1336.10	4483.53	4383.53	ADWR (GWSI)
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	12/15/1999	34682	273.00	4455.53	1358.05	1366.58	1336.10	4483.53	4383.53	ADWR (GWSI)
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	11/29/2001	35397	276.00	4452.53	1357.13	1366.58	1336.10	4483.53	4383.53	ADWR (GWSI)
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	11/28/2006	37222	275.00	4453.53	1357.44	1366.58	1336.10	4483.53	4383.53	ADWR (GWSI)
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	3/5/2008	37685	288.30	4440.23	1353.38	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	5/15/2008	37756	286.53	4442.00	1353.92	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	7/31/2008	37833	286.82	4441.71	1353.83	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	10/20/2008	37914	287.09	4441.44	1353.75	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	2/11/2009	38028	287.74	4440.79	1353.55	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	4/20/2009	38096	287.47	4441.06	1353.64	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	7/15/2009	38182	287.58	4440.95	1353.60	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	10/14/2009	38273	287.99	4440.54	1353.48	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	2/1/2010	38383	288.38	4440.15	1353.36	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	5/18/2010	38489	288.65	4439.88	1353.28	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	7/16/2010	38548	288.88	4439.65	1353.21	1366.58	1336.10	4483.53	4383.53	2010 Q3 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	10/19/2010	38643	289.09	4439.44	1353.14	1366.58	1336.10	4483.53	4383.53	CQ Database - 021312
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	1/19/2011	38735	289.54	4438.99	1353.00	1366.58	1336.10	4483.53	4383.53	CQ Database - 021312
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	4/4/2011	38810	289.87	4438.66	1352.90	1366.58	1336.10	4483.53	4383.53	CQ Database - 021312
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	7/12/2011	38909	289.98	4438.55	1352.87	1366.58	1336.10	4483.53	4383.53	CCA Q4 2011 Monitoring Report
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	10/12/2011	39001	290.47	4438.06	1352.72	1366.58	1336.10	4483.53	4383.53	CCA Q4 2011 Monitoring Report
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	2/7/2012	39119	290.92	4437.61	1352.58	1366.58	1336.10	4483.53	4383.53	2012 Q4 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	4/12/2012	39184	291.15	4437.38	1352.51	1366.58	1336.10	4483.53	4383.53	2012 Q4 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	7/18/2012	39281	291.37	4437.16	1352.45	1366.58	1336.10	4483.53	4383.53	2012 Q4 CQB Groundwater Tables.xls
071891	D-24-24 05DBB	METZLER	602123.9	3471229.3	4728.53	10/4/2012	39359	291.63	4436.90	1352.37	1366.58	1336.10	4483.53	4383.53	2012 Q4 CQB Groundwater Tables.xls
576415	D-24-24 05DBB	PARRA	602170.7	3471263.5	4727.21	10/6/1999	34612	263.00	4464.21	1360.69	1363.13	1332.65	4472.21	4372.21	Well 55
576415	D-24-24 05DBB	PARRA	602170.7	3471263.5	4727.21	5/15/2008	37756	279.78	4447.43	1355.58	1363.13	1332.65	4472.21	4372.21	2010 Q3 CQB Groundwater Tables.xls
576415	D-24-24 05DBB	PARRA	602170.7	3471263.5	4727.21	8/18/2008	37851	280.06	4447.15	1355.49	1363.13	1332.65	4472.21	4372.21	2010 Q3 CQB Groundwater Tables.xls
576415	D-24-24 05DBB	PARRA	602170.7	3471263.5	4727.21	10/20/2008	37914	280.39	4446.82	1355.39	1363.13	1332.65	4472.21	4372.21	CQ Database - 021312
576415	D-24-24 05DBB	PARRA	602170.7	3471263.5	4727.21	11/3/2008	37928	280.39	4446.82	1355.39	1363.13	1332.65	4472.21	4372.21	2010 Q3 CQB Groundwater Tables.xls
576415	D-24-24 05DBB	PARRA	602170.7	3471263.5	4727.21	2/13/2009	38030	280.75	4446.46	1355.28	1363.13	1332.65	4472.21	4372.21	2010 Q3 CQB Groundwater Tables.xls
576415	D-24-24 05DBB	PARRA	602170.7	3471263.5	4727.21	4/20/2009	38096	280.88	4446.33	1355.24	1363.13	1332.65	4472.21	4372.21	CQ Database - 021312
576415	D-24-24 05DBB	PARRA	602170.7	3471263.5	4727.21	4/28/2009	38104	280.88	4446.33	1355.24	1363.13	1332.65	4472.21	4372.21	2010 Q3 CQB Groundwater Tables.xls
576415	D-24-24 05DBB	PARRA	602170.7	3471263.5	4727.21	7/20/2009	38187	280.99	4446.22	1355.21	1363.13	1332.65	4472.21	4372.21	2010 Q3 CQB Groundwater Tables.xls
507823	D-24-24 05DBC	HECK	602076.6	3471101.0	4715.00	5/4/1984	28979	208.00	4507.00	1373.73	1373.73	1343.25	4507.00	4407.00	Well 55
507823	D-24-24 05DBC	HECK	602076.6	3471101.0	4715.00	11/21/1985	29545	213.00	4502.00	1372.21	1373.73	1343.25	4507.00	4407.00	Littin 1987
602134	D-24-24 05DCB	BULLARD	602078.7	3470901.0	4699.75	9/6/1974	25451	80.00	4619.75	1408.10	1366.95	1341.04	4484.75	4399.75	Well 55
602134	D-24-24 05DCB	BULLARD	602078.7	3470901.0	4699.75	6/16/1988	30483	220.26	4479.49	1365.35	1366.95	1341.04	4484.75	4399.75	WMC-WAPP
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	5/22/2008	37763	191.00	4435.90	1352.06	1306.65	1276.17	4286.90	4186.90	Well 55
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	7/10/2008	37812	191.63	4435.27	1351.87	1306.65	1276.17	4286.90	4186.90	2010 Q3 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	11/4/2008	37929	190.25	4436.65	1352.29	1306.65	1276.17	4286.90	4186.90	2010 Q3 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	2/20/2009	38037	190.70	4436.20	1352.15	1306.65	1276.17	4286.90	4186.90	2010 Q3 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	4/28/2009	38104	190.98	4435.92	1352.07	1306.65	1276.17	4286.90	4186.90	2010 Q3 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	8/4/2009	38202	191.77	4435.13	1351.83	1306.65	1276.17	4286.90	4186.90	2010 Q3 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	10/26/2009	38285	192.14	4434.76	1351.71	1306.65	1276.17	4286.90	4186.90	2010 Q3 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	2/15/2010	38397	191.78	4435.12	1351.82	1306.65	1276.17	4286.90	4186.90	2010 Q3 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	4/15/2010	38456	191.64	4435.26	1351.87	1306.65	1276.17	4286.90	4186.90	2010 Q3 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	7/1/2010	38533	192.53	4434.37	1351.60	1306.65	1276.17	4286.90	4186.90	2010 Q3 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	10/5/2010	38629	192.96	4433.94	1351.46	1306.65	1276.17	4286.90	4186.90	CQ Database - 021312
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	2/14/2011	38761	450.00	4176.90	1273.12	1306.65	1276.17	4286.90	4186.90	CQ Database - 021312
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	5/12/2011	38848	193.68	4433.22	1351.25	1306.65	1276.17	4286.90	4186.90	CQ Database - 021312
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	7/12/2011	38909	194.47	4432.43	1351.00	1306.65	1276.17	4286.90	4186.90	CCA Q4 2011 Monitoring Report
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	12/7/2011	39057	194.92	4431.98	1350.87	1306.65	1276.17	4286.90	4186.90	CCA Q4 2011 Monitoring Report
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	2/3/2012	39115	194.65	4432.25	1350.95	1306.65	1276.17	4286.90	4186.90	2012 Q4 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	4/18/2012	39190	195.00	4431.90	1350.84	1306.65	1276.17	4286.90	4186.90	2012 Q4 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	7/10/2012	39273	196.10	4430.80	1350.51	1306.65	1276.17	4286.90	4186.90	2012 Q4 CQB Groundwater Tables.xls
909019	D-24-24 06ACC	BMO-2008-6M	600367.9	3469813.9	4626.90	10/16/2012	39371	196.53	4430.37	1350.38	1306.65	1276.17	4286.90	4186.90	2012 Q4 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	5/31/2008	37772	190.00	4437.44	1352.53	1351.01	1332.72	4432.44	4372.44	Well 55
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	7/16/2008	37818	190.13	4437.31	1352.49	1351.01	1332.72	4432.44	4372.44	2010 Q3 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	11/4/2008	37929	190.23	4437.21	1352.46	1351.01	1332.72	4432.44	4372.44	2010 Q3 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	2/19/2009	38036	189.71	4437.73	1352.62	1351.01	1332.72	4432.44	4372.44	2010 Q3 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	4/27/2009	38103	189.99	4437.45	1352.53	1351.01	1332.72	4432.44	4372.44	2010 Q3 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	8/4/2009	38202	190.80	4436.64	1352.29	1351.01	1332.72	4432.44	4372.44	2010 Q3 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	10/26/2009	38285	191.04	4436.40	1352.21	1351.01	1332.72	4432.44	4372.44	2010 Q3 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	2/15/2010	38397	190.82	4436.62	1352.28	1351.01	1332.72	4432.44	4372.44	2010 Q3 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	4/15/2010	38456	190.75	4436.69	1352.30	1351.01	1332.72	4432.44	4372.44	2010 Q3 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	7/1/2010	38533	191.43	4436.01	1352.10	1351.01	1332.72	4432.44	4372.44	2010 Q3 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	10/5/2010	38629	192.50	4434.94	1351.77	1351.01	1332.72	4432.44	4372.44	CQ Database - 021312

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	2/14/2011	38761	265.00	4362.44	1329.67	1351.01	1332.72	4432.44	4372.44	CQ Database - 021312
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	5/12/2011	38848	192.70	4434.74	1351.71	1351.01	1332.72	4432.44	4372.44	CQ Database - 021312
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	7/12/2011	38909	193.30	4434.14	1351.53	1351.01	1332.72	4432.44	4372.44	CCA Q4 2011 Monitoring Report
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	12/7/2011	39057	193.85	4433.59	1351.36	1351.01	1332.72	4432.44	4372.44	CCA Q4 2011 Monitoring Report
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	2/3/2012	39115	193.60	4433.84	1351.43	1351.01	1332.72	4432.44	4372.44	2012 Q4 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	4/18/2012	39190	193.90	4433.54	1351.34	1351.01	1332.72	4432.44	4372.44	2012 Q4 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	7/10/2012	39273	194.75	4432.69	1351.08	1351.01	1332.72	4432.44	4372.44	2012 Q4 CQB Groundwater Tables.xls
909146	D-24-24 06ACC	BMO-2008-6B	600366.5	3469820.6	4627.44	10/16/2012	39371	195.71	4431.73	1350.79	1351.01	1332.72	4432.44	4372.44	2012 Q4 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	12/12/1984	29201	174.00	4465.09	1360.96	1349.07	1322.55	4426.09	4339.09	Well 55
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	11/21/1985	29545	170.00	4469.09	1362.18	1349.07	1322.55	4426.09	4339.09	Littin 1987
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	12/6/1990	31386	177.00	4462.09	1360.05	1349.07	1322.55	4426.09	4339.09	ADWR (GWSI)
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	12/5/2001	35403	287.00	4352.09	1326.52	1349.07	1322.55	4426.09	4339.09	ADWR (GWSI)
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	11/28/2006	37222	294.00	4345.09	1324.38	1349.07	1322.55	4426.09	4339.09	ADWR (GWSI)
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	2/20/2008	37671	204.22	4434.87	1351.75	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	5/19/2008	37760	204.72	4434.37	1351.60	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	7/31/2008	37833	205.56	4433.53	1351.34	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	10/21/2008	37915	205.06	4434.03	1351.49	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	2/13/2009	38030	204.74	4434.35	1351.59	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	4/21/2009	38097	204.87	4434.22	1351.55	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	7/20/2009	38187	205.69	4433.40	1351.30	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	10/20/2009	38279	206.06	4433.03	1351.19	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	2/24/2010	38406	205.59	4433.50	1351.33	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	4/22/2010	38463	205.48	4433.61	1351.36	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	7/14/2010	38546	206.58	4432.51	1351.03	1349.07	1322.55	4426.09	4339.09	2010 Q3 CQB Groundwater Tables.xls
509518	D-24-24 06BCC	POOL	599683.6	3470013.8	4639.09	10/20/2010	38644	206.74	4432.35	1350.98	1349.07	1322.55	4426.09	4339.09	CQ Database - 021312
517526	D-24-24 06BCC	ROSS	599665.9	3471480.0	4732.77	4/16/1987	30056	375.00	4357.77	1328.25	1328.25	1313.01	4357.77	4307.77	Well 55
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	10/18/1988	30607	268.89	4460.37	1359.52	1362.23	1343.94	4469.26	4409.26	CQ Database - 021312
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	1/11/1989	30692	265.00	4464.26	1360.71	1362.23	1343.94	4469.26	4409.26	Well 55
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	2/8/1989	30720	269.14	4460.12	1359.45	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	3/9/1989	30749	269.39	4459.87	1359.37	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	4/18/1989	30789	269.44	4459.82	1359.35	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	5/19/1989	30820	269.47	4459.79	1359.34	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	6/19/1989	30851	269.82	4459.44	1359.24	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	7/20/1989	30882	270.09	4459.17	1359.16	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	9/6/1989	30930	270.54	4458.72	1359.02	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	10/22/1989	30976	269.89	4459.37	1359.22	1362.23	1343.94	4469.26	4409.26	CQ Database - 021312
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	11/6/1989	30991	268.23	4461.03	1359.72	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	12/1/1989	31016	267.03	4462.23	1360.09	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	2/1/1990	31078	267.25	4462.01	1360.02	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	4/1/1990	31137	267.70	4461.56	1359.88	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	6/25/1996	33414	283.49	4445.77	1355.07	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	10/29/1996	33540	284.14	4445.12	1354.87	1362.23	1343.94	4469.26	4409.26	CQ Database - 021312
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	6/1/1999	34485	284.90	4444.36	1354.64	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	6/30/1999	34514	284.90	4444.36	1354.64	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	3/1/2000	34759	285.50	4443.76	1354.46	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	6/1/2000	34851	286.00	4443.26	1354.31	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	9/1/2000	34943	286.40	4442.86	1354.18	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	12/1/2000	35034	286.90	4442.36	1354.03	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	2/1/2001	35096	287.15	4442.11	1353.96	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	6/1/2001	35216	287.60	4441.66	1353.82	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	10/1/2001	35338	288.20	4441.06	1353.64	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	2/1/2002	35461	288.80	4440.46	1353.45	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	6/1/2002	35581	289.20	4440.06	1353.33	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	9/1/2002	35673	289.40	4439.86	1353.27	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	11/1/2002	35734	289.60	4439.66	1353.21	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	5/1/2006	37011	294.70	4434.56	1351.65	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	8/1/2006	37103	295.00	4434.26	1351.56	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	11/1/2006	37195	295.00	4434.26	1351.56	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	2/1/2007	37287	295.00	4434.26	1351.56	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	6/1/2007	37407	295.00	4434.26	1351.56	1362.23	1343.94	4469.26	4409.26	FMICQB
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	12/1/2007	37590	295.00	4434.26	1351.56	1362.23	1343.94	4469.26	4409.26	FMICQB

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	2/27/2008	37678	294.90	4434.36	1351.59	1362.23	1343.94	4469.26	4409.26	CQ Database - 021312
522699	D-24-24 06BCC	TM-15 MILLER	599617.3	3471427.5	4729.26	2/26/2009	38043	295.11	4434.15	1351.53	1362.23	1343.94	4469.26	4409.26	CQ Database - 021312
219449	D-24-24 07BCB	ECHAVE	599698.0	3470167.1	4648.00	2/1/2012	39113	216.71	4431.29	1350.66	1334.02	1309.64	4376.72	4296.72	2012 Q4 CQB Groundwater Tables.xls
219449	D-24-24 07BCB	ECHAVE	599698.0	3470167.1	4648.00	10/9/2012	39364	216.71	4431.29	1350.66	1334.02	1309.64	4376.72	4296.72	2012 Q4 CQB Groundwater Tables.xls
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	10/18/1988	30607	171.97	4471.51	1362.92	1365.04	1349.80	4478.48	4428.48	CQ Database - 021312
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	1/12/1989	30693	178.00	4465.48	1361.08	1365.04	1349.80	4478.48	4428.48	Well 55
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	3/10/1989	30750	172.52	4470.96	1362.75	1365.04	1349.80	4478.48	4428.48	FMICQB
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	4/18/1989	30789	172.87	4470.61	1362.64	1365.04	1349.80	4478.48	4428.48	FMICQB
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	5/18/1989	30819	172.62	4470.86	1362.72	1365.04	1349.80	4478.48	4428.48	FMICQB
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	6/19/1989	30851	173.65	4469.83	1362.40	1365.04	1349.80	4478.48	4428.48	FMICQB
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	7/18/1989	30880	174.02	4469.46	1362.29	1365.04	1349.80	4478.48	4428.48	FMICQB
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	9/6/1989	30930	174.22	4469.26	1362.23	1365.04	1349.80	4478.48	4428.48	FMICQB
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	10/22/1989	30976	173.72	4469.76	1362.38	1365.04	1349.80	4478.48	4428.48	CQ Database - 021312
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	11/6/1989	30991	177.71	4465.77	1361.17	1365.04	1349.80	4478.48	4428.48	FMICQB
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	1/1/1990	31047	180.95	4462.53	1360.18	1365.04	1349.80	4478.48	4428.48	FMICQB
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	4/1/1990	31137	181.55	4461.93	1360.00	1365.04	1349.80	4478.48	4428.48	FMICQB
522816	D-24-24 07BCB	TM-14 NELSON	599687.6	3470076.0	4643.48	2/8/2008	37659	211.79	4431.69	1350.78	1365.04	1349.80	4478.48	4428.48	CQ Database - 021312
641340	D-24-24 07CAC	MILLER 340	600090.4	3469474.0	4604.00	1/1/1940	12784	150.00	4454.00	1357.58	1357.58	1342.34	4454.00	4404.00	Well 55
641340	D-24-24 07CAC	MILLER 340	600090.4	3469474.0	4604.00	11/20/1985	29544	133.00	4471.00	1362.76	1357.58	1342.34	4454.00	4404.00	Littin 1987
641340	D-24-24 07CAC	MILLER 340	600090.4	3469474.0	4604.00	12/6/1990	31386	137.00	4467.00	1361.54	1357.58	1342.34	4454.00	4404.00	ADWR (GWSI)
641340	D-24-24 07CAC	MILLER 340	600090.4	3469474.0	4604.00	12/5/2001	35403	160.00	4444.00	1354.53	1357.58	1342.34	4454.00	4404.00	ADWR (GWSI)
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	8/22/2008	37855	147.00	4438.02	1352.71	1293.88	1263.40	4245.02	4145.02	Well 55
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	10/2/2008	37896	146.65	4438.37	1352.82	1293.88	1263.40	4245.02	4145.02	2010 Q3 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	2/18/2009	38035	145.97	4439.05	1353.02	1293.88	1263.40	4245.02	4145.02	2010 Q3 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	4/27/2009	38103	146.46	4438.56	1352.87	1293.88	1263.40	4245.02	4145.02	2010 Q3 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	8/4/2009	38202	147.13	4437.89	1352.67	1293.88	1263.40	4245.02	4145.02	2010 Q3 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	10/29/2009	38288	147.68	4437.34	1352.50	1293.88	1263.40	4245.02	4145.02	2010 Q3 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	2/15/2010	38397	147.07	4437.95	1352.69	1293.88	1263.40	4245.02	4145.02	2010 Q3 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	4/16/2010	38457	147.34	4437.68	1352.60	1293.88	1263.40	4245.02	4145.02	2010 Q3 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	7/7/2010	38539	148.28	4436.74	1352.32	1293.88	1263.40	4245.02	4145.02	2010 Q3 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	10/5/2010	38629	148.68	4436.34	1352.20	1293.88	1263.40	4245.02	4145.02	CQ Database - 021312
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	2/14/2011	38761	450.00	4135.02	1260.35	1293.88	1263.40	4245.02	4145.02	CQ Database - 021312
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	5/12/2011	38848	149.66	4435.36	1351.90	1293.88	1263.40	4245.02	4145.02	CQ Database - 021312
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	7/12/2011	38909	150.20	4434.82	1351.73	1293.88	1263.40	4245.02	4145.02	CCA Q4 2011 Monitoring Report
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	12/7/2011	39057	150.30	4434.72	1351.70	1293.88	1263.40	4245.02	4145.02	CCA Q4 2011 Monitoring Report
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	2/3/2012	39115	150.05	4434.97	1351.78	1293.88	1263.40	4245.02	4145.02	2012 Q4 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	4/18/2012	39190	150.70	4434.32	1351.58	1293.88	1263.40	4245.02	4145.02	2012 Q4 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	7/10/2012	39273	151.65	4433.37	1351.29	1293.88	1263.40	4245.02	4145.02	2012 Q4 CQB Groundwater Tables.xls
909552	D-24-24 07DCC	BMO-2008-5M	600445.3	3468994.0	4585.02	10/16/2012	39371	151.77	4433.25	1351.25	1293.88	1263.40	4245.02	4145.02	2012 Q4 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	8/27/2008	37860	145.00	4440.10	1353.34	1354.87	1312.19	4445.10	4305.10	Well 55
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	9/30/2008	37894	145.10	4440.00	1353.31	1354.87	1312.19	4445.10	4305.10	2010 Q3 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	2/18/2009	38035	144.35	4440.75	1353.54	1354.87	1312.19	4445.10	4305.10	2010 Q3 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	4/27/2009	38103	144.78	4440.32	1353.41	1354.87	1312.19	4445.10	4305.10	2010 Q3 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	8/4/2009	38202	145.36	4439.74	1353.23	1354.87	1312.19	4445.10	4305.10	2010 Q3 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	10/29/2009	38288	145.88	4439.22	1353.07	1354.87	1312.19	4445.10	4305.10	2010 Q3 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	2/15/2010	38397	145.42	4439.68	1353.21	1354.87	1312.19	4445.10	4305.10	2010 Q3 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	4/15/2010	38456	145.80	4439.30	1353.10	1354.87	1312.19	4445.10	4305.10	2010 Q3 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	7/7/2010	38539	146.59	4438.51	1352.86	1354.87	1312.19	4445.10	4305.10	2010 Q3 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	10/5/2010	38629	147.00	4438.10	1352.73	1354.87	1312.19	4445.10	4305.10	CQ Database - 021312
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	2/14/2011	38761	285.00	4300.10	1310.67	1354.87	1312.19	4445.10	4305.10	CQ Database - 021312
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	5/12/2011	38848	148.04	4437.06	1352.42	1354.87	1312.19	4445.10	4305.10	CQ Database - 021312
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	7/13/2011	38910	148.31	4436.79	1352.33	1354.87	1312.19	4445.10	4305.10	CCA Q4 2011 Monitoring Report
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	12/7/2011	39057	148.45	4436.65	1352.29	1354.87	1312.19	4445.10	4305.10	CCA Q4 2011 Monitoring Report
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	2/3/2012	39115	148.47	4436.63	1352.28	1354.87	1312.19	4445.10	4305.10	2012 Q4 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	4/18/2012	39190	149.02	4436.08	1352.12	1354.87	1312.19	4445.10	4305.10	2012 Q4 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	7/10/2012	39273	148.65	4436.45	1352.23	1354.87	1312.19	4445.10	4305.10	2012 Q4 CQB Groundwater Tables.xls
909653	D-24-24 07DCC	BMO-2008-5B	600449.7	3468994.4	4585.10	10/16/2012	39371	149.91	4435.19	1351.85	1354.87	1312.19	4445.10	4305.10	2012 Q4 CQB Groundwater Tables.xls
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	9/16/2008	37880	207.00	4442.21	1353.99	1336.61	1275.65	4385.21	4185.21	Well 55
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	10/3/2008	37897	206.42	4442.79	1354.16	1336.61	1275.65	4385.21	4185.21	2010 Q3 CQB Groundwater Tables.xls
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	2/17/2009	38034	206.11	4443.10	1354.26	1336.61	1275.65	4385.21	4185.21	2010 Q3 CQB Groundwater Tables.xls
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	5/6/2009	38112	206.32	4442.89	1354.19	1336.61	1275.65	4385.21	4185.21	2010 Q3 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	8/5/2009	38203	206.79	4442.42	1354.05	1336.61	1275.65	4385.21	4185.21	2010 Q3 CQB Groundwater Tables.xls
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	10/28/2009	38287	207.08	4442.13	1353.96	1336.61	1275.65	4385.21	4185.21	2010 Q3 CQB Groundwater Tables.xls
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	2/16/2010	38398	207.26	4441.95	1353.91	1336.61	1275.65	4385.21	4185.21	2010 Q3 CQB Groundwater Tables.xls
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	4/14/2010	38455	207.27	4441.94	1353.90	1336.61	1275.65	4385.21	4185.21	2010 Q3 CQB Groundwater Tables.xls
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	7/6/2010	38538	207.68	4441.53	1353.78	1336.61	1275.65	4385.21	4185.21	2010 Q3 CQB Groundwater Tables.xls
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	2/10/2011	38757	208.51	4440.70	1353.53	1336.61	1275.65	4385.21	4185.21	CQ Database - 021312
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	5/13/2011	38849	208.95	4440.26	1353.39	1336.61	1275.65	4385.21	4185.21	CQ Database - 021312
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	7/15/2011	38912	209.36	4439.85	1353.27	1336.61	1275.65	4385.21	4185.21	CCA Q4 2011 Monitoring Report
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	2/9/2012	39121	209.78	4439.43	1353.14	1336.61	1275.65	4385.21	4185.21	2012 Q4 CQB Groundwater Tables.xls
909551	D-24-24 08BCA	BMO-2008-13B	601580.0	3469829.0	4649.21	7/11/2012	39274	210.60	4438.61	1352.89	1336.61	1275.65	4385.21	4185.21	2012 Q4 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	11/17/2008	37942	206.00	4441.15	1353.66	1136.04	1105.56	3727.15	3627.15	Well 55
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	12/3/2008	37958	206.00	4441.15	1353.66	1136.04	1105.56	3727.15	3627.15	2010 Q3 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	2/17/2009	38034	208.74	4438.41	1352.83	1136.04	1105.56	3727.15	3627.15	2010 Q3 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	4/29/2009	38105	208.53	4438.62	1352.89	1136.04	1105.56	3727.15	3627.15	2010 Q3 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	8/5/2009	38203	208.85	4438.30	1352.79	1136.04	1105.56	3727.15	3627.15	2010 Q3 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	10/28/2009	38287	208.91	4438.24	1352.78	1136.04	1105.56	3727.15	3627.15	2010 Q3 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	2/16/2010	38398	209.16	4437.99	1352.70	1136.04	1105.56	3727.15	3627.15	2010 Q3 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	4/13/2010	38454	209.20	4437.95	1352.69	1136.04	1105.56	3727.15	3627.15	2010 Q3 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	7/2/2010	38534	209.30	4437.85	1352.66	1136.04	1105.56	3727.15	3627.15	2010 Q3 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	2/10/2011	38757	210.36	4436.79	1352.33	1136.04	1105.56	3727.15	3627.15	CQ Database - 021312
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	5/13/2011	38849	210.50	4436.65	1352.29	1136.04	1105.56	3727.15	3627.15	CQ Database - 021312
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	7/15/2011	38912	210.67	4436.48	1352.24	1136.04	1105.56	3727.15	3627.15	CCA Q4 2011 Monitoring Report
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	2/6/2012	39118	210.90	4436.25	1352.17	1136.04	1105.56	3727.15	3627.15	2012 Q4 CQB Groundwater Tables.xls
909760	D-24-24 08BCA	BMO-2008-13M	601483.6	3470094.0	4647.15	8/13/2012	39307	211.42	4435.73	1352.01	1136.04	1105.56	3727.15	3627.15	2012 Q4 CQB Groundwater Tables.xls
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	10/18/1988	30607	155.86	4461.43	1359.84	1364.68	1346.39	4477.29	4417.29	CQ Database - 021312
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	1/5/1989	30686	152.00	4465.29	1361.02	1364.68	1346.39	4477.29	4417.29	Well 55
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	2/1/1989	30713	155.91	4461.38	1359.83	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	3/2/1989	30742	156.36	4460.93	1359.69	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	4/17/1989	30788	156.76	4460.53	1359.57	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	5/17/1989	30818	156.66	4460.63	1359.60	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	6/19/1989	30851	157.56	4459.73	1359.33	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	7/18/1989	30880	157.96	4459.33	1359.20	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	9/6/1989	30930	158.71	4458.58	1358.98	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	10/22/1989	30976	158.36	4458.93	1359.08	1364.68	1346.39	4477.29	4417.29	CQ Database - 021312
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	11/6/1989	30991	157.35	4459.94	1359.39	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	1/1/1990	31047	156.43	4460.86	1359.67	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	4/1/1990	31137	157.27	4460.02	1359.41	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	1/26/1994	32533	171.56	4445.73	1355.06	1364.68	1346.39	4477.29	4417.29	WMC-WAPP
522698	D-24-24 08BCC	TM-13 MILLER	601283.9	3469891.0	4617.29	11/29/2001	35397	183.00	4434.29	1351.57	1364.68	1346.39	4477.29	4417.29	ADWR (GWSI)
647003	D-24-24 08BCD	KENNEDY	601485.9	3469892.0	4638.25	6/9/1982	28284	60.00	4578.25	1395.45	1413.74	1380.21	4638.25	4528.25	Well 55
616436	D-24-24 08CBA	ASLD	601488.2	3469690.0	4628.00	7/15/1920	5675	110.00	4518.00	1377.09	1380.13	1364.89	4528.00	4478.00	Well 55
616436	D-24-24 08CBA	ASLD	601488.2	3469690.0	4628.00	11/19/1985	29543	135.00	4493.00	1369.47	1380.13	1364.89	4528.00	4478.00	Littin 1987
616436	D-24-24 08CBA	ASLD	601488.2	3469690.0	4628.00	5/19/1988	30455	160.35	4467.65	1361.74	1380.13	1364.89	4528.00	4478.00	WMC-WAPP
616436	D-24-24 08CBA	ASLD	601488.2	3469690.0	4628.00	12/5/1990	31385	153.00	4475.00	1363.98	1380.13	1364.89	4528.00	4478.00	ADWR (GWSI)
616436	D-24-24 08CBA	ASLD	601488.2	3469690.0	4628.00	12/15/1999	34682	171.00	4457.00	1358.49	1380.13	1364.89	4528.00	4478.00	ADWR (GWSI)
616436	D-24-24 08CBA	ASLD	601488.2	3469690.0	4628.00	11/29/2001	35397	170.00	4458.00	1358.80	1380.13	1364.89	4528.00	4478.00	ADWR (GWSI)
616436	D-24-24 08CBA	ASLD	601488.2	3469690.0	4628.00	11/28/2006	37222	170.00	4458.00	1358.80	1380.13	1364.89	4528.00	4478.00	ADWR (GWSI)
525548	D-24-24 08DAC	TM-30	602500.4	3469496.0	4635.89	9/25/1989	30949	162.00	4473.89	1363.64	1243.86	1199.66	4080.89	3935.89	Well 55
525548	D-24-24 08DAC	TM-30	602500.4	3469496.0	4635.89	10/22/1989	30976	157.89	4478.00	1364.89	1243.86	1199.66	4080.89	3935.89	CQ Database - 021312
525548	D-24-24 08DAC	TM-30	602500.4	3469496.0	4635.89	11/6/1989	30991	161.50	4474.39	1363.79	1243.86	1199.66	4080.89	3935.89	WMC-WAPP
525548	D-24-24 08DAC	TM-30	602500.4	3469496.0	4635.89	11/7/1989	30992	162.82	4473.07	1363.39	1243.86	1199.66	4080.89	3935.89	WMC-WAPP
525558	D-24-24 08DAC	TM-30A	602500.4	3469496.0	4636.92	9/13/1989	30937	163.00	4473.92	1363.65	1244.17	1199.97	4081.92	3936.92	Well 55
525558	D-24-24 08DAC	TM-30A	602500.4	3469496.0	4636.92	10/1/1989	30955	162.00	4474.92	1363.96	1244.17	1199.97	4081.92	3936.92	WMC-WAPP
525558	D-24-24 08DAC	TM-30A	602500.4	3469496.0	4636.92	11/1/1989	30986	160.20	4476.72	1364.50	1244.17	1199.97	4081.92	3936.92	WMC-WAPP
525558	D-24-24 08DAC	TM-30A	602500.4	3469496.0	4636.92	11/7/1989	30992	160.37	4476.55	1364.45	1244.17	1199.97	4081.92	3936.92	WMC-WAPP
525558	D-24-24 08DAC	TM-30A	602500.4	3469496.0	4636.92	4/1/1990	31137	161.30	4475.62	1364.17	1244.17	1199.97	4081.92	3936.92	WMC-WAPP
525559	D-24-24 08DAC	TM-30B	602500.4	3469496.0	4636.74	9/26/1989	30950	180.00	4456.74	1358.41	1367.86	1349.27	4487.74	4426.74	Well 55
525559	D-24-24 08DAC	TM-30B	602500.4	3469496.0	4636.74	11/7/1989	30992	164.57	4472.17	1363.12	1367.86	1349.27	4487.74	4426.74	WMC-WAPP
525559	D-24-24 08DAC	TM-30B	602500.4	3469496.0	4636.74	12/1/1989	31016	165.00	4471.74	1362.99	1367.86	1349.27	4487.74	4426.74	WMC-WAPP
525559	D-24-24 08DAC	TM-30B	602500.4	3469496.0	4636.74	3/1/1990	31106	166.11	4470.63	1362.65	1367.86	1349.27	4487.74	4426.74	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	10/18/1988	30607	153.82	4473.50	1363.52	1364.69	1346.40	4477.32	4417.32	CQ Database - 021312

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	11/16/1988	30636	158.00	4469.32	1362.25	1364.69	1346.40	4477.32	4417.32	Well 55
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/30/1989	30711	154.87	4472.45	1363.20	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	3/1/1989	30741	155.42	4471.90	1363.04	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	4/7/1989	30778	155.57	4471.75	1362.99	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	5/2/1989	30803	155.82	4471.50	1362.91	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	6/9/1989	30841	156.42	4470.90	1362.73	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	7/13/1989	30875	156.97	4470.35	1362.56	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	9/6/1989	30930	157.67	4469.65	1362.35	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	10/22/1989	30976	156.82	4470.50	1362.61	1364.69	1346.40	4477.32	4417.32	CQ Database - 021312
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	11/6/1989	30991	157.50	4469.82	1362.40	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	12/1/1989	31016	157.60	4469.72	1362.37	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/1/1990	31047	157.30	4470.02	1362.46	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/31/1990	31077	163.26	4464.06	1360.65	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	2/1/1990	31078	157.40	4469.92	1362.43	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	3/8/1990	31113	159.71	4467.61	1361.73	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	4/4/1990	31140	160.06	4467.26	1361.62	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	7/30/1990	31257	161.52	4465.80	1361.18	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	10/19/1990	31338	162.31	4465.01	1360.94	1364.69	1346.40	4477.32	4417.32	CQ Database - 021312
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	12/4/1990	31384	157.00	4470.32	1362.55	1364.69	1346.40	4477.32	4417.32	ADWR (GWSI)
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/31/1991	31442	163.26	4464.06	1360.65	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	4/16/1991	31517	163.86	4463.46	1360.46	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	6/24/1991	31586	164.61	4462.71	1360.23	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	6/27/1991	31589	164.61	4462.71	1360.23	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	7/16/1991	31608	164.86	4462.46	1360.16	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	10/14/1991	31698	165.86	4461.46	1359.85	1364.69	1346.40	4477.32	4417.32	CQ Database - 021312
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/15/1992	31791	166.66	4460.66	1359.61	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	4/6/1992	31873	167.26	4460.06	1359.43	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/11/1993	32153	169.51	4457.81	1358.74	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/24/1993	32166	172.31	4455.01	1357.89	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	4/19/1993	32251	170.11	4457.21	1358.56	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	7/21/1993	32344	170.86	4456.46	1358.33	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	10/19/1993	32434	171.76	4455.56	1358.05	1364.69	1346.40	4477.32	4417.32	CQ Database - 021312
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	11/23/1993	32469	171.86	4455.46	1358.02	1364.69	1346.40	4477.32	4417.32	CQ Database - 021312
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/4/1994	32511	172.16	4455.16	1357.93	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/24/1994	32531	172.26	4455.06	1357.90	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	4/12/1994	32609	172.76	4454.56	1357.75	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	7/19/1994	32707	173.56	4453.76	1357.51	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	10/18/1994	32798	174.31	4453.01	1357.28	1364.69	1346.40	4477.32	4417.32	CQ Database - 021312
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	1/17/1995	32889	174.86	4452.46	1357.11	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	10/17/1995	33162	176.86	4450.46	1356.50	1364.69	1346.40	4477.32	4417.32	CQ Database - 021312
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	6/25/1996	33414	178.76	4448.56	1355.92	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	8/22/1996	33472	178.81	4448.51	1355.91	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	9/25/1996	33506	179.66	4447.66	1355.65	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	10/29/1996	33540	179.71	4447.61	1355.63	1364.69	1346.40	4477.32	4417.32	CQ Database - 021312
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	9/1/2005	36769	196.95	4430.37	1350.38	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	11/1/2005	36830	198.30	4429.02	1349.97	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	2/1/2006	36922	197.00	4430.32	1350.36	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	5/1/2006	37011	196.40	4430.92	1350.54	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	8/1/2006	37103	197.00	4430.32	1350.36	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	11/1/2006	37195	197.70	4429.62	1350.15	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	2/1/2007	37287	198.00	4429.32	1350.06	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	6/1/2007	37407	198.50	4428.82	1349.90	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522580	D-24-24 08DDC1	TM-19	602523.7	3469075.7	4627.32	9/1/2007	37499	199.50	4427.82	1349.60	1364.69	1346.40	4477.32	4417.32	WMC-WAPP
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	11/17/1988	30637	153.00	4492.87	1369.43	1237.75	1204.23	4060.87	3950.87	Well 55
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	1/30/1989	30711	160.11	4485.76	1367.26	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	3/1/1989	30741	160.51	4485.36	1367.14	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	4/7/1989	30778	160.96	4484.91	1367.00	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	5/2/1989	30803	161.31	4484.56	1366.89	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	6/9/1989	30841	161.71	4484.16	1366.77	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	7/13/1989	30875	162.21	4483.66	1366.62	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	9/6/1989	30930	162.91	4482.96	1366.41	1237.75	1204.23	4060.87	3950.87	FMICQB

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	10/22/1989	30976	162.41	4483.46	1366.56	1237.75	1204.23	4060.87	3950.87	CQ Database - 021312
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	11/6/1989	30991	157.25	4488.62	1368.13	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	12/1/1989	31016	157.25	4488.62	1368.13	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	1/1/1990	31047	158.00	4487.87	1367.90	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	2/1/1990	31078	157.90	4487.97	1367.93	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	3/1/1990	31106	158.70	4487.17	1367.69	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	4/1/1990	31137	158.70	4487.17	1367.69	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	12/4/1990	31384	156.70	4489.17	1368.30	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	1/4/1994	32511	177.85	4468.02	1361.85	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	6/25/1996	33414	184.52	4461.35	1359.82	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	8/22/1996	33472	185.05	4460.82	1359.66	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	9/25/1996	33506	185.45	4460.42	1359.54	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	10/29/1996	33540	185.45	4460.42	1359.54	1237.75	1204.23	4060.87	3950.87	CQ Database - 021312
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	12/19/1996	33591	185.95	4459.92	1359.38	1237.75	1204.23	4060.87	3950.87	CQ Database - 021312
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	1/29/1997	33632	186.05	4459.82	1359.35	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	2/27/1997	33661	186.15	4459.72	1359.32	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	4/16/1997	33709	186.65	4459.22	1359.17	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	10/10/1997	33886	187.95	4457.92	1358.77	1237.75	1204.23	4060.87	3950.87	CQ Database - 021312
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	1/5/1998	33973	188.55	4457.32	1358.59	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	5/6/1998	34094	182.60	4463.27	1360.40	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	10/1/1998	34242	183.55	4462.32	1360.12	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	1/25/1999	34358	184.60	4461.27	1359.80	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	6/1/1999	34485	185.45	4460.42	1359.54	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	6/30/1999	34514	185.45	4460.42	1359.54	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	3/1/2000	34759	186.20	4459.67	1359.31	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	6/1/2000	34851	186.95	4458.92	1359.08	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	9/1/2000	34943	187.60	4458.27	1358.88	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	12/1/2000	35034	188.00	4457.87	1358.76	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	2/1/2001	35096	188.40	4457.47	1358.64	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	6/1/2001	35216	188.95	4456.92	1358.47	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	10/1/2001	35338	189.55	4456.32	1358.29	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	2/1/2002	35461	190.25	4455.62	1358.07	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	6/1/2002	35581	191.30	4454.57	1357.75	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	9/1/2002	35673	191.50	4454.37	1357.69	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	11/1/2002	35734	191.90	4453.97	1357.57	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	1/1/2003	35795	192.00	4453.87	1357.54	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	5/1/2003	35915	192.40	4453.47	1357.42	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	8/1/2003	36007	192.85	4453.02	1357.28	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	12/1/2003	36129	193.20	4452.67	1357.17	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	2/1/2004	36191	193.80	4452.07	1356.99	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	5/1/2004	36281	194.05	4451.82	1356.91	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	8/1/2004	36373	194.80	4451.07	1356.69	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	11/1/2004	36465	195.70	4450.17	1356.41	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	2/1/2005	36557	195.90	4449.97	1356.35	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	6/1/2005	36677	196.20	4449.67	1356.26	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	9/1/2007	37499	199.50	4446.37	1355.25	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	12/1/2007	37590	198.60	4447.27	1355.53	1237.75	1204.23	4060.87	3950.87	FMICQB
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	3/6/2008	37686	199.85	4446.02	1355.15	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	5/22/2008	37763	199.50	4446.37	1355.25	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	8/6/2008	37839	199.19	4446.68	1355.35	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	11/18/2008	37943	199.46	4446.41	1355.27	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	3/3/2009	38048	199.81	4446.06	1355.16	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	4/22/2009	38098	200.57	4445.30	1354.93	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	8/12/2009	38210	201.46	4444.41	1354.66	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	11/4/2009	38294	201.16	4444.71	1354.75	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	3/10/2010	38420	201.34	4444.53	1354.69	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	4/9/2010	38450	201.55	4444.32	1354.63	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	7/7/2010	38539	202.35	4443.52	1354.38	1237.75	1204.23	4060.87	3950.87	2010 Q3 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	2/14/2011	38761	203.00	4442.87	1354.19	1237.75	1204.23	4060.87	3950.87	CQ Database - 021312
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	7/15/2011	38912	203.30	4442.57	1354.10	1237.75	1204.23	4060.87	3950.87	CCA Q4 2011 Monitoring Report
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	2/2/2012	39114	203.84	4442.03	1353.93	1237.75	1204.23	4060.87	3950.87	2012 Q4 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	7/11/2012	39274	204.75	4441.12	1353.65	1237.75	1204.23	4060.87	3950.87	2012 Q4 CQB Groundwater Tables.xls
522581	D-24-24 08DDC2	TM-19A	602458.7	3469189.8	4645.87	10/16/2012	39371	205.02	4440.85	1353.57	1237.75	1204.23	4060.87	3950.87	2012 Q4 CQB Groundwater Tables.xls
1008	D-24-24 08DDD		602639.8	3469060.2	4640.00	1/1/1951	16802	75.00	4565.00	1391.41	1399.03	1356.36	4590.00	4450.00	
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	10/18/1988	30607	221.55	4492.95	1369.45	1371.45	1356.21	4499.50	4449.50	CQ Database - 021312
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	11/1/1988	30621	219.00	4495.50	1370.23	1371.45	1356.21	4499.50	4449.50	Well 55
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	2/1/1989	30713	223.93	4490.57	1368.73	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	3/2/1989	30742	224.70	4489.80	1368.49	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	4/17/1989	30788	225.60	4488.90	1368.22	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	5/17/1989	30818	225.55	4488.95	1368.23	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	6/23/1989	30855	226.90	4487.60	1367.82	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	7/19/1989	30881	227.30	4487.20	1367.70	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	9/6/1989	30930	228.15	4486.35	1367.44	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	10/22/1989	30976	226.55	4487.95	1367.93	1371.45	1356.21	4499.50	4449.50	CQ Database - 021312
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	11/6/1989	30991	229.55	4484.95	1367.01	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	12/1/1989	31016	226.55	4487.95	1367.93	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	1/1/1990	31047	227.60	4486.90	1367.61	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	2/1/1990	31078	228.20	4486.30	1367.42	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
522569	D-24-24 09AAB	TM-01	604096.2	3470517.0	4714.50	3/1/1990	31106	228.65	4485.85	1367.29	1371.45	1356.21	4499.50	4449.50	WMC-WAPP
525556	D-24-24 09AAB	TM-01B	604096.2	3470517.0	4710.78	9/11/1989	30935	217.00	4493.78	1369.70	1373.67	1355.07	4506.78	4445.78	Well 55
525556	D-24-24 09AAB	TM-01B	604096.2	3470517.0	4710.78	11/6/1989	30991	221.55	4489.23	1368.32	1373.67	1355.07	4506.78	4445.78	WMC-WAPP
525557	D-24-24 09AAB	TM-01A	604096.2	3470517.0	4712.43	9/9/1989	30933	223.00	4489.43	1368.38	1374.17	1355.58	4508.43	4447.43	Well 55
525557	D-24-24 09AAB	TM-01A	604096.2	3470517.0	4712.43	11/6/1989	30991	225.07	4487.36	1367.75	1374.17	1355.58	4508.43	4447.43	WMC-WAPP
525552	D-24-24 09BBC	TM-37	602890.9	3470303.0	4670.86	10/9/1989	30963	190.00	4480.86	1365.77	1282.25	1210.32	4206.86	3970.86	Well 55
525552	D-24-24 09BBC	TM-37	602890.9	3470303.0	4670.86	10/22/1989	30976	198.68	4472.18	1363.12	1282.25	1210.32	4206.86	3970.86	CQ Database - 021312
525552	D-24-24 09BBC	TM-37	602890.9	3470303.0	4670.86	11/7/1989	30992	191.90	4478.96	1365.19	1282.25	1210.32	4206.86	3970.86	WMC-WAPP
525552	D-24-24 09BBC	TM-37	602890.9	3470303.0	4670.86	2/1/1990	31078	192.25	4478.61	1365.08	1282.25	1210.32	4206.86	3970.86	WMC-WAPP
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	3/2/2006	36951	240.00	4443.26	1354.31	1320.78	1302.49	4333.26	4273.26	Well 55
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	2/22/2008	37673	232.47	4450.79	1356.60	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	5/20/2008	37761	233.12	4450.14	1356.40	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	7/30/2008	37832	233.37	4449.89	1356.33	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	10/23/2008	37917	233.62	4449.64	1356.25	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	2/12/2009	38029	234.05	4449.21	1356.12	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	4/21/2009	38097	234.99	4448.27	1355.83	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	7/22/2009	38189	234.34	4448.92	1356.03	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	10/22/2009	38281	234.69	4448.57	1355.92	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	2/4/2010	38386	235.15	4448.11	1355.78	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	4/20/2010	38461	235.47	4447.79	1355.69	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	7/13/2010	38545	235.68	4447.58	1355.62	1320.78	1302.49	4333.26	4273.26	2010 Q3 CQB Groundwater Tables.xls
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	7/14/2011	38911	236.98	4446.28	1355.23	1320.78	1302.49	4333.26	4273.26	CCA Q4 2011 Monitoring Report
903992	D-24-24 09BCA	COB MW-1	603153.3	3469889.9	4683.26	7/12/2012	39275	238.24	4445.02	1354.84	1320.78	1302.49	4333.26	4273.26	2012 Q4 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	5/14/2008	37755	237.00	4451.33	1356.77	1258.31	1227.83	4128.33	4028.33	Well 55
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	7/14/2008	37816	238.31	4450.02	1356.37	1258.31	1227.83	4128.33	4028.33	2010 Q3 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	11/6/2008	37931	239.69	4448.64	1355.95	1258.31	1227.83	4128.33	4028.33	2010 Q3 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	2/18/2009	38035	238.90	4449.43	1356.19	1258.31	1227.83	4128.33	4028.33	2010 Q3 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	5/11/2009	38117	239.03	4449.30	1356.15	1258.31	1227.83	4128.33	4028.33	2010 Q3 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	8/6/2009	38204	239.17	4449.16	1356.10	1258.31	1227.83	4128.33	4028.33	2010 Q3 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	10/27/2009	38286	239.55	4448.78	1355.99	1258.31	1227.83	4128.33	4028.33	2010 Q3 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	2/17/2010	38399	239.98	4448.35	1355.86	1258.31	1227.83	4128.33	4028.33	2010 Q3 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	4/15/2010	38456	240.13	4448.20	1355.81	1258.31	1227.83	4128.33	4028.33	2010 Q3 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	7/6/2010	38538	240.28	4448.05	1355.77	1258.31	1227.83	4128.33	4028.33	2010 Q3 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	2/14/2011	38761	241.26	4447.07	1355.47	1258.31	1227.83	4128.33	4028.33	CQ Database - 021312
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	7/15/2011	38912	241.81	4446.52	1355.30	1258.31	1227.83	4128.33	4028.33	CCA Q4 2011 Monitoring Report
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	1/30/2012	39111	242.44	4445.89	1355.11	1258.31	1227.83	4128.33	4028.33	2012 Q4 CQB Groundwater Tables.xls
908794	D-24-24 09BCA	BMO-2008-7M	603099.2	3470029.3	4688.33	7/11/2012	39274	243.00	4445.33	1354.94	1258.31	1227.83	4128.33	4028.33	2012 Q4 CQB Groundwater Tables.xls
525553	D-24-24 09CAA	TM-38	603502.4	3469707.0	4667.97	10/3/1989	30957	186.00	4481.97	1366.10	1308.50	1209.44	4292.97	3967.97	Well 55
525553	D-24-24 09CAA	TM-38	603502.4	3469707.0	4667.97	10/22/1989	30976	190.52	4477.45	1364.73	1308.50	1209.44	4292.97	3967.97	CQ Database - 021312
525553	D-24-24 09CAA	TM-38	603502.4	3469707.0	4667.97	11/6/1989	30991	188.93	4479.04	1365.21	1308.50	1209.44	4292.97	3967.97	WMC-WAPP
525553	D-24-24 09CAA	TM-38	603502.4	3469707.0	4667.97	2/1/1990	31078	188.75	4479.22	1365.27	1308.50	1209.44	4292.97	3967.97	WMC-WAPP
509394	D-24-24 09CBC	509394	602902.9	3469500.0	4670.00	12/10/1985	29564	149.00	4521.00	1378.00	1421.44	1421.44	4663.53	4663.53	Littin 1987
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	9/15/2010	38609	264.13	4482.03	1366.12	1364.64	1333.85	4477.16	4376.16	CQ Database - 021312
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	11/11/2010	38666	263.94	4482.22	1366.18	1364.64	1333.85	4477.16	4376.16	CQ Database - 021312

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	2/10/2011	38757	380.00	4366.16	1330.81	1364.64	1333.85	4477.16	4376.16	CQ Database - 021312
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	5/12/2011	38848	266.90	4479.26	1365.28	1364.64	1333.85	4477.16	4376.16	CQ Database - 021312
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	5/13/2011	38849	266.97	4479.19	1365.26	1364.64	1333.85	4477.16	4376.16	CQ Database - 021312
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	7/14/2011	38911	268.05	4478.11	1364.93	1364.64	1333.85	4477.16	4376.16	CCA Q4 2011 Monitoring Report
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	12/13/2011	39063	270.98	4475.18	1364.03	1364.64	1333.85	4477.16	4376.16	CCA Q4 2011 Monitoring Report
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	1/30/2012	39111	271.50	4474.66	1363.88	1364.64	1333.85	4477.16	4376.16	2012 Q4 CQB Groundwater Tables.xls
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	4/18/2012	39190	272.31	4473.85	1363.63	1364.64	1333.85	4477.16	4376.16	2012 Q4 CQB Groundwater Tables.xls
219958	D-24-24 10AAB	BMO-2010-2M	605685.5	3470564.6	4746.16	7/9/2012	39272	273.20	4472.96	1363.36	1364.64	1333.85	4477.16	4376.16	2012 Q4 CQB Groundwater Tables.xls
219957	D-24-24 10ACD	BMO-2010-1M	605581.3	3469935.8	4718.55	9/7/2010	38601	224.13	4494.42	1369.90	1304.10	1273.62	4278.55	4178.55	CQ Database - 021312
219957	D-24-24 10ACD	BMO-2010-1M	605581.3	3469935.8	4718.55	11/11/2010	38666	222.97	4495.58	1370.25	1304.10	1273.62	4278.55	4178.55	CQ Database - 021312
219957	D-24-24 10ACD	BMO-2010-1M	605581.3	3469935.8	4718.55	2/11/2011	38758	222.01	4496.54	1370.55	1304.10	1273.62	4278.55	4178.55	CQ Database - 021312
219957	D-24-24 10ACD	BMO-2010-1M	605581.3	3469935.8	4718.55	5/12/2011	38848	223.08	4495.47	1370.22	1304.10	1273.62	4278.55	4178.55	CQ Database - 021312
219957	D-24-24 10ACD	BMO-2010-1M	605581.3	3469935.8	4718.55	8/31/2011	38959	224.38	4494.17	1369.82	1304.10	1273.62	4278.55	4178.55	CCA Q4 2011 Monitoring Report
219957	D-24-24 10ACD	BMO-2010-1M	605581.3	3469935.8	4718.55	12/13/2011	39063	222.86	4495.69	1370.29	1304.10	1273.62	4278.55	4178.55	CCA Q4 2011 Monitoring Report
219957	D-24-24 10ACD	BMO-2010-1M	605581.3	3469935.8	4718.55	2/8/2012	39120	222.97	4495.58	1370.25	1304.10	1273.62	4278.55	4178.55	2012 Q4 CQB Groundwater Tables.xls
219957	D-24-24 10ACD	BMO-2010-1M	605581.3	3469935.8	4718.55	4/24/2012	39196	223.87	4494.68	1369.98	1304.10	1273.62	4278.55	4178.55	2012 Q4 CQB Groundwater Tables.xls
219957	D-24-24 10ACD	BMO-2010-1M	605581.3	3469935.8	4718.55	7/9/2012	39272	225.05	4493.50	1369.62	1304.10	1273.62	4278.55	4178.55	2012 Q4 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/18/1988	30607	85.10	4632.61	1412.02	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	12/15/1988	30665	75.00	4642.71	1415.10	1418.15	1402.91	4652.71	4602.71	Well 55
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/27/1989	30708	85.15	4632.56	1412.00	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	3/1/1989	30741	81.24	4636.47	1413.20	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	4/6/1989	30777	81.44	4636.27	1413.14	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	5/3/1989	30804	81.54	4636.17	1413.10	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	6/1/1989	30833	81.64	4636.07	1413.07	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/13/1989	30875	81.87	4635.84	1413.00	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	8/8/1989	30901	82.04	4635.67	1412.95	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	9/8/1989	30932	84.29	4633.42	1412.27	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/11/1989	30965	83.94	4633.77	1412.37	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/22/1989	30976	81.50	4636.21	1413.12	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/6/1989	30991	84.02	4633.69	1412.35	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/9/1989	30994	82.84	4634.87	1412.71	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/13/1989	30998	84.02	4633.69	1412.35	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	12/7/1989	31022	84.04	4633.67	1412.34	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/4/1990	31050	84.14	4633.57	1412.31	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/7/1990	31084	84.24	4633.47	1412.28	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	3/7/1990	31112	84.34	4633.37	1412.25	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	4/3/1990	31139	84.44	4633.27	1412.22	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/11/1990	31238	84.79	4632.92	1412.11	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/17/1990	31336	85.14	4632.57	1412.01	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	12/4/1990	31384	74.00	4643.71	1415.40	1418.15	1402.91	4652.71	4602.71	ADWR (GWSI)
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/29/1991	31440	85.44	4632.27	1411.92	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	4/16/1991	31517	84.74	4632.97	1412.13	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/16/1991	31608	86.14	4631.57	1411.70	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/14/1991	31698	85.04	4632.67	1412.04	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/15/1992	31791	86.74	4630.97	1411.52	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	4/6/1992	31873	87.09	4630.62	1411.41	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/11/1993	32153	88.14	4629.57	1411.09	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	4/19/1993	32251	88.54	4629.17	1410.97	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/21/1993	32344	88.84	4628.87	1410.88	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/19/1993	32434	89.44	4628.27	1410.70	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/5/1994	32512	89.44	4628.27	1410.70	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/24/1994	32531	89.64	4628.07	1410.64	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	4/12/1994	32609	89.84	4627.87	1410.57	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/19/1994	32707	90.24	4627.47	1410.45	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/17/1995	32889	90.54	4627.17	1410.36	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	4/18/1995	32980	90.04	4627.67	1410.51	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/27/1995	33080	90.14	4627.57	1410.48	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/17/1995	33162	90.24	4627.47	1410.45	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	6/25/1996	33414	90.54	4627.17	1410.36	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	8/22/1996	33472	90.54	4627.17	1410.36	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	9/25/1996	33506	90.14	4627.57	1410.48	1418.15	1402.91	4652.71	4602.71	FMICQB

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/29/1996	33540	89.89	4627.82	1410.56	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	12/19/1996	33591	89.54	4628.17	1410.67	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/29/1997	33632	89.44	4628.27	1410.70	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/27/1997	33661	89.39	4628.32	1410.71	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	4/16/1997	33709	89.49	4628.22	1410.68	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/1/1997	33785	89.64	4628.07	1410.64	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/10/1997	33886	89.89	4627.82	1410.56	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/6/1997	33913	89.94	4627.77	1410.54	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/5/1998	33973	89.74	4627.97	1410.61	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	5/6/1998	34094	82.30	4635.41	1412.87	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/1/1998	34242	81.50	4636.21	1413.12	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/25/1999	34358	80.65	4637.06	1413.38	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	6/1/1999	34485	80.80	4636.91	1413.33	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	6/30/1999	34514	80.80	4636.91	1413.33	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	3/1/2000	34759	79.25	4638.46	1413.80	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	6/1/2000	34851	78.55	4639.16	1414.02	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	9/1/2000	34943	77.65	4640.06	1414.29	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	12/1/2000	35034	77.10	4640.61	1414.46	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/1/2001	35096	76.95	4640.76	1414.50	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	6/1/2001	35216	76.55	4641.16	1414.63	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	10/1/2001	35338	76.20	4641.51	1414.73	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/1/2002	35461	76.00	4641.71	1414.79	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	6/1/2002	35581	76.45	4641.26	1414.66	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	9/1/2002	35673	76.50	4641.21	1414.64	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/1/2002	35734	76.60	4641.11	1414.61	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	1/1/2003	35795	76.60	4641.11	1414.61	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	5/1/2003	35915	77.30	4640.41	1414.40	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	8/1/2003	36007	77.85	4639.86	1414.23	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	12/1/2003	36129	78.10	4639.61	1414.15	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/1/2004	36191	78.45	4639.26	1414.05	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	5/1/2004	36281	78.80	4638.91	1413.94	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	8/1/2004	36373	79.00	4638.71	1413.88	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/1/2004	36465	79.30	4638.41	1413.79	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/1/2005	36557	79.50	4638.21	1413.73	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	6/1/2005	36677	79.80	4637.91	1413.63	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	9/1/2005	36769	79.75	4637.96	1413.65	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/1/2005	36830	79.75	4637.96	1413.65	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/1/2006	36922	79.90	4637.81	1413.60	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	5/1/2006	37011	80.30	4637.41	1413.48	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	8/1/2006	37103	77.85	4639.86	1414.23	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/1/2006	37195	80.80	4636.91	1413.33	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/1/2007	37287	80.75	4636.96	1413.35	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	6/1/2007	37407	80.80	4636.91	1413.33	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	9/1/2007	37499	80.90	4636.81	1413.30	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	12/1/2007	37590	80.90	4636.81	1413.30	1418.15	1402.91	4652.71	4602.71	FMICQB
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	3/5/2008	37685	81.00	4636.71	1413.27	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	5/22/2008	37763	81.24	4636.47	1413.20	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	8/6/2008	37839	81.65	4636.06	1413.07	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/5/2008	37930	81.75	4635.96	1413.04	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/20/2009	38037	81.88	4635.83	1413.00	1418.15	1402.91	4652.71	4602.71	CQ Database - 021312
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	2/26/2009	38043	81.88	4635.83	1413.00	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	5/13/2009	38119	82.01	4635.70	1412.96	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	8/19/2009	38217	82.37	4635.34	1412.85	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	11/10/2009	38300	82.83	4634.88	1412.71	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	3/2/2010	38412	83.09	4634.62	1412.63	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	4/14/2010	38455	83.22	4634.49	1412.59	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/2/2010	38534	83.51	4634.20	1412.50	1418.15	1402.91	4652.71	4602.71	2010 Q3 CQB Groundwater Tables.xls
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/14/2011	38911	80.41	4637.30	1413.45	1418.15	1402.91	4652.71	4602.71	CCA Q4 2011 Monitoring Report
522578	D-24-24 10ACD	TM-16	605588.3	3469842.1	4717.71	7/9/2012	39272	72.55	4645.16	1415.84	1418.15	1402.91	4652.71	4602.71	2012 Q4 CQB Groundwater Tables.xls
525554	D-24-24 10CBD	TM-39	604709.7	3469520.0	4671.51	10/22/1989	30976	184.00	4487.51	1367.79	1387.91	1294.64	4553.51	4247.51	Well 55
525554	D-24-24 10CBD	TM-39	604709.7	3469520.0	4671.51	11/6/1989	30991	157.19	4514.32	1375.96	1387.91	1294.64	4553.51	4247.51	WMC-WAPP

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
525554	D-24-24 10CBD	TM-39	604709.7	3469520.0	4671.51	12/1/1989	31016	157.70	4513.81	1375.81	1387.91	1294.64	4553.51	4247.51	WMC-WAPP
525554	D-24-24 10CBD	TM-39	604709.7	3469520.0	4671.51	3/1/1990	31106	158.87	4512.64	1375.45	1387.91	1294.64	4553.51	4247.51	WMC-WAPP
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	10/1/1959	19997	96.00	4590.34	1399.14	1397.92	1367.44	4586.34	4486.34	Well 55
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	11/19/1985	29543	133.00	4553.34	1387.86	1397.92	1367.44	4586.34	4486.34	Littin 1987
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	6/22/1988	30489	133.05	4553.29	1387.84	1397.92	1367.44	4586.34	4486.34	FMICQB
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	12/5/1990	31385	135.00	4551.34	1387.25	1397.92	1367.44	4586.34	4486.34	ADWR (GWSI)
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	12/4/2001	35402	151.00	4535.34	1382.37	1397.92	1367.44	4586.34	4486.34	ADWR (GWSI)
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	12/5/2006	37229	158.00	4528.34	1380.24	1397.92	1367.44	4586.34	4486.34	ADWR (GWSI)
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	5/12/2008	37753	81.38	4604.96	1403.59	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	7/24/2008	37826	82.20	4604.14	1403.34	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	10/13/2008	37907	81.82	4604.52	1403.46	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	1/22/2009	38008	82.33	4604.01	1403.30	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	4/9/2009	38085	82.84	4603.50	1403.15	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	7/8/2009	38175	86.88	4599.46	1401.92	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	10/6/2009	38265	87.27	4599.07	1401.80	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	1/21/2010	38372	88.54	4597.80	1401.41	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	4/19/2010	38460	89.53	4596.81	1401.11	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	7/20/2010	38552	90.79	4595.55	1400.72	1397.92	1367.44	4586.34	4486.34	2010 Q3 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	10/18/2010	38642	90.33	4596.01	1400.86	1397.92	1367.44	4586.34	4486.34	CQ Database - 021312
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	1/19/2011	38735	90.34	4596.00	1400.86	1397.92	1367.44	4586.34	4486.34	CQ Database - 021312
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	4/5/2011	38811	91.05	4595.29	1400.64	1397.92	1367.44	4586.34	4486.34	CQ Database - 021312
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	7/12/2011	38909	92.07	4594.27	1400.33	1397.92	1367.44	4586.34	4486.34	CCA Q4 2011 Monitoring Report
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	10/10/2011	38999	93.11	4593.23	1400.02	1397.92	1367.44	4586.34	4486.34	CCA Q4 2011 Monitoring Report
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	1/31/2012	39112	93.68	4592.66	1399.84	1397.92	1367.44	4586.34	4486.34	2012 Q4 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	4/12/2012	39184	94.19	4592.15	1399.69	1397.92	1367.44	4586.34	4486.34	2012 Q4 CQB Groundwater Tables.xls
644927	D-24-24 10DCB	DODSON	605594.6	3469063.8	4686.34	10/4/2012	39359	97.80	4588.54	1398.59	1397.92	1367.44	4586.34	4486.34	2012 Q4 CQB Groundwater Tables.xls
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	2/7/2009	38024	200.00	4493.68	1369.67	1313.29	1295.00	4308.68	4248.68	Well 55
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	2/18/2009	38035	299.30	4394.38	1339.41	1313.29	1295.00	4308.68	4248.68	2010 Q3 CQB Groundwater Tables.xls
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	3/19/2009	38064	299.30	4394.38	1339.41	1313.29	1295.00	4308.68	4248.68	CQ Database - 021312
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	4/8/2009	38084	301.81	4391.87	1338.64	1313.29	1295.00	4308.68	4248.68	2010 Q3 CQB Groundwater Tables.xls
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	7/7/2009	38174	304.60	4389.08	1337.79	1313.29	1295.00	4308.68	4248.68	2010 Q3 CQB Groundwater Tables.xls
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	10/6/2009	38265	307.84	4385.84	1336.80	1313.29	1295.00	4308.68	4248.68	2010 Q3 CQB Groundwater Tables.xls
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	1/21/2010	38372	311.73	4381.95	1335.62	1313.29	1295.00	4308.68	4248.68	2010 Q3 CQB Groundwater Tables.xls
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	4/20/2010	38461	315.26	4378.42	1334.54	1313.29	1295.00	4308.68	4248.68	2010 Q3 CQB Groundwater Tables.xls
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	7/15/2010	38547	318.32	4375.36	1333.61	1313.29	1295.00	4308.68	4248.68	2010 Q3 CQB Groundwater Tables.xls
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	11/4/2010	38659	349.62	4344.06	1324.07	1313.29	1295.00	4308.68	4248.68	CQ Database - 021312
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	11/14/2010	38669	349.62	4344.06	1324.07	1313.29	1295.00	4308.68	4248.68	CQ Database - 021312
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	1/19/2011	38735	356.89	4336.79	1321.85	1313.29	1295.00	4308.68	4248.68	CQ Database - 021312
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	7/12/2011	38909	364.72	4328.96	1319.47	1313.29	1295.00	4308.68	4248.68	CCA Q4 2011 Monitoring Report
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	2/3/2012	39115	370.84	4322.84	1317.60	1313.29	1295.00	4308.68	4248.68	2012 Q4 CQB Groundwater Tables.xls
218386	D-24-24 10DDB	FLEMING	605714.0	3469330.0	4693.68	7/9/2012	39272	373.86	4319.82	1316.68	1313.29	1295.00	4308.68	4248.68	2012 Q4 CQB Groundwater Tables.xls
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	9/20/1904	-102	173.00	4518.00	1377.09	1331.67	1289.00	4369.00	4229.00	R
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	12/31/1926	8035	216.00	4475.00	1363.98	1331.67	1289.00	4369.00	4229.00	Well 55
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	3/21/1969	23456	180.50	4560.00	1389.89	1331.67	1289.00	4369.00	4229.00	USGS (GWSI)
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	9/22/1977	26563	216.40	4474.60	1363.86	1331.67	1289.00	4369.00	4229.00	USGS (GWSI)
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	11/19/1985	29543	170.00	4521.00	1378.00	1331.67	1289.00	4369.00	4229.00	Littin 1987
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	12/5/1990	31385	197.00	4494.00	1369.77	1331.67	1289.00	4369.00	4229.00	ADWR (GWSI)
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	1/1/1997	33604	450.00	4241.00	1292.66	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	8/1/2000	34912	305.00	4386.00	1336.85	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	10/1/2000	34973	290.00	4401.00	1341.42	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	2/1/2001	35096	315.00	4376.00	1333.80	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	4/1/2004	36251	315.00	4376.00	1333.80	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	9/20/2004	36423	173.00	4518.00	1377.09	1331.67	1289.00	4369.00	4229.00	ADWRGWSI
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	12/1/2004	36495	384.00	4307.00	1312.77	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	10/1/2005	36799	140.00	4551.00	1387.14	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	12/1/2005	36860	344.00	4347.00	1324.97	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	5/8/2008	37749	410.00	4281.00	1304.85	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	6/8/2008	37780	412.00	4279.00	1304.24	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	7/9/2008	37811	411.00	4280.00	1304.54	1331.67	1289.00	4369.00	4229.00	
627685	D-24-24 10DDC	NWC-04 CAPPED	605825.5	3469074.2	4691.00	4/23/2009	38099	130.62	4560.38	1390.00	1331.67	1289.00	4369.00	4229.00	CQ Database - 021312
551849	D-24-24 10DDD	NWC-04	605829.8	3469072.0	4690.77	8/24/1995	33108	375.00	4315.77	1315.45	1265.15	1187.43	4150.77	3895.77	Well 55

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
551849	D-24-24 10DDD	NWC-04	605829.8	3469072.0	4690.77	12/2/2008	37957	352.11	4338.66	1322.42	1265.15	1187.43	4150.77	3895.77	2010 Q3 CQB Groundwater Tables.xls
551849	D-24-24 10DDD	NWC-04	605829.8	3469072.0	4690.77	4/23/2009	38099	328.00	4362.77	1329.77	1265.15	1187.43	4150.77	3895.77	CQ Database - 021312
551849	D-24-24 10DDD	NWC-04	605829.8	3469072.0	4690.77	4/29/2009	38105	328.00	4362.77	1329.77	1265.15	1187.43	4150.77	3895.77	2010 Q3 CQB Groundwater Tables.xls
551849	D-24-24 10DDD	NWC-04	605829.8	3469072.0	4690.77	9/10/2009	38239	324.00	4366.77	1330.99	1265.15	1187.43	4150.77	3895.77	2010 Q3 CQB Groundwater Tables.xls
551849	D-24-24 10DDD	NWC-04	605829.8	3469072.0	4690.77	4/1/2010	38442	216.00	4474.77	1363.91	1265.15	1187.43	4150.77	3895.77	2010 Q3 CQB Groundwater Tables.xls
626702	D-24-24 10DDD	UNION PACIFIC RR	605916.3	3469131.0	4687.58	1/31/1918	4779	216.00	4471.58	1362.94	1367.81	1313.26	4487.58	4308.58	Well 55
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	6/12/1982	28287	300.00	4348.18	1325.33	1355.81	1313.44	4448.18	4309.18	Well 55
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	2/27/2008	37678	208.00	4440.18	1353.37	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	5/12/2008	37753	216.30	4431.88	1350.84	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	7/21/2008	37823	228.95	4419.23	1346.98	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	10/13/2008	37907	228.20	4419.98	1347.21	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	1/21/2009	38007	206.64	4441.54	1353.78	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	4/8/2009	38084	205.50	4442.68	1354.13	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	7/9/2009	38176	235.68	4412.50	1344.93	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	7/22/2009	38189	235.68	4412.50	1344.93	1355.81	1313.44	4448.18	4309.18	CQ Database - 021312
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	10/7/2009	38266	236.71	4411.47	1344.62	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	2/25/2010	38407	216.98	4431.20	1350.63	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	4/20/2010	38461	219.35	4428.83	1349.91	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	7/20/2010	38552	235.60	4412.58	1344.95	1355.81	1313.44	4448.18	4309.18	2010 Q3 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	10/20/2010	38644	230.24	4417.94	1346.59	1355.81	1313.44	4448.18	4309.18	CQ Database - 021312
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	1/17/2011	38733	215.28	4432.90	1351.15	1355.81	1313.44	4448.18	4309.18	CQ Database - 021312
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	4/5/2011	38811	221.68	4426.50	1349.20	1355.81	1313.44	4448.18	4309.18	CQ Database - 021312
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	7/11/2011	38908	237.39	4410.79	1344.41	1355.81	1313.44	4448.18	4309.18	CCA Q4 2011 Monitoring Report
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	10/12/2011	39001	237.34	4410.84	1344.42	1355.81	1313.44	4448.18	4309.18	CCA Q4 2011 Monitoring Report
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	1/31/2012	39112	228.95	4419.23	1346.98	1355.81	1313.44	4448.18	4309.18	2012 Q4 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	4/11/2012	39183	219.39	4428.79	1349.90	1355.81	1313.44	4448.18	4309.18	2012 Q4 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	7/6/2012	39269	232.59	4415.59	1345.87	1355.81	1313.44	4448.18	4309.18	2012 Q4 CQB Groundwater Tables.xls
647987	D-24-24 11000	BANKS 987	606981.9	3469206.2	4648.18	10/4/2012	39359	237.16	4411.02	1344.48	1355.81	1313.44	4448.18	4309.18	2012 Q4 CQB Groundwater Tables.xls
1009	D-24-24 11AAC		607320.7	3470342.9	4700.00	3/29/1970	23829	24.00	4676.00	1425.24	1417.32	1386.84	4650.00	4550.00	
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	11/20/1985	29544	14.30	4697.65	1431.84	1399.02	1357.56	4589.95	4453.95	Littin 1987
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	6/27/1988	30494	61.35	4650.60	1417.50	1399.02	1357.56	4589.95	4453.95	FMICQB
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	8/5/1993	32359	94.00	4617.95	1407.55	1399.02	1357.56	4589.95	4453.95	Well 55
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	5/13/2008	37754	68.65	4643.30	1415.28	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	8/5/2008	37838	69.53	4642.42	1415.01	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	10/16/2008	37910	69.83	4642.12	1414.92	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	1/20/2009	38006	69.23	4642.72	1415.10	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	4/7/2009	38083	69.60	4642.35	1414.99	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	7/8/2009	38175	96.61	4615.34	1406.76	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	8/18/2009	38216	96.61	4615.34	1406.76	1399.02	1357.56	4589.95	4453.95	CQ Database - 021312
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	10/5/2009	38264	75.09	4636.86	1413.31	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	1/21/2010	38372	75.37	4636.58	1413.23	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	4/19/2010	38460	81.59	4630.36	1411.33	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	7/12/2010	38544	83.00	4628.95	1410.90	1399.02	1357.56	4589.95	4453.95	2010 Q3 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	7/12/2011	38909	74.60	4637.35	1413.46	1399.02	1357.56	4589.95	4453.95	CCA Q4 2011 Monitoring Report
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	2/3/2012	39115	74.57	4637.38	1413.47	1399.02	1357.56	4589.95	4453.95	2012 Q4 CQB Groundwater Tables.xls
643436	D-24-24 11ABC	OSBORN	607031.8	3470270.5	4711.95	7/9/2012	39272	74.63	4637.32	1413.46	1399.02	1357.56	4589.95	4453.95	2012 Q4 CQB Groundwater Tables.xls
587749	D-24-24 11ADA	LESNICK	607516.1	3470145.0	4681.60	5/4/2002	35553	350.00	4331.60	1320.27	1317.22	1305.03	4321.60	4281.60	Well 55
643481	D-24-24 11CAC	CAMPBELL	606412.6	3469396.7	4700.00	3/21/1969	23456	180.00	4520.00	1377.70	1402.08	1374.65	4600.00	4510.00	USGS (GWSI)
628546	D-24-24 11CBB	GGOOSE 546	606156.2	3469550.5	4720.00	2/11/1963	21226	143.00	4577.00	1395.07	1307.59	1194.82	4290.00	3920.00	Well 55
628546	D-24-24 11CBB	GGOOSE 546	606156.2	3469550.5	4720.00	11/19/1985	29543	79.80	4640.20	1414.33	1307.59	1194.82	4290.00	3920.00	Littin 1987
628546	D-24-24 11CBB	GGOOSE 546	606156.2	3469550.5	4720.00	5/10/1988	30446	125.05	4594.95	1400.54	1307.59	1194.82	4290.00	3920.00	WMC-WAPP
628546	D-24-24 11CBB	GGOOSE 546	606156.2	3469550.5	4720.00	12/6/1990	31386	139.00	4581.00	1396.29	1307.59	1194.82	4290.00	3920.00	ADWR (GWSI)
628546	D-24-24 11CBB	GGOOSE 546	606156.2	3469550.5	4720.00	12/5/2001	35403	202.00	4518.00	1377.09	1307.59	1194.82	4290.00	3920.00	ADWR (GWSI)
628546	D-24-24 11CBB	GGOOSE 546	606156.2	3469550.5	4720.00	12/5/2006	37229	209.00	4511.00	1374.95	1307.59	1194.82	4290.00	3920.00	ADWR (GWSI)
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	8/18/1961	20684	104.00	4613.11	1406.08	1254.90	1193.94	4117.11	3917.11	Well 55
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	11/19/1985	29543	87.60	4629.51	1411.07	1254.90	1193.94	4117.11	3917.11	Littin 1987
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	5/10/1988	30446	123.62	4593.49	1400.10	1254.90	1193.94	4117.11	3917.11	FMICQB
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	5/21/2008	37762	220.91	4496.20	1370.44	1254.90	1193.94	4117.11	3917.11	2010 Q3 CQB Groundwater Tables.xls
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	8/15/2008	37848	238.48	4478.63	1365.09	1254.90	1193.94	4117.11	3917.11	2010 Q3 CQB Groundwater Tables.xls
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	10/29/2008	37923	235.90	4481.21	1365.87	1254.90	1193.94	4117.11	3917.11	2010 Q3 CQB Groundwater Tables.xls
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	2/24/2009	38041	236.13	4480.98	1365.80	1254.90	1193.94	4117.11	3917.11	2010 Q3 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	5/14/2009	38120	236.17	4480.94	1365.79	1254.90	1193.94	4117.11	3917.11	2010 Q3 CQB Groundwater Tables.xls
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	8/19/2009	38217	236.01	4481.10	1365.84	1254.90	1193.94	4117.11	3917.11	2010 Q3 CQB Groundwater Tables.xls
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	11/11/2009	38301	237.66	4479.45	1365.34	1254.90	1193.94	4117.11	3917.11	2010 Q3 CQB Groundwater Tables.xls
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	3/9/2010	38419	238.84	4478.27	1364.98	1254.90	1193.94	4117.11	3917.11	2010 Q3 CQB Groundwater Tables.xls
628547	D-24-24 11CBD	GGOOSE 547	606256.7	3469820.3	4717.11	4/27/2010	38468	239.17	4477.94	1364.88	1254.90	1193.94	4117.11	3917.11	2010 Q3 CQB Groundwater Tables.xls
085010	D-24-24 11CCC	BARTON 010	606201.1	3469047.5	4688.95	1/1/1981	27760	168.00	4520.95	1377.99	1374.33	1337.75	4508.95	4388.95	Well 55
085010	D-24-24 11CCC	BARTON 010	606201.1	3469047.5	4688.95	5/12/2008	37753	227.50	4461.45	1359.85	1374.33	1337.75	4508.95	4388.95	CQ Database - 021312
644919	D-24-24 11CCC	BARTON 919	606243.9	3469076.7	4692.36	10/30/1968	23314	40.00	4652.36	1418.04	1396.09	1360.13	4580.36	4462.36	WELL 35
644919	D-24-24 11CCC	BARTON 919	606243.9	3469076.7	4692.36	6/2/1982	28277	90.00	4602.36	1402.80	1396.09	1360.13	4580.36	4462.36	Well 55
644919	D-24-24 11CCC	BARTON 919	606243.9	3469076.7	4692.36	5/12/2008	37753	113.71	4578.65	1395.57	1396.09	1360.13	4580.36	4462.36	2010 Q3 CQB Groundwater Tables.xls
644919	D-24-24 11CCC	BARTON 919	606243.9	3469076.7	4692.36	7/23/2008	37825	113.56	4578.80	1395.62	1396.09	1360.13	4580.36	4462.36	2010 Q3 CQB Groundwater Tables.xls
644919	D-24-24 11CCC	BARTON 919	606243.9	3469076.7	4692.36	10/16/2008	37910	113.20	4579.16	1395.73	1396.09	1360.13	4580.36	4462.36	2010 Q3 CQB Groundwater Tables.xls
644919	D-24-24 11CCC	BARTON 919	606243.9	3469076.7	4692.36	3/11/2009	38056	112.92	4579.44	1395.81	1396.09	1360.13	4580.36	4462.36	2010 Q3 CQB Groundwater Tables.xls
644919	D-24-24 11CCC	BARTON 919	606243.9	3469076.7	4692.36	4/10/2009	38086	112.89	4579.47	1395.82	1396.09	1360.13	4580.36	4462.36	2010 Q3 CQB Groundwater Tables.xls
644919	D-24-24 11CCC	BARTON 919	606243.9	3469076.7	4692.36	7/7/2009	38174	112.86	4579.50	1395.83	1396.09	1360.13	4580.36	4462.36	2010 Q3 CQB Groundwater Tables.xls
627696	D-24-24 11D00	NWC-05	606980.1	3469445.6	4680.00	1/1/1960	20089	104.00	4576.00	1394.76	1400.25	1373.12	4594.00	4505.00	Well 55
627696	D-24-24 11D00	NWC-05	606980.1	3469445.6	4680.00	5/1/1960	20210	104.00	4576.00	1394.76	1400.25	1373.12	4594.00	4505.00	
627696	D-24-24 11D00	NWC-05	606980.1	3469445.6	4680.00	5/18/1988	30454	93.96	4586.04	1397.82	1400.25	1373.12	4594.00	4505.00	WMC-WAPP
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	9/19/2002	35691	110.00	4571.73	1393.46	1426.99	1366.03	4681.73	4481.73	Well 55
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	2/13/2008	37664	87.76	4593.97	1400.24	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	5/13/2008	37754	87.21	4594.52	1400.41	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	7/22/2008	37824	86.90	4594.83	1400.50	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	10/16/2008	37910	86.45	4595.28	1400.64	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	1/20/2009	38006	86.26	4595.47	1400.70	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	4/8/2009	38084	86.04	4595.69	1400.77	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	7/7/2009	38174	86.16	4595.57	1400.73	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	10/5/2009	38264	86.19	4595.54	1400.72	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	1/21/2010	38372	86.45	4595.28	1400.64	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	4/19/2010	38460	87.19	4594.54	1400.42	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	7/12/2010	38544	87.55	4594.18	1400.31	1426.99	1366.03	4681.73	4481.73	2010 Q3 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	1/18/2011	38734	87.80	4593.93	1400.23	1426.99	1366.03	4681.73	4481.73	CQ Database - 021312
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	7/12/2011	38909	88.38	4593.35	1400.05	1426.99	1366.03	4681.73	4481.73	CCA Q4 2011 Monitoring Report
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	1/30/2012	39111	88.92	4592.81	1399.89	1426.99	1366.03	4681.73	4481.73	2012 Q4 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	4/11/2012	39183	89.18	4592.55	1399.81	1426.99	1366.03	4681.73	4481.73	2012 Q4 CQB Groundwater Tables.xls
592792	D-24-24 11DAB	DOUGLASS 792	607607.5	3469829.1	4681.73	7/5/2012	39268	95.64	4586.09	1397.84	1426.99	1366.03	4681.73	4481.73	2012 Q4 CQB Groundwater Tables.xls
630852	D-24-24 11DC0	GREGG	607023.8	3469240.0	4660.00	11/19/1985	29543	36.40	4623.60	1409.27	1389.89	1359.41	4560.00	4460.00	Littin 1987
630852	D-24-24 11DC0	GREGG	607023.8	3469240.0	4660.00	7/13/1988	30510	70.37	4589.63	1398.92	1389.89	1359.41	4560.00	4460.00	WMC-WAPP
630852	D-24-24 11DC0	GREGG	607023.8	3469240.0	4660.00	9/2/1988	30561	48.57	4611.43	1405.56	1389.89	1359.41	4560.00	4460.00	WMC-WAPP
212447	D-24-24 11DCC	FULTZ	607153.3	3469063.9	4642.92	6/23/2006	37064	124.00	4518.92	1377.37	1354.20	1323.72	4442.92	4342.92	Well 55
212447	D-24-24 11DCC	FULTZ	607153.3	3469063.9	4642.92	10/22/2008	37916	40.59	4602.33	1402.79	1354.20	1323.72	4442.92	4342.92	2010 Q3 CQB Groundwater Tables.xls
212447	D-24-24 11DCC	FULTZ	607153.3	3469063.9	4642.92	1/21/2009	38007	40.66	4602.26	1402.77	1354.20	1323.72	4442.92	4342.92	2010 Q3 CQB Groundwater Tables.xls
212447	D-24-24 11DCC	FULTZ	607153.3	3469063.9	4642.92	4/9/2009	38085	42.88	4600.04	1402.09	1354.20	1323.72	4442.92	4342.92	2010 Q3 CQB Groundwater Tables.xls
212447	D-24-24 11DCC	FULTZ	607153.3	3469063.9	4642.92	7/13/2009	38180	54.94	4587.98	1398.42	1354.20	1323.72	4442.92	4342.92	2010 Q3 CQB Groundwater Tables.xls
212447	D-24-24 11DCC	FULTZ	607153.3	3469063.9	4642.92	10/8/2009	38267	56.16	4586.76	1398.04	1354.20	1323.72	4442.92	4342.92	2010 Q3 CQB Groundwater Tables.xls
212447	D-24-24 11DCC	FULTZ	607153.3	3469063.9	4642.92	1/25/2010	38376	53.45	4589.47	1398.87	1354.20	1323.72	4442.92	4342.92	2010 Q3 CQB Groundwater Tables.xls
212447	D-24-24 11DCC	FULTZ	607153.3	3469063.9	4642.92	4/20/2010	38461	63.82	4579.10	1395.71	1354.20	1323.72	4442.92	4342.92	2010 Q3 CQB Groundwater Tables.xls
212447	D-24-24 11DCC	FULTZ	607153.3	3469063.9	4642.92	7/14/2010	38546	119.86	4523.06	1378.63	1354.20	1323.72	4442.92	4342.92	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	5/13/2008	37754	44.94	4606.28	1403.99	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	8/5/2008	37838	46.61	4604.61	1403.49	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	10/16/2008	37910	46.60	4604.62	1403.49	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	1/21/2009	38007	47.19	4604.03	1403.31	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	4/8/2009	38084	48.45	4602.77	1402.92	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	7/7/2009	38174	49.41	4601.81	1402.63	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	10/7/2009	38266	50.33	4600.89	1402.35	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	1/26/2010	38377	51.13	4600.09	1402.11	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	4/20/2010	38461	51.24	4599.98	1402.07	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	7/14/2010	38546	51.91	4599.31	1401.87	1387.21	1341.49	4551.22	4401.22	2010 Q3 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	1/18/2011	38734	52.98	4598.24	1401.54	1387.21	1341.49	4551.22	4401.22	CQ Database - 021312
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	7/11/2011	38908	54.44	4596.78	1401.10	1387.21	1341.49	4551.22	4401.22	CCA Q4 2011 Monitoring Report
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	1/31/2012	39112	55.65	4595.57	1400.73	1387.21	1341.49	4551.22	4401.22	2012 Q4 CQB Groundwater Tables.xls
808560	D-24-24 11DCC	STEPHENS	606981.8	3469072.8	4651.22	7/9/2012	39272	10.69	4640.53	1414.43	1387.21	1341.49	4551.22	4401.22	2012 Q4 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	7/6/1982	28311	60.00	4587.91	1398.39	1401.44	1386.20	4597.91	4547.91	Well 55
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	12/5/1990	31385	32.00	4615.91	1406.93	1401.44	1386.20	4597.91	4547.91	ADWR (GWSI)
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	2/15/2008	37666	40.85	4607.06	1404.23	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	5/13/2008	37754	43.82	4604.09	1403.33	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	7/29/2008	37831	45.25	4602.66	1402.89	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	10/22/2008	37916	44.54	4603.37	1403.11	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	1/20/2009	38006	44.31	4603.60	1403.18	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	4/8/2009	38084	44.68	4603.23	1403.06	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	7/9/2009	38176	48.99	4598.92	1401.75	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	10/7/2009	38266	49.87	4598.04	1401.48	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	1/26/2010	38377	47.61	4600.30	1402.17	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	4/20/2010	38461	49.78	4598.13	1401.51	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	7/14/2010	38546	51.36	4596.55	1401.03	1401.44	1386.20	4597.91	4547.91	2010 Q3 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	10/20/2010	38644	49.85	4598.06	1401.49	1401.44	1386.20	4597.91	4547.91	CQ Database - 021312
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	1/17/2011	38733	50.51	4597.40	1401.29	1401.44	1386.20	4597.91	4547.91	CQ Database - 021312
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	4/5/2011	38811	51.84	4596.07	1400.88	1401.44	1386.20	4597.91	4547.91	CQ Database - 021312
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	7/11/2011	38908	55.74	4592.17	1399.69	1401.44	1386.20	4597.91	4547.91	CCA Q4 2011 Monitoring Report
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	10/12/2011	39001	53.63	4594.28	1400.34	1401.44	1386.20	4597.91	4547.91	CCA Q4 2011 Monitoring Report
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	1/31/2012	39112	53.21	4594.70	1400.46	1401.44	1386.20	4597.91	4547.91	2012 Q4 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	4/11/2012	39183	54.50	4593.41	1400.07	1401.44	1386.20	4597.91	4547.91	2012 Q4 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	7/6/2012	39269	58.75	4589.16	1398.78	1401.44	1386.20	4597.91	4547.91	2012 Q4 CQB Groundwater Tables.xls
803772	D-24-24 11DCD	RAY	607194.1	3468878.2	4647.91	10/3/2012	39358	60.98	4586.93	1398.10	1401.44	1386.20	4597.91	4547.91	2012 Q4 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	11/19/1985	29543	11.10	4631.76	1411.76	1369.42	1334.37	4492.86	4377.86	Littin 1987
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	11/15/1989	31000	30.00	4612.86	1406.00	1369.42	1334.37	4492.86	4377.86	Well 55
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	3/11/2008	37691	29.52	4613.34	1406.15	1369.42	1334.37	4492.86	4377.86	2010 Q3 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	5/12/2008	37753	30.64	4612.22	1405.80	1369.42	1334.37	4492.86	4377.86	2010 Q3 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	7/21/2008	37823	25.59	4617.27	1407.34	1369.42	1334.37	4492.86	4377.86	2010 Q3 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	10/14/2008	37908	24.53	4618.33	1407.67	1369.42	1334.37	4492.86	4377.86	2010 Q3 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	1/21/2009	38007	27.35	4615.51	1406.81	1369.42	1334.37	4492.86	4377.86	2010 Q3 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	4/8/2009	38084	29.08	4613.78	1406.28	1369.42	1334.37	4492.86	4377.86	2010 Q3 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	7/9/2009	38176	31.51	4611.35	1405.54	1369.42	1334.37	4492.86	4377.86	2010 Q3 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	10/7/2009	38266	29.92	4612.94	1406.02	1369.42	1334.37	4492.86	4377.86	2010 Q3 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	7/20/2010	38552	50.38	4592.48	1399.79	1369.42	1334.37	4492.86	4377.86	2010 Q3 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	10/20/2010	38644	48.88	4593.98	1400.25	1369.42	1334.37	4492.86	4377.86	CQ Database - 021312
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	1/17/2011	38733	51.13	4591.73	1399.56	1369.42	1334.37	4492.86	4377.86	CQ Database - 021312
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	4/5/2011	38811	53.81	4589.05	1398.74	1369.42	1334.37	4492.86	4377.86	CQ Database - 021312
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	7/11/2011	38908	56.82	4586.04	1397.82	1369.42	1334.37	4492.86	4377.86	CCA Q4 2011 Monitoring Report
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	10/12/2011	39001	37.62	4605.24	1403.68	1369.42	1334.37	4492.86	4377.86	CCA Q4 2011 Monitoring Report
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	1/31/2012	39112	46.80	4596.06	1400.88	1369.42	1334.37	4492.86	4377.86	2012 Q4 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	4/11/2012	39183	52.07	4590.79	1399.27	1369.42	1334.37	4492.86	4377.86	2012 Q4 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	7/6/2012	39269	62.39	4580.47	1396.13	1369.42	1334.37	4492.86	4377.86	2012 Q4 CQB Groundwater Tables.xls
805641	D-24-24 11DCD	EPPELE 641	607165.4	3469229.9	4642.86	10/3/2012	39358	71.66	4571.20	1393.30	1369.42	1334.37	4492.86	4377.86	2012 Q4 CQB Groundwater Tables.xls
805642	D-24-24 11DCD	EPPELE 642	607125.5	3469140.0	4635.18	12/31/1900	-1461	20.00	4615.18	1406.71	1412.80	1400.61	4635.18	4595.18	Well 55
805643	D-24-24 11DCD	EPPELE 643	607125.5	3469140.0	4635.18	11/15/1989	31000	30.00	4605.18	1403.66	1397.56	1362.51	4585.18	4470.18	Well 55
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	9/21/2002	35693	110.00	4593.27	1400.03	1433.56	1372.60	4703.27	4503.27	Well 55
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	2/13/2008	37664	22.11	4681.16	1426.82	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	5/13/2008	37754	24.60	4678.67	1426.06	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	7/22/2008	37824	27.00	4676.27	1425.33	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	10/16/2008	37910	23.60	4679.67	1426.36	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	1/19/2009	38005	26.51	4676.76	1425.48	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	4/8/2009	38084	28.53	4674.74	1424.86	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	7/7/2009	38174	31.04	4672.23	1424.10	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	10/5/2009	38264	31.49	4671.78	1423.96	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	1/21/2010	38372	34.55	4668.72	1423.03	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	4/19/2010	38460	36.40	4666.87	1422.46	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	7/12/2010	38544	36.74	4666.53	1422.36	1433.56	1372.60	4703.27	4503.27	2010 Q3 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	1/18/2011	38734	25.96	4677.31	1425.64	1433.56	1372.60	4703.27	4503.27	CQ Database - 021312
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	1/30/2012	39111	27.72	4675.55	1425.11	1433.56	1372.60	4703.27	4503.27	2012 Q4 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	4/11/2012	39183	29.99	4673.28	1424.42	1433.56	1372.60	4703.27	4503.27	2012 Q4 CQB Groundwater Tables.xls
592791	D-24-24 12BCB	DOUGLASS 791	607633.0	3470222.7	4703.27	7/5/2012	39268	32.67	4670.60	1423.60	1433.56	1372.60	4703.27	4503.27	2012 Q4 CQB Groundwater Tables.xls
578819	D-24-24 12CBC	PALMER 819	607724.4	3469545.0	4662.60	1/10/2000	34708	68.00	4594.60	1400.43	1360.20	1354.10	4462.60	4442.60	Well 55

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
642937	D-24-24 12CBD		607926.1	3469546.0	4657.06	1/1/1925	7306	50.00	4607.06	1404.23	1396.61	1388.99	4582.06	4557.06	Well 55
502527	D-24-24 13BBC	GALLANT	607769.6	3468524.4	4599.58	4/26/1982	28240	25.00	4574.58	1394.33	1389.76	1359.28	4559.58	4459.58	Well 55
502527	D-24-24 13BBC	GALLANT	607769.6	3468524.4	4599.58	11/19/1985	29543	28.10	4571.48	1393.39	1389.76	1359.28	4559.58	4459.58	Littin 1987
502527	D-24-24 13BBC	GALLANT	607769.6	3468524.4	4599.58	2/11/2008	37662	28.32	4571.26	1393.32	1389.76	1359.28	4559.58	4459.58	CQ Database - 021312
502527	D-24-24 13BBC	GALLANT	607769.6	3468524.4	4599.58	7/23/2008	37825	33.05	4566.53	1391.88	1389.76	1359.28	4559.58	4459.58	CQ Database - 021312
502527	D-24-24 13BBC	GALLANT	607769.6	3468524.4	4599.58	3/3/2009	38048	31.59	4567.99	1392.32	1389.76	1359.28	4559.58	4459.58	CQ Database - 021312
502827	D-24-24 13BCC		607734.6	3468339.0	4619.76	6/1/1982	28276	28.00	4591.76	1399.57	1395.91	1365.43	4579.76	4479.76	Well 55
564859	D-24-24 13BDA		608342.1	3468542.0	4643.97	12/10/1997	33947	50.00	4593.97	1400.24	1397.19	1391.10	4583.97	4563.97	Well 55
623280	D-24-24 13CB0		607838.5	3468038.0	4598.85	6/8/1982	28283	33.00	4565.85	1391.67	1386.49	1325.53	4548.85	4348.85	WELL 55
602081	D-24-24 13CCA		607944.4	3467736.0	4597.04	4/1/1968	23102	32.00	4565.04	1391.42	1373.75	1356.98	4507.04	4452.04	Well 55
557737	D-24-24 13CCC		607740.1	3467535.0	4620.87	6/7/1996	33396	30.00	4590.87	1399.30	1390.15	1377.96	4560.87	4520.87	Well 55
807286	D-24-24 13CCC		607740.1	3467535.0	4620.87	12/31/1909	1826	25.00	4595.87	1400.82	1402.35	1386.50	4600.87	4548.87	Well 55
645913	D-24-24 13CDB1		608557.3	3467736.0	4575.00	1/1/1925	7306	50.00	4525.00	1379.22	1379.22	1376.17	4525.00	4515.00	Well 55
645913	D-24-24 13CDB1		608557.3	3467736.0	4575.00	12/5/1990	31385	29.00	4546.00	1385.62	1379.22	1376.17	4525.00	4515.00	ADWR (GWSI)
645913	D-24-24 13CDB1		608557.3	3467736.0	4575.00	12/5/2001	35403	29.00	4546.00	1385.62	1379.22	1376.17	4525.00	4515.00	ADWR (GWSI)
500220	D-24-24 13CDB2		608548.1	3467732.9	4571.00	1/1/1981	27760	60.00	4511.00	1374.95	1377.09	1348.13	4518.00	4423.00	Well 55
500220	D-24-24 13CDB2		608548.1	3467732.9	4571.00	12/5/1990	31385	30.00	4541.00	1384.10	1377.09	1348.13	4518.00	4423.00	ADWR (GWSI)
500220	D-24-24 13CDB2		608548.1	3467732.9	4571.00	9/15/1993	32400	34.00	4537.00	1382.88	1377.09	1348.13	4518.00	4423.00	ADWR (GWSI)
500220	D-24-24 13CDB2		608548.1	3467732.9	4571.00	12/5/2001	35403	32.00	4539.00	1383.49	1377.09	1348.13	4518.00	4423.00	ADWR (GWSI)
569841	D-24-24 13DBA		608754.4	3468139.0	4623.48	8/18/1998	34198	70.00	4553.48	1387.90	1381.80	1372.66	4533.48	4503.48	Well 55
599381	D-24-24 13DCA		608761.5	3467736.0	4580.22	10/23/2003	36090	110.00	4470.22	1362.52	1374.72	1332.04	4510.22	4370.22	Well 55
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	10/30/2003	36097	35.00	4591.01	1399.34	1384.10	1371.91	4541.01	4501.01	Well 55
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	2/8/2008	37659	50.20	4575.81	1394.71	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	5/14/2008	37755	52.45	4573.56	1394.02	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	7/23/2008	37825	52.16	4573.85	1394.11	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	10/14/2008	37908	52.19	4573.82	1394.10	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	1/20/2009	38006	50.52	4575.49	1394.61	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	4/8/2009	38084	51.91	4574.10	1394.19	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	7/13/2009	38180	56.93	4569.08	1392.66	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	10/8/2009	38267	60.95	4565.06	1391.43	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	1/25/2010	38376	59.35	4566.66	1391.92	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	4/21/2010	38462	58.88	4567.13	1392.06	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	7/14/2010	38546	61.86	4564.15	1391.15	1384.10	1371.91	4541.01	4501.01	2010 Q3 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	10/20/2010	38644	61.20	4564.81	1391.35	1384.10	1371.91	4541.01	4501.01	CQ Database - 021312
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	1/18/2011	38734	59.79	4566.22	1391.78	1384.10	1371.91	4541.01	4501.01	CQ Database - 021312
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	4/5/2011	38811	59.73	4566.28	1391.80	1384.10	1371.91	4541.01	4501.01	CQ Database - 021312
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	7/12/2011	38909	63.79	4562.22	1390.56	1384.10	1371.91	4541.01	4501.01	CCA Q4 2011 Monitoring Report
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	10/12/2011	39001	63.64	4562.37	1390.61	1384.10	1371.91	4541.01	4501.01	CCA Q4 2011 Monitoring Report
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	1/31/2012	39112	63.82	4562.19	1390.56	1384.10	1371.91	4541.01	4501.01	2012 Q4 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	4/11/2012	39183	65.72	4560.29	1389.98	1384.10	1371.91	4541.01	4501.01	2012 Q4 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	7/9/2012	39272	70.50	4555.51	1388.52	1384.10	1371.91	4541.01	4501.01	2012 Q4 CQB Groundwater Tables.xls
599796	D-24-24 14ABD	EAST	607076.4	3468712.2	4626.01	10/4/2012	39359	73.34	4552.67	1387.65	1384.10	1371.91	4541.01	4501.01	2012 Q4 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	10/18/1988	30607	164.05	4543.83	1384.96	1389.24	1374.00	4557.88	4507.88	CQ Database - 021312
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	1/24/1989	30705	157.00	4550.88	1387.11	1389.24	1374.00	4557.88	4507.88	Well 55
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	3/13/1989	30753	164.15	4543.73	1384.93	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	4/20/1989	30791	164.15	4543.73	1384.93	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	5/23/1989	30824	164.21	4543.67	1384.91	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	6/23/1989	30855	164.20	4543.68	1384.91	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	7/24/1989	30886	164.15	4543.73	1384.93	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	9/6/1989	30930	164.20	4543.68	1384.91	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	10/22/1989	30976	164.15	4543.73	1384.93	1389.24	1374.00	4557.88	4507.88	CQ Database - 021312
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	11/6/1989	30991	157.70	4550.18	1386.89	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	1/1/1990	31047	157.55	4550.33	1386.94	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	4/1/1990	31137	157.65	4550.23	1386.91	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	6/25/1996	33414	164.85	4543.03	1384.71	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	8/22/1996	33472	164.85	4543.03	1384.71	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	9/25/1996	33506	164.90	4542.98	1384.70	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	10/29/1996	33540	164.90	4542.98	1384.70	1389.24	1374.00	4557.88	4507.88	CQ Database - 021312
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	12/19/1996	33591	164.95	4542.93	1384.69	1389.24	1374.00	4557.88	4507.88	CQ Database - 021312
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	1/29/1997	33632	164.95	4542.93	1384.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	2/27/1997	33661	164.90	4542.98	1384.70	1389.24	1374.00	4557.88	4507.88	FMICQB

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	4/16/1997	33709	164.90	4542.98	1384.70	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	10/10/1997	33886	164.95	4542.93	1384.69	1389.24	1374.00	4557.88	4507.88	CQ Database - 021312
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	1/5/1998	33973	164.80	4543.08	1384.73	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	5/6/1998	34094	158.40	4549.48	1386.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	10/1/1998	34242	158.40	4549.48	1386.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	1/25/1999	34358	158.40	4549.48	1386.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	6/1/1999	34485	158.40	4549.48	1386.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	6/29/1999	34513	158.40	4549.48	1386.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	6/30/1999	34514	158.40	4549.48	1386.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	3/1/2000	34759	158.20	4549.68	1386.74	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	6/1/2000	34851	158.30	4549.58	1386.71	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	9/1/2000	34943	158.40	4549.48	1386.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	12/1/2000	35034	158.40	4549.48	1386.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	2/1/2001	35096	158.30	4549.58	1386.71	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	6/1/2001	35216	158.30	4549.58	1386.71	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	10/1/2001	35338	158.25	4549.63	1386.73	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	2/1/2002	35461	158.20	4549.68	1386.74	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	6/1/2002	35581	158.30	4549.58	1386.71	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	9/1/2002	35673	158.30	4549.58	1386.71	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	11/1/2002	35734	158.25	4549.63	1386.73	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	1/1/2003	35795	158.25	4549.63	1386.73	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	5/1/2003	35915	158.30	4549.58	1386.71	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	8/1/2003	36007	158.35	4549.53	1386.70	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	12/1/2003	36129	158.40	4549.48	1386.68	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	9/1/2005	36769	158.70	4549.18	1386.59	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	11/1/2005	36830	158.50	4549.38	1386.65	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	5/1/2006	37011	158.70	4549.18	1386.59	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	8/1/2006	37103	158.70	4549.18	1386.59	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	11/1/2006	37195	158.80	4549.08	1386.56	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	2/1/2007	37287	158.80	4549.08	1386.56	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	6/1/2007	37407	158.80	4549.08	1386.56	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	12/1/2007	37590	158.70	4549.18	1386.59	1389.24	1374.00	4557.88	4507.88	FMICQB
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	2/26/2008	37677	158.78	4549.10	1386.57	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	5/20/2008	37761	158.76	4549.12	1386.57	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	8/4/2008	37837	158.80	4549.08	1386.56	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	8/6/2008	37839	158.02	4549.86	1386.80	1389.24	1374.00	4557.88	4507.88	CQ Database - 021312
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	10/29/2008	37923	158.85	4549.03	1386.54	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	2/16/2009	38033	159.28	4548.60	1386.41	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	2/26/2009	38043	159.28	4548.60	1386.41	1389.24	1374.00	4557.88	4507.88	CQ Database - 021312
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	5/13/2009	38119	158.81	4549.07	1386.56	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	8/18/2009	38216	158.91	4548.97	1386.53	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	11/12/2009	38302	158.96	4548.92	1386.51	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	3/8/2010	38418	158.99	4548.89	1386.50	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	4/14/2010	38455	159.02	4548.86	1386.49	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	7/2/2010	38534	159.13	4548.75	1386.46	1389.24	1374.00	4557.88	4507.88	2010 Q3 CQB Groundwater Tables.xls
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	7/21/2011	38918	159.88	4548.00	1386.23	1389.24	1374.00	4557.88	4507.88	CCA Q4 2011 Monitoring Report
522695	D-24-24 14BCC	TM-06 MILLER	606124.4	3468324.0	4707.88	7/9/2012	39272	161.40	4546.48	1385.77	1389.24	1374.00	4557.88	4507.88	2012 Q4 CQB Groundwater Tables.xls
200393	D-24-24 14DDA	WALKER	607564.7	3468577.5	4601.55	11/12/2003	36110	38.00	4563.55	1390.97	1378.17	1372.07	4521.55	4501.55	WELL 55
200393	D-24-24 14DDA	WALKER	607564.7	3468577.5	4601.55	2/13/2008	37664	25.20	4576.35	1394.87	1378.17	1372.07	4521.55	4501.55	CQ Database - 021312
200393	D-24-24 14DDA	WALKER	607564.7	3468577.5	4601.55	7/23/2008	37825	42.65	4558.90	1389.55	1378.17	1372.07	4521.55	4501.55	CQ Database - 021312
200393	D-24-24 14DDA	WALKER	607564.7	3468577.5	4601.55	3/3/2009	38048	28.19	4573.36	1393.96	1378.17	1372.07	4521.55	4501.55	CQ Database - 021312
1010	D-24-24 15AAB		605680.5	3468876.9	4675.00	6/4/1918	4903	128.00	4547.00	1385.93	1394.46	1360.63	4575.00	4464.00	
1011	D-24-24 15ABB		605386.8	3468962.6	4676.00	12/5/1990	31385	92.00	4584.00	1397.20	1394.76	1364.28	4576.00	4476.00	ADWR (GWSI)
1011	D-24-24 15ABB		605386.8	3468962.6	4676.00	11/29/2001	35397	81.00	4595.00	1400.56	1394.76	1364.28	4576.00	4476.00	ADWR (GWSI)
1011	D-24-24 15ABB		605386.8	3468962.6	4676.00	11/28/2006	37222	79.00	4597.00	1401.17	1394.76	1364.28	4576.00	4476.00	ADWR (GWSI)
641342	D-24-24 15CCC	MILLER 342	604439.3	3467569.4	4627.79	1/1/1957	18994	160.00	4467.79	1361.78	1380.07	1349.59	4527.79	4427.79	Well 55
641342	D-24-24 15CCC	MILLER 342	604439.3	3467569.4	4627.79	11/20/1985	29544	139.00	4488.79	1368.18	1380.07	1349.59	4527.79	4427.79	Littin 1987
641342	D-24-24 15CCC	MILLER 342	604439.3	3467569.4	4627.79	6/1/1988	30468	133.25	4494.54	1369.94	1380.07	1349.59	4527.79	4427.79	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	10/18/1988	30607	162.63	4468.37	1361.96	1365.81	1350.57	4481.00	4431.00	CQ Database - 021312
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	1/17/1989	30698	159.00	4472.00	1363.07	1365.81	1350.57	4481.00	4431.00	Well 55
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	2/6/1989	30718	162.83	4468.17	1361.90	1365.81	1350.57	4481.00	4431.00	WMC-WAPP

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	3/8/1989	30748	163.13	4467.87	1361.81	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	4/17/1989	30788	163.37	4467.63	1361.73	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	5/17/1989	30818	163.33	4467.67	1361.75	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	6/22/1989	30854	163.78	4467.22	1361.61	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	7/19/1989	30881	163.98	4467.02	1361.55	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	9/6/1989	30930	164.28	4466.72	1361.46	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	10/22/1989	30976	164.43	4466.57	1361.41	1365.81	1350.57	4481.00	4431.00	CQ Database - 021312
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	11/6/1989	30991	163.46	4467.54	1361.71	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	1/1/1990	31047	162.15	4468.85	1362.11	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	4/1/1990	31137	162.80	4468.20	1361.91	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
522700	D-24-24 16ACA	TM-17	603914.7	3468504.0	4631.00	1/26/1994	32533	175.93	4455.07	1357.91	1365.81	1350.57	4481.00	4431.00	WMC-WAPP
500101	D-24-24 16BBB	FRANCO	602849.9	3468835.7	4636.00	7/1/1981	27941	120.00	4516.00	1376.48	1358.19	1352.09	4456.00	4436.00	Well 55
221383	D-24-24 16BBB2	FRANCO 383	602817.9	3468831.6	4636.88	9/13/2012	39338	195.19	4441.69	1353.83	1227.15	1196.97	4026.07	3927.07	2012 Q4 CQB Groundwater Tables.xls
221383	D-24-24 16BBB2	FRANCO 383	602817.9	3468831.6	4636.88	10/5/2012	39360	195.00	4441.88	1353.89	1227.15	1196.97	4026.07	3927.07	2012 Q4 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	10/12/2001	35349	180.00	4460.74	1359.63	1237.71	1213.33	4060.74	3980.74	Well 55
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	2/1/2002	35461	184.65	4456.09	1358.22	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	6/1/2002	35581	185.30	4455.44	1358.02	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	9/1/2002	35673	186.00	4454.74	1357.80	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	11/1/2002	35734	186.50	4454.24	1357.65	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	1/1/2003	35795	186.30	4454.44	1357.71	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	5/1/2003	35915	187.50	4453.24	1357.35	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	12/1/2003	36129	187.70	4453.04	1357.29	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	2/1/2004	36191	188.02	4452.72	1357.19	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	8/1/2004	36373	188.90	4451.84	1356.92	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	11/1/2004	36465	189.15	4451.59	1356.84	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	2/1/2005	36557	189.10	4451.64	1356.86	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	6/1/2005	36677	194.30	4446.44	1355.27	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	9/1/2005	36769	189.35	4451.39	1356.78	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	11/1/2005	36830	189.75	4450.99	1356.66	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	5/1/2006	37011	190.60	4450.14	1356.40	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	8/1/2006	37103	193.00	4447.74	1355.67	1237.71	1213.33	4060.74	3980.74	FMICQB
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	2/4/2008	37655	193.20	4447.54	1355.61	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	5/5/2008	37746	195.90	4444.84	1354.79	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	7/15/2008	37817	193.58	4447.16	1355.49	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	10/15/2008	37909	194.35	4446.39	1355.26	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	1/28/2009	38014	194.80	4445.94	1355.12	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	4/15/2009	38091	195.54	4445.20	1354.90	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	7/16/2009	38183	194.88	4445.86	1355.10	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	10/14/2009	38273	196.36	4444.38	1354.65	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	2/2/2010	38384	195.32	4445.42	1354.96	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	4/22/2010	38463	196.01	4444.73	1354.75	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	8/25/2010	38588	195.57	4445.17	1354.89	1237.71	1213.33	4060.74	3980.74	2010 Q3 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	10/19/2010	38643	225.83	4414.91	1345.66	1237.71	1213.33	4060.74	3980.74	CQ Database - 021312
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	1/19/2011	38735	196.89	4443.85	1354.49	1237.71	1213.33	4060.74	3980.74	CQ Database - 021312
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	4/6/2011	38812	197.40	4443.34	1354.33	1237.71	1213.33	4060.74	3980.74	CQ Database - 021312
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	7/15/2011	38912	198.07	4442.67	1354.13	1237.71	1213.33	4060.74	3980.74	CCA Q4 2011 Monitoring Report
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	10/11/2011	39000	197.75	4442.99	1354.22	1237.71	1213.33	4060.74	3980.74	CCA Q4 2011 Monitoring Report
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	2/2/2012	39114	199.50	4441.24	1353.69	1237.71	1213.33	4060.74	3980.74	2012 Q4 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	4/13/2012	39185	200.40	4440.34	1353.42	1237.71	1213.33	4060.74	3980.74	2012 Q4 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	7/11/2012	39274	199.15	4441.59	1353.80	1237.71	1213.33	4060.74	3980.74	2012 Q4 CQB Groundwater Tables.xls
587635	D-24-24 17AAA	GARNER 635	602665.4	3468967.9	4640.74	10/5/2012	39360	202.71	4438.03	1352.71	1237.71	1213.33	4060.74	3980.74	2012 Q4 CQB Groundwater Tables.xls
610692	D-24-24 17AAA	GOAR	602677.3	3468966.3	4636.94	1/1/1950	16437	175.00	4461.94	1360.00	1382.86	1337.14	4536.94	4386.94	Well 55
610686	D-24-24 17AAA1	GOAR	602670.2	3468959.9	4635.00	1/1/1950	16437	175.00	4460.00	1359.41	1382.27	1321.31	4535.00	4335.00	Well 55
610686	D-24-24 17AAA1	GOAR	602670.2	3468959.9	4635.00	9/22/1977	26563	144.00	4491.00	1368.86	1382.27	1321.31	4535.00	4335.00	USGS (GWSI)
610686	D-24-24 17AAA1	GOAR	602670.2	3468959.9	4635.00	6/15/1988	30482	160.60	4474.40	1363.80	1382.27	1321.31	4535.00	4335.00	WMC-WAPP
610686	D-24-24 17AAA1	GOAR	602670.2	3468959.9	4635.00	12/5/1990	31385	154.00	4481.00	1365.81	1382.27	1321.31	4535.00	4335.00	ADWR (GWSI)
610686	D-24-24 17AAA1	GOAR	602670.2	3468959.9	4635.00	12/4/2001	35402	181.00	4454.00	1357.58	1382.27	1321.31	4535.00	4335.00	ADWR (GWSI)
610686	D-24-24 17AAA1	GOAR	602670.2	3468959.9	4635.00	12/5/2006	37229	188.00	4447.00	1355.45	1382.27	1321.31	4535.00	4335.00	ADWR (GWSI)
610686	D-24-24 17AAA1	GOAR	602670.2	3468959.9	4635.00	1/27/2009	38013	184.87	4450.13	1356.40	1382.27	1321.31	4535.00	4335.00	CQ Database - 021312
610686	D-24-24 17AAA1	GOAR	602670.2	3468959.9	4635.00	7/13/2010	38545	186.76	4448.24	1355.82	1382.27	1321.31	4535.00	4335.00	CQ Database - 021312
610686	D-24-24 17AAA1	GOAR	602670.2	3468959.9	4635.00	1/19/2011	38735	187.52	4447.48	1355.59	1382.27	1321.31	4535.00	4335.00	CQ Database - 021312

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
610687	D-24-24 17AAA1	GOAR_G7	602297.4	3468962.6	4622.00	1/1/1950	16437	175.00	4447.00	1355.45	1378.31	1332.59	4522.00	4372.00	Well 55
610687	D-24-24 17AAA1	GOAR_G7	602297.4	3468962.6	4622.00	11/20/1985	29544	144.00	4478.00	1364.89	1378.31	1332.59	4522.00	4372.00	Littin 1987
610687	D-24-24 17AAA1	GOAR_G7	602297.4	3468962.6	4622.00	12/4/2001	35402	169.00	4453.00	1357.27	1378.31	1332.59	4522.00	4372.00	ADWR (GWSI)
610693	D-24-24 17AAA3	GOAR	602668.5	3468959.2	4635.00	1/1/1950	16437	175.00	4460.00	1359.41	1382.27	1336.55	4535.00	4385.00	Well 55
610693	D-24-24 17AAA3	GOAR	602668.5	3468959.2	4635.00	12/4/2001	35402	181.00	4454.00	1357.58	1382.27	1336.55	4535.00	4385.00	ADWR (GWSI)
610693	D-24-24 17AAA3	GOAR	602668.5	3468959.2	4635.00	12/5/2006	37229	187.00	4448.00	1355.75	1382.27	1336.55	4535.00	4385.00	ADWR (GWSI)
610694	D-24-24 17AAB1	GOAR_G2	602402.8	3468901.7	4627.00	1/1/1950	16437	175.00	4452.00	1356.97	1379.83	1334.11	4527.00	4377.00	Well 55
610694	D-24-24 17AAB1	GOAR_G2	602402.8	3468901.7	4627.00	12/5/1990	31385	137.00	4490.00	1368.55	1379.83	1334.11	4527.00	4377.00	ADWR (GWSI)
610694	D-24-24 17AAB1	GOAR_G2	602402.8	3468901.7	4627.00	12/4/2001	35402	165.00	4462.00	1360.02	1379.83	1334.11	4527.00	4377.00	ADWR (GWSI)
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	1/1/1950	16437	175.00	4456.13	1358.23	1381.09	1335.37	4531.13	4381.13	Well 55
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	12/5/1990	31385	147.00	4484.13	1366.76	1381.09	1335.37	4531.13	4381.13	ADWR (GWSI)
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	12/4/2001	35402	175.00	4456.13	1358.23	1381.09	1335.37	4531.13	4381.13	ADWR (GWSI)
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	12/18/2006	37242	181.00	4450.13	1356.40	1381.09	1335.37	4531.13	4381.13	ADWR (GWSI)
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	2/21/2008	37672	183.90	4447.23	1355.52	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	5/5/2008	37746	188.11	4443.02	1354.23	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	7/16/2008	37818	184.41	4446.72	1355.36	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	10/22/2008	37916	184.68	4446.45	1355.28	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	1/27/2009	38013	184.87	4446.26	1355.22	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	4/15/2009	38091	184.96	4446.17	1355.19	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	7/7/2009	38174	185.36	4445.77	1355.07	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	10/12/2009	38271	185.72	4445.41	1354.96	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	2/2/2010	38384	186.25	4444.88	1354.80	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	4/22/2010	38463	186.44	4444.69	1354.74	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	7/13/2010	38545	186.76	4444.37	1354.64	1381.09	1335.37	4531.13	4381.13	2010 Q3 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	7/12/2011	38909	188.24	4442.89	1354.19	1381.09	1335.37	4531.13	4381.13	CCA Q4 2011 Monitoring Report
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	2/6/2012	39118	189.02	4442.11	1353.96	1381.09	1335.37	4531.13	4381.13	2012 Q4 CQB Groundwater Tables.xls
610695	D-24-24 17AAB2	GOAR RANCH	602454.8	3468892.5	4631.13	9/13/2012	39338	190.08	4441.05	1353.63	1381.09	1335.37	4531.13	4381.13	2012 Q4 CQB Groundwater Tables.xls
632924	D-24-24 17AB0	IRONS	602203.6	3468788.0	4616.85	12/12/1955	18608	30.00	4586.85	1398.07	1376.74	1353.88	4516.85	4441.85	Well 55
610691	D-24-24 17ABA2	GOAR	602323.9	3468841.1	4620.00	1/1/1950	16437	175.00	4445.00	1354.84	1377.70	1331.98	4520.00	4370.00	Well 55
610691	D-24-24 17ABA2	GOAR	602323.9	3468841.1	4620.00	12/5/1990	31385	139.00	4481.00	1365.81	1377.70	1331.98	4520.00	4370.00	ADWR (GWSI)
610691	D-24-24 17ABA2	GOAR	602323.9	3468841.1	4620.00	12/4/2001	35402	166.00	4454.00	1357.58	1377.70	1331.98	4520.00	4370.00	ADWR (GWSI)
610691	D-24-24 17ABA2	GOAR	602323.9	3468841.1	4620.00	12/5/2006	37229	173.00	4447.00	1355.45	1377.70	1331.98	4520.00	4370.00	ADWR (GWSI)
610689	D-24-24 17ABA3	GOAR	602326.6	3468809.8	4620.00	1/1/1950	16437	175.00	4445.00	1354.84	1377.70	1331.98	4520.00	4370.00	Well 55
610689	D-24-24 17ABA3	GOAR	602326.6	3468809.8	4620.00	6/15/1988	30482	145.60	4474.40	1363.80	1377.70	1331.98	4520.00	4370.00	WMC-WAPP
610689	D-24-24 17ABA3	GOAR	602326.6	3468809.8	4620.00	12/5/1990	31385	141.00	4479.00	1365.20	1377.70	1331.98	4520.00	4370.00	ADWR (GWSI)
610689	D-24-24 17ABA3	GOAR	602326.6	3468809.8	4620.00	12/5/2001	35403	166.00	4454.00	1357.58	1377.70	1331.98	4520.00	4370.00	ADWR (GWSI)
610689	D-24-24 17ABA3	GOAR	602326.6	3468809.8	4620.00	12/5/2006	37229	173.00	4447.00	1355.45	1377.70	1331.98	4520.00	4370.00	ADWR (GWSI)
610688	D-24-24 17ABB	GOAR	602008.1	3468960.8	4615.00	1/1/1950	16437	175.00	4440.00	1353.31	1376.17	1330.45	4515.00	4365.00	Well 55
610688	D-24-24 17ABB	GOAR	602008.1	3468960.8	4615.00	12/5/1990	31385	137.00	4478.00	1364.89	1376.17	1330.45	4515.00	4365.00	ADWR (GWSI)
610688	D-24-24 17ABB	GOAR	602008.1	3468960.8	4615.00	11/29/2001	35397	143.00	4472.00	1363.07	1376.17	1330.45	4515.00	4365.00	ADWR (GWSI)
610688	D-24-24 17ABB	GOAR	602008.1	3468960.8	4615.00	12/5/2006	37229	142.00	4473.00	1363.37	1376.17	1330.45	4515.00	4365.00	ADWR (GWSI)
610690	D-24-24 17B00	GOAR_G4	601596.4	3468580.0	4597.23	1/1/1950	16437	175.00	4422.23	1347.90	1370.76	1325.04	4497.23	4347.23	Well 55
801607	D-24-24 17B00	HAUBERT	601596.4	3468580.0	4597.23	1/1/1955	18263	114.00	4483.23	1366.49	1370.76	1341.80	4497.23	4402.23	Well 55
801607	D-24-24 17B00	HAUBERT	601596.4	3468580.0	4597.23	5/17/1988	30453	129.28	4467.95	1361.83	1370.76	1341.80	4497.23	4402.23	WMC-WAPP
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	3/2/1964	21611	130.00	4467.21	1361.61	1343.93	1304.91	4409.21	4281.21	Well 55
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	2/27/2008	37678	163.05	4434.16	1351.53	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	5/7/2008	37748	163.28	4433.93	1351.46	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	7/14/2008	37816	163.87	4433.34	1351.28	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	10/16/2008	37910	163.95	4433.26	1351.26	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	1/28/2009	38014	163.82	4433.39	1351.30	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	4/15/2009	38091	164.16	4433.05	1351.19	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	7/14/2009	38181	164.59	4432.62	1351.06	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	10/15/2009	38274	165.00	4432.21	1350.94	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	3/2/2010	38412	165.32	4431.89	1350.84	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	5/18/2010	38489	165.71	4431.50	1350.72	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	7/20/2010	38552	166.17	4431.04	1350.58	1343.93	1304.91	4409.21	4281.21	2010 Q3 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	10/19/2010	38643	166.45	4430.76	1350.50	1343.93	1304.91	4409.21	4281.21	CQ Database - 021312
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	8/31/2011	38959	167.76	4429.45	1350.10	1343.93	1304.91	4409.21	4281.21	CCA Q4 2011 Monitoring Report
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4597.21	12/14/2011	39064	168.13	4429.08	1349.98	1343.93	1304.91	4409.21	4281.21	CCA Q4 2011 Monitoring Report
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4607.60	2/1/2012	39113	168.09	4439.51	1353.16	1343.93	1304.91	4409.21	4281.21	2012 Q4 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4607.60	4/19/2012	39191	168.32	4439.28	1353.09	1343.93	1304.91	4409.21	4281.21	2012 Q4 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4607.60	7/11/2012	39274	169.10	4438.50	1352.85	1343.93	1304.91	4409.21	4281.21	2012 Q4 CQB Groundwater Tables.xls
805290	D-24-24 17BA0	HOBAN	601705.8	3468880.3	4607.60	10/17/2012	39372	169.40	4438.20	1352.76	1343.93	1304.91	4409.21	4281.21	2012 Q4 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	7/6/1993	32329	165.00	4435.70	1352.00	1349.26	1336.46	4426.70	4384.70	Well 55
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	2/20/2008	37671	156.15	4444.55	1354.70	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	5/6/2008	37747	156.40	4444.30	1354.62	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	7/15/2008	37817	157.07	4443.63	1354.42	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	11/19/2008	37944	157.17	4443.53	1354.39	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	1/28/2009	38014	156.70	4444.00	1354.53	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	4/15/2009	38091	157.22	4443.48	1354.37	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	7/15/2009	38182	157.59	4443.11	1354.26	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	10/12/2009	38271	158.13	4442.57	1354.10	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	1/26/2010	38377	158.35	4442.35	1354.03	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	4/22/2010	38463	158.68	4442.02	1353.93	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	7/21/2010	38553	159.37	4441.33	1353.72	1349.26	1336.46	4426.70	4384.70	2010 Q3 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	10/18/2010	38642	159.63	4441.07	1353.64	1349.26	1336.46	4426.70	4384.70	CQ Database - 021312
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	1/19/2011	38735	159.69	4441.01	1353.62	1349.26	1336.46	4426.70	4384.70	CQ Database - 021312
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	4/8/2011	38814	159.10	4441.60	1353.80	1349.26	1336.46	4426.70	4384.70	CQ Database - 021312
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	7/12/2011	38909	160.77	4439.93	1353.29	1349.26	1336.46	4426.70	4384.70	CCA Q4 2011 Monitoring Report
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	10/11/2011	39000	161.17	4439.53	1353.17	1349.26	1336.46	4426.70	4384.70	CCA Q4 2011 Monitoring Report
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	2/7/2012	39119	161.31	4439.39	1353.13	1349.26	1336.46	4426.70	4384.70	2012 Q4 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	4/11/2012	39183	161.57	4439.13	1353.05	1349.26	1336.46	4426.70	4384.70	2012 Q4 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	7/6/2012	39269	162.36	4438.34	1352.81	1349.26	1336.46	4426.70	4384.70	2012 Q4 CQB Groundwater Tables.xls
539265	D-24-24 17BBB	MCCONNELL 265	601463.1	3468840.1	4600.70	10/8/2012	39363	162.43	4438.27	1352.78	1349.26	1336.46	4426.70	4384.70	2012 Q4 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	9/4/1996	33485	170.00	4468.45	1361.98	1358.94	1322.36	4458.45	4338.45	Well 55
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	1/29/1997	33632	172.40	4466.05	1361.25	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	4/16/1997	33709	172.90	4465.55	1361.10	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	7/1/1997	33785	173.70	4464.75	1360.86	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	10/10/1997	33886	174.25	4464.20	1360.69	1358.94	1322.36	4458.45	4338.45	CQ Database - 021312
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	1/21/1998	33989	174.90	4463.55	1360.49	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	5/6/1998	34094	175.40	4463.05	1360.34	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	1/25/1999	34358	172.20	4466.25	1361.31	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	6/1/1999	34485	178.20	4460.25	1359.48	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	6/30/1999	34514	178.20	4460.25	1359.48	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	3/1/2000	34759	178.70	4459.75	1359.33	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	6/1/2000	34851	179.90	4458.55	1358.97	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	9/1/2000	34943	180.50	4457.95	1358.78	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	12/1/2000	35034	181.00	4457.45	1358.63	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	2/1/2002	35461	182.75	4455.70	1358.10	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	6/1/2002	35581	183.20	4455.25	1357.96	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	9/1/2002	35673	183.80	4454.65	1357.78	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	11/1/2002	35734	184.05	4454.40	1357.70	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	1/1/2003	35795	184.30	4454.15	1357.62	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	5/1/2003	35915	185.30	4453.15	1357.32	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	12/1/2003	36129	185.70	4452.75	1357.20	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	2/1/2004	36191	186.02	4452.43	1357.10	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	8/1/2004	36373	186.90	4451.55	1356.83	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	11/1/2004	36465	187.00	4451.45	1356.80	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	2/1/2005	36557	187.20	4451.25	1356.74	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	6/1/2005	36677	187.80	4450.65	1356.56	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	9/1/2005	36769	187.05	4451.40	1356.79	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	11/1/2005	36830	188.30	4450.15	1356.41	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	5/1/2006	37011	188.90	4449.55	1356.22	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	8/1/2006	37103	189.40	4449.05	1356.07	1358.94	1322.36	4458.45	4338.45	FMICQB
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	2/21/2008	37672	191.05	4447.40	1355.57	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	5/5/2008	37746	191.28	4447.17	1355.50	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	7/15/2008	37817	191.44	4447.01	1355.45	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	10/16/2008	37910	191.83	4446.62	1355.33	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	1/28/2009	38014	191.92	4446.53	1355.30	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	4/15/2009	38091	192.09	4446.36	1355.25	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	7/16/2009	38183	192.52	4445.93	1355.12	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	10/14/2009	38273	192.82	4445.63	1355.03	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	2/2/2010	38384	193.33	4445.12	1354.87	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	4/22/2010	38463	193.49	4444.96	1354.82	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	7/20/2010	38552	193.93	4444.52	1354.69	1358.94	1322.36	4458.45	4338.45	2010 Q3 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	10/19/2010	38643	194.29	4444.16	1354.58	1358.94	1322.36	4458.45	4338.45	CQ Database - 021312
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	1/19/2011	38735	194.61	4443.84	1354.48	1358.94	1322.36	4458.45	4338.45	CQ Database - 021312
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	4/6/2011	38812	194.86	4443.59	1354.41	1358.94	1322.36	4458.45	4338.45	CQ Database - 021312
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	7/15/2011	38912	195.25	4443.20	1354.29	1358.94	1322.36	4458.45	4338.45	CCA Q4 2011 Monitoring Report
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	10/11/2011	39000	195.72	4442.73	1354.14	1358.94	1322.36	4458.45	4338.45	CCA Q4 2011 Monitoring Report
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	2/2/2012	39114	196.09	4442.36	1354.03	1358.94	1322.36	4458.45	4338.45	2012 Q4 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	4/13/2012	39185	196.30	4442.15	1353.97	1358.94	1322.36	4458.45	4338.45	2012 Q4 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	7/11/2012	39274	196.72	4441.73	1353.84	1358.94	1322.36	4458.45	4338.45	2012 Q4 CQB Groundwater Tables.xls
558557	D-24-24 17BBB	GARNER 557	602659.2	3468962.4	4638.45	10/5/2012	39360	197.08	4441.37	1353.73	1358.94	1322.36	4458.45	4338.45	2012 Q4 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	7/29/1966	22490	165.00	4434.14	1351.53	1371.34	1334.76	4499.14	4379.14	Well 55
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	3/4/2008	37684	155.08	4444.06	1354.55	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	5/5/2008	37746	155.34	4443.80	1354.47	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	7/15/2008	37817	156.01	4443.13	1354.27	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	10/16/2008	37910	155.85	4443.29	1354.31	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	1/27/2009	38013	155.62	4443.52	1354.38	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	4/14/2009	38090	155.86	4443.28	1354.31	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	7/14/2009	38181	156.50	4442.64	1354.12	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	10/12/2009	38271	156.89	4442.25	1354.00	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	1/27/2010	38378	157.03	4442.11	1353.96	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	4/22/2010	38463	157.31	4441.83	1353.87	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	7/21/2010	38553	158.00	4441.14	1353.66	1371.34	1334.76	4499.14	4379.14	2010 Q3 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	10/20/2010	38644	158.41	4440.73	1353.53	1371.34	1334.76	4499.14	4379.14	CQ Database - 021312
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	1/17/2011	38733	158.37	4440.77	1353.55	1371.34	1334.76	4499.14	4379.14	CQ Database - 021312
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	4/11/2011	38817	158.74	4440.40	1353.43	1371.34	1334.76	4499.14	4379.14	CQ Database - 021312
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	8/26/2011	38954	159.51	4439.63	1353.20	1371.34	1334.76	4499.14	4379.14	CCA Q4 2011 Monitoring Report
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	10/13/2011	39002	159.81	4439.33	1353.11	1371.34	1334.76	4499.14	4379.14	CCA Q4 2011 Monitoring Report
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	2/1/2012	39113	159.80	4439.34	1353.11	1371.34	1334.76	4499.14	4379.14	2012 Q4 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	4/25/2012	39197	160.26	4438.88	1352.97	1371.34	1334.76	4499.14	4379.14	2012 Q4 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	7/12/2012	39275	160.88	4438.26	1352.78	1371.34	1334.76	4499.14	4379.14	2012 Q4 CQB Groundwater Tables.xls
637069	D-24-24 17BBB	COOPER C	601350.0	3468913.0	4599.14	10/10/2012	39365	161.10	4438.04	1352.71	1371.34	1334.76	4499.14	4379.14	2012 Q4 CQB Groundwater Tables.xls
221459	D-24-24 17BBB2	MCCONNELL 459	601471.7	3468840.7	4601.55	7/27/2012	39290	170.50	4431.05	1350.58	1182.19	1139.51	3878.56	3738.56	2012 Q4 CQB Groundwater Tables.xls
221459	D-24-24 17BBB2	MCCONNELL 459	601471.7	3468840.7	4601.55	10/8/2012	39363	166.81	4434.74	1351.71	1182.19	1139.51	3878.56	3738.56	2012 Q4 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	11/20/1985	29544	110.00	4483.92	1366.70	1354.50	1308.78	4443.91	4293.91	Littin 1987
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	3/4/2008	37684	150.10	4443.81	1354.47	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	5/8/2008	37749	150.70	4443.21	1354.29	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	7/14/2008	37816	150.91	4443.00	1354.23	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	10/15/2008	37909	150.67	4443.24	1354.30	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	1/28/2009	38014	150.67	4443.24	1354.30	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	4/15/2009	38091	151.15	4442.76	1354.15	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	7/15/2009	38182	151.76	4442.15	1353.97	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	10/12/2009	38271	152.08	4441.83	1353.87	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	1/27/2010	38378	152.20	4441.71	1353.83	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	4/21/2010	38462	152.30	4441.61	1353.80	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	7/19/2010	38551	153.16	4440.75	1353.54	1354.50	1308.78	4443.91	4293.91	2010 Q3 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	10/18/2010	38642	153.53	4440.38	1353.43	1354.50	1308.78	4443.91	4293.91	CQ Database - 021312
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	10/19/2010	38643	153.53	4440.38	1353.43	1354.50	1308.78	4443.91	4293.91	CQ Database - 021312
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	1/17/2011	38733	153.51	4440.40	1353.43	1354.50	1308.78	4443.91	4293.91	CQ Database - 021312
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	4/11/2011	38817	154.24	4439.67	1353.21	1354.50	1308.78	4443.91	4293.91	CQ Database - 021312
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	8/26/2011	38954	154.79	4439.12	1353.04	1354.50	1308.78	4443.91	4293.91	CCA Q4 2011 Monitoring Report
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	10/11/2011	39000	155.02	4438.89	1352.97	1354.50	1308.78	4443.91	4293.91	CCA Q4 2011 Monitoring Report
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	2/1/2012	39113	155.08	4438.83	1352.96	1354.50	1308.78	4443.91	4293.91	2012 Q4 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	4/13/2012	39185	155.40	4438.51	1352.86	1354.50	1308.78	4443.91	4293.91	2012 Q4 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	9/13/2012	39338	156.29	4437.62	1352.59	1354.50	1308.78	4443.91	4293.91	2012 Q4 CQB Groundwater Tables.xls
2	D-24-24 17BBC	HOWARD	601281.2	3468770.2	4593.91	10/16/2012	39371	156.43	4437.48	1352.54	1354.50	1308.78	4443.91	4293.91	2012 Q4 CQB Groundwater Tables.xls
221312	D-24-24 17BBC2	HOWARD 312	601308.9	3468772.6	4594.94	8/14/2012	39308	188.36	4406.58	1343.12	1156.44	1102.19	3794.11	3616.11	2012 Q4 CQB Groundwater Tables.xls
221312	D-24-24 17BBC2	HOWARD 312	601308.9	3468772.6	4594.94	10/16/2012	39371	193.33	4401.61	1341.61	1156.44	1102.19	3794.11	3616.11	2012 Q4 CQB Groundwater Tables.xls
209737	D-24-24 17BBD	JALYN	601495.7	3468680.0	4595.00	11/16/2005	36845	150.00	4445.00	1354.84	1344.17	1325.88	4410.00	4350.00	Well 55
588270	D-24-24 17BCB	SUNNYSIDE	601293.2	3468476.0	4583.75	8/28/2001	35304	115.00	4468.75	1362.08	1348.36	1336.17	4423.75	4383.75	Well 55

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
618175	D-24-24 17BCC	LUCERO	601312.1	3468274.0	4576.00	6/12/1972	24635	95.00	4481.00	1365.81	1361.24	1303.02	4466.00	4275.00	WELL 35
618175	D-24-24 17BCC	LUCERO	601312.1	3468274.0	4576.00	6/26/1972	24649	95.00	4481.00	1365.81	1361.24	1303.02	4466.00	4275.00	Well 55
618175	D-24-24 17BCC	LUCERO	601312.1	3468274.0	4576.00	12/6/1990	31386	104.00	4472.00	1363.07	1361.24	1303.02	4466.00	4275.00	ADWR (GWSI)
618175	D-24-24 17BCC	LUCERO	601312.1	3468274.0	4576.00	12/4/2001	35402	129.00	4447.00	1355.45	1361.24	1303.02	4466.00	4275.00	ADWR (GWSI)
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	6/15/2008	37787	138.00	4445.97	1355.13	1351.47	1320.99	4433.97	4333.97	Well 55
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	7/18/2008	37820	138.05	4445.92	1355.12	1351.47	1320.99	4433.97	4333.97	2010 Q3 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	11/4/2008	37929	137.95	4446.02	1355.15	1351.47	1320.99	4433.97	4333.97	2010 Q3 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	2/19/2009	38036	138.19	4445.78	1355.07	1351.47	1320.99	4433.97	4333.97	2010 Q3 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	5/11/2009	38117	138.46	4445.51	1354.99	1351.47	1320.99	4433.97	4333.97	2010 Q3 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	8/6/2009	38204	139.02	4444.95	1354.82	1351.47	1320.99	4433.97	4333.97	2010 Q3 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	10/26/2009	38285	139.60	4444.37	1354.64	1351.47	1320.99	4433.97	4333.97	2010 Q3 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	3/3/2010	38413	140.03	4443.94	1354.51	1351.47	1320.99	4433.97	4333.97	2010 Q3 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	4/8/2010	38449	140.07	4443.90	1354.50	1351.47	1320.99	4433.97	4333.97	2010 Q3 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	7/1/2010	38533	140.70	4443.27	1354.31	1351.47	1320.99	4433.97	4333.97	2010 Q3 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	2/14/2011	38761	260.00	4323.97	1317.95	1351.47	1320.99	4433.97	4333.97	CQ Database - 021312
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	7/12/2011	38909	142.21	4441.76	1353.85	1351.47	1320.99	4433.97	4333.97	CCA Q4 2011 Monitoring Report
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	2/23/2012	39135	143.90	4440.07	1353.33	1351.47	1320.99	4433.97	4333.97	2012 Q4 CQB Groundwater Tables.xls
909147	D-24-24 17CAA	BMO-2008-3B	602012.9	3467919.6	4583.97	7/10/2012	39273	143.70	4440.27	1353.39	1351.47	1320.99	4433.97	4333.97	2012 Q4 CQB Groundwater Tables.xls
641341	D-24-24 17CDA	MILLER 341	601876.7	3467711.0	4580.00	1/1/1920	5479	60.00	4520.00	1377.70	1380.74	1365.50	4530.00	4480.00	Well 55
641341	D-24-24 17CDA	MILLER 341	601876.7	3467711.0	4580.00	11/20/1985	29544	95.80	4484.20	1366.78	1380.74	1365.50	4530.00	4480.00	Littin 1987
641341	D-24-24 17CDA	MILLER 341	601876.7	3467711.0	4580.00	12/5/1990	31385	105.00	4475.00	1363.98	1380.74	1365.50	4530.00	4480.00	ADWR (GWSI)
641341	D-24-24 17CDA	MILLER 341	601876.7	3467711.0	4580.00	11/29/2001	35397	106.00	4474.00	1363.68	1380.74	1365.50	4530.00	4480.00	ADWR (GWSI)
641341	D-24-24 17CDA	MILLER 341	601876.7	3467711.0	4580.00	11/29/2006	37223	106.00	4474.00	1363.68	1380.74	1365.50	4530.00	4480.00	ADWR (GWSI)
645050	D-24-24 18000	VALENZUELA	600395.4	3468167.0	4557.47	1/1/1947	15341	115.00	4442.47	1354.06	1358.64	1338.22	4457.47	4390.47	Well 55
647847	D-24-24 18000	MOROYOQUI	600395.4	3468167.0	4557.47	6/18/1969	23545	130.00	4427.47	1349.49	1352.54	1334.25	4437.47	4377.47	Well 55
649153	D-24-24 18000	HUMPHREY	600395.4	3468167.0	4557.47	1/1/1938	12054	120.00	4437.47	1352.54	1358.64	1340.35	4457.47	4397.47	Well 55
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	7/17/2008	37819	149.88	4442.25	1354.00	1369.20	1308.24	4492.13	4292.13	2010 Q3 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	8/12/2008	37845	149.88	4442.25	1354.00	1369.20	1308.24	4492.13	4292.13	CQ Database - 021312
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	10/27/2008	37921	150.99	4441.14	1353.66	1369.20	1308.24	4492.13	4292.13	CQ Database - 021312
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	11/3/2008	37928	150.99	4441.14	1353.66	1369.20	1308.24	4492.13	4292.13	2010 Q3 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	1/29/2009	38015	149.68	4442.45	1354.06	1369.20	1308.24	4492.13	4292.13	CQ Database - 021312
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	2/25/2009	38042	149.68	4442.45	1354.06	1369.20	1308.24	4492.13	4292.13	2010 Q3 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	4/14/2009	38090	150.01	4442.12	1353.96	1369.20	1308.24	4492.13	4292.13	2010 Q3 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	7/13/2009	38180	150.47	4441.66	1353.82	1369.20	1308.24	4492.13	4292.13	2010 Q3 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	10/7/2009	38266	150.96	4441.17	1353.67	1369.20	1308.24	4492.13	4292.13	2010 Q3 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	3/8/2010	38418	151.11	4441.02	1353.62	1369.20	1308.24	4492.13	4292.13	2010 Q3 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	4/26/2010	38467	151.32	4440.81	1353.56	1369.20	1308.24	4492.13	4292.13	2010 Q3 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	7/15/2010	38547	151.90	4440.23	1353.38	1369.20	1308.24	4492.13	4292.13	2010 Q3 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	10/18/2010	38642	152.38	4439.75	1353.24	1369.20	1308.24	4492.13	4292.13	CQ Database - 021312
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	1/19/2011	38735	152.38	4439.75	1353.24	1369.20	1308.24	4492.13	4292.13	CQ Database - 021312
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	4/8/2011	38814	153.04	4439.09	1353.03	1369.20	1308.24	4492.13	4292.13	CQ Database - 021312
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	7/12/2011	38909	153.57	4438.56	1352.87	1369.20	1308.24	4492.13	4292.13	CCA Q4 2011 Monitoring Report
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	10/11/2011	39000	153.87	4438.26	1352.78	1369.20	1308.24	4492.13	4292.13	CCA Q4 2011 Monitoring Report
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	2/1/2012	39113	153.92	4438.21	1352.77	1369.20	1308.24	4492.13	4292.13	2012 Q4 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	4/12/2012	39184	154.35	4437.78	1352.64	1369.20	1308.24	4492.13	4292.13	2012 Q4 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	7/11/2012	39274	154.97	4437.16	1352.45	1369.20	1308.24	4492.13	4292.13	2012 Q4 CQB Groundwater Tables.xls
613395	D-24-24 18AAA	PIONKE	600936.3	3468836.6	4592.13	10/17/2012	39372	155.31	4436.82	1352.34	1369.20	1308.24	4492.13	4292.13	2012 Q4 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	1/1/1954	17898	126.00	4462.51	1360.17	1368.10	1326.65	4488.51	4352.51	Well 55
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	12/6/1990	31386	116.00	4472.51	1363.22	1368.10	1326.65	4488.51	4352.51	ADWR (GWSI)
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	12/4/2001	35402	141.00	4447.51	1355.60	1368.10	1326.65	4488.51	4352.51	ADWR (GWSI)
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	11/28/2006	37222	148.00	4440.51	1353.47	1368.10	1326.65	4488.51	4352.51	ADWR (GWSI)
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	3/20/2008	37700	145.46	4443.05	1354.24	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	5/5/2008	37746	145.84	4442.67	1354.13	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	7/14/2008	37816	146.16	4442.35	1354.03	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	10/15/2008	37909	146.21	4442.30	1354.01	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	1/27/2009	38013	145.97	4442.54	1354.09	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	4/14/2009	38090	146.21	4442.30	1354.01	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	7/14/2009	38181	146.88	4441.63	1353.81	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	10/12/2009	38271	147.31	4441.20	1353.68	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	1/27/2010	38378	147.31	4441.20	1353.68	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	4/21/2010	38462	147.57	4440.94	1353.60	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	7/19/2010	38551	148.34	4440.17	1353.36	1368.10	1326.65	4488.51	4352.51	2010 Q3 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	10/19/2010	38643	147.75	4440.76	1353.54	1368.10	1326.65	4488.51	4352.51	CQ Database - 021312
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	1/17/2011	38733	148.63	4439.88	1353.28	1368.10	1326.65	4488.51	4352.51	CQ Database - 021312
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	4/11/2011	38817	149.46	4439.05	1353.02	1368.10	1326.65	4488.51	4352.51	CQ Database - 021312
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	7/14/2011	38911	149.92	4438.59	1352.88	1368.10	1326.65	4488.51	4352.51	CCA Q4 2011 Monitoring Report
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	10/11/2011	39000	150.19	4438.32	1352.80	1368.10	1326.65	4488.51	4352.51	CCA Q4 2011 Monitoring Report
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	2/1/2012	39113	150.19	4438.32	1352.80	1368.10	1326.65	4488.51	4352.51	2012 Q4 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	4/25/2012	39197	150.69	4437.82	1352.65	1368.10	1326.65	4488.51	4352.51	2012 Q4 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	7/12/2012	39275	151.34	4437.17	1352.45	1368.10	1326.65	4488.51	4352.51	2012 Q4 CQB Groundwater Tables.xls
613396	D-24-24 18AAA	ANDERSON	601134.7	3468816.1	4588.51	10/10/2012	39365	151.50	4437.01	1352.40	1368.10	1326.65	4488.51	4352.51	2012 Q4 CQB Groundwater Tables.xls
221458	D-24-24 18AAA2	ANDERSON 458	601118.8	3468826.0	4585.37	9/7/2012	39332	173.76	4411.61	1344.66	1210.53	1174.26	3971.55	3852.55	2012 Q4 CQB Groundwater Tables.xls
221458	D-24-24 18AAA2	ANDERSON 458	601118.8	3468826.0	4585.37	10/10/2012	39365	151.82	4433.55	1351.35	1210.53	1174.26	3971.55	3852.55	2012 Q4 CQB Groundwater Tables.xls
221517	D-24-24 18AAA2	PIONKE 517	600910.0	3468866.7	4587.21	9/18/2012	39343	152.00	4435.21	1351.85	1244.61	1214.44	4083.38	3984.38	2012 Q4 CQB Groundwater Tables.xls
221517	D-24-24 18AAA2	PIONKE 517	600910.0	3468866.7	4587.21	10/11/2012	39366	152.15	4435.06	1351.81	1244.61	1214.44	4083.38	3984.38	2012 Q4 CQB Groundwater Tables.xls
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	10/18/1988	30607	112.06	4461.04	1359.72	1363.71	1345.42	4474.10	4414.10	CQ Database - 021312
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	11/18/1988	30638	108.00	4465.10	1360.96	1363.71	1345.42	4474.10	4414.10	Well 55
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	1/24/1989	30705	112.41	4460.69	1359.62	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	2/27/1989	30739	112.76	4460.34	1359.51	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	4/4/1989	30775	113.31	4459.79	1359.34	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	5/1/1989	30802	113.81	4459.29	1359.19	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	6/6/1989	30838	114.18	4458.92	1359.08	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	7/12/1989	30874	114.96	4458.14	1358.84	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	9/6/1989	30930	115.26	4457.84	1358.75	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	10/22/1989	30976	114.66	4458.44	1358.93	1363.71	1345.42	4474.10	4414.10	CQ Database - 021312
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	11/6/1989	30991	113.41	4459.69	1359.31	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	12/1/1989	31016	112.40	4460.70	1359.62	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	1/1/1990	31047	112.65	4460.45	1359.55	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	2/1/1990	31078	112.75	4460.35	1359.51	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	3/1/1990	31106	112.95	4460.15	1359.45	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
522815	D-24-24 18AAB	TM-11 PIONKE	600892.3	3468876.0	4573.10	4/1/1990	31137	113.45	4459.65	1359.30	1363.71	1345.42	4474.10	4414.10	WMC-WAPP
641801	D-24-24 18AAD	ROGERS 801	600991.1	3468691.4	4582.08	1/1/1960	20089	92.00	4490.08	1368.58	1366.14	1353.34	4482.08	4440.08	Well 55
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	2/15/2008	37666	143.31	4443.58	1354.40	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	5/7/2008	37748	143.90	4442.99	1354.22	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	7/16/2008	37818	144.22	4442.67	1354.13	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	10/28/2008	37922	145.81	4441.08	1353.64	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	1/29/2009	38015	143.99	4442.90	1354.20	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	4/15/2009	38091	144.38	4442.51	1354.08	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	7/15/2009	38182	144.99	4441.90	1353.89	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	10/15/2009	38274	145.66	4441.23	1353.69	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	2/2/2010	38384	145.28	4441.61	1353.80	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	4/22/2010	38463	145.72	4441.17	1353.67	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	7/19/2010	38551	146.46	4440.43	1353.44	1367.60	1337.12	4486.89	4386.89	2010 Q3 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	10/20/2010	38644	147.11	4439.78	1353.24	1367.60	1337.12	4486.89	4386.89	CQ Database - 021312
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	1/17/2011	38733	146.72	4440.17	1353.36	1367.60	1337.12	4486.89	4386.89	CQ Database - 021312
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	4/11/2011	38817	146.31	4440.58	1353.49	1367.60	1337.12	4486.89	4386.89	CQ Database - 021312
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	8/26/2011	38954	148.06	4438.83	1352.96	1367.60	1337.12	4486.89	4386.89	CCA Q4 2011 Monitoring Report
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	10/13/2011	39002	148.30	4438.59	1352.88	1367.60	1337.12	4486.89	4386.89	CCA Q4 2011 Monitoring Report
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	2/1/2012	39113	148.23	4438.66	1352.90	1367.60	1337.12	4486.89	4386.89	2012 Q4 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	4/25/2012	39197	148.82	4438.07	1352.72	1367.60	1337.12	4486.89	4386.89	2012 Q4 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	7/13/2012	39276	149.79	4437.10	1352.43	1367.60	1337.12	4486.89	4386.89	2012 Q4 CQB Groundwater Tables.xls
641802	D-24-24 18AAD	WEISKOPF	601155.0	3468658.9	4586.89	10/11/2012	39366	149.73	4437.16	1352.45	1367.60	1337.12	4486.89	4386.89	2012 Q4 CQB Groundwater Tables.xls
568875	D-24-24 18ACA	TVI 875	600715.1	3468419.3	4567.93	6/14/1998	34133	140.00	4427.93	1349.63	1311.23	1294.77	4301.93	4247.93	Well 55
568875	D-24-24 18ACA	TVI 875	600715.1	3468419.3	4567.93	7/15/2008	37817	126.30	4441.63	1353.81	1311.23	1294.77	4301.93	4247.93	CQ Database - 021312
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	12/7/2008	37962	131.00	4442.17	1353.97	1241.50	1211.02	4073.17	3973.17	Well 55
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	12/11/2008	37966	130.77	4442.40	1354.04	1241.50	1211.02	4073.17	3973.17	2010 Q3 CQB Groundwater Tables.xls
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	2/18/2009	38035	130.58	4442.59	1354.10	1241.50	1211.02	4073.17	3973.17	2010 Q3 CQB Groundwater Tables.xls
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	4/30/2009	38106	131.24	4441.93	1353.90	1241.50	1211.02	4073.17	3973.17	2010 Q3 CQB Groundwater Tables.xls
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	8/6/2009	38204	131.96	4441.21	1353.68	1241.50	1211.02	4073.17	3973.17	2010 Q3 CQB Groundwater Tables.xls
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	10/27/2009	38286	132.04	4441.13	1353.66	1241.50	1211.02	4073.17	3973.17	2010 Q3 CQB Groundwater Tables.xls
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	2/24/2010	38406	131.82	4441.35	1353.72	1241.50	1211.02	4073.17	3973.17	2010 Q3 CQB Groundwater Tables.xls
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	4/16/2010	38457	132.65	4440.52	1353.47	1241.50	1211.02	4073.17	3973.17	2010 Q3 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	7/2/2010	38534	133.20	4439.97	1353.30	1241.50	1211.02	4073.17	3973.17	2010 Q3 CQB Groundwater Tables.xls
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	2/15/2011	38762	610.00	3963.17	1207.97	1241.50	1211.02	4073.17	3973.17	CQ Database - 021312
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	7/22/2011	38919	134.80	4438.37	1352.82	1241.50	1211.02	4073.17	3973.17	CCA Q4 2011 Monitoring Report
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	2/23/2012	39135	134.64	4438.53	1352.86	1241.50	1211.02	4073.17	3973.17	2012 Q4 CQB Groundwater Tables.xls
910096	D-24-24 18ADA	BMO-2008-4B	601099.4	3468383.4	4573.17	9/17/2012	39342	136.15	4437.02	1352.40	1241.50	1211.02	4073.17	3973.17	2012 Q4 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	6/11/2006	37052	123.00	4441.49	1353.77	1312.01	1298.29	4304.49	4259.49	Well 55
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	2/8/2008	37659	121.80	4442.69	1354.13	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	5/19/2008	37760	123.49	4441.00	1353.62	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	7/29/2008	37831	122.64	4441.85	1353.88	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	10/22/2008	37916	123.39	4441.10	1353.65	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	1/29/2009	38015	122.87	4441.62	1353.81	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	2/23/2009	38040	122.69	4441.80	1353.86	1312.01	1298.29	4304.49	4259.49	CQ Database - 021312
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	4/17/2009	38093	123.53	4440.96	1353.60	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	7/10/2009	38177	124.15	4440.34	1353.42	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	10/6/2009	38265	124.55	4439.94	1353.29	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	1/22/2010	38373	124.32	4440.17	1353.36	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	4/21/2010	38462	124.65	4439.84	1353.26	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	7/21/2010	38553	125.80	4438.69	1352.91	1312.01	1298.29	4304.49	4259.49	2010 Q3 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	10/19/2010	38643	126.30	4438.19	1352.76	1312.01	1298.29	4304.49	4259.49	CQ Database - 021312
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	1/17/2011	38733	125.35	4439.14	1353.05	1312.01	1298.29	4304.49	4259.49	CQ Database - 021312
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	4/11/2011	38817	127.50	4436.99	1352.39	1312.01	1298.29	4304.49	4259.49	CQ Database - 021312
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	7/18/2011	38915	127.67	4436.82	1352.34	1312.01	1298.29	4304.49	4259.49	CCA Q4 2011 Monitoring Report
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	10/12/2011	39001	127.51	4436.98	1352.39	1312.01	1298.29	4304.49	4259.49	CCA Q4 2011 Monitoring Report
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	2/6/2012	39118	127.34	4437.15	1352.44	1312.01	1298.29	4304.49	4259.49	2012 Q4 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	4/10/2012	39182	127.78	4436.71	1352.31	1312.01	1298.29	4304.49	4259.49	2012 Q4 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	7/16/2012	39279	128.84	4435.65	1351.99	1312.01	1298.29	4304.49	4259.49	2012 Q4 CQB Groundwater Tables.xls
210865	D-24-24 18ADC	SCHWARTZ	600811.0	3468269.7	4564.49	10/17/2012	39372	128.98	4435.51	1351.94	1312.01	1298.29	4304.49	4259.49	2012 Q4 CQB Groundwater Tables.xls
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	9/16/1999	34592	140.00	4437.35	1352.50	1325.07	1306.78	4347.35	4287.35	Well 55
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	11/11/2009	38301	135.46	4441.89	1353.89	1325.07	1306.78	4347.35	4287.35	2010 Q3 CQB Groundwater Tables.xls
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	2/25/2010	38407	135.89	4441.46	1353.76	1325.07	1306.78	4347.35	4287.35	2010 Q3 CQB Groundwater Tables.xls
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	4/22/2010	38463	135.62	4441.73	1353.84	1325.07	1306.78	4347.35	4287.35	2010 Q3 CQB Groundwater Tables.xls
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	7/16/2010	38548	136.63	4440.72	1353.53	1325.07	1306.78	4347.35	4287.35	2010 Q3 CQB Groundwater Tables.xls
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	10/19/2010	38643	136.61	4440.74	1353.54	1325.07	1306.78	4347.35	4287.35	CQ Database - 021312
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	11/11/2010	38666	135.46	4441.89	1353.89	1325.07	1306.78	4347.35	4287.35	CQ Database - 021312
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	1/20/2011	38736	134.21	4443.14	1354.27	1325.07	1306.78	4347.35	4287.35	CQ Database - 021312
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	4/5/2011	38811	137.68	4439.67	1353.21	1325.07	1306.78	4347.35	4287.35	CQ Database - 021312
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	7/14/2011	38911	138.09	4439.26	1353.09	1325.07	1306.78	4347.35	4287.35	CCA Q4 2011 Monitoring Report
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	10/12/2011	39001	138.09	4439.26	1353.09	1325.07	1306.78	4347.35	4287.35	CCA Q4 2011 Monitoring Report
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	1/30/2012	39111	137.91	4439.44	1353.14	1325.07	1306.78	4347.35	4287.35	2012 Q4 CQB Groundwater Tables.xls
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	4/23/2012	39195	138.61	4438.74	1352.93	1325.07	1306.78	4347.35	4287.35	2012 Q4 CQB Groundwater Tables.xls
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	7/13/2012	39276	139.65	4437.70	1352.61	1325.07	1306.78	4347.35	4287.35	2012 Q4 CQB Groundwater Tables.xls
573596	D-24-24 18ADC	ROGERS 596	600894.1	3468271.0	4577.35	10/10/2012	39365	139.55	4437.80	1352.64	1325.07	1306.78	4347.35	4287.35	2012 Q4 CQB Groundwater Tables.xls
203321	D-24-24 18ADD	NWC-03R	601153.9	3468350.8	4574.99	6/22/2004	36333	140.00	4434.99	1351.78	1317.65	1299.36	4322.99	4262.99	Well 55
203321	D-24-24 18ADD	NWC-03R	601153.9	3468350.8	4574.99	11/3/2008	37928	131.48	4443.51	1354.38	1317.65	1299.36	4322.99	4262.99	2010 Q3 CQB Groundwater Tables.xls
203321	D-24-24 18ADD	NWC-03R	601153.9	3468350.8	4574.99	4/29/2009	38105	130.00	4444.99	1354.83	1317.65	1299.36	4322.99	4262.99	2010 Q3 CQB Groundwater Tables.xls
203321	D-24-24 18ADD	NWC-03R	601153.9	3468350.8	4574.99	9/10/2009	38239	126.00	4448.99	1356.05	1317.65	1299.36	4322.99	4262.99	2010 Q3 CQB Groundwater Tables.xls
203321	D-24-24 18ADD	NWC-03R	601153.9	3468350.8	4574.99	10/9/2009	38268	125.00	4449.99	1356.36	1317.65	1299.36	4322.99	4262.99	2010 Q3 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	4/13/1905	103	94.00	4478.82	1365.14	1352.65	1334.36	4437.82	4377.82	
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	5/13/1905	133	95.00	4477.82	1364.84	1352.65	1334.36	4437.82	4377.82	
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	1/1/1930	9132	94.00	4478.82	1365.14	1352.65	1334.36	4437.82	4377.82	Well 55
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	3/20/1968	23090	91.00	4481.82	1366.06	1352.65	1334.36	4437.82	4377.82	ADWRGWSI
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	9/22/1977	26563	96.00	4476.82	1364.53	1352.65	1334.36	4437.82	4377.82	ADWRGWSI
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	12/12/1985	29566	99.30	4473.52	1363.53	1352.65	1334.36	4437.82	4377.82	Littin 1987
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	5/18/1988	30454	93.78	4479.04	1365.21	1352.65	1334.36	4437.82	4377.82	WMC-WAPP
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	3/1/2004	36220	121.00	4451.82	1356.91	1352.65	1334.36	4437.82	4377.82	
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	4/1/2004	36251	121.00	4451.82	1356.91	1352.65	1334.36	4437.82	4377.82	
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	6/1/2004	36312	140.00	4432.82	1351.12	1352.65	1334.36	4437.82	4377.82	
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	10/27/2008	37921	131.48	4441.34	1353.72	1352.65	1334.36	4437.82	4377.82	CQ Database - 021312
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	2/2/2009	38019	130.03	4442.79	1354.16	1352.65	1334.36	4437.82	4377.82	2010 Q3 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	4/22/2009	38098	130.62	4442.20	1353.98	1352.65	1334.36	4437.82	4377.82	2010 Q3 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	4/23/2009	38099	130.00	4442.82	1354.17	1352.65	1334.36	4437.82	4377.82	CQ Database - 021312

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	7/21/2009	38188	131.26	4441.56	1353.79	1352.65	1334.36	4437.82	4377.82	2010 Q3 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	10/21/2009	38280	131.60	4441.22	1353.68	1352.65	1334.36	4437.82	4377.82	2010 Q3 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	2/3/2010	38385	131.34	4441.48	1353.76	1352.65	1334.36	4437.82	4377.82	2010 Q3 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	4/21/2010	38462	131.86	4440.96	1353.60	1352.65	1334.36	4437.82	4377.82	2010 Q3 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	7/20/2010	38552	131.50	4441.32	1353.71	1352.65	1334.36	4437.82	4377.82	2010 Q3 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	1/18/2011	38734	132.91	4439.91	1353.28	1352.65	1334.36	4437.82	4377.82	CQ Database - 021312
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	7/15/2011	38912	134.42	4438.40	1352.82	1352.65	1334.36	4437.82	4377.82	CCA Q4 2011 Monitoring Report
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	10/13/2011	39002	134.73	4438.09	1352.73	1352.65	1334.36	4437.82	4377.82	CCA Q4 2011 Monitoring Report
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	1/31/2012	39112	134.50	4438.32	1352.80	1352.65	1334.36	4437.82	4377.82	2012 Q4 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	4/25/2012	39197	135.09	4437.73	1352.62	1352.65	1334.36	4437.82	4377.82	2012 Q4 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	7/18/2012	39281	135.73	4437.09	1352.43	1352.65	1334.36	4437.82	4377.82	2012 Q4 CQB Groundwater Tables.xls
627684	D-24-24 18ADD	NWC-03	601153.2	3468344.5	4572.82	10/10/2012	39365	135.97	4436.85	1352.35	1352.65	1334.36	4437.82	4377.82	2012 Q4 CQB Groundwater Tables.xls
633316	D-24-24 18ADD	MINOR 316	601173.1	3468486.6	4582.75	1/1/1955	18263	95.00	4487.75	1367.87	1366.34	1333.42	4482.75	4374.75	Well 55
633316	D-24-24 18ADD	MINOR 316	601173.1	3468486.6	4582.75	6/23/1988	30490	118.65	4464.10	1360.66	1366.34	1333.42	4482.75	4374.75	WMC-WAPP
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	7/30/2010	38562	118.48	4432.05	1350.89	1260.20	1227.90	4134.53	4028.53	2010 Q3 CQB Groundwater Tables.xls
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	7/31/2010	38563	118.63	4431.90	1350.84	1260.20	1227.90	4134.53	4028.53	CQ Database - 021312
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	11/10/2010	38665	118.75	4431.78	1350.81	1260.20	1227.90	4134.53	4028.53	CQ Database - 021312
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	1/20/2011	38736	118.32	4432.21	1350.94	1260.20	1227.90	4134.53	4028.53	CQ Database - 021312
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	4/7/2011	38813	119.09	4431.44	1350.70	1260.20	1227.90	4134.53	4028.53	CQ Database - 021312
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	8/25/2011	38953	120.74	4429.79	1350.20	1260.20	1227.90	4134.53	4028.53	CCA Q4 2011 Monitoring Report
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	10/13/2011	39002	120.67	4429.86	1350.22	1260.20	1227.90	4134.53	4028.53	CCA Q4 2011 Monitoring Report
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	2/2/2012	39114	119.91	4430.62	1350.45	1260.20	1227.90	4134.53	4028.53	2012 Q4 CQB Groundwater Tables.xls
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	4/24/2012	39196	120.93	4429.60	1350.14	1260.20	1227.90	4134.53	4028.53	2012 Q4 CQB Groundwater Tables.xls
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	7/5/2012	39268	122.05	4428.48	1349.80	1260.20	1227.90	4134.53	4028.53	2012 Q4 CQB Groundwater Tables.xls
219969	D-24-24 18BCA	BMO-2010-3M	599970.8	3468353.4	4550.53	10/18/2012	39373	122.06	4428.47	1349.80	1260.20	1227.90	4134.53	4028.53	2012 Q4 CQB Groundwater Tables.xls
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	7/28/2010	38560	115.23	4435.36	1351.90	1350.44	1289.48	4430.59	4230.59	2010 Q3 CQB Groundwater Tables.xls
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	11/10/2010	38665	115.80	4434.79	1351.72	1350.44	1289.48	4430.59	4230.59	CQ Database - 021312
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	1/20/2011	38736	115.46	4435.13	1351.83	1350.44	1289.48	4430.59	4230.59	CQ Database - 021312
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	4/7/2011	38813	116.11	4434.48	1351.63	1350.44	1289.48	4430.59	4230.59	CQ Database - 021312
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	7/13/2011	38910	117.30	4433.29	1351.27	1350.44	1289.48	4430.59	4230.59	CCA Q4 2011 Monitoring Report
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	10/13/2011	39002	117.72	4432.87	1351.14	1350.44	1289.48	4430.59	4230.59	CCA Q4 2011 Monitoring Report
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	2/2/2012	39114	117.18	4433.41	1351.30	1350.44	1289.48	4430.59	4230.59	2012 Q4 CQB Groundwater Tables.xls
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	4/24/2012	39196	117.92	4432.67	1351.08	1350.44	1289.48	4430.59	4230.59	2012 Q4 CQB Groundwater Tables.xls
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	7/5/2012	39268	118.84	4431.75	1350.80	1350.44	1289.48	4430.59	4230.59	2012 Q4 CQB Groundwater Tables.xls
219970	D-24-24 18BCA	BMO-2010-3B	599978.0	3468347.3	4550.59	10/18/2012	39373	119.13	4431.46	1350.71	1350.44	1289.48	4430.59	4230.59	2012 Q4 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	4/14/1998	34072	100.00	4467.22	1361.61	1367.70	1348.20	4487.22	4423.22	Well 55
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	5/7/2008	37748	127.10	4440.12	1353.35	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	7/14/2008	37816	126.30	4440.92	1353.59	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	10/15/2008	37909	130.00	4437.22	1352.46	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	2/11/2009	38028	149.87	4417.35	1346.41	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	4/17/2009	38093	126.73	4440.49	1353.46	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	7/8/2009	38175	127.36	4439.86	1353.27	1367.70	1348.20	4487.22	4423.22	CQ Database - 021312
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	7/21/2009	38188	127.36	4439.86	1353.27	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	10/19/2009	38278	127.79	4439.43	1353.14	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	2/2/2010	38384	126.71	4440.51	1353.47	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	4/23/2010	38464	127.53	4439.69	1353.22	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	7/15/2010	38547	129.14	4438.08	1352.73	1367.70	1348.20	4487.22	4423.22	2010 Q3 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	10/20/2010	38644	130.84	4436.38	1352.21	1367.70	1348.20	4487.22	4423.22	CQ Database - 021312
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	1/20/2011	38736	134.36	4432.86	1351.14	1367.70	1348.20	4487.22	4423.22	CQ Database - 021312
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	4/11/2011	38817	135.72	4431.50	1350.72	1367.70	1348.20	4487.22	4423.22	CQ Database - 021312
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	7/15/2011	38912	131.61	4435.61	1351.97	1367.70	1348.20	4487.22	4423.22	CCA Q4 2011 Monitoring Report
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	10/12/2011	39001	130.33	4436.89	1352.36	1367.70	1348.20	4487.22	4423.22	CCA Q4 2011 Monitoring Report
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	2/3/2012	39115	130.01	4437.21	1352.46	1367.70	1348.20	4487.22	4423.22	2012 Q4 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	4/25/2012	39197	131.33	4435.89	1352.06	1367.70	1348.20	4487.22	4423.22	2012 Q4 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	7/16/2012	39279	131.97	4435.25	1351.86	1367.70	1348.20	4487.22	4423.22	2012 Q4 CQB Groundwater Tables.xls
567713	D-24-24 18BCC	TVI 713	600729.1	3468412.9	4567.22	10/9/2012	39364	132.16	4435.06	1351.81	1367.70	1348.20	4487.22	4423.22	2012 Q4 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	9/10/2007	37508	145.00	4445.66	1355.04	1326.08	1312.37	4350.66	4305.66	Well 55
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	7/17/2008	37819	149.65	4441.01	1353.62	1326.08	1312.37	4350.66	4305.66	2010 Q3 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	10/27/2008	37921	150.15	4440.51	1353.47	1326.08	1312.37	4350.66	4305.66	CQ Database - 021312
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	11/3/2008	37928	150.15	4440.51	1353.47	1326.08	1312.37	4350.66	4305.66	2010 Q3 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	2/10/2009	38027	149.02	4441.64	1353.81	1326.08	1312.37	4350.66	4305.66	2010 Q3 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	4/16/2009	38092	149.53	4441.13	1353.66	1326.08	1312.37	4350.66	4305.66	2010 Q3 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	7/13/2009	38180	150.31	4440.35	1353.42	1326.08	1312.37	4350.66	4305.66	2010 Q3 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	10/6/2009	38265	150.76	4439.90	1353.28	1326.08	1312.37	4350.66	4305.66	2010 Q3 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	1/25/2010	38376	150.64	4440.02	1353.32	1326.08	1312.37	4350.66	4305.66	2010 Q3 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	4/21/2010	38462	150.97	4439.69	1353.22	1326.08	1312.37	4350.66	4305.66	2010 Q3 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	8/25/2010	38588	151.15	4439.51	1353.16	1326.08	1312.37	4350.66	4305.66	2010 Q3 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	10/19/2010	38643	151.57	4439.09	1353.03	1326.08	1312.37	4350.66	4305.66	CQ Database - 021312
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	10/13/2011	39002	153.79	4436.87	1352.36	1326.08	1312.37	4350.66	4305.66	CCA Q4 2011 Monitoring Report
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	1/30/2012	39111	153.56	4437.10	1352.43	1326.08	1312.37	4350.66	4305.66	2012 Q4 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	4/10/2012	39182	154.13	4436.53	1352.25	1326.08	1312.37	4350.66	4305.66	2012 Q4 CQB Groundwater Tables.xls
216018	D-24-24 18BCD	ROGERS E	599895.4	3468264.0	4590.66	7/17/2012	39280	155.10	4435.56	1351.96	1326.08	1312.37	4350.66	4305.66	2012 Q4 CQB Groundwater Tables.xls
562944	D-24-24 18CAD	NWC-02R	600177.4	3467474.7	4600.44	6/11/1997	33765	150.00	4450.44	1356.49	1337.60	1307.12	4388.44	4288.44	Well 55
562944	D-24-24 18CAD	NWC-02R	600177.4	3467474.7	4600.44	10/27/2008	37921	160.51	4439.93	1353.29	1337.60	1307.12	4388.44	4288.44	2010 Q3 CQB Groundwater Tables.xls
562944	D-24-24 18CAD	NWC-02R	600177.4	3467474.7	4600.44	4/29/2009	38105	160.50	4439.94	1353.29	1337.60	1307.12	4388.44	4288.44	2010 Q3 CQB Groundwater Tables.xls
562944	D-24-24 18CAD	NWC-02R	600177.4	3467474.7	4600.44	9/10/2009	38239	155.00	4445.44	1354.97	1337.60	1307.12	4388.44	4288.44	2010 Q3 CQB Groundwater Tables.xls
562944	D-24-24 18CAD	NWC-02R	600177.4	3467474.7	4600.44	4/1/2010	38442	131.00	4469.44	1362.29	1337.60	1307.12	4388.44	4288.44	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	2/10/2005	36566	165.00	4415.94	1345.98	1329.21	1317.02	4360.94	4320.94	Well 55
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	2/4/2008	37655	144.85	4436.09	1352.12	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	5/6/2008	37747	145.33	4435.61	1351.97	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	7/16/2008	37818	146.40	4434.54	1351.65	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	10/28/2008	37922	146.01	4434.93	1351.77	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	2/10/2009	38027	144.83	4436.11	1352.13	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	4/16/2009	38092	144.94	4436.00	1352.09	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	7/14/2009	38181	146.14	4434.80	1351.73	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	10/13/2009	38272	146.77	4434.17	1351.54	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	1/26/2010	38377	146.34	4434.60	1351.67	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	4/22/2010	38463	146.27	4434.67	1351.69	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	7/21/2010	38553	147.81	4433.13	1351.22	1329.21	1317.02	4360.94	4320.94	2010 Q3 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	10/19/2010	38643	147.80	4433.14	1351.22	1329.21	1317.02	4360.94	4320.94	CQ Database - 021312
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	1/18/2011	38734	147.80	4433.14	1351.22	1329.21	1317.02	4360.94	4320.94	CQ Database - 021312
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	4/6/2011	38812	147.84	4433.10	1351.21	1329.21	1317.02	4360.94	4320.94	CQ Database - 021312
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	7/13/2011	38910	148.91	4432.03	1350.88	1329.21	1317.02	4360.94	4320.94	CCA Q4 2011 Monitoring Report
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	10/12/2011	39001	149.50	4431.44	1350.70	1329.21	1317.02	4360.94	4320.94	CCA Q4 2011 Monitoring Report
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	1/31/2012	39112	149.31	4431.63	1350.76	1329.21	1317.02	4360.94	4320.94	2012 Q4 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	4/10/2012	39182	149.64	4431.30	1350.66	1329.21	1317.02	4360.94	4320.94	2012 Q4 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	7/17/2012	39280	150.63	4430.31	1350.36	1329.21	1317.02	4360.94	4320.94	2012 Q4 CQB Groundwater Tables.xls
205126	D-24-24 18CBB	ZANDER	599678.9	3467998.5	4580.94	10/8/2012	39363	150.92	4430.02	1350.27	1329.21	1317.02	4360.94	4320.94	2012 Q4 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	11/15/2005	36844	136.00	4436.03	1352.10	1337.17	1318.88	4387.03	4327.03	Well 55
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	2/6/2008	37657	134.67	4437.36	1352.51	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	5/6/2008	37747	135.28	4436.75	1352.32	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	7/16/2008	37818	136.24	4435.79	1352.03	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	10/28/2008	37922	135.87	4436.16	1352.14	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	1/28/2009	38014	134.88	4437.15	1352.44	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	4/16/2009	38092	135.00	4437.03	1352.41	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	7/14/2009	38181	136.07	4435.96	1352.08	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	10/13/2009	38272	136.67	4435.36	1351.90	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	1/26/2010	38377	136.26	4435.77	1352.02	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	4/20/2010	38461	136.26	4435.77	1352.02	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	7/15/2010	38547	137.29	4434.74	1351.71	1337.17	1318.88	4387.03	4327.03	2010 Q3 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	10/19/2010	38643	137.68	4434.35	1351.59	1337.17	1318.88	4387.03	4327.03	CQ Database - 021312
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	1/18/2011	38734	137.42	4434.61	1351.67	1337.17	1318.88	4387.03	4327.03	CQ Database - 021312
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	4/6/2011	38812	137.91	4434.12	1351.52	1337.17	1318.88	4387.03	4327.03	CQ Database - 021312
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	7/18/2011	38915	140.39	4431.64	1350.76	1337.17	1318.88	4387.03	4327.03	CCA Q4 2011 Monitoring Report
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	10/11/2011	39000	141.68	4430.35	1350.37	1337.17	1318.88	4387.03	4327.03	CCA Q4 2011 Monitoring Report
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	2/6/2012	39118	139.27	4432.76	1351.11	1337.17	1318.88	4387.03	4327.03	2012 Q4 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	4/23/2012	39195	139.76	4432.27	1350.96	1337.17	1318.88	4387.03	4327.03	2012 Q4 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	7/17/2012	39280	140.69	4431.34	1350.67	1337.17	1318.88	4387.03	4327.03	2012 Q4 CQB Groundwater Tables.xls
209744	D-24-24 18CBB	KEEFER	599879.2	3468119.0	4572.03	10/9/2012	39364	141.00	4431.03	1350.58	1337.17	1318.88	4387.03	4327.03	2012 Q4 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	11/21/2007	37580	300.00	4296.61	1309.61	1321.80	1309.61	4336.61	4296.61	Well 55
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	10/27/2008	37921	159.45	4437.16	1352.45	1321.80	1309.61	4336.61	4296.61	2010 Q3 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	1/29/2009	38015	158.74	4437.87	1352.66	1321.80	1309.61	4336.61	4296.61	2010 Q3 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	4/16/2009	38092	158.66	4437.95	1352.69	1321.80	1309.61	4336.61	4296.61	2010 Q3 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	7/10/2009	38177	159.64	4436.97	1352.39	1321.80	1309.61	4336.61	4296.61	2010 Q3 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	10/6/2009	38265	160.36	4436.25	1352.17	1321.80	1309.61	4336.61	4296.61	2010 Q3 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	1/25/2010	38376	160.10	4436.51	1352.25	1321.80	1309.61	4336.61	4296.61	2010 Q3 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	4/21/2010	38462	159.96	4436.65	1352.29	1321.80	1309.61	4336.61	4296.61	2010 Q3 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	7/21/2010	38553	161.05	4435.56	1351.96	1321.80	1309.61	4336.61	4296.61	2010 Q3 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	10/19/2010	38643	161.23	4435.38	1351.90	1321.80	1309.61	4336.61	4296.61	CQ Database - 021312
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	1/18/2011	38734	161.22	4435.39	1351.91	1321.80	1309.61	4336.61	4296.61	CQ Database - 021312
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	4/11/2011	38817	161.48	4435.13	1351.83	1321.80	1309.61	4336.61	4296.61	CQ Database - 021312
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	7/18/2011	38915	162.39	4434.22	1351.55	1321.80	1309.61	4336.61	4296.61	CCA Q4 2011 Monitoring Report
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	10/12/2011	39001	163.04	4433.57	1351.35	1321.80	1309.61	4336.61	4296.61	CCA Q4 2011 Monitoring Report
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	4/10/2012	39182	163.22	4433.39	1351.30	1321.80	1309.61	4336.61	4296.61	2012 Q4 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	7/6/2012	39269	163.85	4432.76	1351.11	1321.80	1309.61	4336.61	4296.61	2012 Q4 CQB Groundwater Tables.xls
216425	D-24-24 18CCB	RAMIREZ	599730.6	3467584.4	4596.61	10/8/2012	39363	164.38	4432.23	1350.94	1321.80	1309.61	4336.61	4296.61	2012 Q4 CQB Groundwater Tables.xls
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	4/13/1905	103	94.00	4498.50	1371.14	1344.93	1296.16	4412.50	4252.50	
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	5/13/1905	133	95.00	4497.50	1370.84	1344.93	1296.16	4412.50	4252.50	
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	9/15/1999	34591	140.00	4452.50	1357.12	1344.93	1296.16	4412.50	4252.50	Well 55
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	12/4/2001	35402	156.00	4436.50	1352.25	1344.93	1296.16	4412.50	4252.50	ADWR (GWSI)
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	3/1/2004	36220	121.00	4471.50	1362.91	1344.93	1296.16	4412.50	4252.50	
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	4/1/2004	36251	121.00	4471.50	1362.91	1344.93	1296.16	4412.50	4252.50	
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	6/1/2004	36312	140.00	4452.50	1357.12	1344.93	1296.16	4412.50	4252.50	
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	11/28/2006	37222	153.00	4439.50	1353.16	1344.93	1296.16	4412.50	4252.50	ADWR (GWSI)
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	5/8/2008	37749	155.00	4437.50	1352.55	1344.93	1296.16	4412.50	4252.50	
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	7/8/2008	37810	157.00	4435.50	1351.94	1344.93	1296.16	4412.50	4252.50	
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	4/23/2009	38099	156.00	4436.50	1352.25	1344.93	1296.16	4412.50	4252.50	CQ Database - 021312
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	4/29/2009	38105	156.00	4436.50	1352.25	1344.93	1296.16	4412.50	4252.50	2010 Q3 CQB Groundwater Tables.xls
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	9/10/2009	38239	155.00	4437.50	1352.55	1344.93	1296.16	4412.50	4252.50	2010 Q3 CQB Groundwater Tables.xls
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	10/9/2009	38268	148.00	4444.50	1354.68	1344.93	1296.16	4412.50	4252.50	2010 Q3 CQB Groundwater Tables.xls
575700	D-24-24 18CCB	NWC-06	599825.8	3467741.7	4592.50	4/1/2010	38442	140.00	4452.50	1357.12	1344.93	1296.16	4412.50	4252.50	2010 Q3 CQB Groundwater Tables.xls
627683	D-24-24 18CCD	NWC-02	600182.7	3467464.6	4600.00	6/19/1905	170	150.00	4450.00	1356.36	1325.27	1306.98	4348.00	4288.00	
627683	D-24-24 18CCD	NWC-02	600182.7	3467464.6	4600.00	8/2/1959	19937	131.00	4469.00	1362.15	1325.27	1306.98	4348.00	4288.00	Well 55
627683	D-24-24 18CCD	NWC-02	600182.7	3467464.6	4600.00	9/22/1977	26563	133.00	4467.00	1361.54	1325.27	1306.98	4348.00	4288.00	USGS (GWSI)
627683	D-24-24 18CCD	NWC-02	600182.7	3467464.6	4600.00	11/20/1985	29544	138.00	4462.00	1360.02	1325.27	1306.98	4348.00	4288.00	Littin 1987
627683	D-24-24 18CCD	NWC-02	600182.7	3467464.6	4600.00	6/1/1997	33755	150.00	4450.00	1356.36	1325.27	1306.98	4348.00	4288.00	
627683	D-24-24 18CCD	NWC-02	600182.7	3467464.6	4600.00	4/1/2004	36251	150.00	4450.00	1356.36	1325.27	1306.98	4348.00	4288.00	
627683	D-24-24 18CCD	NWC-02	600182.7	3467464.6	4600.00	10/27/2008	37921	160.51	4439.49	1353.16	1325.27	1306.98	4348.00	4288.00	CQ Database - 021312
627683	D-24-24 18CCD	NWC-02	600182.7	3467464.6	4600.00	4/23/2009	38099	160.50	4439.50	1353.16	1325.27	1306.98	4348.00	4288.00	CQ Database - 021312
651116	D-24-24 18CD0	COTA	600196.7	3467563.0	4593.40	7/14/1982	28319	140.00	4453.40	1357.40	1369.59	1351.30	4493.40	4433.40	Well 55
627682	D-24-24 18CDC	NWC-01	599987.7	3467340.9	4603.00	5/4/1905	124	140.00	4463.00	1360.32	1372.51	1337.46	4503.00	4388.00	
627682	D-24-24 18CDC	NWC-01	599987.7	3467340.9	4603.00	6/19/1905	170	152.00	4451.00	1356.66	1372.51	1337.46	4503.00	4388.00	
627682	D-24-24 18CDC	NWC-01	599987.7	3467340.9	4603.00	9/24/1951	17068	140.00	4463.00	1360.32	1372.51	1337.46	4503.00	4388.00	Well 55
627682	D-24-24 18CDC	NWC-01	599987.7	3467340.9	4603.00	11/20/1985	29544	138.00	4465.00	1360.93	1372.51	1337.46	4503.00	4388.00	Littin 1987
627682	D-24-24 18CDC	NWC-01	599987.7	3467340.9	4603.00	5/19/1988	30455	145.75	4457.25	1358.57	1372.51	1337.46	4503.00	4388.00	WMC-WAPP
627682	D-24-24 18CDC	NWC-01	599987.7	3467340.9	4603.00	12/6/1990	31386	152.00	4451.00	1356.66	1372.51	1337.46	4503.00	4388.00	ADWR (GWSI)
627682	D-24-24 18CDC	NWC-01	599987.7	3467340.9	4603.00	5/1/1995	32993	152.00	4451.00	1356.66	1372.51	1337.46	4503.00	4388.00	
627682	D-24-24 18CDC	NWC-01	599987.7	3467340.9	4603.00	5/1/1996	33359	155.00	4448.00	1355.75	1372.51	1337.46	4503.00	4388.00	
629807	D-24-24 18CDC	CHAMBERS	600096.9	3467462.0	4598.67	1/1/1977	26299	137.00	4461.67	1359.92	1359.00	1328.52	4458.67	4358.67	Well 55
633317	D-24-24 18DAA	MINOR 317	601172.2	3468568.0	4578.86	1/1/1956	18628	95.00	4483.86	1366.68	1365.16	1348.39	4478.86	4423.86	Well 55
633317	D-24-24 18DAA	MINOR 317	601172.2	3468568.0	4578.86	2/12/2008	37663	135.30	4443.56	1354.40	1365.16	1348.39	4478.86	4423.86	CQ Database - 021312
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	1/20/2006	36910	118.00	4448.21	1355.81	1363.74	1345.45	4474.21	4414.21	Well 55
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	2/22/2008	37673	122.85	4443.36	1354.34	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	5/20/2008	37761	123.00	4443.21	1354.29	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	7/30/2008	37832	123.53	4442.68	1354.13	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	10/23/2008	37917	124.02	4442.19	1353.98	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	2/12/2009	38029	123.39	4442.82	1354.17	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	4/23/2009	38099	124.16	4442.05	1353.94	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	7/22/2009	38189	124.91	4441.30	1353.71	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	10/22/2009	38281	125.33	4440.88	1353.58	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	3/3/2010	38413	124.93	4441.28	1353.70	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	4/26/2010	38467	125.47	4440.74	1353.54	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	7/13/2010	38545	126.54	4439.67	1353.21	1363.74	1345.45	4474.21	4414.21	2010 Q3 CQB Groundwater Tables.xls

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	1/20/2011	38736	126.46	4439.75	1353.24	1363.74	1345.45	4474.21	4414.21	CQ Database - 021312
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	7/14/2011	38911	128.17	4438.04	1352.71	1363.74	1345.45	4474.21	4414.21	CCA Q4 2011 Monitoring Report
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	1/31/2012	39112	128.04	4438.17	1352.75	1363.74	1345.45	4474.21	4414.21	2012 Q4 CQB Groundwater Tables.xls
903984	D-24-24 18DAA	COB MW-2	600973.3	3468114.8	4566.21	7/12/2012	39275	129.58	4436.63	1352.28	1363.74	1345.45	4474.21	4414.21	2012 Q4 CQB Groundwater Tables.xls
1016	D-24-24 18DB	TVI SS2	600555.0	3467965.7	4566.00	5/6/1985	29346	85.00	4481.00	1365.81	1361.24	1300.28	4466.00	4266.00	Littin 1987
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	2/14/1934	10637	100.00	4461.98	1360.01	1360.01	1322.83	4461.98	4339.98	Well 55
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	4/29/1953	17651	60.00	4501.98	1372.20	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	8/12/1953	17756	60.00	4501.98	1372.20	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	12/3/1953	17869	60.00	4501.98	1372.20	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	2/24/1954	17952	60.00	4501.98	1372.20	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	8/26/1954	18135	60.00	4501.98	1372.20	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	1/24/1956	18651	63.00	4498.98	1371.29	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	5/22/1956	18770	64.00	4497.98	1370.98	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	7/18/1956	18827	66.00	4495.98	1370.37	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	9/10/1956	18881	72.00	4489.98	1368.55	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	10/16/1956	18917	72.00	4489.98	1368.55	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	11/19/1956	18951	59.00	4502.98	1372.51	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	12/17/1956	18979	65.00	4496.98	1370.68	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	3/5/1957	19057	68.00	4493.98	1369.77	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	7/10/1957	19184	67.00	4494.98	1370.07	1360.01	1322.83	4461.98	4339.98	USGS (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	12/6/1990	31386	90.60	4471.38	1362.88	1360.01	1322.83	4461.98	4339.98	FMICQB
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	12/15/1999	34682	110.20	4451.78	1356.90	1360.01	1322.83	4461.98	4339.98	FMICQB
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	12/4/2001	35402	114.00	4447.98	1355.74	1360.01	1322.83	4461.98	4339.98	ADWR (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	11/28/2006	37222	120.00	4441.98	1353.92	1360.01	1322.83	4461.98	4339.98	ADWR (GWSI)
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	5/7/2008	37748	123.30	4438.68	1352.91	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	7/15/2008	37817	121.55	4440.43	1353.44	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	10/15/2008	37909	122.35	4439.63	1353.20	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	2/11/2009	38028	121.28	4440.70	1353.53	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	4/17/2009	38093	122.73	4439.25	1353.08	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	7/21/2009	38188	123.96	4438.02	1352.71	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	10/19/2009	38278	123.88	4438.10	1352.73	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	2/2/2010	38384	122.26	4439.72	1353.23	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	4/23/2010	38464	122.70	4439.28	1353.09	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	7/15/2010	38547	125.08	4436.90	1352.37	1360.01	1322.83	4461.98	4339.98	2010 Q3 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	7/15/2011	38912	127.23	4434.75	1351.71	1360.01	1322.83	4461.98	4339.98	CCA Q4 2011 Monitoring Report
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	7/16/2012	39279	127.81	4434.17	1351.54	1360.01	1322.83	4461.98	4339.98	2012 Q4 CQB Groundwater Tables.xls
802236	D-24-24 18DBB1	TVI 236	600552.2	3467978.4	4561.98	10/9/2012	39364	128.45	4433.53	1351.34	1360.01	1322.83	4461.98	4339.98	2012 Q4 CQB Groundwater Tables.xls
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	1/1/1916	4018	200.00	4387.78	1337.40	1367.88	1337.40	4487.78	4387.78	Well 55
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	12/8/1949	16413	101.00	4486.78	1367.57	1367.88	1337.40	4487.78	4387.78	USGS (GWSI)
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	1/5/1950	16441	102.00	4485.78	1367.27	1367.88	1337.40	4487.78	4387.78	USGS (GWSI)
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	9/21/1950	16700	101.00	4486.78	1367.57	1367.88	1337.40	4487.78	4387.78	USGS (GWSI)
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	12/19/1950	16789	102.00	4485.78	1367.27	1367.88	1337.40	4487.78	4387.78	USGS (GWSI)
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	4/12/1951	16903	101.00	4486.78	1367.57	1367.88	1337.40	4487.78	4387.78	USGS (GWSI)
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	9/22/1977	26563	131.00	4456.78	1358.43	1367.88	1337.40	4487.78	4387.78	USGS (GWSI)
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	12/6/1990	31386	90.00	4497.78	1370.92	1367.88	1337.40	4487.78	4387.78	ADWR (GWSI)
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	12/15/1999	34682	110.00	4477.78	1364.83	1367.88	1337.40	4487.78	4387.78	ADWR (GWSI)
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	12/4/2001	35402	113.00	4474.78	1363.91	1367.88	1337.40	4487.78	4387.78	ADWR (GWSI)
616776	D-24-24 18DBB2	ANDERSON M	600442.9	3467630.7	4587.78	11/28/2006	37222	120.00	4467.78	1361.78	1367.88	1337.40	4487.78	4387.78	ADWR (GWSI)
649994	D-24-24 18DCC	SHAFER	600496.7	3467463.0	4600.00	5/1/1966	22401	118.00	4482.00	1366.11	1365.50	1353.92	4480.00	4442.00	
649994	D-24-24 18DCC	SHAFER	600496.7	3467463.0	4600.00	7/15/1966	22476	120.00	4480.00	1365.50	1365.50	1353.92	4480.00	4442.00	Well 55
641750	D-24-24 18DDA	ROLLINS	601095.7	3467667.0	4579.02	2/7/2008	37658	129.85	4449.17	1356.11	1380.45	1349.97	4529.02	4429.02	2010 Q3 CQB Groundwater Tables.xls
641750	D-24-24 18DDA	ROLLINS	601095.7	3467667.0	4579.02	7/29/2008	37831	131.86	4447.16	1355.49	1380.45	1349.97	4529.02	4429.02	2010 Q3 CQB Groundwater Tables.xls
641750	D-24-24 18DDA	ROLLINS	601095.7	3467667.0	4579.02	10/22/2008	37916	132.08	4446.94	1355.43	1380.45	1349.97	4529.02	4429.02	2010 Q3 CQB Groundwater Tables.xls
641750	D-24-24 18DDA	ROLLINS	601095.7	3467667.0	4579.02	2/10/2009	38027	130.62	4448.40	1355.87	1380.45	1349.97	4529.02	4429.02	2010 Q3 CQB Groundwater Tables.xls
641750	D-24-24 18DDA	ROLLINS	601095.7	3467667.0	4579.02	4/29/2009	38105	131.33	4447.69	1355.66	1380.45	1349.97	4529.02	4429.02	2010 Q3 CQB Groundwater Tables.xls
641750	D-24-24 18DDA	ROLLINS	601095.7	3467667.0	4579.02	8/3/2009	38201	135.07	4443.95	1354.52	1380.45	1349.97	4529.02	4429.02	2010 Q3 CQB Groundwater Tables.xls
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	1/1/1960	20089	92.00	4484.16	1366.77	1324.71	1306.42	4346.16	4286.16	Well 55
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	2/7/2008	37658	129.85	4446.31	1355.24	1324.71	1306.42	4346.16	4286.16	CQ Database - 021312
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	7/29/2008	37831	131.86	4444.30	1354.62	1324.71	1306.42	4346.16	4286.16	CQ Database - 021312
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	10/22/2008	37916	132.08	4444.08	1354.56	1324.71	1306.42	4346.16	4286.16	CQ Database - 021312
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	2/10/2009	38027	130.62	4445.54	1355.00	1324.71	1306.42	4346.16	4286.16	CQ Database - 021312

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	4/29/2009	38105	131.33	4444.83	1354.78	1324.71	1306.42	4346.16	4286.16	CQ Database - 021312
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	8/3/2009	38201	135.07	4441.09	1353.64	1324.71	1306.42	4346.16	4286.16	CQ Database - 021312
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	10/19/2009	38278	132.38	4443.78	1354.46	1324.71	1306.42	4346.16	4286.16	CQ Database - 021312
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	11/5/2009	38295	132.49	4443.67	1354.43	1324.71	1306.42	4346.16	4286.16	CQ Database - 021312
641803	D-24-24 18DDA	ROGERS 803	601003.2	3468480.0	4576.16	10/19/2010	38643	139.70	4436.46	1352.23	1324.71	1306.42	4346.16	4286.16	CQ Database - 021312
650255	D-24-24 18DDD	ALVAREZ	601096.3	3467466.0	4588.15	1/1/1938	12054	120.00	4468.15	1361.89	1367.99	1349.70	4488.15	4428.15	Well 55
650256	D-24-24 18DDD	MENDEZ	601096.3	3467466.0	4588.15	1/1/1938	12054	120.00	4468.15	1361.89	1367.99	1349.70	4488.15	4428.15	Well 55
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	10/18/1988	30607	127.45	4461.99	1360.01	1361.98	1346.74	4468.44	4418.44	CQ Database - 021312
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	1/12/1989	30693	128.00	4461.44	1359.85	1361.98	1346.74	4468.44	4418.44	Well 55
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	2/8/1989	30720	127.25	4462.19	1360.08	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	3/16/1989	30756	127.65	4461.79	1359.95	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	4/18/1989	30789	127.95	4461.49	1359.86	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	5/18/1989	30819	127.75	4461.69	1359.92	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	6/22/1989	30854	129.02	4460.42	1359.54	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	7/19/1989	30881	129.60	4459.84	1359.36	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	9/6/1989	30930	130.15	4459.29	1359.19	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	10/22/1989	30976	129.95	4459.49	1359.25	1361.98	1346.74	4468.44	4418.44	CQ Database - 021312
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	11/6/1989	30991	130.38	4459.06	1359.12	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	1/1/1990	31047	130.65	4458.79	1359.04	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	4/1/1990	31137	132.25	4457.19	1358.55	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	6/25/1996	33414	146.14	4443.30	1354.32	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	8/22/1996	33472	146.29	4443.15	1354.27	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	9/25/1996	33506	146.24	4443.20	1354.29	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	10/29/1996	33540	146.54	4442.90	1354.20	1361.98	1346.74	4468.44	4418.44	CQ Database - 021312
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	12/19/1996	33591	146.39	4443.05	1354.24	1361.98	1346.74	4468.44	4418.44	CQ Database - 021312
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	1/29/1997	33632	146.14	4443.30	1354.32	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	2/27/1997	33661	146.24	4443.20	1354.29	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	4/16/1997	33709	146.84	4442.60	1354.10	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	10/10/1997	33886	148.74	4440.70	1353.53	1361.98	1346.74	4468.44	4418.44	CQ Database - 021312
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	1/5/1998	33973	148.34	4441.10	1353.65	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522697	D-24-24 20BAB	TM-12 MILLER	601576.8	3467164.3	4589.44	5/6/1998	34094	147.94	4441.50	1353.77	1361.98	1346.74	4468.44	4418.44	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	10/18/1988	30607	139.14	4458.92	1359.08	1364.91	1352.72	4478.06	4438.06	CQ Database - 021312
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	2/8/1989	30720	139.20	4458.86	1359.06	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	3/9/1989	30749	139.29	4458.77	1359.03	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	4/18/1989	30789	139.36	4458.70	1359.01	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	5/18/1989	30819	139.35	4458.71	1359.01	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	6/22/1989	30854	139.47	4458.59	1358.98	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	7/19/1989	30881	139.64	4458.42	1358.93	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	9/6/1989	30930	140.19	4457.87	1358.76	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	10/22/1989	30976	139.84	4458.22	1358.86	1364.91	1352.72	4478.06	4438.06	CQ Database - 021312
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	11/6/1989	30991	132.85	4465.21	1361.00	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	12/1/1989	31016	133.20	4464.86	1360.89	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	4/1/1990	31137	133.90	4464.16	1360.68	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	6/25/1996	33414	154.81	4443.25	1354.30	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	8/22/1996	33472	155.26	4442.80	1354.16	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	9/25/1996	33506	155.51	4442.55	1354.09	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	10/29/1996	33540	155.76	4442.30	1354.01	1364.91	1352.72	4478.06	4438.06	CQ Database - 021312
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	12/19/1996	33591	156.11	4441.95	1353.91	1364.91	1352.72	4478.06	4438.06	CQ Database - 021312
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	1/29/1997	33632	156.26	4441.80	1353.86	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	2/27/1997	33661	156.26	4441.80	1353.86	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	4/16/1997	33709	156.61	4441.45	1353.75	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	10/10/1997	33886	157.76	4440.30	1353.40	1364.91	1352.72	4478.06	4438.06	CQ Database - 021312
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	1/5/1998	33973	158.01	4440.05	1353.33	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	5/6/1998	34094	150.60	4447.46	1355.59	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	10/1/1998	34242	151.35	4446.71	1355.36	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	1/25/1999	34358	152.25	4445.81	1355.08	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	6/1/1999	34485	153.05	4445.01	1354.84	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	6/30/1999	34514	153.05	4445.01	1354.84	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	3/1/2000	34759	153.65	4444.41	1354.66	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	6/1/2000	34851	156.25	4441.81	1353.86	1364.91	1352.72	4478.06	4438.06	WMC-WAPP
522694	D-24-24 21AAB	TM-05 MILLER	603896.9	3467185.2	4598.06	9/1/2000	34943	157.00	4441.06	1353.64	1364.91	1352.72	4478.06	4438.06	WMC-WAPP

TABLE G.2.1 - Water Level Data Used for Model Targets

ADWR Number	Local ID	Well Name	Easting (meters)	Northing (meters)	Measuring Point Elevation (feet amsl)	Date Measured	Days of Model Simulation	Depth to Water (feet)	Water Level Elevation (feet amsl)	Water Level Elevation (meters amsl)	Top of Screen (meters)	Bottom of Screen (meters)	Top of Screen (feet)	Bottom of Screen (feet)	Data Source*
101	Mexico	EN-01	601752.6	3464463.1	4736.75	10/21/2008	37915	180.00	4556.75	1388.90	1413.28	1291.36	4636.75	4236.75	Estimated DTW - Site visit HGC Oct 2008
102	Mexico	EN-02	601885.9	3465282.2	4694.19	10/21/2008	37915	165.00	4529.19	1380.50	1400.31	1278.39	4594.19	4194.19	Estimated DTW - Site visit HGC Oct 2008
103	Mexico	EN-03	602355.8	3465212.4	4694.19	5/29/1986	29734	185.00	4509.19	1374.40	1401.12	1279.20	4596.85	4196.85	Littin 1987
103	Mexico	EN-03	602355.8	3465212.4	4696.85	10/21/2008	37915	180.00	4516.85	1376.74	1401.12	1279.20	4596.85	4196.85	Estimated DTW - Site visit HGC Oct 2008
105	Mexico	EN-05	602139.9	3466050.6	4651.25	10/21/2008	37915	180.00	4471.25	1362.84	1387.22	1265.30	4551.25	4151.25	Estimated DTW - Site visit HGC Oct 2008
106	Mexico	EN-06	601962.1	3466114.1	4643.93	10/21/2008	37915	115.00	4528.93	1380.42	1384.99	1263.07	4543.93	4143.93	Estimated DTW - Site visit HGC Oct 2008
201	Mexico	UN-1	600000.0	3466342.7	4637.47	10/14/2008	37908	211.41	4426.06	1349.06	1383.02	1322.06	4537.47	4337.47	CQ Database - 021312
202	Mexico	UN-2	600012.7	3465396.5	4698.65	4/29/1986	29704	219.00	4479.65	1365.40	1366.62	1282.80	4483.65	4208.65	Littin 1987
202	Mexico	UN-2	600012.7	3465396.5	4698.65	3/15/1996	33312	215.00	4483.65	1366.62	1366.62	1282.80	4483.65	4208.65	BECC Proposal for Water Upgrade 3/15/96
203	Mexico	UN-3	599949.2	3465796.6	4674.21	3/15/1996	33312	158.00	4516.21	1376.54	1376.54	1324.72	4516.21	4346.21	BECC Proposal for Water Upgrade 3/15/96
205	Mexico	UN-5	600742.9	3464444.0	4749.51	10/14/2008	37908	272.00	4477.51	1364.75	1386.69	1249.53	4549.51	4099.51	CQ Database - 021312

NOTES:

*Listing includes only water levels in the model domain, used as targets.
ADWR = Arizona Department of Water Resources
AMSL = above mean sea level
CCA = Clear Creek Associates
CQB = Copper Queen Branch
DTW = depth to water
FMI - Freeport-McMoran Incorporated
GWSI = Groundwater Site Inventory
HGC = Hydro Geo Chem
Littin 1987 = Littin, G.R. 1987. Ground-Water Resources of the Bisbee - Naco Area, Cochise County, Arizona. June 1987.
USGS = United States Geological Survey
Well 55 = Arizona Department of Water Resources Database of Registered Wells
WMC WAPP = Water Management Consultants (WMC). 2006. Copper Queen Branch Warren Mining District Aquifer Protection Permit Application. January 2006.

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
071891	METZLER	D24024005DBB	602123.9	3471229.3	3/5/2008	37685	4728.53	245	345	317	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	3/5/2008	37685	4728.53	245	345	317	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	5/15/2008	37756	4728.53	245	345	329	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	5/15/2008	37756	4728.53	245	345	329	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	7/31/2008	37833	4728.53	245	345	317	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	10/20/2008	37914	4728.53	245	345	326	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	10/20/2008	37914	4728.53	245	345	305	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	2/11/2009	38028	4728.53	245	345	321	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	4/20/2009	38096	4728.53	245	345	313	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	7/15/2009	38182	4728.53	245	345	309	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	7/15/2009	38182	4728.53	245	345	293	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	10/14/2009	38273	4728.53	245	345	315	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	2/1/2010	38383	4728.53	245	345	286	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	5/18/2010	38489	4728.53	245	345	330	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	5/18/2010	38489	4728.53	245	345	330	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	7/16/2010	38548	4728.53	245	345	330	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	10/19/2010	38643	4728.53	245	345	319	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	1/19/2011	38735	4728.53	245	345	298	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	1/19/2011	38735	4728.53	245	345	298	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	4/4/2011	38810	4728.53	245	345	323	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	7/12/2011	38909	4728.53	245	345	312	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	10/12/2011	39001	4728.53	245	345	301	4483.53	4383.53	1366.58	1336.10	
071891	METZLER	D24024005DBB	602123.9	3471229.3	2/7/2012	39119	4728.53	245	345	326	4483.53	4383.53	1366.58	1336.10	2012 Q4 CQB Groundwater Tables
071891	METZLER	D24024005DBB	602123.9	3471229.3	4/12/2012	39184	4728.53	245	345	320	4483.53	4383.53	1366.58	1336.10	2012 Q4 CQB Groundwater Tables
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	4/21/2008	37732	4691.40	141	200	410	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	4/21/2008	37732	4691.40	141	200	410	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	7/21/2008	37823	4691.40	141	200	444	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	10/13/2008	37907	4691.40	141	200	480	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	10/13/2008	37907	4691.40	141	200	500	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	1/22/2009	38008	4691.40	141	200	397	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	4/9/2009	38085	4691.40	141	200	431	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	4/9/2009	38085	4691.40	141	200	426	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	7/9/2009	38176	4691.40	141	200	490	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	10/6/2009	38265	4691.40	141	200	472	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	1/21/2010	38372	4691.40	141	200	318	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	4/20/2010	38461	4691.40	141	200	608	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	7/20/2010	38552	4691.40	141	200	706	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	10/18/2010	38642	4691.40	141	200	568	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	10/18/2010	38642	4691.40	141	200	568	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	7/14/2011	38911	4691.40	141	200	223	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	8/25/2011	38953	4691.40	141	200	222	4550.40	4491.40	1386.96	1368.98	
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	2/6/2012	39118	4691.40	141	200	166	4550.40	4491.40	1386.96	1368.98	2012 Q4 CQB Groundwater Tables
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	2/29/2012	39141	4691.40	141	200	362	4550.40	4491.40	1386.96	1368.98	2012 Q4 CQB Groundwater Tables
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	3/15/2012	39156	4691.40	141	200	282	4550.40	4491.40	1386.96	1368.98	2012 Q4 CQB Groundwater Tables
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	4/12/2012	39184	4691.40	141	200	352	4550.40	4491.40	1386.96	1368.98	2012 Q4 CQB Groundwater Tables
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	4/12/2012	39184	4691.40	141	200	346	4550.40	4491.40	1386.96	1368.98	2012 Q4 CQB Groundwater Tables
076413	PANAGAKOS	D23024010CDB	605311.7	3469321.0	7/9/2012	39272	4691.40	141	200	292	4550.40	4491.40	1386.96	1368.98	2012 Q4 CQB Groundwater Tables
086091	WESTERN LANDSCAPE	D24023013BAA	598685.9	3468855.0	12/11/1985	29565	4533.30	100	256	12	4433.30	4277.30	1351.27	1303.72	Littin 1987
1000	DURAZO	D24024005DBB	602015.5	3471241.2	2/10/2009	38027	4725.00	250	300	386	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	4/7/2009	38083	4725.00	250	300	19.9	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	4/15/2009	38091	4725.00	250	300	620	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	4/20/2009	38096	4725.00	250	300	367	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	7/8/2009	38175	4725.00	250	300	18.5	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	7/15/2009	38182	4725.00	250	300	332	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	10/5/2009	38264	4725.00	250	300	19.7	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	10/12/2009	38271	4725.00	250	300	600	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	10/14/2009	38273	4725.00	250	300	377	4475.00	4425.00	1363.98	1348.74	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
1000	DURAZO	D24024005DBB	602015.5	3471241.2	1/21/2010	38372	4725.00	250	300	18.4	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	1/27/2010	38378	4725.00	250	300	440	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	2/1/2010	38383	4725.00	250	300	344	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	4/21/2010	38462	4725.00	250	300	710	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	4/26/2010	38467	4725.00	250	300	388	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	7/19/2010	38551	4725.00	250	300	22.2	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	7/20/2010	38552	4725.00	250	300	405	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	10/18/2010	38642	4725.00	250	300	568	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	10/19/2010	38643	4725.00	250	300	398	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	1/19/2011	38735	4725.00	250	300	360	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	1/19/2011	38735	4725.00	250	300	360	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	4/4/2011	38810	4725.00	250	300	383	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	7/14/2011	38911	4725.00	250	300	409	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	10/12/2011	39001	4725.00	250	300	396	4475.00	4425.00	1363.98	1348.74	
1000	DURAZO	D24024005DBB	602015.5	3471241.2	2/7/2012	39119	4725.00	250	300	404	4475.00	4425.00	1363.98	1348.74	2012 Q4 CQB Groundwater Tables
1000	DURAZO	D24024005DBB	602015.5	3471241.2	4/12/2012	39184	4725.00	250	300	407	4475.00	4425.00	1363.98	1348.74	2012 Q4 CQB Groundwater Tables
1015	MARCELL_OLD	D24024018AAD	601162.3	3468601.0	8/26/2011	38954	4582.00	0	500	669	4582.00	4082.00	1396.59	1244.19	
1015	MARCELL_OLD	D24024018AAD	601162.3	3468601.0	9/26/2011	38985	4582.00	0	500	638	4582.00	4082.00	1396.59	1244.19	
1015	MARCELL_OLD	D24024018AAD	601162.3	3468601.0	11/22/2011	39042	4582.00	0	500	687	4582.00	4082.00	1396.59	1244.19	
1015	MARCELL_OLD	D24024018AAD	601162.3	3468601.0	2/1/2012	39113	4582.00	0	500	705	4582.00	4082.00	1396.59	1244.19	2012 Q4 CQB Groundwater Tables
1015	MARCELL_OLD	D24024018AAD	601162.3	3468601.0	4/13/2012	39185	4582.00	0	500	668	4582.00	4082.00	1396.59	1244.19	2012 Q4 CQB Groundwater Tables
1015	MARCELL_OLD	D24024018AAD	601162.3	3468601.0	7/13/2012	39276	4582.00	0	500	650	4582.00	4082.00	1396.59	1244.19	2012 Q4 CQB Groundwater Tables
1015	MARCELL_OLD	D24024018AAD	601162.3	3468601.0	10/17/2012	39372	4582.00	0	500	657	4582.00	4082.00	1396.59	1244.19	2012 Q4 CQB Groundwater Tables
1015	MARCELL_OLD	D24024018AAD	601162.3	3468601.0	10/17/2012	39372	4582.00	0	500	660	4582.00	4082.00	1396.59	1244.19	2012 Q4 CQB Groundwater Tables
1016	TVI SS2	D24024018DB	600555.0	3467965.7	12/10/1985	29564	4566.00	100	300	13	4466.00	4266.00	1361.24	1300.28	Littin 1987
102	EN-02	Mexico	601885.9	3465282.2	10/21/2008	37915	4694.19	100	500	7.1	4594.19	4194.19	1400.31	1278.39	
1020	AWC-01	D24023013ABC2	598964.8	3468753.6	12/13/1956	18975	4520.00	0	0	11	4520.00	4520.00	1377.70	1377.70	Littin 1987
1020	AWC-01	D24023013ABC2	598964.8	3468753.6	12/9/1960	20432	4520.00	0	0	8	4520.00	4520.00	1377.70	1377.70	Littin 1987
1020	AWC-01	D24023013ABC2	598964.8	3468753.6	1/23/1964	21572	4520.00	0	0	6	4520.00	4520.00	1377.70	1377.70	Littin 1987
103	EN-03	Mexico	602355.8	3465212.4	10/21/2008	37915	4696.85	100	500	8.7	4596.85	4196.85	1401.12	1279.20	
105	EN-05	Mexico	602139.9	3466050.6	10/21/2008	37915	4651.25	100	500	6.1	4551.25	4151.25	1387.22	1265.30	
106	EN-06	Mexico	601962.1	3466114.1	10/21/2008	37915	4643.93	100	500	9.8	4543.93	4143.93	1384.99	1263.07	
2	HOWARD	D24024017BBC	601281.2	3468770.2	3/4/2008	37684	4593.91	150	300	571	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	3/4/2008	37684	4593.91	150	300	571	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	5/8/2008	37749	4593.91	150	300	673	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	5/8/2008	37749	4593.91	150	300	673	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	5/14/2008	37755	4593.91	150	300	23.7	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	7/14/2008	37816	4593.91	150	300	610	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	7/24/2008	37826	4593.91	150	300	18	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	10/15/2008	37909	4593.91	150	300	683	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	10/16/2008	37910	4593.91	150	300	19	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	1/20/2009	38006	4593.91	150	300	19.8	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	1/28/2009	38014	4593.91	150	300	640	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	1/28/2009	38014	4593.91	150	300	640	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	4/15/2009	38091	4593.91	150	300	620	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	7/15/2009	38182	4593.91	150	300	640	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	10/12/2009	38271	4593.91	150	300	600	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	1/27/2010	38378	4593.91	150	300	520	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	1/27/2010	38378	4593.91	150	300	440	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	4/21/2010	38462	4593.91	150	300	710	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	7/19/2010	38551	4593.91	150	300	548	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	10/18/2010	38642	4593.91	150	300	568	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	10/18/2010	38642	4593.91	150	300	568	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	1/17/2011	38733	4593.91	150	300	520	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	1/17/2011	38733	4593.91	150	300	520	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	4/11/2011	38817	4593.91	150	300	616	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	4/11/2011	38817	4593.91	150	300	616	4443.91	4293.91	1354.50	1308.78	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
2	HOWARD	D24024017BBC	601281.2	3468770.2	8/26/2011	38954	4593.91	150	300	498	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	10/11/2011	39000	4593.91	150	300	545	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	10/11/2011	39000	4593.91	150	300	538	4443.91	4293.91	1354.50	1308.78	
2	HOWARD	D24024017BBC	601281.2	3468770.2	2/1/2012	39113	4593.91	150	300	630	4443.91	4293.91	1354.50	1308.78	2012 Q4 CQB Groundwater Tables
2	HOWARD	D24024017BBC	601281.2	3468770.2	4/13/2012	39185	4593.91	150	300	632	4443.91	4293.91	1354.50	1308.78	2012 Q4 CQB Groundwater Tables
2	HOWARD	D24024017BBC	601281.2	3468770.2	9/13/2012	39338	4593.91	150	300	699	4443.91	4293.91	1354.50	1308.78	2012 Q4 CQB Groundwater Tables
2	HOWARD	D24024017BBC	601281.2	3468770.2	10/16/2012	39371	4593.91	150	300	576	4443.91	4293.91	1354.50	1308.78	2012 Q4 CQB Groundwater Tables
200393	WALKER	D24024014DDA	607564.7	3468577.5	2/13/2008	37664	4601.55	80	100	20	4521.55	4501.55	1378.17	1372.07	
200393	WALKER	D24024014DDA	607564.7	3468577.5	2/13/2008	37664	4601.55	80	100	20	4521.55	4501.55	1378.17	1372.07	
200393	WALKER	D24024014DDA	607564.7	3468577.5	7/23/2008	37825	4601.55	80	100	45.4	4521.55	4501.55	1378.17	1372.07	
201531	SUNBELT	D24024003ADA	605998.3	3471735.1	2/6/2008	37657	4806.52	300	380	18.7	4506.52	4426.52	1373.59	1349.20	
201531	SUNBELT	D24024003ADA	605998.3	3471735.1	2/6/2008	37657	4806.52	300	380	18.7	4506.52	4426.52	1373.59	1349.20	
202	UN-2	Mexico	600012.7	3465396.5	10/14/2008	37908	4698.65	215	490	6.5	4483.65	4208.65	1366.62	1282.80	
203	UN-3	Mexico	599949.2	3465796.6	1/14/1986	29599	4674.21	158	328	6.5	4516.21	4346.21	1376.54	1324.72	Littin 1987
203	UN-3	Mexico	599949.2	3465796.6	10/14/2008	37908	4674.21	158	328	6.7	4516.21	4346.21	1376.54	1324.72	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	10/14/2005	36812	4574.99	252	312	460	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	11/9/2005	36838	4574.99	252	312	390	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	11/29/2006	37223	4574.99	252	312	360	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	3/4/2008	37684	4574.99	252	312	560	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	6/9/2008	37781	4574.99	252	312	524	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	10/27/2008	37921	4574.99	252	312	489	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	2/12/2009	38029	4574.99	252	312	412	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	4/23/2009	38099	4574.99	252	312	466	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	4/23/2009	38099	4574.99	252	312	460	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	7/21/2009	38188	4574.99	252	312	458	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	10/21/2009	38280	4574.99	252	312	444	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	2/3/2010	38385	4574.99	252	312	444	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	4/21/2010	38462	4574.99	252	312	433	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	7/20/2010	38552	4574.99	252	312	477	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	10/19/2010	38643	4574.99	252	312	432	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	1/18/2011	38734	4574.99	252	312	386	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	4/6/2011	38812	4574.99	252	312	361	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	7/15/2011	38912	4574.99	252	312	386	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	10/13/2011	39002	4574.99	252	312	353	4322.99	4262.99	1317.65	1299.36	
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	1/30/2012	39111	4574.99	252	312	379	4322.99	4262.99	1317.65	1299.36	2012 Q4 CQB Groundwater Tables
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	4/25/2012	39197	4574.99	252	312	346	4322.99	4262.99	1317.65	1299.36	2012 Q4 CQB Groundwater Tables
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	4/25/2012	39197	4574.99	252	312	347	4322.99	4262.99	1317.65	1299.36	2012 Q4 CQB Groundwater Tables
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	7/18/2012	39281	4574.99	252	312	354	4322.99	4262.99	1317.65	1299.36	2012 Q4 CQB Groundwater Tables
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	10/10/2012	39365	4574.99	252	312	354	4322.99	4262.99	1317.65	1299.36	2012 Q4 CQB Groundwater Tables
203321	NWC-03R	D24024018ADD	601153.9	3468350.8	10/10/2012	39365	4574.99	252	312	353	4322.99	4262.99	1317.65	1299.36	2012 Q4 CQB Groundwater Tables
204	UN-4	Mexico	601212.8	3466298.2	10/14/2008	37908	4637.14	200	400	6.8	4437.14	4237.14	1352.44	1291.48	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	2/4/2008	37655	4580.94	220	260	5.7	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	2/4/2008	37655	4580.94	220	260	5.7	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	5/6/2008	37747	4580.94	220	260	6.3	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	5/6/2008	37747	4580.94	220	260	6.3	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	7/16/2008	37818	4580.94	220	260	6.9	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	10/28/2008	37922	4580.94	220	260	15	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	2/10/2009	38027	4580.94	220	260	6	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	4/16/2009	38092	4580.94	220	260	5.5	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	7/14/2009	38181	4580.94	220	260	4.5	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	10/13/2009	38272	4580.94	220	260	6.3	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	1/26/2010	38377	4580.94	220	260	5.7	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	4/2/2010	38443	4580.94	220	260	6.7	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	4/22/2010	38463	4580.94	220	260	6.7	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	7/21/2010	38553	4580.94	220	260	6.78	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	10/19/2010	38643	4580.94	220	260	6.56	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	10/19/2010	38643	4580.94	220	260	6.56	4360.94	4320.94	1329.21	1317.02	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
205126	ZANDER	D24024018CBB	599678.9	3467998.5	1/18/2011	38734	4580.94	220	260	6.14	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	1/18/2011	38734	4580.94	220	260	6.14	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	1/18/2011	38734	4580.94	220	260	6.06	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	4/6/2011	38812	4580.94	220	260	6.12	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	7/13/2011	38910	4580.94	220	260	6.43	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	10/12/2011	39001	4580.94	220	260	6.38	4360.94	4320.94	1329.21	1317.02	
205126	ZANDER	D24024018CBB	599678.9	3467998.5	1/31/2012	39112	4580.94	220	260	6.59	4360.94	4320.94	1329.21	1317.02	2012 Q4 CQB Groundwater Tables
205126	ZANDER	D24024018CBB	599678.9	3467998.5	4/10/2012	39182	4580.94	220	260	6.9	4360.94	4320.94	1329.21	1317.02	2012 Q4 CQB Groundwater Tables
205126	ZANDER	D24024018CBB	599678.9	3467998.5	4/10/2012	39182	4580.94	220	260	6.65	4360.94	4320.94	1329.21	1317.02	2012 Q4 CQB Groundwater Tables
205126	ZANDER	D24024018CBB	599678.9	3467998.5	7/17/2012	39280	4580.94	220	260	6.38	4360.94	4320.94	1329.21	1317.02	2012 Q4 CQB Groundwater Tables
205126	ZANDER	D24024018CBB	599678.9	3467998.5	10/8/2012	39363	4580.94	220	260	7.03	4360.94	4320.94	1329.21	1317.02	2012 Q4 CQB Groundwater Tables
209744	KEEFER	D24024018CBB	599879.2	3468119.0	2/6/2008	37657	4572.03	185	245	6.8	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	2/6/2008	37657	4572.03	185	245	6.8	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	5/6/2008	37747	4572.03	185	245	9	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	5/6/2008	37747	4572.03	185	245	9	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	7/16/2008	37818	4572.03	185	245	8	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	10/28/2008	37922	4572.03	185	245	21.2	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	1/28/2009	38014	4572.03	185	245	6.1	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	4/16/2009	38092	4572.03	185	245	7.7	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	7/14/2009	38181	4572.03	185	245	7	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	10/13/2009	38272	4572.03	185	245	8.7	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	1/26/2010	38377	4572.03	185	245	7.3	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	4/20/2010	38461	4572.03	185	245	8.77	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	7/15/2010	38547	4572.03	185	245	8.84	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	10/19/2010	38643	4572.03	185	245	7.89	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	10/19/2010	38643	4572.03	185	245	7.89	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	1/18/2011	38734	4572.03	185	245	7.24	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	1/18/2011	38734	4572.03	185	245	7.24	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	4/6/2011	38812	4572.03	185	245	8.04	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	7/18/2011	38915	4572.03	185	245	7.79	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	10/11/2011	39000	4572.03	185	245	7.98	4387.03	4327.03	1337.17	1318.88	
209744	KEEFER	D24024018CBB	599879.2	3468119.0	2/6/2012	39118	4572.03	185	245	6.84	4387.03	4327.03	1337.17	1318.88	2012 Q4 CQB Groundwater Tables
209744	KEEFER	D24024018CBB	599879.2	3468119.0	4/23/2012	39195	4572.03	185	245	7.14	4387.03	4327.03	1337.17	1318.88	2012 Q4 CQB Groundwater Tables
209744	KEEFER	D24024018CBB	599879.2	3468119.0	7/17/2012	39280	4572.03	185	245	7.29	4387.03	4327.03	1337.17	1318.88	2012 Q4 CQB Groundwater Tables
209744	KEEFER	D24024018CBB	599879.2	3468119.0	10/9/2012	39364	4572.03	185	245	8.47	4387.03	4327.03	1337.17	1318.88	2012 Q4 CQB Groundwater Tables
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	2/8/2008	37659	4564.49	260	305	158	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	2/8/2008	37659	4564.49	260	305	158	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	4/21/2008	37732	4564.49	260	305	122	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	4/21/2008	37732	4564.49	260	305	122	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	5/13/2008	37754	4564.49	260	305	130	4304.49	4259.49	1312.01	1298.29	2012 Q4 CQB Groundwater Tables
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	5/19/2008	37760	4564.49	260	305	130	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	5/19/2008	37760	4564.49	260	305	130	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	6/23/2008	37795	4564.49	260	305	129	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	7/29/2008	37831	4564.49	260	305	245	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	8/28/2008	37861	4564.49	260	305	131	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	9/23/2008	37887	4564.49	260	305	124	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	10/22/2008	37916	4564.49	260	305	135	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	11/19/2008	37944	4564.49	260	305	140	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	12/17/2008	37972	4564.49	260	305	144	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	1/29/2009	38015	4564.49	260	305	124	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	2/23/2009	38040	4564.49	260	305	123	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	4/17/2009	38093	4564.49	260	305	120	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	7/10/2009	38177	4564.49	260	305	116	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	7/10/2009	38177	4564.49	260	305	117	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	10/6/2009	38265	4564.49	260	305	120	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	1/22/2010	38373	4564.49	260	305	133	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	4/21/2010	38462	4564.49	260	305	129	4304.49	4259.49	1312.01	1298.29	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	7/21/2010	38553	4564.49	260	305	134	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	10/19/2010	38643	4564.49	260	305	147	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	10/19/2010	38643	4564.49	260	305	147	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	1/17/2011	38733	4564.49	260	305	1160	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	1/17/2011	38733	4564.49	260	305	116	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	4/11/2011	38817	4564.49	260	305	128	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	4/11/2011	38817	4564.49	260	305	128	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	7/18/2011	38915	4564.49	260	305	116	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	10/12/2011	39001	4564.49	260	305	124	4304.49	4259.49	1312.01	1298.29	
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	2/6/2012	39118	4564.49	260	305	116	4304.49	4259.49	1312.01	1298.29	2012 Q4 CQB Groundwater Tables
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	2/6/2012	39118	4564.49	260	305	114	4304.49	4259.49	1312.01	1298.29	2012 Q4 CQB Groundwater Tables
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	4/10/2012	39182	4564.49	260	305	120	4304.49	4259.49	1312.01	1298.29	2012 Q4 CQB Groundwater Tables
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	7/16/2012	39279	4564.49	260	305	117	4304.49	4259.49	1312.01	1298.29	2012 Q4 CQB Groundwater Tables
210865	SCHWARTZ	D24024018ADC	600811.0	3468269.7	10/17/2012	39372	4564.49	260	305	121	4304.49	4259.49	1312.01	1298.29	2012 Q4 CQB Groundwater Tables
211345	SRC	D23024031CCC	599722.5	3472503.3	4/23/2008	37734	4810.12	845	965	19	3965.12	3845.12	1208.57	1171.99	
211345	SRC	D23024031CCC	599722.5	3472503.3	4/23/2008	37734	4810.12	845	965	19	3965.12	3845.12	1208.57	1171.99	
211345	SRC	D23024031CCC	599722.5	3472503.3	8/5/2008	37838	4810.12	845	965	15.4	3965.12	3845.12	1208.57	1171.99	
212268	BURKE	D23024032ACD	602230.1	3473029.8	2/7/2008	37658	4856.30	661	781	29.5	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	4/22/2008	37733	4856.30	661	781	26	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	4/22/2008	37733	4856.30	661	781	26	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	8/5/2008	37838	4856.30	661	781	21.9	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	10/20/2008	37914	4856.30	661	781	20.5	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	2/11/2009	38028	4856.30	661	781	23.9	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	4/28/2009	38104	4856.30	661	781	24.2	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	8/19/2009	38217	4856.30	661	781	22.5	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	12/16/2009	38336	4856.30	661	781	26	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	3/2/2010	38412	4856.30	661	781	23.8	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	4/22/2010	38463	4856.30	661	781	24.8	4195.30	4075.30	1278.73	1242.15	
212268	BURKE	D23024032ACD	602230.1	3473029.8	7/21/2010	38553	4856.30	661	781	33.1	4195.30	4075.30	1278.73	1242.15	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	2/27/2008	37678	4642.92	200	300	152	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	2/27/2008	37678	4642.92	200	300	152	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	4/21/2008	37732	4642.92	200	300	137	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	4/21/2008	37732	4642.92	200	300	137	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	5/13/2008	37754	4642.92	200	300	131	4442.92	4342.92	1354.20	1323.72	2012 Q4 CQB Groundwater Tables
212447	FULTZ	D24024011DCC	607153.3	3469063.9	5/14/2008	37755	4642.92	200	300	131	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	5/14/2008	37755	4642.92	200	300	131	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	6/23/2008	37795	4642.92	200	300	111	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	7/29/2008	37831	4642.92	200	300	152	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	8/28/2008	37861	4642.92	200	300	137	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	9/23/2008	37887	4642.92	200	300	137	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	10/22/2008	37916	4642.92	200	300	145	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	1/21/2009	38007	4642.92	200	300	82	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	4/9/2009	38085	4642.92	200	300	138	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	7/13/2009	38180	4642.92	200	300	81	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	10/8/2009	38267	4642.92	200	300	71.8	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	10/8/2009	38267	4642.92	200	300	72	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	1/25/2010	38376	4642.92	200	300	66.7	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	4/20/2010	38461	4642.92	200	300	68.3	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	7/14/2010	38546	4642.92	200	300	57	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	10/20/2010	38644	4642.92	200	300	54.7	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	10/20/2010	38644	4642.92	200	300	54.7	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	1/18/2011	38734	4642.92	200	300	56.9	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	1/18/2011	38734	4642.92	200	300	56.9	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	4/5/2011	38811	4642.92	200	300	49.5	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	4/5/2011	38811	4642.92	200	300	51.7	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	8/25/2011	38953	4642.92	200	300	50.6	4442.92	4342.92	1354.20	1323.72	
212447	FULTZ	D24024011DCC	607153.3	3469063.9	10/12/2011	39001	4642.92	200	300	48.5	4442.92	4342.92	1354.20	1323.72	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
215509	CAMPBELL	D24024011CDB	606420.8	3469320.3	2/5/2008	37656	4694.29	20	350	211	4674.29	4344.29	1424.72	1324.14	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	2/4/2008	37655	4590.66	240	285	4.6	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	2/4/2008	37655	4590.66	240	285	4.6	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	5/7/2008	37748	4590.66	240	285	5.9	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	5/7/2008	37748	4590.66	240	285	5.9	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	7/17/2008	37819	4590.66	240	285	7.1	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	10/27/2008	37921	4590.66	240	285	15.7	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	2/10/2009	38027	4590.66	240	285	5.4	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	4/16/2009	38092	4590.66	240	285	4.9	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	7/13/2009	38180	4590.66	240	285	3.8	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	10/6/2009	38265	4590.66	240	285	5.8	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	1/25/2010	38376	4590.66	240	285	5.1	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	4/21/2010	38462	4590.66	240	285	6.04	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	7/21/2010	38553	4590.66	240	285	6.47	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	10/19/2010	38643	4590.66	240	285	5.92	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	1/18/2011	38734	4590.66	240	285	5.5	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	1/18/2011	38734	4590.66	240	285	5.5	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	4/11/2011	38817	4590.66	240	285	6.13	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	4/11/2011	38817	4590.66	240	285	6.13	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	7/18/2011	38915	4590.66	240	285	6	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	10/13/2011	39002	4590.66	240	285	5.99	4350.66	4305.66	1326.08	1312.37	
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	1/30/2012	39111	4590.66	240	285	6.22	4350.66	4305.66	1326.08	1312.37	2012 Q4 CQB Groundwater Tables
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	4/10/2012	39182	4590.66	240	285	6.31	4350.66	4305.66	1326.08	1312.37	2012 Q4 CQB Groundwater Tables
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	7/17/2012	39280	4590.66	240	285	5.85	4350.66	4305.66	1326.08	1312.37	2012 Q4 CQB Groundwater Tables
216018	ROGERS E	D24024018BCD	599895.4	3468264.0	10/17/2012	39372	4590.66	240	285	6.04	4350.66	4305.66	1326.08	1312.37	2012 Q4 CQB Groundwater Tables
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	2/4/2008	37655	4596.61	260	300	7.6	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	2/4/2008	37655	4596.61	260	300	7.6	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	5/6/2008	37747	4596.61	260	300	8.3	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	5/6/2008	37747	4596.61	260	300	8.3	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	7/17/2008	37819	4596.61	260	300	8.8	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	10/27/2008	37921	4596.61	260	300	7.3	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	1/29/2009	38015	4596.61	260	300	8.3	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	4/16/2009	38092	4596.61	260	300	7.6	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	7/10/2009	38177	4596.61	260	300	6.4	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	10/6/2009	38265	4596.61	260	300	8.4	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	1/25/2010	38376	4596.61	260	300	7.8	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	4/21/2010	38462	4596.61	260	300	9.04	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	7/21/2010	38553	4596.61	260	300	8.98	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	10/19/2010	38643	4596.61	260	300	10.8	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	10/19/2010	38643	4596.61	260	300	10.8	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	1/18/2011	38734	4596.61	260	300	8.18	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	1/18/2011	38734	4596.61	260	300	8.18	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	4/11/2011	38817	4596.61	260	300	8.65	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	4/11/2011	38817	4596.61	260	300	8.65	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	7/18/2011	38915	4596.61	260	300	8.44	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	10/12/2011	39001	4596.61	260	300	8.55	4336.61	4296.61	1321.80	1309.61	
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	1/30/2012	39111	4596.61	260	300	8.8	4336.61	4296.61	1321.80	1309.61	2012 Q4 CQB Groundwater Tables
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	4/10/2012	39182	4596.61	260	300	8.7	4336.61	4296.61	1321.80	1309.61	2012 Q4 CQB Groundwater Tables
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	7/6/2012	39269	4596.61	260	300	8.97	4336.61	4296.61	1321.80	1309.61	2012 Q4 CQB Groundwater Tables
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	10/8/2012	39363	4596.61	260	300	9.14	4336.61	4296.61	1321.80	1309.61	2012 Q4 CQB Groundwater Tables
216425	RAMIREZ	D24024018CCB	599730.6	3467584.4	10/8/2012	39363	4596.61	260	300	9.07	4336.61	4296.61	1321.80	1309.61	2012 Q4 CQB Groundwater Tables
218386	FLEMING	D24024010DDB	605714.0	3469330.0	7/15/2010	38547	4693.68	385	445	573	4308.68	4248.68	1313.29	1295.00	
219449	ECHAVE	D24024007BCB	599698.0	3470167.1	2/1/2012	39113	4641.72	265	345	26.7	4376.72	4296.72	1334.02	1309.64	2012 Q4 CQB Groundwater Tables
219449	ECHAVE	D24024007BCB	599698.0	3470167.1	4/23/2012	39195	4641.72	265	345	26.4	4376.72	4296.72	1334.02	1309.64	2012 Q4 CQB Groundwater Tables
219449	ECHAVE	D24024007BCB	599698.0	3470167.1	7/17/2012	39280	4641.72	265	345	26.1	4376.72	4296.72	1334.02	1309.64	2012 Q4 CQB Groundwater Tables
219449	ECHAVE	D24024007BCB	599698.0	3470167.1	10/9/2012	39364	4641.72	265	345	26.1	4376.72	4296.72	1334.02	1309.64	2012 Q4 CQB Groundwater Tables
219449	ECHAVE	D24024007BCB	599698.0	3470167.1	10/9/2012	39364	4641.72	265	345	26	4376.72	4296.72	1334.02	1309.64	2012 Q4 CQB Groundwater Tables

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	9/9/2010	38603	4718.55	440	540	150	4278.55	4178.55	1304.10	1273.62	
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	11/11/2010	38666	4718.55	440	540	98	4278.55	4178.55	1304.10	1273.62	
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	11/11/2010	38666	4718.55	440	540	98	4278.55	4178.55	1304.10	1273.62	
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	2/11/2011	38758	4718.55	440	540	138	4278.55	4178.55	1304.10	1273.62	
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	2/11/2011	38758	4718.55	440	540	138	4278.55	4178.55	1304.10	1273.62	
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	5/12/2011	38848	4718.55	440	540	129	4278.55	4178.55	1304.10	1273.62	
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	5/12/2011	38848	4718.55	440	540	129	4278.55	4178.55	1304.10	1273.62	
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	8/31/2011	38959	4718.55	440	540	154	4278.55	4178.55	1304.10	1273.62	
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	12/13/2011	39063	4718.55	440	540	149	4278.55	4178.55	1304.10	1273.62	
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	2/8/2012	39120	4718.55	440	540	158	4278.55	4178.55	1304.10	1273.62	2012 Q4 CQB Groundwater Tables
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	4/24/2012	39196	4718.55	440	540	150	4278.55	4178.55	1304.10	1273.62	2012 Q4 CQB Groundwater Tables
219957	BMO-2010-1M	D24024010ACD	605581.3	3469935.8	7/9/2012	39272	4718.55	440	540	161	4278.55	4178.55	1304.10	1273.62	2012 Q4 CQB Groundwater Tables
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	9/15/2010	38609	4746.16	269	370	915	4477.16	4376.16	1364.64	1333.85	
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	11/11/2010	38666	4746.16	269	370	935	4477.16	4376.16	1364.64	1333.85	
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	11/11/2010	38666	4746.16	269	370	935	4477.16	4376.16	1364.64	1333.85	
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	2/10/2011	38757	4746.16	269	370	950	4477.16	4376.16	1364.64	1333.85	
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	2/10/2011	38757	4746.16	269	370	950	4477.16	4376.16	1364.64	1333.85	
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	5/13/2011	38849	4746.16	269	370	887	4477.16	4376.16	1364.64	1333.85	
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	5/13/2011	38849	4746.16	269	370	887	4477.16	4376.16	1364.64	1333.85	
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	7/14/2011	38911	4746.16	269	370	917	4477.16	4376.16	1364.64	1333.85	
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	12/13/2011	39063	4746.16	269	370	984	4477.16	4376.16	1364.64	1333.85	
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	1/30/2012	39111	4746.16	269	370	989	4477.16	4376.16	1364.64	1333.85	2012 Q4 CQB Groundwater Tables
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	4/18/2012	39190	4746.16	269	370	893	4477.16	4376.16	1364.64	1333.85	2012 Q4 CQB Groundwater Tables
219958	BMO-2010-2M	D24024010AAB	605685.5	3470564.6	7/9/2012	39272	4746.16	269	370	1030	4477.16	4376.16	1364.64	1333.85	2012 Q4 CQB Groundwater Tables
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	7/31/2010	38563	4550.53	416	522	14.8	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	11/10/2010	38665	4550.53	416	522	12.6	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	11/10/2010	38665	4550.53	416	522	12.6	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	11/10/2010	38665	4550.53	416	522	12.7	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	1/20/2011	38736	4550.53	416	522	11.5	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	1/20/2011	38736	4550.53	416	522	11.5	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	4/7/2011	38813	4550.53	416	522	12.3	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	4/7/2011	38813	4550.53	416	522	12.3	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	8/25/2011	38953	4550.53	416	522	10.4	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	10/13/2011	39002	4550.53	416	522	10.5	4134.53	4028.53	1260.20	1227.90	
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	2/2/2012	39114	4550.53	416	522	10.6	4134.53	4028.53	1260.20	1227.90	2012 Q4 CQB Groundwater Tables
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	4/24/2012	39196	4550.53	416	522	10.1	4134.53	4028.53	1260.20	1227.90	2012 Q4 CQB Groundwater Tables
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	7/5/2012	39268	4550.53	416	522	10.3	4134.53	4028.53	1260.20	1227.90	2012 Q4 CQB Groundwater Tables
219969	BMO-2010-3M	D24024018BCA	599970.8	3468353.4	10/18/2012	39373	4550.53	416	522	10.4	4134.53	4028.53	1260.20	1227.90	2012 Q4 CQB Groundwater Tables
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	7/29/2010	38561	4550.59	120	320	16	4430.59	4230.59	1350.44	1289.48	
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	11/10/2010	38665	4550.59	120	320	14.9	4430.59	4230.59	1350.44	1289.48	
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	11/10/2010	38665	4550.59	120	320	14.9	4430.59	4230.59	1350.44	1289.48	
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	1/20/2011	38736	4550.59	120	320	14.4	4430.59	4230.59	1350.44	1289.48	
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	1/20/2011	38736	4550.59	120	320	14.4	4430.59	4230.59	1350.44	1289.48	
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	4/7/2011	38813	4550.59	120	320	14.9	4430.59	4230.59	1350.44	1289.48	
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	4/7/2011	38813	4550.59	120	320	14.9	4430.59	4230.59	1350.44	1289.48	
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	7/13/2011	38910	4550.59	120	320	13.8	4430.59	4230.59	1350.44	1289.48	
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	10/13/2011	39002	4550.59	120	320	15.9	4430.59	4230.59	1350.44	1289.48	
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	2/2/2012	39114	4550.59	120	320	16.9	4430.59	4230.59	1350.44	1289.48	2012 Q4 CQB Groundwater Tables
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	2/2/2012	39114	4550.59	120	320	17.1	4430.59	4230.59	1350.44	1289.48	2012 Q4 CQB Groundwater Tables
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	4/24/2012	39196	4550.59	120	320	16	4430.59	4230.59	1350.44	1289.48	2012 Q4 CQB Groundwater Tables
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	7/5/2012	39268	4550.59	120	320	15.7	4430.59	4230.59	1350.44	1289.48	2012 Q4 CQB Groundwater Tables
219970	BMO-2010-3B	D24024018BCA	599978.0	3468347.3	10/18/2012	39373	4550.59	120	320	17	4430.59	4230.59	1350.44	1289.48	2012 Q4 CQB Groundwater Tables
221312	HOWARD 312	D24024017BBC2	601308.9	3468772.6	8/14/2012	39308	4596.11	802	980	69.2	3794.11	3616.11	1156.44	1102.19	2012 Q4 CQB Groundwater Tables
221312	HOWARD 312	D24024017BBC2	601308.9	3468772.6	10/16/2012	39371	4596.11	802	980	68.1	3794.11	3616.11	1156.44	1102.19	2012 Q4 CQB Groundwater Tables
221383	FRANCO 383	D24024016BBB2	602817.9	3468831.6	9/13/2012	39338	4638.07	612	711	318	4026.07	3927.07	1227.15	1196.97	2012 Q4 CQB Groundwater Tables
221383	FRANCO 383	D24024016BBB2	602817.9	3468831.6	10/5/2012	39360	4638.07	612	711	324	4026.07	3927.07	1227.15	1196.97	2012 Q4 CQB Groundwater Tables
221458	ANDERSON 458	D24024018AAA	601118.8	3468826.0	9/9/2012	39334	4586.55	615	734	31	3971.55	3852.55	1210.53	1174.26	2012 Q4 CQB Groundwater Tables

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
221458	ANDERSON 458	D24024018AAA	601118.8	3468826.0	10/10/2012	39365	4586.55	615	734	30.3	3971.55	3852.55	1210.53	1174.26	2012 Q4 CQB Groundwater Tables
221459	MCCONNELL 459	D23024014BCC2	601471.7	3468840.7	7/27/2012	39290	4601.56	723	863	41	3878.56	3738.56	1182.19	1139.51	2012 Q4 CQB Groundwater Tables
221459	MCCONNELL 459	D23024014BCC2	601471.7	3468840.7	10/8/2012	39363	4601.56	723	863	43.4	3878.56	3738.56	1182.19	1139.51	2012 Q4 CQB Groundwater Tables
221517	PIONKE 517	D24024018AAA2	600910.0	3468866.7	9/18/2012	39343	4588.38	505	604	14	4083.38	3984.38	1244.61	1214.44	2012 Q4 CQB Groundwater Tables
221517	PIONKE 517	D24024018AAA2	600910.0	3468866.7	10/11/2012	39366	4588.38	505	604	14.9	4083.38	3984.38	1244.61	1214.44	2012 Q4 CQB Groundwater Tables
3	SWAN	D23025018DBD	607378.5	3470648.3	2/13/2008	37664	4716.59	300	500	24.1	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	2/13/2008	37664	4716.59	300	500	24.1	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	5/14/2008	37755	4716.59	300	500	23.7	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	5/14/2008	37755	4716.59	300	500	23.7	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	7/24/2008	37826	4716.59	300	500	220	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	10/16/2008	37910	4716.59	300	500	19	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	1/20/2009	38006	4716.59	300	500	19.8	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	4/7/2009	38083	4716.59	300	500	19.9	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	4/7/2009	38083	4716.59	300	500	19.9	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	7/8/2009	38175	4716.59	300	500	18.5	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	10/5/2009	38264	4716.59	300	500	19.7	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	1/21/2010	38372	4716.59	300	500	18.4	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	4/21/2010	38462	4716.59	300	500	20.9	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	7/19/2010	38551	4716.59	300	500	22.2	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	1/18/2011	38734	4716.59	300	500	18.7	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	1/18/2011	38734	4716.59	300	500	18.7	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	7/12/2011	38909	4716.59	300	500	19.1	4416.59	4216.59	1346.18	1285.22	
3	SWAN	D23025018DBD	607378.5	3470648.3	2/3/2012	39115	4716.59	300	500	19.5	4416.59	4216.59	1346.18	1285.22	2012 Q4 CQB Groundwater Tables
3	SWAN	D23025018DBD	607378.5	3470648.3	2/3/2012	39115	4716.59	300	500	20.1	4416.59	4216.59	1346.18	1285.22	2012 Q4 CQB Groundwater Tables
3	SWAN	D23025018DBD	607378.5	3470648.3	7/10/2012	39273	4716.59	300	500	19.4	4416.59	4216.59	1346.18	1285.22	2012 Q4 CQB Groundwater Tables
500101	FRANCO	D24024016BBB	602849.9	3468835.7	2/6/2008	37657	4636.00	180	200	670	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	2/6/2008	37657	4636.00	180	200	670	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	5/5/2008	37746	4636.00	180	200	680	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	5/5/2008	37746	4636.00	180	200	680	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	7/14/2008	37816	4636.00	180	200	680	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	10/15/2008	37909	4636.00	180	200	680	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	1/22/2009	38008	4636.00	180	200	740	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	4/14/2009	38090	4636.00	180	200	690	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	7/13/2009	38180	4636.00	180	200	670	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	10/12/2009	38271	4636.00	180	200	650	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	1/26/2010	38377	4636.00	180	200	640	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	4/23/2010	38464	4636.00	180	200	699	4456.00	4436.00	1358.19	1352.09	
500101	FRANCO	D24024016BBB	602849.9	3468835.7	7/13/2010	38545	4636.00	180	200	188	4456.00	4436.00	1358.19	1352.09	
502527	GALLANT	D24024013BBC	607769.6	3468524.4	2/11/2008	37662	4599.58	40	140	17.9	4559.58	4459.58	1389.76	1359.28	
502527	GALLANT	D24024013BBC	607769.6	3468524.4	2/11/2008	37662	4599.58	40	140	17.9	4559.58	4459.58	1389.76	1359.28	
502527	GALLANT	D24024013BBC	607769.6	3468524.4	7/23/2008	37825	4599.58	40	140	20.9	4559.58	4459.58	1389.76	1359.28	
509518	POOL	D24024007BCB	599683.6	3470013.8	2/20/2008	37671	4639.09	213	300	134	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	2/20/2008	37671	4639.09	213	300	134	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	5/19/2008	37760	4639.09	213	300	122	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	5/19/2008	37760	4639.09	213	300	122	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	7/31/2008	37833	4639.09	213	300	117	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	10/21/2008	37915	4639.09	213	300	120	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	2/13/2009	38030	4639.09	213	300	141	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	4/21/2009	38097	4639.09	213	300	124	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	7/20/2009	38187	4639.09	213	300	122	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	10/20/2009	38279	4639.09	213	300	122	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	2/24/2010	38406	4639.09	213	300	110	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	4/22/2010	38463	4639.09	213	300	130	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	7/14/2010	38546	4639.09	213	300	117	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	10/20/2010	38644	4639.09	213	300	115	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	1/20/2011	38736	4639.09	213	300	112	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	1/20/2011	38736	4639.09	213	300	114	4426.09	4339.09	1349.07	1322.55	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
509518	POOL	D24024007BCB	599683.6	3470013.8	1/20/2011	38736	4639.09	213	300	112	4426.09	4339.09	1349.07	1322.55	
509518	POOL	D24024007BCB	599683.6	3470013.8	4/6/2011	38812	4639.09	213	300	114	4426.09	4339.09	1349.07	1322.55	
522569	TM-01	D24024009AAB	604096.2	3470517.0	2/1/1989	30713	4714.50	215	265	1650	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	3/2/1989	30742	4714.50	215	265	1630	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	4/17/1989	30788	4714.50	215	265	1660	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	5/17/1989	30818	4714.50	215	265	1450	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	6/23/1989	30855	4714.50	215	265	146	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	7/1/1989	30863	4714.50	215	265	1600	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	8/1/1989	30894	4714.50	215	265	1620	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	9/1/1989	30925	4714.50	215	265	1520	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	10/1/1989	30955	4714.50	215	265	1600	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	12/1/1989	31016	4714.50	215	265	1500	4499.50	4449.50	1371.45	1356.21	
522569	TM-01	D24024009AAB	604096.2	3470517.0	1/1/1990	31047	4714.50	215	265	1480	4499.50	4449.50	1371.45	1356.21	
522573	TM-02	D24024004AAC	604077.6	3471921.0	1/27/1989	30708	4791.72	280	360	2600	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	2/27/1989	30739	4791.72	280	360	2500	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	4/6/1989	30777	4791.72	280	360	2700	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	5/1/1989	30802	4791.72	280	360	2890	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	6/8/1989	30840	4791.72	280	360	2900	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	7/13/1989	30875	4791.72	280	360	2640	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	8/2/1989	30895	4791.72	280	360	2950	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	9/12/1989	30936	4791.72	280	360	2700	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	10/16/1989	30970	4791.72	280	360	2800	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	11/13/1989	30998	4791.72	280	360	2840	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	12/11/1989	31026	4791.72	280	360	2700	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	1/4/1990	31050	4791.72	280	360	2800	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	11/23/1993	32469	4791.72	280	360	2200	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	6/20/1996	33409	4791.72	280	360	1200	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	7/18/1996	33437	4791.72	280	360	1156	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	8/6/1996	33456	4791.72	280	360	1300	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	8/6/1996	33456	4791.72	280	360	523	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	7/30/1997	33814	4791.72	280	360	1290	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	11/6/1997	33913	4791.72	280	360	1210	4511.72	4431.72	1375.17	1350.79	
522573	TM-02	D24024004AAC	604077.6	3471921.0	11/20/2002	35753	4791.72	280	360	1320	4511.72	4431.72	1375.17	1350.79	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	2/24/1989	30736	4808.43	825	925	640	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	3/3/1989	30743	4808.43	825	925	26	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	4/6/1989	30777	4808.43	825	925	27	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	5/1/1989	30802	4808.43	825	925	29	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	6/8/1989	30840	4808.43	825	925	27	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	7/13/1989	30875	4808.43	825	925	24	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	8/7/1989	30900	4808.43	825	925	27	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	9/12/1989	30936	4808.43	825	925	26	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	10/16/1989	30970	4808.43	825	925	26	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	11/13/1989	30998	4808.43	825	925	27	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	12/11/1989	31026	4808.43	825	925	26	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	1/4/1990	31050	4808.43	825	925	27	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	11/23/1993	32469	4808.43	825	925	20	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	6/24/1996	33413	4808.43	825	925	15	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	3/4/2008	37684	4808.43	825	925	12.3	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	3/4/2008	37684	4808.43	825	925	12.3	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	5/23/2008	37764	4808.43	825	925	14.7	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	5/23/2008	37764	4808.43	825	925	14.7	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	8/15/2008	37848	4808.43	825	925	14.4	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	10/30/2008	37924	4808.43	825	925	21.9	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	2/24/2009	38041	4808.43	825	925	20.3	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	5/6/2009	38112	4808.43	825	925	18.7	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	8/12/2009	38210	4808.43	825	925	20	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	11/4/2009	38294	4808.43	825	925	21.8	3983.43	3883.43	1214.15	1183.67	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
522574	TM-02A	D24024004AAC	604152.1	3472008.8	3/10/2010	38420	4808.43	825	925	21.3	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	3/10/2010	38420	4808.43	825	925	21.4	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	4/6/2010	38447	4808.43	825	925	25.6	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	4/7/2010	38448	4808.43	825	925	25.6	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	7/6/2010	38538	4808.43	825	925	22.1	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	2/10/2011	38757	4808.43	825	925	22.9	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	2/10/2011	38757	4808.43	825	925	22.9	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	7/13/2011	38910	4808.43	825	925	22.5	3983.43	3883.43	1214.15	1183.67	
522574	TM-02A	D24024004AAC	604152.1	3472008.8	2/2/2012	39114	4808.43	825	925	23	3983.43	3883.43	1214.15	1183.67	2012 Q4 CQB Groundwater Tables
522574	TM-02A	D24024004AAC	604152.1	3472008.8	8/14/2012	39308	4808.43	825	925	23.4	3983.43	3883.43	1214.15	1183.67	2012 Q4 CQB Groundwater Tables
522578	TM-16	D24024010ACD	605588.3	3469842.1	1/27/1989	30708	4717.71	65	115	510	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	3/1/1989	30741	4717.71	65	115	560	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	4/6/1989	30777	4717.71	65	115	555	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	5/3/1989	30804	4717.71	65	115	535	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	6/1/1989	30833	4717.71	65	115	560	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	7/13/1989	30875	4717.71	65	115	540	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	8/8/1989	30901	4717.71	65	115	508	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	9/8/1989	30932	4717.71	65	115	510	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	10/11/1989	30965	4717.71	65	115	500	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	11/13/1989	30998	4717.71	65	115	500	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	12/7/1989	31022	4717.71	65	115	520	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	1/4/1990	31050	4717.71	65	115	520	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	6/27/1996	33416	4717.71	65	115	500	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	8/6/1996	33456	4717.71	65	115	470	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	8/6/1996	33456	4717.71	65	115	553	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	1/23/1997	33626	4717.71	65	115	484	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	7/29/1997	33813	4717.71	65	115	500	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	11/6/1997	33913	4717.71	65	115	506	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	3/5/2008	37685	4717.71	65	115	497	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	3/5/2008	37685	4717.71	65	115	497	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	5/22/2008	37763	4717.71	65	115	522	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	5/22/2008	37763	4717.71	65	115	522	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	8/6/2008	37839	4717.71	65	115	466	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	11/5/2008	37930	4717.71	65	115	547	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	2/20/2009	38037	4717.71	65	115	492	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	5/13/2009	38119	4717.71	65	115	484	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	8/19/2009	38217	4717.71	65	115	468	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	11/10/2009	38300	4717.71	65	115	505	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	3/2/2010	38412	4717.71	65	115	451	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	4/14/2010	38455	4717.71	65	115	484	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	7/2/2010	38534	4717.71	65	115	474	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	7/14/2011	38911	4717.71	65	115	511	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	7/16/2011	38913	4717.71	65	115	513	4652.71	4602.71	1418.15	1402.91	
522578	TM-16	D24024010ACD	605588.3	3469842.1	7/9/2012	39272	4717.71	65	115	544	4652.71	4602.71	1418.15	1402.91	2012 Q4 CQB Groundwater Tables
522580	TM-19	D24024008DDC	602523.7	3469075.7	1/30/1989	30711	4627.32	150	210	50	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	3/1/1989	30741	4627.32	150	210	54	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	4/7/1989	30778	4627.32	150	210	55	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	5/2/1989	30803	4627.32	150	210	50	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	6/9/1989	30841	4627.32	150	210	55	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	7/13/1989	30875	4627.32	150	210	55	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	8/8/1989	30901	4627.32	150	210	53	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	9/11/1989	30935	4627.32	150	210	58	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	10/13/1989	30967	4627.32	150	210	58	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	11/14/1989	30999	4627.32	150	210	58	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	12/7/1989	31022	4627.32	150	210	58	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	1/4/1990	31050	4627.32	150	210	62	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	11/23/1993	32469	4627.32	150	210	63	4477.32	4417.32	1364.69	1346.40	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
522580	TM-19	D24024008DDC	602523.7	3469075.7	6/25/1996	33414	4627.32	150	210	56	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	3/6/2008	37686	4627.32	150	210	56.1	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	5/22/2008	37763	4627.32	150	210	64.5	4477.32	4417.32	1364.69	1346.40	
522580	TM-19	D24024008DDC	602523.7	3469075.7	8/6/2008	37839	4627.32	150	210	55.3	4477.32	4417.32	1364.69	1346.40	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	1/30/1989	30711	4645.87	585	695	1100	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	3/1/1989	30741	4645.87	585	695	1100	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	4/7/1989	30778	4645.87	585	695	1180	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	5/2/1989	30803	4645.87	585	695	1125	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	6/9/1989	30841	4645.87	585	695	1070	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	7/13/1989	30875	4645.87	585	695	1120	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	8/8/1989	30901	4645.87	585	695	1110	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	9/8/1989	30932	4645.87	585	695	1080	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	10/13/1989	30967	4645.87	585	695	1200	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	11/14/1989	30999	4645.87	585	695	1100	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	12/7/1989	31022	4645.87	585	695	1120	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	1/4/1990	31050	4645.87	585	695	1120	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	11/23/1993	32469	4645.87	585	695	1100	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	6/20/1996	33409	4645.87	585	695	1100	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	8/6/1996	33456	4645.87	585	695	1200	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	8/6/1996	33456	4645.87	585	695	1120	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	1/23/1997	33626	4645.87	585	695	1140	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	3/6/2008	37686	4645.87	585	695	56.1	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	3/6/2008	37686	4645.87	585	695	56.1	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	5/22/2008	37763	4645.87	585	695	64.5	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	5/22/2008	37763	4645.87	585	695	64.5	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	8/6/2008	37839	4645.87	585	695	55.3	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	11/18/2008	37943	4645.87	585	695	66.3	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	8/6/2008	37839	4645.87	585	695	55.3	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	11/18/2008	37943	4645.87	585	695	66.3	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	3/3/2009	38048	4645.87	585	695	66.2	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	4/22/2009	38098	4645.87	585	695	62.5	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	8/12/2009	38210	4645.87	585	695	61.3	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	11/4/2009	38294	4645.87	585	695	63	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	3/10/2010	38420	4645.87	585	695	60.6	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	4/9/2010	38450	4645.87	585	695	66.5	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	7/7/2010	38539	4645.87	585	695	63.2	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	2/14/2011	38761	4645.87	585	695	61.9	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	2/14/2011	38761	4645.87	585	695	61.9	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	7/15/2011	38912	4645.87	585	695	62.1	4060.87	3950.87	1237.75	1204.23	
522581	TM-19A	D24024008DDC	602458.7	3469189.8	2/2/2012	39114	4645.87	585	695	62.2	4060.87	3950.87	1237.75	1204.23	2012 Q4 CQB Groundwater Tables
522581	TM-19A	D24024008DDC	602458.7	3469189.8	7/10/2012	39273	4645.87	585	695	63.7	4060.87	3950.87	1237.75	1204.23	2012 Q4 CQB Groundwater Tables
522694	TM-05 MILLER	D24024021AAB	603896.9	3467185.2	6/26/1996	33415	4598.06	120	160	10	4478.06	4438.06	1364.91	1352.72	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	6/26/1996	33415	4707.88	150	200	29	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	2/27/2008	37678	4707.88	150	200	13.9	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	2/27/2008	37678	4707.88	150	200	13.9	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	5/20/2008	37761	4707.88	150	200	32.7	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	5/20/2008	37761	4707.88	150	200	32.7	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	8/4/2008	37837	4707.88	150	200	31.3	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	10/29/2008	37923	4707.88	150	200	34.5	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	2/26/2009	38043	4707.88	150	200	32.7	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	5/13/2009	38119	4707.88	150	200	30.6	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	8/18/2009	38216	4707.88	150	200	29.9	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	8/18/2009	38216	4707.88	150	200	30.9	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	11/12/2009	38302	4707.88	150	200	31.1	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	4/14/2010	38455	4707.88	150	200	29	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	7/2/2010	38534	4707.88	150	200	29.8	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	7/21/2011	38918	4707.88	150	200	31.7	4557.88	4507.88	1389.24	1374.00	
522695	TM-06 MILLER	D24024014BCC	606124.4	3468324.0	7/9/2012	39272	4707.88	150	200	33.5	4557.88	4507.88	1389.24	1374.00	2012 Q4 CQB Groundwater Tables
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	1/30/1989	30711	4768.93	240	290	16	4528.93	4478.93	1380.42	1365.18	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	3/2/1989	30742	4768.93	240	290	16	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	4/7/1989	30778	4768.93	240	290	16	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	5/2/1989	30803	4768.93	240	290	12	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	6/7/1989	30839	4768.93	240	290	17	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	7/14/1989	30876	4768.93	240	290	18	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	8/10/1989	30903	4768.93	240	290	14	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	9/7/1989	30931	4768.93	240	290	15	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	10/10/1989	30964	4768.93	240	290	15	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	11/14/1989	30999	4768.93	240	290	15	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	12/4/1989	31019	4768.93	240	290	15	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	1/3/1990	31049	4768.93	240	290	17	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	12/8/2011	39058	4768.93	240	290	16.8	4528.93	4478.93	1380.42	1365.18	
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	3/15/2012	39156	4768.93	240	290	15.1	4528.93	4478.93	1380.42	1365.18	2012 Q4 CQB Groundwater Tables
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	4/24/2012	39196	4768.93	240	290	13.4	4528.93	4478.93	1380.42	1365.18	2012 Q4 CQB Groundwater Tables
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	4/24/2012	39196	4768.93	240	290	13.3	4528.93	4478.93	1380.42	1365.18	2012 Q4 CQB Groundwater Tables
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	9/13/2012	39338	4768.93	240	290	13.3	4528.93	4478.93	1380.42	1365.18	2012 Q4 CQB Groundwater Tables
522696	TM-10 USBP	D24024005BAC	601666.4	3471898.0	10/19/2012	39374	4768.93	240	290	12.8	4528.93	4478.93	1380.42	1365.18	2012 Q4 CQB Groundwater Tables
522697	TM-12 MILLER	D24024020BAB	601576.8	3467164.3	6/26/1996	33415	4589.44	121	171	7	4468.44	4418.44	1361.98	1346.74	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	6/27/1996	33416	4729.26	260	320	14	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	2/27/2008	37678	4729.26	260	320	14	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	2/27/2008	37678	4729.26	260	320	14	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	5/23/2008	37764	4729.26	260	320	14.4	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	5/23/2008	37764	4729.26	260	320	14.4	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	8/5/2008	37838	4729.26	260	320	13.7	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	10/28/2008	37922	4729.26	260	320	18.6	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	10/28/2008	37922	4729.26	260	320	18.8	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	2/26/2009	38043	4729.26	260	320	14.6	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	5/13/2009	38119	4729.26	260	320	13.7	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	8/17/2009	38215	4729.26	260	320	14.2	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	11/3/2009	38293	4729.26	260	320	14.8	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	2/24/2010	38406	4729.26	260	320	14.4	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	4/27/2010	38468	4729.26	260	320	14.9	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	7/20/2010	38552	4729.26	260	320	14.3	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	7/12/2011	38909	4729.26	260	320	14.2	4469.26	4409.26	1362.23	1343.94	
522699	TM-15 MILLER	D24024006BCC	599617.3	3471427.5	7/10/2012	39273	4729.26	260	320	14.9	4469.26	4409.26	1362.23	1343.94	2012 Q4 CQB Groundwater Tables
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	1/24/1989	30705	4573.10	99	159	9	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	2/27/1989	30739	4573.10	99	159	10	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	4/4/1989	30775	4573.10	99	159	9	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	5/1/1989	30802	4573.10	99	159	10	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	6/6/1989	30838	4573.10	99	159	11	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	7/12/1989	30874	4573.10	99	159	8	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	8/7/1989	30900	4573.10	99	159	7	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	9/7/1989	30931	4573.10	99	159	16	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	10/10/1989	30964	4573.10	99	159	9	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	11/8/1989	30993	4573.10	99	159	9	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	12/4/1989	31019	4573.10	99	159	9	4474.10	4414.10	1363.71	1345.42	
522815	TM-11 PIONKE	D24024018AAB	600892.3	3468876.0	1/3/1990	31049	4573.10	99	159	9	4474.10	4414.10	1363.71	1345.42	
522816	TM-14 NELSON	D24024007BCB	599687.6	3470076.0	2/8/2008	37659	4643.48	165	215	32.9	4478.48	4428.48	1365.04	1349.80	
522816	TM-14 NELSON	D24024007BCB	599687.6	3470076.0	2/8/2008	37659	4643.48	165	215	32.9	4478.48	4428.48	1365.04	1349.80	
522816	TM-14 NELSON	D24024007BCB	599687.6	3470076.0	2/9/2008	37660	4643.48	165	215	32.9	4478.48	4428.48	1365.04	1349.80	
522816	TM-14 NELSON	D24024007BCB	599687.6	3470076.0	2/9/2008	37660	4643.48	165	215	32.9	4478.48	4428.48	1365.04	1349.80	
522817	TM-08 SWAN	D24024001CCC	607769.7	3470649.1	2/13/2008	37664	4725.44	757	817	12.6	3968.44	3908.44	1209.58	1191.29	
522817	TM-08 SWAN	D24024001CCC	607769.7	3470649.1	2/13/2008	37664	4725.44	757	817	12.6	3968.44	3908.44	1209.58	1191.29	
522817	TM-08 SWAN	D24024001CCC	607769.7	3470649.1	5/14/2008	37755	4725.44	757	817	12.6	3968.44	3908.44	1209.58	1191.29	
522817	TM-08 SWAN	D24024001CCC	607769.7	3470649.1	5/14/2008	37755	4725.44	757	817	12.6	3968.44	3908.44	1209.58	1191.29	
522817	TM-08 SWAN	D24024001CCC	607769.7	3470649.1	7/23/2008	37825	4725.44	757	817	12.6	3968.44	3908.44	1209.58	1191.29	
522823	NSD-01	D24023013BBC	598080.4	3468647.0	10/21/1997	33897	4522.45	0	0	14	4522.45	4522.45	1378.44	1378.44	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
522823	NSD-01	D24023013BBC	598080.4	3468647.0	1/29/2003	35823	4522.45	0	0	11.6	4522.45	4522.45	1378.44	1378.44	
522823	NSD-01	D24023013BBC	598080.4	3468647.0	4/6/2004	36256	4522.45	0	0	26	4522.45	4522.45	1378.44	1378.44	
522823	NSD-01	D24023013BBC	598080.4	3468647.0	2/8/2005	36564	4522.45	0	0	14	4522.45	4522.45	1378.44	1378.44	
522823	NSD-01	D24023013BBC	598080.4	3468647.0	7/7/2005	36713	4522.45	0	0	15	4522.45	4522.45	1378.44	1378.44	
522823	NSD-01	D24023013BBC	598080.4	3468647.0	11/10/2005	36839	4522.45	0	0	14	4522.45	4522.45	1378.44	1378.44	
522823	NSD-01	D24023013BBC	598080.4	3468647.0	2/14/2006	36935	4522.45	0	0	9	4522.45	4522.45	1378.44	1378.44	
522823	NSD-01	D24023013BBC	598080.4	3468647.0	2/19/2007	37305	4522.45	0	0	17.1	4522.45	4522.45	1378.44	1378.44	
522823	NSD-01	D24023013BBC	598080.4	3468647.0	8/13/2007	37480	4522.45	0	0	18.4	4522.45	4522.45	1378.44	1378.44	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	10/21/1997	33897	4518.28	55	95	122	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	4/5/2001	35159	4518.28	55	95	109	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	4/6/2004	36256	4518.28	55	95	94	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	2/8/2005	36564	4518.28	55	95	85	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	7/7/2005	36713	4518.28	55	95	58.9	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	11/10/2005	36839	4518.28	55	95	80	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	2/14/2006	36935	4518.28	55	95	39	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	2/19/2007	37305	4518.28	55	95	76	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	8/13/2007	37480	4518.28	55	95	0.137	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	2/5/2008	37656	4518.28	55	95	70.7	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	2/5/2008	37656	4518.28	55	95	70.7	4463.28	4423.28	1360.41	1348.22	
527586	NSD-03	D24023013BBC	598076.9	3468637.5	7/7/2008	37809	4518.28	55	95	58.9	4463.28	4423.28	1360.41	1348.22	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	10/21/1997	33897	4531.38	75	115	25	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	10/4/2001	35341	4531.38	75	115	18.2	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	1/29/2003	35823	4531.38	75	115	34.2	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	4/6/2004	36256	4531.38	75	115	16	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	2/8/2005	36564	4531.38	75	115	43	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	7/7/2005	36713	4531.38	75	115	44	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	11/10/2005	36839	4531.38	75	115	48	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	2/14/2006	36935	4531.38	75	115	73	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	2/19/2007	37305	4531.38	75	115	54	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	8/13/2007	37480	4531.38	75	115	67.3	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	2/5/2008	37656	4531.38	75	115	43	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	2/5/2008	37656	4531.38	75	115	43	4456.38	4416.38	1358.30	1346.11	
527587	NSD-02	D24023013ABB	598884.4	3468847.3	7/7/2008	37809	4531.38	75	115	44	4456.38	4416.38	1358.30	1346.11	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	2/5/2008	37656	4735.18	252	312	263	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	2/5/2008	37656	4735.18	252	312	263	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	5/15/2008	37756	4735.18	252	312	265	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	5/15/2008	37756	4735.18	252	312	265	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	7/30/2008	37832	4735.18	252	312	243	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	10/20/2008	37914	4735.18	252	312	238	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	2/12/2009	38029	4735.18	252	312	254	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	4/21/2009	38097	4735.18	252	312	227	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	8/3/2009	38201	4735.18	252	312	221	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	10/28/2009	38287	4735.18	252	312	220	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	2/1/2010	38383	4735.18	252	312	236	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	4/26/2010	38467	4735.18	252	312	240	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	7/20/2010	38552	4735.18	252	312	240	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	10/20/2010	38644	4735.18	252	312	231	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	1/18/2011	38734	4735.18	252	312	213	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	1/18/2011	38734	4735.18	252	312	213	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	4/8/2011	38814	4735.18	252	312	236	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	4/8/2011	38814	4735.18	252	312	236	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	8/26/2011	38954	4735.18	252	312	220	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	10/13/2011	39002	4735.18	252	312	230	4483.18	4423.18	1366.47	1348.19	
531770	RUIZ	D24024004BCC	602857.4	3471424.2	2/7/2012	39119	4735.18	252	312	230	4483.18	4423.18	1366.47	1348.19	2012 Q4 CQB Groundwater Tables
531770	RUIZ	D24024004BCC	602857.4	3471424.2	2/7/2012	39119	4735.18	252	312	228	4483.18	4423.18	1366.47	1348.19	2012 Q4 CQB Groundwater Tables
531770	RUIZ	D24024004BCC	602857.4	3471424.2	4/13/2012	39185	4735.18	252	312	203	4483.18	4423.18	1366.47	1348.19	2012 Q4 CQB Groundwater Tables
531770	RUIZ	D24024004BCC	602857.4	3471424.2	7/18/2012	39281	4735.18	252	312	214	4483.18	4423.18	1366.47	1348.19	2012 Q4 CQB Groundwater Tables

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
531770	RUIZ	D24024004BCC	602857.4	3471424.2	10/9/2012	39364	4735.18	252	312	229	4483.18	4423.18	1366.47	1348.19	2012 Q4 CQB Groundwater Tables
538847	MOORE	D24023013DAA	599494.9	3468060.0	2/20/2008	37671	4577.27	180	220	7.1	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	2/20/2008	37671	4577.27	180	220	7.1	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	5/8/2008	37749	4577.27	180	220	7.5	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	5/8/2008	37749	4577.27	180	220	7.5	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	7/16/2008	37818	4577.27	180	220	9.8	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	10/29/2008	37923	4577.27	180	220	19.2	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	1/29/2009	38015	4577.27	180	220	6.6	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	4/16/2009	38092	4577.27	180	220	6.4	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	7/15/2009	38182	4577.27	180	220	5.8	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	10/13/2009	38272	4577.27	180	220	7.1	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	1/26/2010	38377	4577.27	180	220	6.3	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	4/22/2010	38463	4577.27	180	220	7.4	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	7/15/2010	38547	4577.27	180	220	7.54	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	7/15/2010	38547	4577.27	180	220	7.11	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	10/19/2010	38643	4577.27	180	220	7.14	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	10/19/2010	38643	4577.27	180	220	7.14	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	1/18/2011	38734	4577.27	180	220	6.42	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	1/18/2011	38734	4577.27	180	220	6.42	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	4/6/2011	38812	4577.27	180	220	6.7	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	7/13/2011	38910	4577.27	180	220	7.62	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	10/11/2011	39000	4577.27	180	220	7.31	4397.27	4357.27	1340.29	1328.10	
538847	MOORE	D24023013DAA	599494.9	3468060.0	1/31/2012	39112	4577.27	180	220	7.21	4397.27	4357.27	1340.29	1328.10	2012 Q4 CQB Groundwater Tables
538847	MOORE	D24023013DAA	599494.9	3468060.0	4/23/2012	39195	4577.27	180	220	6.99	4397.27	4357.27	1340.29	1328.10	2012 Q4 CQB Groundwater Tables
538847	MOORE	D24023013DAA	599494.9	3468060.0	4/23/2012	39195	4577.27	180	220	7.05	4397.27	4357.27	1340.29	1328.10	2012 Q4 CQB Groundwater Tables
538847	MOORE	D24023013DAA	599494.9	3468060.0	7/17/2012	39280	4577.27	180	220	7.01	4397.27	4357.27	1340.29	1328.10	2012 Q4 CQB Groundwater Tables
538847	MOORE	D24023013DAA	599494.9	3468060.0	7/17/2012	39280	4577.27	180	220	6.99	4397.27	4357.27	1340.29	1328.10	2012 Q4 CQB Groundwater Tables
538847	MOORE	D24023013DAA	599494.9	3468060.0	10/8/2012	39363	4577.27	180	220	7.51	4397.27	4357.27	1340.29	1328.10	2012 Q4 CQB Groundwater Tables
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	2/20/2008	37671	4600.70	174	216	720	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	2/20/2008	37671	4600.70	174	216	720	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	5/6/2008	37747	4600.70	174	216	737	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	5/6/2008	37747	4600.70	174	216	737	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	7/15/2008	37817	4600.70	174	216	700	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	8/12/2008	37845	4600.70	174	216	725	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	10/15/2008	37909	4600.70	174	216	703	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	1/28/2009	38014	4600.70	174	216	660	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	4/15/2009	38091	4600.70	174	216	657	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	7/15/2009	38182	4600.70	174	216	662	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	10/12/2009	38271	4600.70	174	216	666	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	1/26/2010	38377	4600.70	174	216	685	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	4/22/2010	38463	4600.70	174	216	811	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	7/21/2010	38553	4600.70	174	216	805	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	10/18/2010	38642	4600.70	174	216	775	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	10/18/2010	38642	4600.70	174	216	775	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	1/19/2011	38735	4600.70	174	216	711	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	1/19/2011	38735	4600.70	174	216	711	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	4/8/2011	38814	4600.70	174	216	810	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	4/8/2011	38814	4600.70	174	216	810	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	7/12/2011	38909	4600.70	174	216	790	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	10/11/2011	39000	4600.70	174	216	845	4426.70	4384.70	1349.26	1336.46	
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	2/7/2012	39119	4600.70	174	216	847	4426.70	4384.70	1349.26	1336.46	2012 Q4 CQB Groundwater Tables
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	4/11/2012	39183	4600.70	174	216	833	4426.70	4384.70	1349.26	1336.46	2012 Q4 CQB Groundwater Tables
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	7/6/2012	39269	4600.70	174	216	851	4426.70	4384.70	1349.26	1336.46	2012 Q4 CQB Groundwater Tables
539265	MCCONNELL 265	D24024017BBB	601463.1	3468840.1	10/8/2012	39363	4600.70	174	216	934	4426.70	4384.70	1349.26	1336.46	2012 Q4 CQB Groundwater Tables
539783	BF-01	D24024004AAA	604169.1	3472151.6	10/6/1993	32421	4835.23	325	385	1400	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	11/24/1993	32470	4835.23	325	385	1500	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	6/25/1996	33414	4835.23	325	385	1400	4510.23	4450.23	1374.72	1356.43	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
539783	BF-01	D24024004AAA	604169.1	3472151.6	3/4/2008	37684	4835.23	325	385	1320	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	3/4/2008	37684	4835.23	325	385	1320	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	5/23/2008	37764	4835.23	325	385	1450	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	5/23/2008	37764	4835.23	325	385	1450	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	8/5/2008	37838	4835.23	325	385	1330	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	11/5/2008	37930	4835.23	325	385	1490	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	2/20/2009	38037	4835.23	325	385	1330	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	5/6/2009	38112	4835.23	325	385	1280	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	8/17/2009	38215	4835.23	325	385	1250	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	11/4/2009	38294	4835.23	325	385	1280	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	3/1/2010	38411	4835.23	325	385	1260	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	4/7/2010	38448	4835.23	325	385	1450	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	7/6/2010	38538	4835.23	325	385	1310	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	7/13/2011	38910	4835.23	325	385	1350	4510.23	4450.23	1374.72	1356.43	
539783	BF-01	D24024004AAA	604169.1	3472151.6	2/1/2012	39113	4835.23	325	385	1480	4510.23	4450.23	1374.72	1356.43	2012 Q4 CQB Groundwater Tables
539783	BF-01	D24024004AAA	604169.1	3472151.6	8/14/2012	39308	4835.23	325	385	1500	4510.23	4450.23	1374.72	1356.43	2012 Q4 CQB Groundwater Tables
539786	BF-02	D24024004BDD	603479.9	3471513.0	10/6/1993	32421	4750.37	265	305	1900	4485.37	4445.37	1367.14	1354.95	
539786	BF-02	D24024004BDD	603479.9	3471513.0	11/23/1993	32469	4750.37	265	305	1900	4485.37	4445.37	1367.14	1354.95	
539786	BF-02	D24024004BDD	603479.9	3471513.0	6/25/1996	33414	4750.37	265	305	2000	4485.37	4445.37	1367.14	1354.95	
539786	BF-02	D24024004BDD	603479.9	3471513.0	8/6/1996	33456	4750.37	265	305	1880	4485.37	4445.37	1367.14	1354.95	
539786	BF-02	D24024004BDD	603479.9	3471513.0	8/6/1996	33456	4750.37	265	305	1280	4485.37	4445.37	1367.14	1354.95	
544535	WEED	D24024005CCC	601434.4	3470924.5	2/14/2008	37665	4679.11	280	320	11.1	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	2/14/2008	37665	4679.11	280	320	11.1	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	5/15/2008	37756	4679.11	280	320	12.6	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	5/15/2008	37756	4679.11	280	320	12.6	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	7/30/2008	37832	4679.11	280	320	11.5	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	10/20/2008	37914	4679.11	280	320	10.2	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	2/13/2009	38030	4679.11	280	320	12.6	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	4/22/2009	38098	4679.11	280	320	11.6	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	7/16/2009	38183	4679.11	280	320	10.8	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	10/20/2009	38279	4679.11	280	320	12.7	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	2/1/2010	38383	4679.11	280	320	12.2	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	4/26/2010	38467	4679.11	280	320	13.4	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	7/21/2010	38553	4679.11	280	320	13.6	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	7/21/2010	38553	4679.11	280	320	13.5	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	10/19/2010	38643	4679.11	280	320	11.7	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	1/19/2011	38735	4679.11	280	320	12.2	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	1/19/2011	38735	4679.11	280	320	12.2	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	4/11/2011	38817	4679.11	280	320	13	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	4/11/2011	38817	4679.11	280	320	13	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	7/18/2011	38915	4679.11	280	320	12.7	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	10/12/2011	39001	4679.11	280	320	13.3	4399.11	4359.11	1340.85	1328.66	
544535	WEED	D24024005CCC	601434.4	3470924.5	2/6/2012	39118	4679.11	280	320	13.5	4399.11	4359.11	1340.85	1328.66	2012 Q4 CQB Groundwater Tables
544535	WEED	D24024005CCC	601434.4	3470924.5	4/25/2012	39197	4679.11	280	320	12.7	4399.11	4359.11	1340.85	1328.66	2012 Q4 CQB Groundwater Tables
544535	WEED	D24024005CCC	601434.4	3470924.5	7/5/2012	39268	4679.11	280	320	12.9	4399.11	4359.11	1340.85	1328.66	2012 Q4 CQB Groundwater Tables
544535	WEED	D24024005CCC	601434.4	3470924.5	10/9/2012	39364	4679.11	280	320	14	4399.11	4359.11	1340.85	1328.66	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	11/2/1995	33178	4690.77	540	795	219	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	11/6/1997	33913	4690.77	540	795	314	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	12/3/2002	35766	4690.77	540	795	255	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	10/14/2005	36812	4690.77	540	795	220	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	10/18/2005	36816	4690.77	540	795	220	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	11/9/2005	36838	4690.77	540	795	200	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	11/30/2006	37224	4690.77	540	795	210	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	3/4/2008	37684	4690.77	540	795	240	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	6/9/2008	37781	4690.77	540	795	231	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	10/27/2008	37921	4690.77	540	795	162	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	1/22/2009	38008	4690.77	540	795	184	4150.77	3895.77	1265.15	1187.43	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
551849	NWC-04	D24024010DDD	605829.8	3469072.0	2/12/2009	38029	4690.77	540	795	181	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	2/12/2009	38029	4690.77	540	795	198	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	3/11/2009	38056	4690.77	540	795	197	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	4/23/2009	38099	4690.77	540	795	188	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	5/28/2009	38134	4690.77	540	795	210	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	6/24/2009	38161	4690.77	540	795	169	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	7/21/2009	38188	4690.77	540	795	193	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	8/19/2009	38217	4690.77	540	795	183	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	9/23/2009	38252	4690.77	540	795	202	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	10/21/2009	38280	4690.77	540	795	191	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	11/18/2009	38308	4690.77	540	795	191	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	12/16/2009	38336	4690.77	540	795	193	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	2/3/2010	38385	4690.77	540	795	167	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	3/8/2010	38418	4690.77	540	795	182	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	4/21/2010	38462	4690.77	540	795	218	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	5/18/2010	38489	4690.77	540	795	210	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	5/18/2010	38489	4690.77	540	795	210	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	6/15/2010	38517	4690.77	540	795	212	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	7/20/2010	38552	4690.77	540	795	188	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	8/25/2010	38588	4690.77	540	795	196	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	9/29/2010	38623	4690.77	540	795	205	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	10/19/2010	38643	4690.77	540	795	195	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	10/19/2010	38643	4690.77	540	795	195	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	11/4/2010	38659	4690.77	540	795	197	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	11/4/2010	38659	4690.77	540	795	197	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	12/14/2010	38699	4690.77	540	795	182	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	12/14/2010	38699	4690.77	540	795	182	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	12/14/2010	38699	4690.77	540	795	182	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	1/18/2011	38734	4690.77	540	795	194	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	1/18/2011	38734	4690.77	540	795	194	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	2/17/2011	38764	4690.77	540	795	169	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	3/17/2011	38792	4690.77	540	795	182	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	4/5/2011	38811	4690.77	540	795	196	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	5/11/2011	38847	4690.77	540	795	175	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	5/11/2011	38847	4690.77	540	795	175	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	6/17/2011	38884	4690.77	540	795	204	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	7/15/2011	38912	4690.77	540	795	202	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	8/25/2011	38953	4690.77	540	795	195	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	9/26/2011	38985	4690.77	540	795	199	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	9/26/2011	38985	4690.77	540	795	198	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	10/13/2011	39002	4690.77	540	795	198	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	11/22/2011	39042	4690.77	540	795	201	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	12/8/2011	39058	4690.77	540	795	207	4150.77	3895.77	1265.15	1187.43	
551849	NWC-04	D24024010DDD	605829.8	3469072.0	1/30/2012	39111	4690.77	540	795	217	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	2/17/2012	39129	4690.77	540	795	203	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	3/15/2012	39156	4690.77	540	795	207	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	4/25/2012	39197	4690.77	540	795	204	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	5/22/2012	39224	4690.77	540	795	178	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	6/6/2012	39239	4690.77	540	795	195	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	7/18/2012	39281	4690.77	540	795	205	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	8/28/2012	39322	4690.77	540	795	208	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	9/13/2012	39338	4690.77	540	795	205	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
551849	NWC-04	D24024010DDD	605829.8	3469072.0	10/10/2012	39365	4690.77	540	795	207	4150.77	3895.77	1265.15	1187.43	2012 Q4 CQB Groundwater Tables
558557	GARNER 557	D24024017BBB	602659.2	3468962.4	2/21/2008	37672	4638.45	180	300	123	4458.45	4338.45	1358.94	1322.36	
558557	GARNER 557	D24024017BBB	602659.2	3468962.4	2/21/2008	37672	4638.45	180	300	123	4458.45	4338.45	1358.94	1322.36	
562554	TM-42	D23024010CBC	603698.3	3469104.9	7/30/1997	33814	4666.67	180	240	985	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	11/6/1997	33913	4666.67	180	240	958	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	3/5/2008	37685	4666.67	180	240	482	4486.67	4426.67	1367.54	1349.25	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
562554	TM-42	D23024010CBC	603698.3	3469104.9	3/5/2008	37685	4666.67	180	240	482	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	5/22/2008	37763	4666.67	180	240	483	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	5/22/2008	37763	4666.67	180	240	483	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	8/6/2008	37839	4666.67	180	240	467	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	11/6/2008	37931	4666.67	180	240	477	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	2/18/2009	38035	4666.67	180	240	429	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	5/7/2009	38113	4666.67	180	240	430	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	5/7/2009	38113	4666.67	180	240	445	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	8/18/2009	38216	4666.67	180	240	428	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	11/3/2009	38293	4666.67	180	240	430	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	2/24/2010	38406	4666.67	180	240	390	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	4/19/2010	38460	4666.67	180	240	444	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	7/2/2010	38534	4666.67	180	240	407	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	7/12/2011	38909	4666.67	180	240	441	4486.67	4426.67	1367.54	1349.25	
562554	TM-42	D23024010CBC	603698.3	3469104.9	2/9/2012	39121	4666.67	180	240	444	4486.67	4426.67	1367.54	1349.25	2012 Q4 CQB Groundwater Tables
562554	TM-42	D23024010CBC	603698.3	3469104.9	7/11/2012	39274	4666.67	180	240	449	4486.67	4426.67	1367.54	1349.25	2012 Q4 CQB Groundwater Tables
562555	TM-41	D23024003CCC	604839.6	3471299.4	7/30/1997	33814	4774.58	145	200	1940	4629.58	4574.58	1411.10	1394.33	
562555	TM-41	D23024003CCC	604839.6	3471299.4	11/6/1997	33913	4774.58	145	200	1900	4629.58	4574.58	1411.10	1394.33	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	10/27/2008	37921	4600.44	212	312	5.1	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	2/12/2009	38029	4600.44	212	312	6.6	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	4/23/2009	38099	4600.44	212	312	6.4	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	7/21/2009	38188	4600.44	212	312	5	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	10/21/2009	38280	4600.44	212	312	6.8	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	2/3/2010	38385	4600.44	212	312	8.5	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	4/21/2010	38462	4600.44	212	312	7.26	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	7/20/2010	38552	4600.44	212	312	6.87	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	10/19/2010	38643	4600.44	212	312	7.39	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	1/18/2011	38734	4600.44	212	312	6.43	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	4/6/2011	38812	4600.44	212	312	6.4	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	7/15/2011	38912	4600.44	212	312	7.24	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	10/13/2011	39002	4600.44	212	312	7.31	4388.44	4288.44	1337.60	1307.12	
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	1/30/2012	39111	4600.44	212	312	7.78	4388.44	4288.44	1337.60	1307.12	2012 Q4 CQB Groundwater Tables
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	4/25/2012	39197	4600.44	212	312	8.42	4388.44	4288.44	1337.60	1307.12	2012 Q4 CQB Groundwater Tables
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	7/18/2012	39281	4600.44	212	312	6.99	4388.44	4288.44	1337.60	1307.12	2012 Q4 CQB Groundwater Tables
562944	NWC-02R	D24024018CAD	600177.4	3467474.7	10/10/2012	39365	4600.44	212	312	7.46	4388.44	4288.44	1337.60	1307.12	2012 Q4 CQB Groundwater Tables
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	2/12/2008	37663	4733.72	260	320	520	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	2/12/2008	37663	4733.72	260	320	520	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	5/29/2008	37770	4733.72	260	320	520	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	5/29/2008	37770	4733.72	260	320	520	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	7/31/2008	37833	4733.72	260	320	536	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	10/20/2008	37914	4733.72	260	320	518	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	2/11/2009	38028	4733.72	260	320	567	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	4/21/2009	38097	4733.72	260	320	499	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	7/20/2009	38187	4733.72	260	320	460	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	7/22/2009	38189	4733.72	260	320	460	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	10/20/2009	38279	4733.72	260	320	513	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	2/2/2010	38384	4733.72	260	320	471	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	4/23/2010	38464	4733.72	260	320	561	4473.72	4413.72	1363.59	1345.30	
565260	ENGLUND	D24024005DAB	602551.3	3471341.3	7/20/2010	38552	4733.72	260	320	569	4473.72	4413.72	1363.59	1345.30	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	2/21/2008	37672	4567.93	266	320	244	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	2/21/2008	37672	4567.93	266	320	244	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	5/7/2008	37748	4567.93	266	320	250	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	5/7/2008	37748	4567.93	266	320	250	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	7/15/2008	37817	4567.93	266	320	274	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	10/15/2008	37909	4567.93	266	320	245	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	2/11/2009	38028	4567.93	266	320	312	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	4/17/2009	38093	4567.93	266	320	251	4301.93	4247.93	1311.23	1294.77	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
568875	TVI 875	D24024018ACA	600715.1	3468419.3	7/21/2009	38188	4567.93	266	320	236	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	10/19/2009	38278	4567.93	266	320	247	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	2/2/2010	38384	4567.93	266	320	250	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	4/23/2010	38464	4567.93	266	320	294	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	7/15/2010	38547	4567.93	266	320	262	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	10/20/2010	38644	4567.93	266	320	242	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	1/20/2011	38736	4567.93	266	320	226	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	1/20/2011	38736	4567.93	266	320	226	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	4/11/2011	38817	4567.93	266	320	235	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	4/11/2011	38817	4567.93	266	320	235	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	7/15/2011	38912	4567.93	266	320	239	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	10/12/2011	39001	4567.93	266	320	262	4301.93	4247.93	1311.23	1294.77	
568875	TVI 875	D24024018ACA	600715.1	3468419.3	2/3/2012	39115	4567.93	266	320	299	4301.93	4247.93	1311.23	1294.77	2012 Q4 CQB Groundwater Tables
568875	TVI 875	D24024018ACA	600715.1	3468419.3	4/25/2012	39197	4567.93	266	320	267	4301.93	4247.93	1311.23	1294.77	2012 Q4 CQB Groundwater Tables
568875	TVI 875	D24024018ACA	600715.1	3468419.3	7/16/2012	39279	4567.93	266	320	261	4301.93	4247.93	1311.23	1294.77	2012 Q4 CQB Groundwater Tables
568875	TVI 875	D24024018ACA	600715.1	3468419.3	7/16/2012	39279	4567.93	266	320	267	4301.93	4247.93	1311.23	1294.77	2012 Q4 CQB Groundwater Tables
568875	TVI 875	D24024018ACA	600715.1	3468419.3	10/9/2012	39364	4567.93	266	320	281	4301.93	4247.93	1311.23	1294.77	2012 Q4 CQB Groundwater Tables
573596	ROGERS 596	D24024018ADC	600894.1	3468271.0	10/19/2009	38278	4577.35	230	290	590	4347.35	4287.35	1325.07	1306.78	
573596	ROGERS 596	D24024018ADC	600894.1	3468271.0	11/5/2009	38295	4577.35	230	290	540	4347.35	4287.35	1325.07	1306.78	
573596	ROGERS 596	D24024018ADC	600894.1	3468271.0	2/25/2010	38407	4577.35	230	290	520	4347.35	4287.35	1325.07	1306.78	
573596	ROGERS 596	D24024018ADC	600894.1	3468271.0	4/22/2010	38463	4577.35	230	290	710	4347.35	4287.35	1325.07	1306.78	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	12/2/1999	34669	4592.50	180	340	8.1	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	12/2/1999	34669	4592.50	180	340	8.1	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	3/4/2008	37684	4592.50	180	340	7.9	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	3/4/2008	37684	4592.50	180	340	7.9	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	6/9/2008	37781	4592.50	180	340	7.2	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	6/9/2008	37781	4592.50	180	340	7.2	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	10/27/2008	37921	4592.50	180	340	6.4	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	2/12/2009	38029	4592.50	180	340	8	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	4/23/2009	38099	4592.50	180	340	7.3	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	7/21/2009	38188	4592.50	180	340	6.4	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	10/21/2009	38280	4592.50	180	340	8	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	2/3/2010	38385	4592.50	180	340	7.5	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	2/3/2010	38385	4592.50	180	340	7.4	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	4/21/2010	38462	4592.50	180	340	8.49	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	7/20/2010	38552	4592.50	180	340	8.59	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	10/19/2010	38643	4592.50	180	340	8.32	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	10/19/2010	38643	4592.50	180	340	8.32	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	1/18/2011	38734	4592.50	180	340	8.24	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	1/18/2011	38734	4592.50	180	340	8.24	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	4/6/2011	38812	4592.50	180	340	7.73	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	4/6/2011	38812	4592.50	180	340	7.76	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	7/15/2011	38912	4592.50	180	340	8.36	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	10/13/2011	39002	4592.50	180	340	8.48	4412.50	4252.50	1344.93	1296.16	
575700	NWC-06	D24024018CCA	599825.8	3467741.7	1/30/2012	39111	4592.50	180	340	8.44	4412.50	4252.50	1344.93	1296.16	2012 Q4 CQB Groundwater Tables
575700	NWC-06	D24024018CCA	599825.8	3467741.7	4/25/2012	39197	4592.50	180	340	7.11	4412.50	4252.50	1344.93	1296.16	2012 Q4 CQB Groundwater Tables
575700	NWC-06	D24024018CCA	599825.8	3467741.7	7/18/2012	39281	4592.50	180	340	8.6	4412.50	4252.50	1344.93	1296.16	2012 Q4 CQB Groundwater Tables
575700	NWC-06	D24024018CCA	599825.8	3467741.7	10/10/2012	39365	4592.50	180	340	9.33	4412.50	4252.50	1344.93	1296.16	2012 Q4 CQB Groundwater Tables
576415	PARRA	D24024005DBB	602170.7	3471263.5	2/11/2008	37662	4727.21	255	355	360	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	2/11/2008	37662	4727.21	255	355	360	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	5/15/2008	37756	4727.21	255	355	405	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	5/15/2008	37756	4727.21	255	355	405	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	7/31/2008	37833	4727.21	255	355	404	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	7/31/2008	37833	4727.21	255	355	404	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	10/20/2008	37914	4727.21	255	355	387	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	2/13/2009	38030	4727.21	255	355	405	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	4/20/2009	38096	4727.21	255	355	372	4472.21	4372.21	1363.13	1332.65	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
576415	PARRA	D24024005DBB	602170.7	3471263.5	7/20/2009	38187	4727.21	255	355	375	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	10/20/2009	38279	4727.21	255	355	388	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	2/1/2010	38383	4727.21	255	355	353	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	4/22/2010	38463	4727.21	255	355	417	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	7/14/2010	38546	4727.21	255	355	391	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	7/14/2010	38546	4727.21	255	355	403	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	10/20/2010	38644	4727.21	255	355	411	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	1/19/2011	38735	4727.21	255	355	391	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	1/19/2011	38735	4727.21	255	355	391	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	4/4/2011	38810	4727.21	255	355	382	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	7/12/2011	38909	4727.21	255	355	404	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	10/12/2011	39001	4727.21	255	355	406	4472.21	4372.21	1363.13	1332.65	
576415	PARRA	D24024005DBB	602170.7	3471263.5	2/7/2012	39119	4727.21	255	355	428	4472.21	4372.21	1363.13	1332.65	2012 Q4 CQB Groundwater Tables
576415	PARRA	D24024005DBB	602170.7	3471263.5	4/13/2012	39185	4727.21	255	355	402	4472.21	4372.21	1363.13	1332.65	2012 Q4 CQB Groundwater Tables
576415	PARRA	D24024005DBB	602170.7	3471263.5	4/13/2012	39185	4727.21	255	355	390	4472.21	4372.21	1363.13	1332.65	2012 Q4 CQB Groundwater Tables
576415	PARRA	D24024005DBB	602170.7	3471263.5	7/18/2012	39281	4727.21	255	355	419	4472.21	4372.21	1363.13	1332.65	2012 Q4 CQB Groundwater Tables
576415	PARRA	D24024005DBB	602170.7	3471263.5	7/18/2012	39281	4727.21	255	355	418	4472.21	4372.21	1363.13	1332.65	2012 Q4 CQB Groundwater Tables
576415	PARRA	D24024005DBB	602170.7	3471263.5	10/9/2012	39364	4727.21	255	355	428	4472.21	4372.21	1363.13	1332.65	2012 Q4 CQB Groundwater Tables
577927	BIMA	D24024002CBB	606001.2	3471852.8	2/6/2008	37657	4802.05	345	465	210	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	2/6/2008	37657	4802.05	345	465	210	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	4/25/2008	37736	4802.05	345	465	190	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	4/25/2008	37736	4802.05	345	465	190	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	5/13/2008	37754	4802.05	345	465	195	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	5/13/2008	37754	4802.05	345	465	195	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	6/23/2008	37795	4802.05	345	465	196	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	6/23/2008	37795	4802.05	345	465	225	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	7/29/2008	37831	4802.05	345	465	204	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	8/28/2008	37861	4802.05	345	465	256	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	9/23/2008	37887	4802.05	345	465	296	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	10/22/2008	37916	4802.05	345	465	285	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	1/20/2009	38006	4802.05	345	465	200	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	1/20/2009	38006	4802.05	345	465	190	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	4/7/2009	38083	4802.05	345	465	212	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	7/8/2009	38175	4802.05	345	465	189	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	10/5/2009	38264	4802.05	345	465	233	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	1/20/2010	38371	4802.05	345	465	222	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	4/19/2010	38460	4802.05	345	465	256	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	4/19/2010	38460	4802.05	345	465	256	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	7/12/2010	38544	4802.05	345	465	273	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	10/18/2010	38642	4802.05	345	465	296	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	10/18/2010	38642	4802.05	345	465	296	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	1/19/2011	38735	4802.05	345	465	283	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	1/19/2011	38735	4802.05	345	465	283	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	4/4/2011	38810	4802.05	345	465	282	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	8/25/2011	38953	4802.05	345	465	300	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	10/10/2011	38999	4802.05	345	465	322	4457.05	4337.05	1358.51	1321.93	
577927	BIMA	D24024002CBB	606001.2	3471852.8	2/3/2012	39115	4802.05	345	465	312	4457.05	4337.05	1358.51	1321.93	2012 Q4 CQB Groundwater Tables
577927	BIMA	D24024002CBB	606001.2	3471852.8	4/23/2012	39195	4802.05	345	465	303	4457.05	4337.05	1358.51	1321.93	2012 Q4 CQB Groundwater Tables
577927	BIMA	D24024002CBB	606001.2	3471852.8	7/10/2012	39273	4802.05	345	465	301	4457.05	4337.05	1358.51	1321.93	2012 Q4 CQB Groundwater Tables
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	2/14/2008	37665	4662.60	200	220	15.9	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	2/14/2008	37665	4662.60	200	220	15.9	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	5/13/2008	37754	4662.60	200	220	16.6	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	5/13/2008	37754	4662.60	200	220	16.6	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	7/22/2008	37824	4662.60	200	220	16.2	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	10/16/2008	37910	4662.60	200	220	15.9	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	1/20/2009	38006	4662.60	200	220	14.3	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	4/8/2009	38084	4662.60	200	220	15.4	4462.60	4442.60	1360.20	1354.10	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	7/8/2009	38175	4662.60	200	220	14.3	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	10/5/2009	38264	4662.60	200	220	16.2	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	1/20/2010	38371	4662.60	200	220	13.8	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	4/22/2010	38463	4662.60	200	220	16.7	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	7/12/2010	38544	4662.60	200	220	15.7	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	10/18/2010	38642	4662.60	200	220	16.5	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	10/18/2010	38642	4662.60	200	220	16.5	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	1/18/2011	38734	4662.60	200	220	15.7	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	1/18/2011	38734	4662.60	200	220	15.7	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	4/5/2011	38811	4662.60	200	220	15.8	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	7/12/2011	38909	4662.60	200	220	16.4	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	10/11/2011	39000	4662.60	200	220	17	4462.60	4442.60	1360.20	1354.10	
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	2/3/2012	39115	4662.60	200	220	17.1	4462.60	4442.60	1360.20	1354.10	2012 Q4 CQB Groundwater Tables
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	4/11/2012	39183	4662.60	200	220	17.3	4462.60	4442.60	1360.20	1354.10	2012 Q4 CQB Groundwater Tables
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	7/10/2012	39273	4662.60	200	220	16.6	4462.60	4442.60	1360.20	1354.10	2012 Q4 CQB Groundwater Tables
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	10/3/2012	39358	4662.60	200	220	17.5	4462.60	4442.60	1360.20	1354.10	2012 Q4 CQB Groundwater Tables
578819	PALMER 819	D24024012CBC	607724.4	3469545.0	10/3/2012	39358	4662.60	200	220	17.6	4462.60	4442.60	1360.20	1354.10	2012 Q4 CQB Groundwater Tables
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	2/4/2008	37655	4640.74	580	660	37.8	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	2/4/2008	37655	4640.74	580	660	37.8	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	5/5/2008	37746	4640.74	580	660	35.8	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	5/5/2008	37746	4640.74	580	660	35.8	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	7/15/2008	37817	4640.74	580	660	37.4	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	10/15/2008	37909	4640.74	580	660	36	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	1/28/2009	38014	4640.74	580	660	37.4	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	4/15/2009	38091	4640.74	580	660	36.9	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	7/16/2009	38183	4640.74	580	660	35.7	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	10/14/2009	38273	4640.74	580	660	36.1	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	2/2/2010	38384	4640.74	580	660	35.1	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	4/22/2010	38463	4640.74	580	660	36.9	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	7/20/2010	38552	4640.74	580	660	38.8	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	10/19/2010	38643	4640.74	580	660	37.9	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	10/19/2010	38643	4640.74	580	660	37.9	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	1/19/2011	38735	4640.74	580	660	35.7	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	1/19/2011	38735	4640.74	580	660	35.7	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	1/19/2011	38735	4640.74	580	660	35.7	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	4/6/2011	38812	4640.74	580	660	35.83	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	7/15/2011	38912	4640.74	580	660	37.7	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	10/11/2011	39000	4640.74	580	660	38	4060.74	3980.74	1237.71	1213.33	
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	2/2/2012	39114	4640.74	580	660	39.2	4060.74	3980.74	1237.71	1213.33	2012 Q4 CQB Groundwater Tables
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	4/13/2012	39185	4640.74	580	660	33.5	4060.74	3980.74	1237.71	1213.33	2012 Q4 CQB Groundwater Tables
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	7/11/2012	39274	4640.74	580	660	37.7	4060.74	3980.74	1237.71	1213.33	2012 Q4 CQB Groundwater Tables
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	7/11/2012	39274	4640.74	580	660	37.2	4060.74	3980.74	1237.71	1213.33	2012 Q4 CQB Groundwater Tables
587635	GARNER 635	D24024017AAA	602665.4	3468967.9	10/5/2012	39360	4640.74	580	660	39.1	4060.74	3980.74	1237.71	1213.33	2012 Q4 CQB Groundwater Tables
590620	AWC-05	D24023013ABD	599269.3	3468541.6	8/5/2002	35646	4542.51	163	1163	9.6	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	11/1/2004	36465	4542.51	163	1163	10.4	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	2/7/2005	36563	4542.51	163	1163	19.5	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	4/4/2005	36619	4542.51	163	1163	12.2	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	6/6/2005	36682	4542.51	163	1163	10.1	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	8/1/2005	36738	4542.51	163	1163	9.8	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	10/3/2005	36801	4542.51	163	1163	11.7	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	12/5/2005	36864	4542.51	163	1163	36	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	2/6/2006	36927	4542.51	163	1163	11	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	4/3/2006	36983	4542.51	163	1163	12	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	6/5/2006	37046	4542.51	163	1163	12.5	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	8/7/2006	37109	4542.51	163	1163	10.4	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	10/2/2006	37165	4542.51	163	1163	11.6	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	12/4/2006	37228	4542.51	163	1163	9	4379.51	3379.51	1334.87	1030.07	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
590620	AWC-05	D24023013ABD	599269.3	3468541.6	2/5/2007	37291	4542.51	163	1163	11.6	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	4/2/2007	37347	4542.51	163	1163	10.5	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	6/4/2007	37410	4542.51	163	1163	29.1	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	8/6/2007	37473	4542.51	163	1163	14	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	12/4/2007	37593	4542.51	163	1163	12	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	12/4/2007	37593	4542.51	163	1163	41	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	2/4/2008	37655	4542.51	163	1163	13	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	4/7/2008	37718	4542.51	163	1163	14	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	6/2/2008	37774	4542.51	163	1163	14.3	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	8/12/2008	37845	4542.51	163	1163	14.9	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	10/23/2008	37917	4542.51	163	1163	15.4	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	3/11/2009	38056	4542.51	163	1163	16.5	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	6/3/2009	38140	4542.51	163	1163	12.1	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	7/22/2009	38189	4542.51	163	1163	14.1	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	10/21/2009	38280	4542.51	163	1163	16.5	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	2/3/2010	38385	4542.51	163	1163	16.3	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	4/23/2010	38464	4542.51	163	1163	17.6	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	7/20/2010	38552	4542.51	163	1163	19.1	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	11/4/2010	38659	4542.51	163	1163	18.4	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	11/4/2010	38659	4542.51	163	1163	18.4	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	1/19/2011	38735	4542.51	163	1163	17	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	1/19/2011	38735	4542.51	163	1163	17	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	4/7/2011	38813	4542.51	163	1163	17.6	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	7/13/2011	38910	4542.51	163	1163	17.9	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	10/13/2011	39002	4542.51	163	1163	19	4379.51	3379.51	1334.87	1030.07	
590620	AWC-05	D24023013ABD	599269.3	3468541.6	2/2/2012	39114	4542.51	163	1163	19.5	4379.51	3379.51	1334.87	1030.07	2012 Q4 CQB Groundwater Tables
590620	AWC-05	D24023013ABD	599269.3	3468541.6	4/24/2012	39196	4542.51	163	1163	15.4	4379.51	3379.51	1334.87	1030.07	2012 Q4 CQB Groundwater Tables
590620	AWC-05	D24023013ABD	599269.3	3468541.6	7/5/2012	39268	4542.51	163	1163	19.1	4379.51	3379.51	1334.87	1030.07	2012 Q4 CQB Groundwater Tables
590620	AWC-05	D24023013ABD	599269.3	3468541.6	10/18/2012	39373	4542.51	163	1163	20.1	4379.51	3379.51	1334.87	1030.07	2012 Q4 CQB Groundwater Tables
593116	COB WL	D23024035CBD	606357.5	3472502.0	2/22/2008	37673	4832.06	90	150	90	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	2/22/2008	37673	4832.06	90	150	90	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	3/24/2008	37704	4832.06	90	150	98.2	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	4/28/2008	37739	4832.06	90	150	98.7	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	5/20/2008	37761	4832.06	90	150	98	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	5/20/2008	37761	4832.06	90	150	98	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	7/30/2008	37832	4832.06	90	150	100	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	10/15/2008	37909	4832.06	90	150	107	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	10/23/2008	37917	4832.06	90	150	104	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	2/12/2009	38029	4832.06	90	150	94	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	4/23/2009	38099	4832.06	90	150	98	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	7/22/2009	38189	4832.06	90	150	97.3	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	10/22/2009	38281	4832.06	90	150	96.1	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	3/3/2010	38413	4832.06	90	150	97.1	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	4/26/2010	38467	4832.06	90	150	97.9	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	4/26/2010	38467	4832.06	90	150	97.7	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	7/13/2010	38545	4832.06	90	150	88.7	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	7/14/2011	38911	4832.06	90	150	87.3	4742.06	4682.06	1445.38	1427.09	
593116	COB WL	D23024035CBD	606357.5	3472502.0	7/12/2012	39275	4832.06	90	150	92	4742.06	4682.06	1445.38	1427.09	2012 Q4 CQB Groundwater Tables
594938	BINYON	D24024013ACB	608544.7	3468542.0	8/18/2008	37851	4648.96	220	260	13	4428.96	4388.96	1349.95	1337.76	
599796	EAST	D24024014ABD	607076.4	3468712.2	2/8/2008	37659	4626.01	85	125	10.6	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	2/8/2008	37659	4626.01	85	125	10.6	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	5/14/2008	37755	4626.01	85	125	14.8	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	5/14/2008	37755	4626.01	85	125	14.8	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	7/23/2008	37825	4626.01	85	125	11.8	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	10/14/2008	37908	4626.01	85	125	8.9	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	1/20/2009	38006	4626.01	85	125	12.5	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	4/8/2009	38084	4626.01	85	125	15.9	4541.01	4501.01	1384.10	1371.91	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
599796	EAST	D24024014ABD	607076.4	3468712.2	7/13/2009	38180	4626.01	85	125	13.8	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	10/8/2009	38267	4626.01	85	125	13.4	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	1/25/2010	38376	4626.01	85	125	10.7	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	4/21/2010	38462	4626.01	85	125	14.4	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	4/21/2010	38462	4626.01	85	125	13.9	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	7/14/2010	38546	4626.01	85	125	12.1	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	10/20/2010	38644	4626.01	85	125	12.1	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	10/20/2010	38644	4626.01	85	125	12.1	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	1/18/2011	38734	4626.01	85	125	13.1	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	1/18/2011	38734	4626.01	85	125	13.1	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	4/5/2011	38811	4626.01	85	125	13.8	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	7/12/2011	38909	4626.01	85	125	12.7	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	10/12/2011	39001	4626.01	85	125	15.1	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	10/12/2011	39001	4626.01	85	125	15.1	4541.01	4501.01	1384.10	1371.91	
599796	EAST	D24024014ABD	607076.4	3468712.2	1/31/2012	39112	4626.01	85	125	12.8	4541.01	4501.01	1384.10	1371.91	2012 Q4 CQB Groundwater Tables
599796	EAST	D24024014ABD	607076.4	3468712.2	4/11/2012	39183	4626.01	85	125	14.6	4541.01	4501.01	1384.10	1371.91	2012 Q4 CQB Groundwater Tables
599796	EAST	D24024014ABD	607076.4	3468712.2	7/9/2012	39272	4626.01	85	125	14.2	4541.01	4501.01	1384.10	1371.91	2012 Q4 CQB Groundwater Tables
599796	EAST	D24024014ABD	607076.4	3468712.2	10/4/2012	39359	4626.01	85	125	15	4541.01	4501.01	1384.10	1371.91	2012 Q4 CQB Groundwater Tables
610690	GOAR_G4	D24024017B00	601596.4	3468580.0	1/7/1986	29592	4597.23	100	250	850	4497.23	4347.23	1370.76	1325.04	Littin 1987
613395	PIONKE	D24024018AAA	600936.3	3468836.6	2/6/2008	37657	4592.13	100	300	394	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	2/6/2008	37657	4592.13	100	300	394	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	5/7/2008	37748	4592.13	100	300	391	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	5/7/2008	37748	4592.13	100	300	391	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	7/17/2008	37819	4592.13	100	300	420	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	8/12/2008	37845	4592.13	100	300	423	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	10/27/2008	37921	4592.13	100	300	460	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	1/29/2009	38015	4592.13	100	300	385	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	4/14/2009	38090	4592.13	100	300	411	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	7/13/2009	38180	4592.13	100	300	472	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	10/7/2009	38266	4592.13	100	300	403	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	3/8/2010	38418	4592.13	100	300	406	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	4/26/2010	38467	4592.13	100	300	438	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	7/15/2010	38547	4592.13	100	300	474	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	10/18/2010	38642	4592.13	100	300	487	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	10/18/2010	38642	4592.13	100	300	473	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	10/18/2010	38642	4592.13	100	300	487	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	1/19/2011	38735	4592.13	100	300	471	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	1/19/2011	38735	4592.13	100	300	471	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	4/8/2011	38814	4592.13	100	300	467	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	4/8/2011	38814	4592.13	100	300	467	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	7/12/2011	38909	4592.13	100	300	500	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	10/11/2011	39000	4592.13	100	300	502	4492.13	4292.13	1369.20	1308.24	
613395	PIONKE	D24024018AAA	600936.3	3468836.6	2/1/2012	39113	4592.13	100	300	495	4492.13	4292.13	1369.20	1308.24	2012 Q4 CQB Groundwater Tables
613395	PIONKE	D24024018AAA	600936.3	3468836.6	2/1/2012	39113	4592.13	100	300	481	4492.13	4292.13	1369.20	1308.24	2012 Q4 CQB Groundwater Tables
613395	PIONKE	D24024018AAA	600936.3	3468836.6	4/12/2012	39184	4592.13	100	300	508	4492.13	4292.13	1369.20	1308.24	2012 Q4 CQB Groundwater Tables
613395	PIONKE	D24024018AAA	600936.3	3468836.6	7/11/2012	39274	4592.13	100	300	439	4492.13	4292.13	1369.20	1308.24	2012 Q4 CQB Groundwater Tables
613395	PIONKE	D24024018AAA	600936.3	3468836.6	10/17/2012	39372	4592.13	100	300	419	4492.13	4292.13	1369.20	1308.24	2012 Q4 CQB Groundwater Tables
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	3/20/2008	37700	4588.51	100	236	431	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	3/20/2008	37700	4588.51	100	236	431	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	5/5/2008	37746	4588.51	100	236	452	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	5/5/2008	37746	4588.51	100	236	452	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	7/14/2008	37816	4588.51	100	236	472	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	10/15/2008	37909	4588.51	100	236	475	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	1/27/2009	38013	4588.51	100	236	488	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	4/14/2009	38090	4588.51	100	236	534	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	7/14/2009	38181	4588.51	100	236	550	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	10/12/2009	38271	4588.51	100	236	510	4488.51	4352.51	1368.10	1326.65	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	1/27/2010	38378	4588.51	100	236	523	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	4/21/2010	38462	4588.51	100	236	627	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	7/19/2010	38551	4588.51	100	236	648	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	10/19/2010	38643	4588.51	100	236	416	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	10/19/2010	38643	4588.51	100	236	416	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	1/17/2011	38733	4588.51	100	236	562	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	1/17/2011	38733	4588.51	100	236	562	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	4/11/2011	38817	4588.51	100	236	609	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	4/11/2011	38817	4588.51	100	236	609	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	7/14/2011	38911	4588.51	100	236	678	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	10/11/2011	39000	4588.51	100	236	543	4488.51	4352.51	1368.10	1326.65	
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	2/1/2012	39113	4588.51	100	236	551	4488.51	4352.51	1368.10	1326.65	2012 Q4 CQB Groundwater Tables
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	4/25/2012	39197	4588.51	100	236	657	4488.51	4352.51	1368.10	1326.65	2012 Q4 CQB Groundwater Tables
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	7/12/2012	39275	4588.51	100	236	667	4488.51	4352.51	1368.10	1326.65	2012 Q4 CQB Groundwater Tables
613396	ANDERSON	D24024018AAA	601134.7	3468816.1	10/10/2012	39365	4588.51	100	236	574	4488.51	4352.51	1368.10	1326.65	2012 Q4 CQB Groundwater Tables
616436	ASLD	D24024008CBA	601488.2	3469690.0	1/7/1986	29592	4628.00	100	150	650	4528.00	4478.00	1380.13	1364.89	Littin 1987
616584	AWC-04	D24023013ABC	598949.7	3468717.5	1/23/1964	21572	4540.48	106	187	8	4434.48	4353.48	1351.63	1326.94	Littin 1987
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/11/1985	29321	4540.48	106	187	7	4434.48	4353.48	1351.63	1326.94	Littin 1987
616584	AWC-04	D24023013ABC	598949.7	3468717.5	6/1/1991	31563	4540.48	106	187	20	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	1/11/1999	34344	4540.48	106	187	18	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/20/1999	34443	4540.48	106	187	20	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	1/17/2000	34715	4540.48	106	187	19	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	1/25/2000	34723	4540.48	106	187	17.8	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	2/17/2000	34746	4540.48	106	187	18	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	2/17/2000	34746	4540.48	106	187	19	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	2/24/2000	34753	4540.48	106	187	21	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	3/9/2000	34767	4540.48	106	187	20	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	3/23/2000	34781	4540.48	106	187	20.8	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	3/30/2000	34788	4540.48	106	187	-5	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/13/2000	34802	4540.48	106	187	18.7	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/27/2000	34816	4540.48	106	187	20.4	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	5/4/2000	34823	4540.48	106	187	18.1	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	5/11/2000	34830	4540.48	106	187	19.3	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	7/5/2000	34885	4540.48	106	187	23.1	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	7/5/2000	34885	4540.48	106	187	23.1	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	8/8/2000	34919	4540.48	106	187	30.3	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	8/21/2000	34932	4540.48	106	187	23.8	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	8/28/2000	34939	4540.48	106	187	26.5	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	9/5/2000	34947	4540.48	106	187	27.7	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	11/6/2000	35009	4540.48	106	187	23.8	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	12/4/2000	35037	4540.48	106	187	24.6	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	2/5/2001	35100	4540.48	106	187	24	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	3/5/2001	35128	4540.48	106	187	24	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/2/2001	35156	4540.48	106	187	24.8	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	5/1/2001	35185	4540.48	106	187	17.8	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	6/4/2001	35219	4540.48	106	187	26.7	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	9/10/2001	35317	4540.48	106	187	23.9	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	11/5/2001	35373	4540.48	106	187	22.5	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	12/3/2001	35401	4540.48	106	187	22.7	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	12/4/2001	35402	4540.48	106	187	16	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	1/7/2002	35436	4540.48	106	187	24.1	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	2/13/2002	35473	4540.48	106	187	22.7	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	3/18/2002	35506	4540.48	106	187	20.5	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/1/2002	35520	4540.48	106	187	19.3	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	5/6/2002	35555	4540.48	106	187	23.4	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	8/5/2002	35646	4540.48	106	187	26.6	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	9/9/2002	35681	4540.48	106	187	29	4434.48	4353.48	1351.63	1326.94	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
616584	AWC-04	D24023013ABC	598949.7	3468717.5	10/7/2002	35709	4540.48	106	187	33.6	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	11/4/2002	35737	4540.48	106	187	26.1	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	12/12/2002	35775	4540.48	106	187	30.9	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	2/4/2008	37655	4540.48	106	187	18	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/7/2008	37718	4540.48	106	187	18	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	6/2/2008	37774	4540.48	106	187	14.3	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	8/12/2008	37845	4540.48	106	187	21.6	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	10/23/2008	37917	4540.48	106	187	24	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	12/4/2008	37959	4540.48	106	187	16	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	3/11/2009	38056	4540.48	106	187	27.2	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/22/2009	38098	4540.48	106	187	26.1	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	7/22/2009	38189	4540.48	106	187	26.2	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	10/21/2009	38280	4540.48	106	187	25.7	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	2/3/2010	38385	4540.48	106	187	26.5	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/23/2010	38464	4540.48	106	187	27.4	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	7/20/2010	38552	4540.48	106	187	26.6	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	11/4/2010	38659	4540.48	106	187	24	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	11/4/2010	38659	4540.48	106	187	24	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	1/19/2011	38735	4540.48	106	187	26.2	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	1/19/2011	38735	4540.48	106	187	26.2	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/7/2011	38813	4540.48	106	187	25.8	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	7/13/2011	38910	4540.48	106	187	25.7	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	10/13/2011	39002	4540.48	106	187	27.6	4434.48	4353.48	1351.63	1326.94	
616584	AWC-04	D24023013ABC	598949.7	3468717.5	2/2/2012	39114	4540.48	106	187	27.2	4434.48	4353.48	1351.63	1326.94	2012 Q4 CQB Groundwater Tables
616584	AWC-04	D24023013ABC	598949.7	3468717.5	4/24/2012	39196	4540.48	106	187	25.2	4434.48	4353.48	1351.63	1326.94	2012 Q4 CQB Groundwater Tables
616584	AWC-04	D24023013ABC	598949.7	3468717.5	7/5/2012	39268	4540.48	106	187	28.2	4434.48	4353.48	1351.63	1326.94	2012 Q4 CQB Groundwater Tables
616584	AWC-04	D24023013ABC	598949.7	3468717.5	7/5/2012	39268	4540.48	106	187	28.1	4434.48	4353.48	1351.63	1326.94	2012 Q4 CQB Groundwater Tables
616584	AWC-04	D24023013ABC	598949.7	3468717.5	10/18/2012	39373	4540.48	106	187	26.6	4434.48	4353.48	1351.63	1326.94	2012 Q4 CQB Groundwater Tables
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/31/1956	18840	4539.52	83	269	10	4456.52	4270.52	1358.35	1301.65	Old GWSI data (USGS)
616585	AWC-03	D24023013ABD	599091.1	3468680.2	12/9/1960	20432	4539.52	83	269	7	4456.52	4270.52	1358.35	1301.65	Old GWSI data (USGS)
616585	AWC-03	D24023013ABD	599091.1	3468680.2	10/17/1966	22570	4539.52	83	269	8	4456.52	4270.52	1358.35	1301.65	Old GWSI data (USGS)
616585	AWC-03	D24023013ABD	599091.1	3468680.2	4/16/1985	29326	4539.52	83	269	13	4456.52	4270.52	1358.35	1301.65	Old GWSI data (USGS)
616585	AWC-03	D24023013ABD	599091.1	3468680.2	12/11/1985	29565	4539.52	83	269	11	4456.52	4270.52	1358.35	1301.65	Littin 1987
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/6/1994	32513	4539.52	83	269	22.5	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	8/6/1996	33456	4539.52	83	269	-10	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/24/2000	34722	4539.52	83	269	22.6	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	2/17/2000	34746	4539.52	83	269	21	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	2/17/2000	34746	4539.52	83	269	29	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	2/24/2000	34753	4539.52	83	269	26	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/9/2000	34767	4539.52	83	269	24	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/23/2000	34781	4539.52	83	269	26.1	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/30/2000	34788	4539.52	83	269	-5	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	4/13/2000	34802	4539.52	83	269	21.6	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	4/27/2000	34816	4539.52	83	269	23.1	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/4/2000	34823	4539.52	83	269	21.7	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/11/2000	34830	4539.52	83	269	26.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/5/2000	34885	4539.52	83	269	27.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/5/2000	34885	4539.52	83	269	27.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	12/12/2000	35045	4539.52	83	269	17.4	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	2/5/2001	35100	4539.52	83	269	13.5	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/1/2001	35185	4539.52	83	269	25	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	6/4/2001	35219	4539.52	83	269	21.1	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	8/6/2001	35282	4539.52	83	269	20.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	11/5/2001	35373	4539.52	83	269	21.6	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/7/2002	35436	4539.52	83	269	23.2	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/18/2002	35506	4539.52	83	269	22.9	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/6/2002	35555	4539.52	83	269	24.3	4456.52	4270.52	1358.35	1301.65	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
616585	AWC-03	D24023013ABD	599091.1	3468680.2	8/5/2002	35646	4539.52	83	269	23.5	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	9/9/2002	35681	4539.52	83	269	23.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	11/4/2002	35737	4539.52	83	269	23.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/6/2003	35800	4539.52	83	269	23.9	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/3/2003	35856	4539.52	83	269	34.4	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/5/2003	35919	4539.52	83	269	24.9	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	8/4/2003	36010	4539.52	83	269	28.2	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	10/6/2003	36073	4539.52	83	269	26.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/5/2004	36164	4539.52	83	269	26.9	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	2/2/2004	36192	4539.52	83	269	34.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/1/2004	36220	4539.52	83	269	29.4	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	4/5/2004	36255	4539.52	83	269	29.1	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/3/2004	36283	4539.52	83	269	28.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	6/7/2004	36318	4539.52	83	269	30.6	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	8/16/2004	36388	4539.52	83	269	30.4	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	10/4/2004	36437	4539.52	83	269	30.6	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	12/6/2004	36500	4539.52	83	269	32.2	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/7/2005	36591	4539.52	83	269	28.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/2/2005	36647	4539.52	83	269	28.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/11/2005	36717	4539.52	83	269	35.4	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/11/2005	36717	4539.52	83	269	35.4	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	9/12/2005	36780	4539.52	83	269	35.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	9/26/2005	36794	4539.52	83	269	36.5	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	11/8/2005	36837	4539.52	83	269	38.4	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/9/2006	36899	4539.52	83	269	36	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/2/2006	37012	4539.52	83	269	36	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/11/2006	37082	4539.52	83	269	36.7	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	9/11/2006	37144	4539.52	83	269	36.7	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	11/6/2006	37200	4539.52	83	269	37.2	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/24/2007	37279	4539.52	83	269	38.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/5/2007	37319	4539.52	83	269	50.6	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	4/2/2007	37347	4539.52	83	269	55.9	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/7/2007	37382	4539.52	83	269	36.9	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/9/2007	37445	4539.52	83	269	36	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	9/10/2007	37508	4539.52	83	269	35	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	9/17/2007	37515	4539.52	83	269	38	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	11/5/2007	37564	4539.52	83	269	34	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/7/2008	37627	4539.52	83	269	12	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/7/2008	37627	4539.52	83	269	41	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/3/2008	37683	4539.52	83	269	38	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	5/5/2008	37746	4539.52	83	269	37.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	8/12/2008	37845	4539.52	83	269	38.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	10/23/2008	37917	4539.52	83	269	41.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	3/11/2009	38056	4539.52	83	269	64.2	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	4/22/2009	38098	4539.52	83	269	42.4	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/22/2009	38189	4539.52	83	269	41.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	10/21/2009	38280	4539.52	83	269	50.5	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	2/3/2010	38385	4539.52	83	269	42	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	4/23/2010	38464	4539.52	83	269	44.4	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/20/2010	38552	4539.52	83	269	46.7	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	11/4/2010	38659	4539.52	83	269	46.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	11/4/2010	38659	4539.52	83	269	46.3	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/19/2011	38735	4539.52	83	269	49	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	1/19/2011	38735	4539.52	83	269	49	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	4/7/2011	38813	4539.52	83	269	46.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/13/2011	38910	4539.52	83	269	46.2	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/13/2011	38910	4539.52	83	269	47.6	4456.52	4270.52	1358.35	1301.65	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
616585	AWC-03	D24023013ABD	599091.1	3468680.2	10/13/2011	39002	4539.52	83	269	48.8	4456.52	4270.52	1358.35	1301.65	
616585	AWC-03	D24023013ABD	599091.1	3468680.2	2/2/2012	39114	4539.52	83	269	47.7	4456.52	4270.52	1358.35	1301.65	2012 Q4 CQB Groundwater Tables
616585	AWC-03	D24023013ABD	599091.1	3468680.2	4/24/2012	39196	4539.52	83	269	51.8	4456.52	4270.52	1358.35	1301.65	2012 Q4 CQB Groundwater Tables
616585	AWC-03	D24023013ABD	599091.1	3468680.2	7/5/2012	39268	4539.52	83	269	50.7	4456.52	4270.52	1358.35	1301.65	2012 Q4 CQB Groundwater Tables
616585	AWC-03	D24023013ABD	599091.1	3468680.2	10/18/2012	39373	4539.52	83	269	51.3	4456.52	4270.52	1358.35	1301.65	2012 Q4 CQB Groundwater Tables
616586	AWC-02	D24023013ABC	598907.1	3468549.4	10/13/1954	18183	4547.64	100	215	50	4447.64	4332.64	1355.64	1320.59	Littin 1987
616586	AWC-02	D24023013ABC	598907.1	3468549.4	12/13/1956	18975	4547.64	100	215	7	4447.64	4332.64	1355.64	1320.59	Littin 1987
616586	AWC-02	D24023013ABC	598907.1	3468549.4	3/27/1995	32958	4547.64	100	215	15.1	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	8/6/1996	33456	4547.64	100	215	19.4	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	3/30/2000	34788	4547.64	100	215	-5	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	4/13/2000	34802	4547.64	100	215	6.6	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	4/27/2000	34816	4547.64	100	215	7.1	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	5/4/2000	34823	4547.64	100	215	6	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	5/11/2000	34830	4547.64	100	215	6	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/5/2000	34885	4547.64	100	215	7.2	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/5/2000	34885	4547.64	100	215	7.2	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	3/5/2001	35128	4547.64	100	215	7	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	8/6/2001	35282	4547.64	100	215	-5	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	9/10/2001	35317	4547.64	100	215	7.3	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	12/3/2001	35401	4547.64	100	215	6.8	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	2/13/2002	35473	4547.64	100	215	7.2	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	4/1/2002	35520	4547.64	100	215	5.7	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	8/6/2002	35647	4547.64	100	215	7.3	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	10/7/2002	35709	4547.64	100	215	6.8	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	12/12/2002	35775	4547.64	100	215	7.4	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	2/3/2003	35828	4547.64	100	215	7	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	4/7/2003	35891	4547.64	100	215	6.7	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/7/2003	35982	4547.64	100	215	7.6	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	9/8/2003	36045	4547.64	100	215	7.2	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	11/3/2003	36101	4547.64	100	215	7.5	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	12/1/2003	36129	4547.64	100	215	8	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	6/7/2004	36318	4547.64	100	215	7.3	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/12/2004	36353	4547.64	100	215	7.7	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	9/21/2004	36424	4547.64	100	215	7.8	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	11/1/2004	36465	4547.64	100	215	9.1	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	3/7/2005	36591	4547.64	100	215	15.6	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	5/2/2005	36647	4547.64	100	215	9.3	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/11/2005	36717	4547.64	100	215	12	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/11/2005	36717	4547.64	100	215	12	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	9/12/2005	36780	4547.64	100	215	12.6	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	9/26/2005	36794	4547.64	100	215	12.5	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	11/8/2005	36837	4547.64	100	215	14	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	1/9/2006	36899	4547.64	100	215	14	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	5/2/2006	37012	4547.64	100	215	13	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/11/2006	37082	4547.64	100	215	11.4	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	9/11/2006	37144	4547.64	100	215	12.4	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	11/6/2006	37200	4547.64	100	215	12.8	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	1/24/2007	37279	4547.64	100	215	13.1	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	3/5/2007	37319	4547.64	100	215	13.5	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	5/7/2007	37382	4547.64	100	215	7.8	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/9/2007	37445	4547.64	100	215	7.3	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	9/10/2007	37508	4547.64	100	215	10	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	9/17/2007	37515	4547.64	100	215	10	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	11/5/2007	37564	4547.64	100	215	11	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	1/7/2008	37627	4547.64	100	215	14	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	1/7/2008	37627	4547.64	100	215	14	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	3/3/2008	37683	4547.64	100	215	16	4447.64	4332.64	1355.64	1320.59	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
616586	AWC-02	D24023013ABC	598907.1	3468549.4	5/5/2008	37746	4547.64	100	215	13.3	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	8/12/2008	37845	4547.64	100	215	14.3	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	10/23/2008	37917	4547.64	100	215	15.9	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	3/11/2009	38056	4547.64	100	215	15.5	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	4/22/2009	38098	4547.64	100	215	14.7	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/22/2009	38189	4547.64	100	215	14.2	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	10/21/2009	38280	4547.64	100	215	16.8	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	2/3/2010	38385	4547.64	100	215	18.6	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	4/23/2010	38464	4547.64	100	215	18.3	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/20/2010	38552	4547.64	100	215	18.2	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	11/4/2010	38659	4547.64	100	215	18.8	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	11/4/2010	38659	4547.64	100	215	18.8	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	1/19/2011	38735	4547.64	100	215	18.4	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	1/19/2011	38735	4547.64	100	215	18.4	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	4/7/2011	38813	4547.64	100	215	17.3	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/13/2011	38910	4547.64	100	215	12.9	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	10/13/2011	39002	4547.64	100	215	17.4	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	10/13/2011	39002	4547.64	100	215	17.4	4447.64	4332.64	1355.64	1320.59	
616586	AWC-02	D24023013ABC	598907.1	3468549.4	2/2/2012	39114	4547.64	100	215	19.4	4447.64	4332.64	1355.64	1320.59	2012 Q4 CQB Groundwater Tables
616586	AWC-02	D24023013ABC	598907.1	3468549.4	4/24/2012	39196	4547.64	100	215	15.5	4447.64	4332.64	1355.64	1320.59	2012 Q4 CQB Groundwater Tables
616586	AWC-02	D24023013ABC	598907.1	3468549.4	7/5/2012	39268	4547.64	100	215	10.1	4447.64	4332.64	1355.64	1320.59	2012 Q4 CQB Groundwater Tables
616586	AWC-02	D24023013ABC	598907.1	3468549.4	10/18/2012	39373	4547.64	100	215	13	4447.64	4332.64	1355.64	1320.59	2012 Q4 CQB Groundwater Tables
623564	COOPER	D24024005AAA	602668.4	3472105.0	1/6/1986	29591	4793.00	285	325	11	4508.00	4468.00	1374.04	1361.85	Littin 1987
623564	COOPER	D24024005AAA	602668.4	3472105.0	2/14/2008	37665	4793.00	285	325	33	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	2/14/2008	37665	4793.00	285	325	33	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	5/14/2008	37755	4793.00	285	325	34.2	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	5/14/2008	37755	4793.00	285	325	34.2	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	7/31/2008	37833	4793.00	285	325	33.7	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	10/20/2008	37914	4793.00	285	325	31.2	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	2/11/2009	38028	4793.00	285	325	34.3	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	4/21/2009	38097	4793.00	285	325	33.4	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	7/20/2009	38187	4793.00	285	325	32.3	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	10/14/2009	38273	4793.00	285	325	33.6	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	2/1/2010	38383	4793.00	285	325	32.4	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	4/22/2010	38463	4793.00	285	325	34.5	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	7/19/2010	38551	4793.00	285	325	35	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	10/18/2010	38642	4793.00	285	325	33.1	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	10/18/2010	38642	4793.00	285	325	33.1	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	1/19/2011	38735	4793.00	285	325	32.1	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	1/19/2011	38735	4793.00	285	325	32.1	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	4/11/2011	38817	4793.00	285	325	34.3	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	4/11/2011	38817	4793.00	285	325	34.3	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	7/11/2011	38908	4793.00	285	325	32.1	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	11/22/2011	39042	4793.00	285	325	33.7	4508.00	4468.00	1374.04	1361.85	
623564	COOPER	D24024005AAA	602668.4	3472105.0	2/1/2012	39113	4793.00	285	325	34.1	4508.00	4468.00	1374.04	1361.85	2012 Q4 CQB Groundwater Tables
623564	COOPER	D24024005AAA	602668.4	3472105.0	4/10/2012	39182	4793.00	285	325	32.5	4508.00	4468.00	1374.04	1361.85	2012 Q4 CQB Groundwater Tables
623564	COOPER	D24024005AAA	602668.4	3472105.0	7/18/2012	39281	4793.00	285	325	33.4	4508.00	4468.00	1374.04	1361.85	2012 Q4 CQB Groundwater Tables
623564	COOPER	D24024005AAA	602668.4	3472105.0	10/9/2012	39364	4793.00	285	325	34.3	4508.00	4468.00	1374.04	1361.85	2012 Q4 CQB Groundwater Tables
624535	POWER	D23024036CAD	608379.4	3472738.9	2/12/2008	37663	4840.37	60	99	15.5	4780.37	4741.37	1457.06	1445.17	
624535	POWER	D23024036CAD	608379.4	3472738.9	2/12/2008	37663	4840.37	60	99	15.5	4780.37	4741.37	1457.06	1445.17	
624535	POWER	D23024036CAD	608379.4	3472738.9	7/22/2008	37824	4840.37	60	99	20.2	4780.37	4741.37	1457.06	1445.17	
627682	NWC-01	D24024019BAB	599987.7	3467340.9	8/14/1996	33464	4603.00	100	215	7.3	4503.00	4388.00	1372.51	1337.46	
627682	NWC-01	D24024019BAB	599987.7	3467340.9	8/14/1996	33464	4603.00	100	215	7.3	4503.00	4388.00	1372.51	1337.46	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	8/14/1996	33464	4600.00	252	312	7.8	4348.00	4288.00	1325.27	1306.98	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	8/14/1996	33464	4600.00	252	312	7.8	4348.00	4288.00	1325.27	1306.98	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	10/27/2008	37921	4600.00	252	312	5.1	4348.00	4288.00	1325.27	1306.98	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	2/12/2009	38029	4600.00	252	312	6.6	4348.00	4288.00	1325.27	1306.98	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
627683	NWC-02	D24024018CD0	600182.7	3467464.6	4/23/2009	38099	4600.00	252	312	6.4	4348.00	4288.00	1325.27	1306.98	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	7/21/2009	38188	4600.00	252	312	5	4348.00	4288.00	1325.27	1306.98	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	10/21/2009	38280	4600.00	252	312	6.8	4348.00	4288.00	1325.27	1306.98	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	2/3/2010	38385	4600.00	252	312	8.5	4348.00	4288.00	1325.27	1306.98	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	4/21/2010	38462	4600.00	252	312	7.26	4348.00	4288.00	1325.27	1306.98	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	10/19/2010	38643	4600.00	252	312	7.39	4348.00	4288.00	1325.27	1306.98	
627683	NWC-02	D24024018CD0	600182.7	3467464.6	1/18/2011	38734	4600.00	252	312	6.43	4348.00	4288.00	1325.27	1306.98	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	1/8/1986	29593	4572.82	135	195	21	4437.82	4377.82	1352.65	1334.36	Littin 1987
627684	NWC-03	D24024018ADD	601153.2	3468344.5	8/7/1996	33457	4572.82	135	195	129	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	8/7/1996	33457	4572.82	135	195	109	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	11/5/1997	33912	4572.82	135	195	148	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	11/5/1997	33912	4572.82	135	195	148	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	12/3/2002	35766	4572.82	135	195	215	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	12/3/2002	35766	4572.82	135	195	215	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	10/10/2005	36808	4572.82	135	195	460	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	11/29/2006	37223	4572.82	135	195	360	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	3/4/2008	37684	4572.82	135	195	560	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	6/9/2008	37781	4572.82	135	195	524	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	10/27/2008	37921	4572.82	135	195	489	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	2/12/2009	38029	4572.82	135	195	412	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	4/23/2009	38099	4572.82	135	195	466	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	7/21/2009	38188	4572.82	135	195	458	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	10/21/2009	38280	4572.82	135	195	444	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	2/3/2010	38385	4572.82	135	195	444	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	4/21/2010	38462	4572.82	135	195	433	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	10/19/2010	38643	4572.82	135	195	432	4437.82	4377.82	1352.65	1334.36	
627684	NWC-03	D24024018ADD	601153.2	3468344.5	1/18/2011	38734	4572.82	135	195	386	4437.82	4377.82	1352.65	1334.36	
627685	NWC-04 CAPPED	D24024010DDD	605825.5	3469074.2	8/7/1996	33457	4691.00	322	462	263	4369.00	4229.00	1331.67	1289.00	
627685	NWC-04 CAPPED	D24024010DDD	605825.5	3469074.2	8/7/1996	33457	4691.00	322	462	248	4369.00	4229.00	1331.67	1289.00	
627685	NWC-04 CAPPED	D24024010DDD	605825.5	3469074.2	11/6/1997	33913	4691.00	322	462	314	4369.00	4229.00	1331.67	1289.00	
627685	NWC-04 CAPPED	D24024010DDD	605825.5	3469074.2	12/3/2002	35766	4691.00	322	462	255	4369.00	4229.00	1331.67	1289.00	
627685	NWC-04 CAPPED	D24024010DDD	605825.5	3469074.2	10/10/2005	36808	4691.00	322	462	220	4369.00	4229.00	1331.67	1289.00	
627696	NWC-05	D24024011D00	606980.1	3469445.6	8/7/1996	33457	4680.00	86	175	78.9	4594.00	4505.00	1400.25	1373.12	
628547	GGOOSE 547	D24024011CBD	606256.7	3469820.3	5/21/2008	37762	4717.11	600	800	199	4117.11	3917.11	1254.90	1193.94	
628547	GGOOSE 547	D24024011CBD	606256.7	3469820.3	5/21/2008	37762	4717.11	600	800	199	4117.11	3917.11	1254.90	1193.94	
628547	GGOOSE 547	D24024011CBD	606256.7	3469820.3	8/15/2008	37848	4717.11	600	800	178	4117.11	3917.11	1254.90	1193.94	
628547	GGOOSE 547	D24024011CBD	606256.7	3469820.3	10/29/2008	37923	4717.11	600	800	216	4117.11	3917.11	1254.90	1193.94	
628547	GGOOSE 547	D24024011CBD	606256.7	3469820.3	2/24/2009	38041	4717.11	600	800	186	4117.11	3917.11	1254.90	1193.94	
628547	GGOOSE 547	D24024011CBD	606256.7	3469820.3	5/14/2009	38120	4717.11	600	800	174	4117.11	3917.11	1254.90	1193.94	
628547	GGOOSE 547	D24024011CBD	606256.7	3469820.3	8/19/2009	38217	4717.11	600	800	175	4117.11	3917.11	1254.90	1193.94	
628547	GGOOSE 547	D24024011CBD	606256.7	3469820.3	11/11/2009	38301	4717.11	600	800	188	4117.11	3917.11	1254.90	1193.94	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	3/6/2008	37686	4598.67	140	240	7.7	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	3/6/2008	37686	4598.67	140	240	7.7	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	5/5/2008	37746	4598.67	140	240	6	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	5/5/2008	37746	4598.67	140	240	6	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	7/14/2008	37816	4598.67	140	240	5.8	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	10/15/2008	37909	4598.67	140	240	4	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	1/27/2009	38013	4598.67	140	240	5.3	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	4/14/2009	38090	4598.67	140	240	6.8	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	4/14/2009	38090	4598.67	140	240	6.8	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	7/15/2009	38182	4598.67	140	240	4.3	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	10/13/2009	38272	4598.67	140	240	6.5	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	1/26/2010	38377	4598.67	140	240	5.7	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	4/23/2010	38464	4598.67	140	240	8.34	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	7/21/2010	38553	4598.67	140	240	7.75	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	10/19/2010	38643	4598.67	140	240	7.04	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	1/18/2011	38734	4598.67	140	240	7.3	4458.67	4358.67	1359.00	1328.52	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	1/18/2011	38734	4598.67	140	240	7.3	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	4/11/2011	38817	4598.67	140	240	7.74	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	4/11/2011	38817	4598.67	140	240	7.74	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	7/18/2011	38915	4598.67	140	240	8.18	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	10/12/2011	39001	4598.67	140	240	7.8	4458.67	4358.67	1359.00	1328.52	
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	2/6/2012	39118	4598.67	140	240	9.08	4458.67	4358.67	1359.00	1328.52	2012 Q4 CQB Groundwater Tables
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	4/23/2012	39195	4598.67	140	240	8.84	4458.67	4358.67	1359.00	1328.52	2012 Q4 CQB Groundwater Tables
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	7/17/2012	39280	4598.67	140	240	8.41	4458.67	4358.67	1359.00	1328.52	2012 Q4 CQB Groundwater Tables
629807	CHAMBERS	D24024018CDC	600096.9	3467462.0	10/8/2012	39363	4598.67	140	240	10.1	4458.67	4358.67	1359.00	1328.52	2012 Q4 CQB Groundwater Tables
633472	BLOMMER	D24024005CC0	602039.8	3471485.9	2/5/2008	37656	4684.62	250	350	206	4434.62	4334.62	1351.67	1321.19	
633472	BLOMMER	D24024005CC0	602039.8	3471485.9	4/21/2008	37732	4684.62	250	350	201	4434.62	4334.62	1351.67	1321.19	
633472	BLOMMER	D24024005CC0	602039.8	3471485.9	5/13/2008	37754	4684.62	250	350	211	4434.62	4334.62	1351.67	1321.19	2012 Q4 CQB Groundwater Tables
633472	BLOMMER	D24024005CC0	602039.8	3471485.9	5/15/2008	37756	4684.62	250	350	211	4434.62	4334.62	1351.67	1321.19	
633472	BLOMMER	D24024005CC0	602039.8	3471485.9	6/23/2008	37795	4684.62	250	350	193	4434.62	4334.62	1351.67	1321.19	
633472	BLOMMER	D24024005CC0	602039.8	3471485.9	7/29/2008	37831	4684.62	250	350	203	4434.62	4334.62	1351.67	1321.19	
633472	BLOMMER	D24024005CC0	602039.8	3471485.9	8/27/2008	37860	4684.62	250	350	189	4434.62	4334.62	1351.67	1321.19	
633472	BLOMMER	D24024005CC0	602039.8	3471485.9	9/23/2008	37887	4684.62	250	350	193	4434.62	4334.62	1351.67	1321.19	
633472	BLOMMER	D24024005CC0	602039.8	3471485.9	10/22/2008	37916	4684.62	250	350	200	4434.62	4334.62	1351.67	1321.19	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	3/4/2008	37684	4599.14	100	220	880	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	3/4/2008	37684	4599.14	100	220	880	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	3/20/2008	37700	4599.14	100	220	990	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	3/20/2008	37700	4599.14	100	220	990	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	5/5/2008	37746	4599.14	100	220	990	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	5/5/2008	37746	4599.14	100	220	990	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	7/15/2008	37817	4599.14	100	220	1040	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	7/15/2008	37817	4599.14	100	220	960	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	10/16/2008	37910	4599.14	100	220	1020	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	1/27/2009	38013	4599.14	100	220	950	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	4/14/2009	38090	4599.14	100	220	930	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	7/14/2009	38181	4599.14	100	220	910	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	10/12/2009	38271	4599.14	100	220	830	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	1/27/2010	38378	4599.14	100	220	620	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	4/22/2010	38463	4599.14	100	220	884	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	7/21/2010	38553	4599.14	100	220	921	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	10/20/2010	38644	4599.14	100	220	829	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	1/17/2011	38733	4599.14	100	220	756	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	1/17/2011	38733	4599.14	100	220	756	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	4/11/2011	38817	4599.14	100	220	834	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	4/11/2011	38817	4599.14	100	220	834	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	8/26/2011	38954	4599.14	100	220	847	4499.14	4379.14	1371.34	1334.76	
637069	COOPER C	D24024017BBB	601350.0	3468913.0	2/1/2012	39113	4599.14	100	220	867	4499.14	4379.14	1371.34	1334.76	2012 Q4 CQB Groundwater Tables
637069	COOPER C	D24024017BBB	601350.0	3468913.0	4/25/2012	39197	4599.14	100	220	817	4499.14	4379.14	1371.34	1334.76	2012 Q4 CQB Groundwater Tables
637069	COOPER C	D24024017BBB	601350.0	3468913.0	7/11/2012	39274	4599.14	100	220	834	4499.14	4379.14	1371.34	1334.76	2012 Q4 CQB Groundwater Tables
637069	COOPER C	D24024017BBB	601350.0	3468913.0	10/10/2012	39365	4599.14	100	220	863	4499.14	4379.14	1371.34	1334.76	2012 Q4 CQB Groundwater Tables
641341	MILLER 341	D24024017CAC	601876.7	3467711.0	12/10/1985	29564	4580.00	50	100	60	4530.00	4480.00	1380.74	1365.50	Littin 1987
641342	MILLER 342	D24024015CCC	604439.3	3467569.4	12/11/1985	29565	4627.79	100	200	13	4527.79	4427.79	1380.07	1349.59	Littin 1987
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	2/15/2008	37666	4586.89	100	200	500	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	2/15/2008	37666	4586.89	100	200	500	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	5/7/2008	37748	4586.89	100	200	483	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	5/7/2008	37748	4586.89	100	200	483	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	7/16/2008	37818	4586.89	100	200	560	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	10/28/2008	37922	4586.89	100	200	602	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	1/29/2009	38015	4586.89	100	200	503	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	4/15/2009	38091	4586.89	100	200	503	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	7/15/2009	38182	4586.89	100	200	486	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	10/15/2009	38274	4586.89	100	200	484	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	2/2/2010	38384	4586.89	100	200	451	4486.89	4386.89	1367.60	1337.12	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	4/22/2010	38463	4586.89	100	200	572	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	7/19/2010	38551	4586.89	100	200	573	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	10/20/2010	38644	4586.89	100	200	529	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	10/20/2010	38644	4586.89	100	200	529	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	1/17/2011	38733	4586.89	100	200	481	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	1/17/2011	38733	4586.89	100	200	481	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	4/11/2011	38817	4586.89	100	200	557	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	4/11/2011	38817	4586.89	100	200	557	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	8/26/2011	38954	4586.89	100	200	549	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	10/13/2011	39002	4586.89	100	200	539	4486.89	4386.89	1367.60	1337.12	
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	2/3/2012	39115	4586.89	100	200	583	4486.89	4386.89	1367.60	1337.12	2012 Q4 CQB Groundwater Tables
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	4/25/2012	39197	4586.89	100	200	575	4486.89	4386.89	1367.60	1337.12	2012 Q4 CQB Groundwater Tables
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	7/13/2012	39276	4586.89	100	200	552	4486.89	4386.89	1367.60	1337.12	2012 Q4 CQB Groundwater Tables
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	10/11/2012	39366	4586.89	100	200	572	4486.89	4386.89	1367.60	1337.12	2012 Q4 CQB Groundwater Tables
641802	WEISKOPF	D24024018AAD	601155.0	3468658.9	10/11/2012	39366	4586.89	100	200	577	4486.89	4386.89	1367.60	1337.12	2012 Q4 CQB Groundwater Tables
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	2/7/2008	37658	4576.16	230	290	138	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	2/7/2008	37658	4576.16	230	290	138	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	3/20/2008	37700	4576.16	230	290	125	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	3/20/2008	37700	4576.16	230	290	125	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	4/21/2008	37732	4576.16	230	290	128	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	4/21/2008	37732	4576.16	230	290	128	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	5/8/2008	37749	4576.16	230	290	141	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	5/8/2008	37749	4576.16	230	290	141	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	6/23/2008	37795	4576.16	230	290	129	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	7/29/2008	37831	4576.16	230	290	134	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	8/28/2008	37861	4576.16	230	290	128	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	9/23/2008	37887	4576.16	230	290	133	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	10/22/2008	37916	4576.16	230	290	144	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	2/10/2009	38027	4576.16	230	290	141	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	4/29/2009	38105	4576.16	230	290	211	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	8/3/2009	38201	4576.16	230	290	150	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	10/19/2009	38278	4576.16	230	290	590	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	11/5/2009	38295	4576.16	230	290	540	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	7/16/2010	38548	4576.16	230	290	169	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	10/19/2010	38643	4576.16	230	290	154	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	10/19/2010	38643	4576.16	230	290	154	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	10/19/2010	38643	4576.16	230	290	154	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	1/20/2011	38736	4576.16	230	290	143	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	1/20/2011	38736	4576.16	230	290	143	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	4/8/2011	38814	4576.16	230	290	160	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	4/8/2011	38814	4576.16	230	290	160	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	7/14/2011	38911	4576.16	230	290	166	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	10/12/2011	39001	4576.16	230	290	175	4346.16	4286.16	1324.71	1306.42	
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	1/30/2012	39111	4576.16	230	290	171	4346.16	4286.16	1324.71	1306.42	2012 Q4 CQB Groundwater Tables
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	4/23/2012	39195	4576.16	230	290	166	4346.16	4286.16	1324.71	1306.42	2012 Q4 CQB Groundwater Tables
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	7/13/2012	39276	4576.16	230	290	171	4346.16	4286.16	1324.71	1306.42	2012 Q4 CQB Groundwater Tables
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	7/13/2012	39276	4576.16	230	290	166	4346.16	4286.16	1324.71	1306.42	2012 Q4 CQB Groundwater Tables
641803	ROGERS 803	D24024018DDA	601003.2	3468480.0	10/10/2012	39365	4576.16	230	290	177	4346.16	4286.16	1324.71	1306.42	2012 Q4 CQB Groundwater Tables
642977	Old House Well	D24023014ABA	597619.2	3468714.0	12/11/1985	29565	4513.40	164	165	20	4349.40	4348.40	1325.70	1325.39	Littin 1987
643436	OSBORN	D24024011ABC	607031.8	3470270.5	2/25/2008	37676	4711.95	122	258	16.4	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	2/25/2008	37676	4711.95	122	258	16.4	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	5/13/2008	37754	4711.95	122	258	17.2	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	5/13/2008	37754	4711.95	122	258	17.2	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	7/22/2008	37824	4711.95	122	258	17.7	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	7/22/2008	37824	4711.95	122	258	17.5	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	10/16/2008	37910	4711.95	122	258	15.9	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	1/20/2009	38006	4711.95	122	258	16	4589.95	4453.95	1399.02	1357.56	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
643436	OSBORN	D24024011ABC	607031.8	3470270.5	4/7/2009	38083	4711.95	122	258	17	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	8/18/2009	38216	4711.95	122	258	17.4	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	10/5/2009	38264	4711.95	122	258	17.9	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	1/21/2010	38372	4711.95	122	258	15.6	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	4/19/2010	38460	4711.95	122	258	19.3	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	7/12/2010	38544	4711.95	122	258	18.4	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	7/12/2011	38909	4711.95	122	258	19.5	4589.95	4453.95	1399.02	1357.56	
643436	OSBORN	D24024011ABC	607031.8	3470270.5	2/3/2012	39115	4711.95	122	258	19.2	4589.95	4453.95	1399.02	1357.56	2012 Q4 CQB Groundwater Tables
644927	DODSON	D24024010DC0	605594.6	3469063.8	12/9/1985	29563	4686.34	100	200	710	4586.34	4486.34	1397.92	1367.44	Littin 1987
644927	DODSON	D24024010DC0	605594.6	3469063.8	2/20/2008	37671	4686.34	100	200	54	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	2/20/2008	37671	4686.34	100	200	54	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	5/12/2008	37753	4686.34	100	200	34.2	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	5/12/2008	37753	4686.34	100	200	34.2	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	7/24/2008	37826	4686.34	100	200	49.3	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	10/13/2008	37907	4686.34	100	200	56.9	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	1/22/2009	38008	4686.34	100	200	51.8	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	4/9/2009	38085	4686.34	100	200	50.1	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	7/8/2009	38175	4686.34	100	200	55.9	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	10/6/2009	38265	4686.34	100	200	49.3	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	1/21/2010	38372	4686.34	100	200	44.6	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	4/19/2010	38460	4686.34	100	200	48.6	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	4/19/2010	38460	4686.34	100	200	48.8	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	7/20/2010	38552	4686.34	100	200	47.5	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	10/18/2010	38642	4686.34	100	200	49.3	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	10/18/2010	38642	4686.34	100	200	49.3	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	1/19/2011	38735	4686.34	100	200	57.9	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	1/19/2011	38735	4686.34	100	200	57.9	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	1/19/2011	38735	4686.34	100	200	57.9	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	4/5/2011	38811	4686.34	100	200	49	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	7/12/2011	38909	4686.34	100	200	52.9	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	10/10/2011	38999	4686.34	100	200	49.6	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	10/10/2011	38999	4686.34	100	200	50.9	4586.34	4486.34	1397.92	1367.44	
644927	DODSON	D24024010DC0	605594.6	3469063.8	1/31/2012	39112	4686.34	100	200	50.4	4586.34	4486.34	1397.92	1367.44	2012 Q4 CQB Groundwater Tables
644927	DODSON	D24024010DC0	605594.6	3469063.8	4/12/2012	39184	4686.34	100	200	45.4	4586.34	4486.34	1397.92	1367.44	2012 Q4 CQB Groundwater Tables
644927	DODSON	D24024010DC0	605594.6	3469063.8	7/11/2012	39274	4686.34	100	200	54	4586.34	4486.34	1397.92	1367.44	2012 Q4 CQB Groundwater Tables
644927	DODSON	D24024010DC0	605594.6	3469063.8	10/4/2012	39359	4686.34	100	200	48.7	4586.34	4486.34	1397.92	1367.44	2012 Q4 CQB Groundwater Tables
645536	BLOMMER	D24024005ACC	602725.9	3471529.1	8/5/1996	33455	4753.69	245	345	308	4508.69	4408.69	1374.25	1343.77	
645536	BLOMMER	D24024005ACC	602725.9	3471529.1	8/6/1996	33456	4753.69	245	345	276	4508.69	4408.69	1374.25	1343.77	
645536	BLOMMER	D24024005ACC	602725.9	3471529.1	2/5/2008	37656	4753.69	245	345	206	4508.69	4408.69	1374.25	1343.77	
645536	BLOMMER	D24024005ACC	602725.9	3471529.1	4/21/2008	37732	4753.69	245	345	201	4508.69	4408.69	1374.25	1343.77	
645536	BLOMMER	D24024005ACC	602725.9	3471529.1	5/15/2008	37756	4753.69	245	345	211	4508.69	4408.69	1374.25	1343.77	
645536	BLOMMER	D24024005ACC	602725.9	3471529.1	10/22/2008	37916	4753.69	245	345	200	4508.69	4408.69	1374.25	1343.77	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	2/21/2008	37672	4561.98	100	222	41.9	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	2/21/2008	37672	4561.98	100	222	41.9	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	3/20/2008	37700	4561.98	100	222	31.3	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	3/20/2008	37700	4561.98	100	222	31.3	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	5/7/2008	37748	4561.98	100	222	32.6	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	5/7/2008	37748	4561.98	100	222	32.6	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	7/15/2008	37817	4561.98	100	222	37.6	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	10/15/2008	37909	4561.98	100	222	36.6	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	2/11/2009	38028	4561.98	100	222	27.6	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	4/17/2009	38093	4561.98	100	222	28.1	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	4/17/2009	38093	4561.98	100	222	28.3	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	7/21/2009	38188	4561.98	100	222	31.3	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	10/19/2009	38278	4561.98	100	222	33.2	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	2/2/2010	38384	4561.98	100	222	26	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	4/23/2010	38464	4561.98	100	222	30.9	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	7/15/2010	38547	4561.98	100	222	39.3	4461.98	4339.98	1360.01	1322.83	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
802236	TVI 236	D24024018DB0	600552.2	3467978.4	7/15/2011	38912	4561.98	100	222	42.9	4461.98	4339.98	1360.01	1322.83	
802236	TVI 236	D24024018DB0	600552.2	3467978.4	7/16/2012	39279	4561.98	100	222	36.3	4461.98	4339.98	1360.01	1322.83	2012 Q4 CQB Groundwater Tables
802236	TVI 236	D24024018DB0	600552.2	3467978.4	10/9/2012	39364	4561.98	100	222	40.9	4461.98	4339.98	1360.01	1322.83	2012 Q4 CQB Groundwater Tables
803772	RAY	D24024011DC0	607194.1	3468878.2	2/15/2008	37666	4647.91	50	100	159	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	2/15/2008	37666	4647.91	50	100	159	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	4/21/2008	37732	4647.91	50	100	125	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	4/21/2008	37732	4647.91	50	100	125	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	5/13/2008	37754	4647.91	50	100	123	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	5/13/2008	37754	4647.91	50	100	123	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	6/23/2008	37795	4647.91	50	100	130	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	7/29/2008	37831	4647.91	50	100	120	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	8/28/2008	37861	4647.91	50	100	129	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	9/23/2008	37887	4647.91	50	100	125	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	10/22/2008	37916	4647.91	50	100	145	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	1/20/2009	38006	4647.91	50	100	88	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	4/8/2009	38084	4647.91	50	100	178	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	7/9/2009	38176	4647.91	50	100	126	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	10/7/2009	38266	4647.91	50	100	127	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	1/26/2010	38377	4647.91	50	100	125	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	4/20/2010	38461	4647.91	50	100	134	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	7/14/2010	38546	4647.91	50	100	137	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	10/20/2010	38644	4647.91	50	100	127	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	1/17/2011	38733	4647.91	50	100	132	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	1/17/2011	38733	4647.91	50	100	125	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	1/17/2011	38733	4647.91	50	100	132	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	4/5/2011	38811	4647.91	50	100	132	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	7/11/2011	38908	4647.91	50	100	126	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	10/12/2011	39001	4647.91	50	100	130	4597.91	4547.91	1401.44	1386.20	
803772	RAY	D24024011DC0	607194.1	3468878.2	1/31/2012	39112	4647.91	50	100	131	4597.91	4547.91	1401.44	1386.20	2012 Q4 CQB Groundwater Tables
803772	RAY	D24024011DC0	607194.1	3468878.2	4/11/2012	39183	4647.91	50	100	131	4597.91	4547.91	1401.44	1386.20	2012 Q4 CQB Groundwater Tables
803772	RAY	D24024011DC0	607194.1	3468878.2	7/6/2012	39269	4647.91	50	100	129	4597.91	4547.91	1401.44	1386.20	2012 Q4 CQB Groundwater Tables
803772	RAY	D24024011DC0	607194.1	3468878.2	10/3/2012	39358	4647.91	50	100	130	4597.91	4547.91	1401.44	1386.20	2012 Q4 CQB Groundwater Tables
805290	HOBAN	D24024017BA0	601705.8	3468880.3	2/27/2008	37678	4597.21	188	316	510	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	2/27/2008	37678	4597.21	188	316	510	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	5/7/2008	37748	4597.21	188	316	670	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	5/7/2008	37748	4597.21	188	316	670	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	7/14/2008	37816	4597.21	188	316	690	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	10/16/2008	37910	4597.21	188	316	692	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	1/28/2009	38014	4597.21	188	316	580	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	4/15/2009	38091	4597.21	188	316	700	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	7/14/2009	38181	4597.21	188	316	670	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	10/15/2009	38274	4597.21	188	316	780	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	10/15/2009	38274	4597.21	188	316	670	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	3/2/2010	38412	4597.21	188	316	580	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	8/31/2011	38959	4597.21	188	316	893	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	12/14/2011	39064	4597.21	188	316	944	4409.21	4281.21	1343.93	1304.91	
805290	HOBAN	D24024017BA0	601705.8	3468880.3	2/1/2012	39113	4597.21	188	316	993	4409.21	4281.21	1343.93	1304.91	2012 Q4 CQB Groundwater Tables
805290	HOBAN	D24024017BA0	601705.8	3468880.3	4/19/2012	39191	4597.21	188	316	868	4409.21	4281.21	1343.93	1304.91	2012 Q4 CQB Groundwater Tables
805290	HOBAN	D24024017BA0	601705.8	3468880.3	7/11/2012	39274	4597.21	188	316	1110	4409.21	4281.21	1343.93	1304.91	2012 Q4 CQB Groundwater Tables
805290	HOBAN	D24024017BA0	601705.8	3468880.3	10/17/2012	39372	4597.21	188	316	1040	4409.21	4281.21	1343.93	1304.91	2012 Q4 CQB Groundwater Tables
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	3/11/2008	37691	4642.86	150	265	21.7	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	3/11/2008	37691	4642.86	150	265	21.7	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	5/12/2008	37753	4642.86	150	265	24.7	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	5/12/2008	37753	4642.86	150	265	24.7	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	7/21/2008	37823	4642.86	150	265	19	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	10/14/2008	37908	4642.86	150	265	21.8	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	1/21/2009	38007	4642.86	150	265	22.7	4492.86	4377.86	1369.42	1334.37	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	4/8/2009	38084	4642.86	150	265	19.7	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	7/9/2009	38176	4642.86	150	265	17.5	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	7/20/2010	38552	4642.86	150	265	21.1	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	10/20/2010	38644	4642.86	150	265	17.2	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	1/17/2011	38733	4642.86	150	265	17.3	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	1/17/2011	38733	4642.86	150	265	17.3	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	4/5/2011	38811	4642.86	150	265	16.7	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	7/11/2011	38908	4642.86	150	265	18.6	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	7/11/2011	38908	4642.86	150	265	18.3	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	10/12/2011	39001	4642.86	150	265	19.6	4492.86	4377.86	1369.42	1334.37	
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	1/31/2012	39112	4642.86	150	265	18.2	4492.86	4377.86	1369.42	1334.37	2012 Q4 CQB Groundwater Tables
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	4/11/2012	39183	4642.86	150	265	19.5	4492.86	4377.86	1369.42	1334.37	2012 Q4 CQB Groundwater Tables
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	4/11/2012	39183	4642.86	150	265	19.6	4492.86	4377.86	1369.42	1334.37	2012 Q4 CQB Groundwater Tables
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	7/6/2012	39269	4642.86	150	265	18.8	4492.86	4377.86	1369.42	1334.37	2012 Q4 CQB Groundwater Tables
805641	EPPELE 641	D24024011DCD	607165.4	3469229.9	10/3/2012	39358	4642.86	150	265	19.5	4492.86	4377.86	1369.42	1334.37	2012 Q4 CQB Groundwater Tables
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	2/22/2008	37673	4566.21	92	152	41	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	2/22/2008	37673	4566.21	92	152	41	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	5/20/2008	37761	4566.21	92	152	40.5	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	5/20/2008	37761	4566.21	92	152	40.5	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	7/30/2008	37832	4566.21	92	152	37.6	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	10/23/2008	37917	4566.21	92	152	34.9	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	2/12/2009	38029	4566.21	92	152	35.6	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	4/23/2009	38099	4566.21	92	152	34	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	7/22/2009	38189	4566.21	92	152	33.5	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	10/22/2009	38281	4566.21	92	152	32.2	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	3/3/2010	38413	4566.21	92	152	33.5	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	4/26/2010	38467	4566.21	92	152	34.8	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	7/13/2010	38545	4566.21	92	152	30.6	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	7/13/2010	38545	4566.21	92	152	30.6	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	1/20/2011	38736	4566.21	92	152	29.6	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	1/20/2011	38736	4566.21	92	152	29.6	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	7/14/2011	38911	4566.21	92	152	29.8	4474.21	4414.21	1363.74	1345.45	
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	1/31/2012	39112	4566.21	92	152	30	4474.21	4414.21	1363.74	1345.45	2012 Q4 CQB Groundwater Tables
903984	COB MW-2	D24024018DAA	600973.3	3468114.8	7/12/2012	39275	4566.21	92	152	29.2	4474.21	4414.21	1363.74	1345.45	2012 Q4 CQB Groundwater Tables
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	3/30/2006	36979	4683.26	350	410	1260	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	4/12/2006	36992	4683.26	350	410	1260	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	2/22/2008	37673	4683.26	350	410	720	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	2/22/2008	37673	4683.26	350	410	720	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	5/20/2008	37761	4683.26	350	410	980	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	5/20/2008	37761	4683.26	350	410	980	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	7/30/2008	37832	4683.26	350	410	730	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	10/23/2008	37917	4683.26	350	410	750	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	2/12/2009	38029	4683.26	350	410	750	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	4/21/2009	38097	4683.26	350	410	720	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	7/22/2009	38189	4683.26	350	410	730	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	7/22/2009	38189	4683.26	350	410	680	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	10/22/2009	38281	4683.26	350	410	820	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	2/4/2010	38386	4683.26	350	410	680	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	4/20/2010	38461	4683.26	350	410	783	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	7/13/2010	38545	4683.26	350	410	919	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	7/14/2011	38911	4683.26	350	410	927	4333.26	4273.26	1320.78	1302.49	
903992	COB MW-1	D24024009BCA	603153.3	3469889.9	7/12/2012	39275	4683.26	350	410	805	4333.26	4273.26	1320.78	1302.49	2012 Q4 CQB Groundwater Tables
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	2/28/2008	37679	4538.63	83	269	57.8	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	2/28/2008	37679	4538.63	83	269	57.8	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	3/27/2008	37707	4538.63	83	269	57.7	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	4/30/2008	37741	4538.63	83	269	37	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	5/20/2008	37761	4538.63	83	269	35.8	4455.63	4269.63	1358.08	1301.38	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	5/20/2008	37761	4538.63	83	269	35.8	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	7/24/2008	37826	4538.63	83	269	64.9	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	7/30/2008	37832	4538.63	83	269	67.3	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	10/9/2008	37903	4538.63	83	269	52.5	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	10/23/2008	37917	4538.63	83	269	76.6	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	2/12/2009	38029	4538.63	83	269	112	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	4/23/2009	38099	4538.63	83	269	43.7	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	7/22/2009	38189	4538.63	83	269	52.3	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	10/22/2009	38281	4538.63	83	269	73.9	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	10/22/2009	38281	4538.63	83	269	74.2	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	3/3/2010	38413	4538.63	83	269	102	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	4/26/2010	38467	4538.63	83	269	77.6	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	7/13/2010	38545	4538.63	83	269	46.5	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	7/14/2011	38911	4538.63	83	269	40.1	4455.63	4269.63	1358.08	1301.38	
906823	COB MW-3	D24023013AAC	599169.3	3468726.1	7/12/2012	39275	4538.63	83	269	39.5	4455.63	4269.63	1358.08	1301.38	2012 Q4 CQB Groundwater Tables
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	7/14/2008	37816	4688.33	560	660	31.4	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	11/6/2008	37931	4688.33	560	660	34.5	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	2/18/2009	38035	4688.33	560	660	27.6	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	5/11/2009	38117	4688.33	560	660	26	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	8/6/2009	38204	4688.33	560	660	25.1	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	10/27/2009	38286	4688.33	560	660	26.1	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	2/17/2010	38399	4688.33	560	660	25	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	2/17/2010	38399	4688.33	560	660	25.4	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	4/15/2010	38456	4688.33	560	660	26	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	7/6/2010	38538	4688.33	560	660	22.8	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	2/14/2011	38761	4688.33	560	660	26.4	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	2/14/2011	38761	4688.33	560	660	27.5	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	2/14/2011	38761	4688.33	560	660	27.5	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	7/15/2011	38912	4688.33	560	660	26.5	4128.33	4028.33	1258.31	1227.83	
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	1/30/2012	39111	4688.33	560	660	26.4	4128.33	4028.33	1258.31	1227.83	2012 Q4 CQB Groundwater Tables
908794	BMO-2008-7M	D24024009BCA	603099.2	3470029.3	7/11/2012	39274	4688.33	560	660	28.1	4128.33	4028.33	1258.31	1227.83	2012 Q4 CQB Groundwater Tables
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	7/10/2008	37812	4626.90	340	440	182	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	11/4/2008	37929	4626.90	340	440	199	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	2/20/2009	38037	4626.90	340	440	193	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	4/28/2009	38104	4626.90	340	440	119	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	8/4/2009	38202	4626.90	340	440	189	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	10/26/2009	38285	4626.90	340	440	187	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	2/15/2010	38397	4626.90	340	440	193	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	4/15/2010	38456	4626.90	340	440	208	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	7/1/2010	38533	4626.90	340	440	198	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	10/5/2010	38629	4626.90	340	440	202	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	10/5/2010	38629	4626.90	340	440	202	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	2/14/2011	38761	4626.90	340	440	202	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	2/14/2011	38761	4626.90	340	440	202	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	5/12/2011	38848	4626.90	340	440	189	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	5/12/2011	38848	4626.90	340	440	189	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	7/12/2011	38909	4626.90	340	440	194	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	12/7/2011	39057	4626.90	340	440	200	4286.90	4186.90	1306.65	1276.17	
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	2/3/2012	39115	4626.90	340	440	206	4286.90	4186.90	1306.65	1276.17	2012 Q4 CQB Groundwater Tables
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	4/18/2012	39190	4626.90	340	440	188	4286.90	4186.90	1306.65	1276.17	2012 Q4 CQB Groundwater Tables
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	7/10/2012	39273	4626.90	340	440	208	4286.90	4186.90	1306.65	1276.17	2012 Q4 CQB Groundwater Tables
909019	BMO-2008-6M	D24024006ACC	600367.9	3469813.9	10/16/2012	39371	4626.90	340	440	207	4286.90	4186.90	1306.65	1276.17	2012 Q4 CQB Groundwater Tables
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	7/16/2008	37818	4627.44	195	255	53.3	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	11/4/2008	37929	4627.44	195	255	60.3	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	2/19/2009	38036	4627.44	195	255	54.3	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	4/27/2009	38103	4627.44	195	255	52.7	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	8/4/2009	38202	4627.44	195	255	48.5	4432.44	4372.44	1351.01	1332.72	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	10/26/2009	38285	4627.44	195	255	48.7	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	2/15/2010	38397	4627.44	195	255	33.5	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	4/15/2010	38456	4627.44	195	255	37	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	7/1/2010	38533	4627.44	195	255	40.1	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	10/5/2010	38629	4627.44	195	255	37.2	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	10/5/2010	38629	4627.44	195	255	37.2	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	2/14/2011	38761	4627.44	195	255	40.2	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	2/14/2011	38761	4627.44	195	255	40.2	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	5/12/2011	38848	4627.44	195	255	35	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	5/12/2011	38848	4627.44	195	255	35	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	7/12/2011	38909	4627.44	195	255	37.8	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	12/7/2011	39057	4627.44	195	255	21.8	4432.44	4372.44	1351.01	1332.72	
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	2/3/2012	39115	4627.44	195	255	23	4432.44	4372.44	1351.01	1332.72	2012 Q4 CQB Groundwater Tables
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	4/18/2012	39190	4627.44	195	255	19.7	4432.44	4372.44	1351.01	1332.72	2012 Q4 CQB Groundwater Tables
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	7/10/2012	39273	4627.44	195	255	21.9	4432.44	4372.44	1351.01	1332.72	2012 Q4 CQB Groundwater Tables
909146	BMO-2008-6B	D24024006ACC	600366.5	3469820.6	10/16/2012	39371	4627.44	195	255	19.9	4432.44	4372.44	1351.01	1332.72	2012 Q4 CQB Groundwater Tables
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	7/18/2008	37820	4583.97	150	250	106	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	11/4/2008	37929	4583.97	150	250	179	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	11/4/2008	37929	4583.97	150	250	177	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	2/19/2009	38036	4583.97	150	250	155	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	5/11/2009	38117	4583.97	150	250	149	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	8/6/2009	38204	4583.97	150	250	151	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	8/6/2009	38204	4583.97	150	250	156	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	10/26/2009	38285	4583.97	150	250	153	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	3/3/2010	38413	4583.97	150	250	164	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	4/8/2010	38449	4583.97	150	250	162	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	7/1/2010	38533	4583.97	150	250	157	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	2/14/2011	38761	4583.97	150	250	169	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	2/14/2011	38761	4583.97	150	250	169	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	7/12/2011	38909	4583.97	150	250	148	4433.97	4333.97	1351.47	1320.99	
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	2/23/2012	39135	4583.97	150	250	173	4433.97	4333.97	1351.47	1320.99	2012 Q4 CQB Groundwater Tables
909147	BMO-2008-3B	D24024017CAA	602012.9	3467919.6	7/10/2012	39273	4583.97	150	250	150	4433.97	4333.97	1351.47	1320.99	2012 Q4 CQB Groundwater Tables
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	8/8/2008	37841	4762.61	665	765	47.3	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	11/5/2008	37930	4762.61	665	765	54.4	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	2/26/2009	38043	4762.61	665	765	28.8	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	5/12/2009	38118	4762.61	665	765	51.7	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	8/17/2009	38215	4762.61	665	765	53.4	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	11/3/2009	38293	4762.61	665	765	56.9	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	3/4/2010	38414	4762.61	665	765	58.6	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	4/6/2010	38447	4762.61	665	765	60.1	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	7/1/2010	38533	4762.61	665	765	61	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	2/10/2011	38757	4762.61	665	765	64.2	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	2/10/2011	38757	4762.61	665	765	64.2	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	7/15/2011	38912	4762.61	665	765	67	4097.61	3997.61	1248.95	1218.47	
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	2/1/2012	39113	4762.61	665	765	67.4	4097.61	3997.61	1248.95	1218.47	2012 Q4 CQB Groundwater Tables
909255	BMO-2008-9M	D24024003CBD	604668.7	3471121.7	7/12/2012	39275	4762.61	665	765	68.9	4097.61	3997.61	1248.95	1218.47	2012 Q4 CQB Groundwater Tables
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	8/4/2008	37837	4793.45	239	439	2210	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	11/5/2008	37930	4793.45	239	439	1890	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	2/25/2009	38042	4793.45	239	439	1740	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	5/6/2009	38112	4793.45	239	439	1710	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	8/11/2009	38209	4793.45	239	439	1690	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	11/2/2009	38292	4793.45	239	439	1730	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	3/10/2010	38420	4793.45	239	439	1700	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	4/7/2010	38448	4793.45	239	439	1510	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	7/6/2010	38538	4793.45	239	439	1670	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	7/13/2011	38910	4793.45	239	439	1670	4554.45	4354.45	1388.20	1327.24	
909272	BMO-2008-10GU	D24024003ABC	605267.6	3471731.9	2/1/2012	39113	4793.45	239	439	1870	4554.45	4354.45	1388.20	1327.24	2012 Q4 CQB Groundwater Tables

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	8/22/2008	37855	4844.67	650	750	14.2	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	11/12/2008	37937	4844.67	650	750	13.9	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	2/26/2009	38043	4844.67	650	750	12.3	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	4/28/2009	38104	4844.67	650	750	11.8	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	8/12/2009	38210	4844.67	650	750	11.2	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	11/9/2009	38299	4844.67	650	750	13.9	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	3/1/2010	38411	4844.67	650	750	13	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	4/9/2010	38450	4844.67	650	750	13	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	7/1/2010	38533	4844.67	650	750	12.3	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	2/10/2011	38757	4844.67	650	750	11.7	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	2/10/2011	38757	4844.67	650	750	11.7	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	7/22/2011	38919	4844.67	650	750	12.1	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	7/22/2011	38919	4844.67	650	750	12	4194.67	4094.67	1278.54	1248.06	
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	1/31/2012	39112	4844.67	650	750	11.9	4194.67	4094.67	1278.54	1248.06	2012 Q4 CQB Groundwater Tables
909434	BMO-2008-11G	D23024033DCA	603801.0	3472626.5	8/14/2012	39308	4844.67	650	750	12.3	4194.67	4094.67	1278.54	1248.06	2012 Q4 CQB Groundwater Tables
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	8/20/2008	37853	4792.21	700	800	1320	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	11/5/2008	37930	4792.21	700	800	1290	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	2/25/2009	38042	4792.21	700	800	1180	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	5/12/2009	38118	4792.21	700	800	1120	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	8/11/2009	38209	4792.21	700	800	1030	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	11/2/2009	38292	4792.21	700	800	1100	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	3/4/2010	38414	4792.21	700	800	1080	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	4/8/2010	38449	4792.21	700	800	1260	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	7/2/2010	38534	4792.21	700	800	1020	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	7/13/2011	38910	4792.21	700	800	644	4092.21	3992.21	1247.31	1216.83	
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	2/2/2012	39114	4792.21	700	800	624	4092.21	3992.21	1247.31	1216.83	2012 Q4 CQB Groundwater Tables
909435	BMO-2008-10GL	D24024003ABC	605264.1	3471702.0	7/13/2012	39276	4792.21	700	800	545	4092.21	3992.21	1247.31	1216.83	2012 Q4 CQB Groundwater Tables
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	8/27/2008	37860	4805.10	180	300	107	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	11/11/2008	37936	4805.10	180	300	143	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	2/25/2009	38042	4805.10	180	300	109	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	4/28/2009	38104	4805.10	180	300	198	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	8/4/2009	38202	4805.10	180	300	104	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	10/27/2009	38286	4805.10	180	300	103	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	2/17/2010	38399	4805.10	180	300	98.4	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	4/15/2010	38456	4805.10	180	300	95.2	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	7/7/2010	38539	4805.10	180	300	87.1	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	7/7/2010	38539	4805.10	180	300	87.1	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	2/10/2011	38757	4805.10	180	300	105	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	2/10/2011	38757	4805.10	180	300	105	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	7/12/2011	38909	4805.10	180	300	121	4625.10	4505.10	1409.73	1373.15	
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	2/8/2012	39120	4805.10	180	300	116	4625.10	4505.10	1409.73	1373.15	2012 Q4 CQB Groundwater Tables
909474	BMO-2008-1G	D24024002CAA	606467.7	3471723.6	8/14/2012	39308	4805.10	180	300	120	4625.10	4505.10	1409.73	1373.15	2012 Q4 CQB Groundwater Tables
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	10/3/2008	37897	4649.21	264	464	980	4385.21	4185.21	1336.61	1275.65	
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	2/17/2009	38034	4649.21	264	464	1000	4385.21	4185.21	1336.61	1275.65	
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	5/6/2009	38112	4649.21	264	464	930	4385.21	4185.21	1336.61	1275.65	
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	8/5/2009	38203	4649.21	264	464	950	4385.21	4185.21	1336.61	1275.65	
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	10/28/2009	38287	4649.21	264	464	1010	4385.21	4185.21	1336.61	1275.65	
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	2/16/2010	38398	4649.21	264	464	997	4385.21	4185.21	1336.61	1275.65	
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	4/14/2010	38455	4649.21	264	464	974	4385.21	4185.21	1336.61	1275.65	
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	7/6/2010	38538	4649.21	264	464	972	4385.21	4185.21	1336.61	1275.65	
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	7/15/2011	38912	4649.21	264	464	1010	4385.21	4185.21	1336.61	1275.65	
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	2/9/2012	39121	4649.21	264	464	1060	4385.21	4185.21	1336.61	1275.65	2012 Q4 CQB Groundwater Tables
909551	BMO-2008-13B	D24024008BCA	601580.0	3469829.0	7/11/2012	39274	4649.21	264	464	1080	4385.21	4185.21	1336.61	1275.65	2012 Q4 CQB Groundwater Tables
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	10/2/2008	37896	4585.02	340	440	107	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	2/18/2009	38035	4585.02	340	440	122	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	4/27/2009	38103	4585.02	340	440	111	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	8/4/2009	38202	4585.02	340	440	122	4245.02	4145.02	1293.88	1263.40	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	10/29/2009	38288	4585.02	340	440	123	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	2/15/2010	38397	4585.02	340	440	123	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	4/16/2010	38457	4585.02	340	440	125	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	4/16/2010	38457	4585.02	340	440	124	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	7/7/2010	38539	4585.02	340	440	123	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	10/5/2010	38629	4585.02	340	440	127	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	10/5/2010	38629	4585.02	340	440	127	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	2/14/2011	38761	4585.02	340	440	124	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	2/14/2011	38761	4585.02	340	440	124	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	5/12/2011	38848	4585.02	340	440	119	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	5/12/2011	38848	4585.02	340	440	119	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	7/12/2011	38909	4585.02	340	440	126	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	12/7/2011	39057	4585.02	340	440	129	4245.02	4145.02	1293.88	1263.40	
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	2/3/2012	39115	4585.02	340	440	130	4245.02	4145.02	1293.88	1263.40	2012 Q4 CQB Groundwater Tables
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	4/18/2012	39190	4585.02	340	440	120	4245.02	4145.02	1293.88	1263.40	2012 Q4 CQB Groundwater Tables
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	7/10/2012	39273	4585.02	340	440	135	4245.02	4145.02	1293.88	1263.40	2012 Q4 CQB Groundwater Tables
909552	BMO-2008-5M	D24024007DCC	600445.3	3468994.0	10/16/2012	39371	4585.02	340	440	134	4245.02	4145.02	1293.88	1263.40	2012 Q4 CQB Groundwater Tables
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	9/30/2008	37894	4585.10	140	280	193	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	2/18/2009	38035	4585.10	140	280	192	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	4/27/2009	38103	4585.10	140	280	177	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	8/4/2009	38202	4585.10	140	280	174	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	10/29/2009	38288	4585.10	140	280	185	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	10/29/2009	38288	4585.10	140	280	181	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	2/15/2010	38397	4585.10	140	280	185	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	4/15/2010	38456	4585.10	140	280	194	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	7/7/2010	38539	4585.10	140	280	183	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	10/5/2010	38629	4585.10	140	280	201	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	10/5/2010	38629	4585.10	140	280	201	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	2/14/2011	38761	4585.10	140	280	203	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	2/14/2011	38761	4585.10	140	280	203	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	5/12/2011	38848	4585.10	140	280	195	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	5/12/2011	38848	4585.10	140	280	195	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	7/13/2011	38910	4585.10	140	280	200	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	12/7/2011	39057	4585.10	140	280	213	4445.10	4305.10	1354.87	1312.19	
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	2/3/2012	39115	4585.10	140	280	215	4445.10	4305.10	1354.87	1312.19	2012 Q4 CQB Groundwater Tables
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	4/18/2012	39190	4585.10	140	280	192	4445.10	4305.10	1354.87	1312.19	2012 Q4 CQB Groundwater Tables
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	7/10/2012	39273	4585.10	140	280	218	4445.10	4305.10	1354.87	1312.19	2012 Q4 CQB Groundwater Tables
909653	BMO-2008-5B	D24024007DCC	600449.7	3468994.4	10/16/2012	39371	4585.10	140	280	207	4445.10	4305.10	1354.87	1312.19	2012 Q4 CQB Groundwater Tables
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	12/9/2008	37964	4752.45	1100	1200	197	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	2/19/2009	38036	4752.45	1100	1200	147	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	2/19/2009	38036	4752.45	1100	1200	149	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	5/5/2009	38111	4752.45	1100	1200	122	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	8/10/2009	38208	4752.45	1100	1200	107	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	11/5/2009	38295	4752.45	1100	1200	104	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	3/3/2010	38413	4752.45	1100	1200	99.5	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	4/16/2010	38457	4752.45	1100	1200	97	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	7/1/2010	38533	4752.45	1100	1200	94.7	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	1/24/2011	38740	4752.45	1100	1200	98.2	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	1/24/2011	38740	4752.45	1100	1200	98.2	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	7/15/2011	38912	4752.45	1100	1200	79.9	3652.45	3552.45	1113.27	1082.79	
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	1/30/2012	39111	4752.45	1100	1200	77.6	3652.45	3552.45	1113.27	1082.79	2012 Q4 CQB Groundwater Tables
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	7/12/2012	39275	4752.45	1100	1200	73.2	3652.45	3552.45	1113.27	1082.79	2012 Q4 CQB Groundwater Tables
909711	BMO-2008-8M	D24024004DAD	604167.9	3471127.9	7/12/2012	39275	4752.45	1100	1200	73.1	3652.45	3552.45	1113.27	1082.79	2012 Q4 CQB Groundwater Tables
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	12/3/2008	37958	4647.15	920	1020	494	3727.15	3627.15	1136.04	1105.56	
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	2/17/2009	38034	4647.15	920	1020	441	3727.15	3627.15	1136.04	1105.56	
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	4/29/2009	38105	4647.15	920	1020	217	3727.15	3627.15	1136.04	1105.56	
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	8/5/2009	38203	4647.15	920	1020	387	3727.15	3627.15	1136.04	1105.56	

TABLE G.2.2 - Sulfate Data Used for Model Targets

ADWR Number	Well Name	Local ID	Easting (meters)	Northing (meters)	Sample Date	Model Days	Measuring Point Elevation (feet amsl)	Top of Screen (feet)	Bottom of Screen (feet)	Sulfate (mg/L)	Top of Screen Elevation (feet amsl)	Bottom of Screen Elevation (feet amsl)	Top of Screen Elevation (meters-MSL)	Bottom of Screen Elevation (meters-MSL)	Source
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	10/28/2009	38287	4647.15	920	1020	403	3727.15	3627.15	1136.04	1105.56	
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	2/16/2010	38398	4647.15	920	1020	375	3727.15	3627.15	1136.04	1105.56	
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	4/13/2010	38454	4647.15	920	1020	398	3727.15	3627.15	1136.04	1105.56	
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	7/2/2010	38534	4647.15	920	1020	386	3727.15	3627.15	1136.04	1105.56	
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	7/15/2011	38912	4647.15	920	1020	388	3727.15	3627.15	1136.04	1105.56	
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	2/6/2012	39118	4647.15	920	1020	0	3727.15	3627.15	1136.04	1105.56	2012 Q4 CQB Groundwater Tables
909760	BMO-2008-13M	D24024008BCA	601483.6	3470094.0	8/13/2012	39307	4647.15	920	1020	397	3727.15	3627.15	1136.04	1105.56	2012 Q4 CQB Groundwater Tables
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	12/11/2008	37966	4573.17	500	600	9.4	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	12/11/2008	37966	4573.17	500	600	10	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	2/18/2009	38035	4573.17	500	600	13.4	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	4/30/2009	38106	4573.17	500	600	11.4	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	4/30/2009	38106	4573.17	500	600	11.8	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	8/6/2009	38204	4573.17	500	600	11.5	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	10/27/2009	38286	4573.17	500	600	11.2	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	2/24/2010	38406	4573.17	500	600	9.7	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	4/16/2010	38457	4573.17	500	600	9.73	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	7/2/2010	38534	4573.17	500	600	10.1	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	2/15/2011	38762	4573.17	500	600	8.9	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	2/15/2011	38762	4573.17	500	600	8.9	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	7/22/2011	38919	4573.17	500	600	10.2	4073.17	3973.17	1241.50	1211.02	
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	2/23/2012	39135	4573.17	500	600	10.5	4073.17	3973.17	1241.50	1211.02	2012 Q4 CQB Groundwater Tables
910096	BMO-2008-4B	D24024018ADA	601099.4	3468383.4	8/15/2012	39309	4573.17	500	600	9.5	4073.17	3973.17	1241.50	1211.02	2012 Q4 CQB Groundwater Tables
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	12/5/2008	37960	4753.25	370	470	1890	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	2/19/2009	38036	4753.25	370	470	1570	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	5/5/2009	38111	4753.25	370	470	1370	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	8/10/2009	38208	4753.25	370	470	1250	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	11/9/2009	38299	4753.25	370	470	1510	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	11/9/2009	38299	4753.25	370	470	1520	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	3/3/2010	38413	4753.25	370	470	1320	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	4/16/2010	38457	4753.25	370	470	1470	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	7/1/2010	38533	4753.25	370	470	1440	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	7/15/2011	38912	4753.25	370	470	1380	4383.25	4283.25	1336.01	1305.53	
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	1/30/2012	39111	4753.25	370	470	1480	4383.25	4283.25	1336.01	1305.53	2012 Q4 CQB Groundwater Tables
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	1/30/2012	39111	4753.25	370	470	1480	4383.25	4283.25	1336.01	1305.53	2012 Q4 CQB Groundwater Tables
910097	BMO-2008-8B	D24024004DAD	604171.3	3471141.7	7/12/2012	39275	4753.25	370	470	1440	4383.25	4283.25	1336.01	1305.53	2012 Q4 CQB Groundwater Tables
913037	WMD2011-3M	D24024003DCC	605366.9	3470677.4	2/2/2012	39114	4747.00	275	535	391	4472.00	4212.00	1363.07	1283.82	2012 Q4 CQB Groundwater Tables

NOTES:

*Listing includes only water levels in the model domain, used as targets.
ADWR = Arizona Department of Water Resources
AMSL = above mean sea level
CCA = Clear Creek Associates
CQB = Copper Queen Branch
DTW = depth to water
FMI - Freeport-McMoran Incorporated
GWSI = Groundwater Site Inventory
HGC = Hydro Geo Chem
Littin 1987 = Littin, G.R. 1987. Ground-Water Resources of the Bisbee - Naco Area, Cochise County, Arizona. June 1987.
USGS = United States Geological Survey
Well 55 = Arizona Department of Water Resources Database of Registered Wells
WMC WAPP = Water Management Consultants (WMC). 2006. Copper Queen Branch Warren Mining District Aquifer Protection Permit Application. January 2006.

APPENDIX G.3

GROUNDWATER PUMPING DATA

TABLE G.3.1
Pumping Rates for Model Calibration and Predictive Runs (CMD)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	SP 14	SP 15	SP 16	SP 17	SP 18	SP 19
						1905-1909	1910-1914	1915-1919	1920-1924	1925-1929	1930-1939	1940-1949	1950-1953	1954-1955	1956-1960	1961-1965	1966	1967	1968	1969-1973	1974	1975-1984	1985-1986	1987-1991
ACKER	598847.4	3472874.0	3	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANDERSON	601134.7	3468816.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ANDERSON_M	600793.0	3468570.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70
ANDERSON_M	600443.0	3467630.7	1	1	9004	-1.10	-1.10	-1.10	-1.10	-1.10	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	0.00	0.00
ASLD	601488.0	3469690.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
AWC-02	598907.0	3468550.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AWC-03	599091.0	3468680.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1856.10	-1856.10	-1856.10	-1856.10	-1856.10	-1856.10	-1856.10	-1856.10	-1856.10	-2000.00	-2000.00
AWC-04	598950.0	3468720.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1856.10	-1856.10	-1856.10	-1856.10	-1856.10	-1856.10	-1856.10	-2000.00	-2000.00
AWC-05	599269.0	3468540.0	1	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BANKS_987	606981.9	3469206.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.20	0.00	0.00
BARTON_010	606201.1	3469047.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.50	-1.60	-1.60
BARTON_919	606243.9	3469076.7	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.80	-1.60	-1.60
BERNAL	600795.7	3467767.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-0.80	-0.80	-0.80	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
BIMA	606001.2	3471852.8	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BINYON	608544.7	3468542.0	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BLOMMER	602039.8	3471485.9	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.20	0.00	0.00
BRINDLEY	601262.7	3472095.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BULLARD	602078.7	3470901.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.20	0.00	0.00
BURKE	602230.1	3473029.8	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAMPBELL	606412.6	3469396.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.30	-0.30
CHAMBERS	600097.0	3467460.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70
CHASE	599695.3	3468062.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.60	-0.60	-0.60	-0.60	-0.60	-0.60	-1.70	-1.70	-1.70
CONNOR	600250.6	3472677.7	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70
COOPER	602668.4	3472105.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.20	-1.70	-1.70
COOPER_C	601350.0	3468910.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.10	-1.10	-1.10	-1.10	-1.10	-1.10	-1.70	-1.70	-1.70
DODSON	605594.6	3469063.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DURAZO	602015.5	3471241.2	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EAST	607076.4	3468712.2	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-01	601752.6	3464463.1	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-02	601885.9	3465282.2	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2699.90	-2699.90	-2699.90	-2699.90	-2699.90	-2699.90	-3799.90	-3799.90	-3799.90
EN-03	602355.8	3465212.4	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2699.90	-2699.90	-2699.90	-2699.90	-2699.90	-2699.90	-3799.90	-3799.90	-3799.90
EN-05	602139.9	3466050.6	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-06	601962.1	3466114.1	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ENGLUND	602551.3	3471341.3	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_641	607165.4	3469229.9	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70
EPPELE_643	607125.5	3469140.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70
FRANCO	602849.9	3468835.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70
FULTZ	607153.3	3469063.9	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GALLANT	607769.6	3468524.4	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.80	-1.70	-1.70
GARNER_557	602659.2	3468962.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GARNER_635	602665.4	3468967.9	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GGOOSE_546	606156.2	3469550.5	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-419.20	-419.20	-419.20	-419.20	-419.20	-419.20	-545.10	0.00	0.00
GGOOSE_547	606256.7	3469820.3	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-419.20	-419.20	-419.20	-419.20	-419.20	-419.20	-545.10	0.00	0.00
GOAR	602670.2	3468959.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602008.1	3468960.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602326.6	3468809.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602323.9	3468841.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602677.3	3468966.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602668.6	3468959.2	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_RANCH	602454.8	3468892.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
GOAR_G2	602402.8	3468901.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-99.80	-99.80
GOAR_G4	601596.4	3468580.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-99.80	-99.80
GOAR_G7	602297.4	3468962.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-99.80	-99.80
GREGG	607023.8	3469240.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HAUBERT	601596.4	3468580.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-545.10	-9.80	-9.80
HECK	602076.6	3471101.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70
HOBAN	601705.9	3468880.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
HULL_854	601435.9	3470954.1	1	1	9059	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
HULL_855	601467.4	3471697.0	1	2	9060	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	0.00	0.00
HUMPHREY	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
IRONS	602203.6	3468788.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
JACKSON	602478.7	3471103.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70
JALYN	601495.7	3468680.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KEEFER	599879.2	3468119.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUCERO	601282.8	3468051.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70
MCCONNELL_265	601463.1	3468840.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.80	-0.80
MENDEZ	601096.0	3467470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
METZLER	602123.9	3471229.3	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70
MILLER_340	600090.0	3469470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-0.80	-0.80	-0.80	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MILLER_341	601699.4	3467875.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
MILLER_342	604439.3	3467569.4	1	2	55	0.00	0.00	0.00	0.00	0.00	-9.80	-9.80	-9.80	-9.80	-9.80	-2.20	-2.20	-2.20	-2.20	-2.20	-2.20	-9.80	0.00	0.00

TABLE G.3.1
Pumping Rates for Model Calibration and Predictive Runs (CMD)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	SP 14	SP 15	SP 16	SP 17	SP 18	SP 19
						1905-1909	1910-1914	1915-1919	1920-1924	1925-1929	1930-1939	1940-1949	1950-1953	1954-1955	1956-1960	1961-1965	1966	1967	1968	1969-1973	1974	1975-1984	1985-1986	1987-1991
MINNERLY	607222.6	3469441.0	3	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.80	-1.70	-1.70
MINOR_316	601173.1	3468486.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.20	-2.20	-2.20	-2.20	-2.20	-2.20	-2.20	-2.20	-2.20	0.00	0.00
MINOR_317	601172.2	3468568.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MOORE	599494.9	3468060.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.80	-0.80
MOROYOQUI	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.80	-0.80	-0.80	-0.80	-0.80	-0.80	-1.70	-1.70	-1.70
NOBLE	602608.3	3468792.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.80	-1.70	-1.70
NSD-02	598884.0	3468850.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NSD-03	598076.9	3468637.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-01	599987.7	3467340.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-273.10	-273.10	-273.10	-273.10	-273.10	-273.10	-273.10	-273.10	-273.10	-340.10	-340.10
NWC-02	600183.0	3467460.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02R	600177.0	3467470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-03	601153.0	3468340.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-119.90	-119.90	-119.90	-119.90	-119.90	-175.00	-175.00	-175.00	-175.00	-175.00	-175.00	-273.10	-273.10	-273.10
NWC-03R	601154.0	3468350.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-04	605829.8	3469072.0	3	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-04_CAPPED	605825.5	3469074.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-05	606980.1	3469445.6	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-06	599826.0	3467740.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OLD_HOUSE_WELL	597619.2	3468714.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
OSBORN	607031.8	3470270.6	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.20	-2.20	-2.20	-2.20	-2.20	-2.20	-2.20	0.00	0.00
PALMER_819	607724.4	3469545.0	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PANAGAKOS	605311.7	3469321.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
PARRA	602170.7	3471263.6	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIONKE	600936.0	3468840.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
POOL	599683.6	3470013.8	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.20	0.00	0.00
RAMIREZ	599730.7	3467584.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RAY	607194.1	3468878.2	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70
RODRIGUEZ	600696.6	3467464.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	0.00	0.00
ROGERS_596	600894.1	3468271.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_801	601092.4	3468676.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ROGERS_803	600977.7	3468417.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ROGERS_E	599895.0	3468260.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROLLINS	601096.0	3467670.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.60	-1.60
ROSS	599665.9	3471480.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.60	-1.60
RUIZ	602857.4	3471424.2	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70
SCHWARTZ	600811.0	3468269.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHAFER	600496.7	3467463.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SILVESTRI	600251.4	3473493.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNBELT	605998.3	3471735.2	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNNYSIDE	601293.2	3468476.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TV_236	600552.2	3467978.4	1	1	55	0.00	0.00	0.00	0.00	0.00	-1636.90	-1636.90	-1636.90	-1636.90	-1636.90	-1636.90	-1636.90	-1636.90	-1636.90	-1636.90	-1636.90	-1090.20	-750.10	-750.10
TVI_875	600715.1	3468419.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TVI_SS2	600555.0	3467965.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-1	600000.0	3466342.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-995.90	-995.90	-995.90	-995.90	-995.90	-995.90	-1333.90	-1990.70	-1990.70
UN-2	600012.7	3465396.5	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-3	599949.2	3465796.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-346.10	-346.10	-346.10	-346.10	-346.10	-346.10	-465.50	-691.70	-691.70
UN-4	601212.8	3466298.2	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-5	600742.9	3464444.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNION_PACIFIC_RR	605916.3	3469131.0	2	2	9121	-5.50	-5.50	-5.50	-5.50	-5.50	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	0.00	0.00
VALENZUELA	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
WALKER	607564.7	3468577.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEED	601434.4	3470924.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.80	-0.80
WEISKOPF	601155.0	3468658.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
WILSON_361	602002.2	3468181.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
WILSON_362	601292.7	3468879.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ZANDER	599678.9	3467998.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE G.3.1
Pumping Rates for Model Calibration and Predictive Runs (CMD)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 26	SP 27	SP 28	SP 29	SP 30	SP 31	SP 32	SP 33	SP 34	SP 35	SP 36	SP 37	SP 38	SP 39	SP 40	SP 41	SP 42	SP 43	SP 44	SP 45
						1992-1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016-2020
ACKER	598847.4	3472874.0	3	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.60	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ANDERSON	601134.7	3468816.1	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ANDERSON_M	600793.0	3468570.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ANDERSON_M	600443.0	3467630.7	1	1	9004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ASLD	601488.0	3469690.0	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AWC-02	598907.0	3468550.0	1	1	55	0.00	-146.70	-159.50	-232.10	-154.00	-216.80	-266.80	-211.90	-430.00	-388.90	-347.90	-354.81	-337.31	-336.54	-378.54	-351.02	-351.02	-351.02	-351.02	-351.02
AWC-03	599091.0	3468680.0	1	1	55	-2000.00	-3141.70	-3061.60	-1975.60	-2129.90	-3006.30	-2747.50	-2804.90	-2635.90	-1799.40	-963.00	-982.12	-933.70	-931.56	-1047.82	-971.64	-971.64	-971.64	-971.64	-971.64
AWC-04	598950.0	3468720.0	1	1	55	-2000.00	-439.20	-553.60	-1885.80	-1557.00	-906.30	-785.70	-117.80	-94.80	-414.10	-733.40	-747.96	-711.08	-709.45	-797.99	-739.98	-739.98	-739.98	-739.98	-739.98
AWC-05	599269.0	3468540.0	1	3	55	0.00	0.00	0.00	0.00	0.00	0.00	-264.10	-862.80	-751.30	-1200.90	-1650.40	-1683.18	-1600.18	-1596.51	-1795.76	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20
BANKS_987	606981.9	3469206.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BARTON_010	606201.1	3469047.5	2	2	55	-1.60	-1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BARTON_919	606243.9	3469076.7	2	2	55	-1.60	-1.60	-1.60	-1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BERNAL	600795.7	3467767.0	1	1	55	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BIMA	606001.2	3471852.8	4	4	55	0.00	0.00	0.00	-1.20	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
BINYON	608544.7	3468542.0	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
BLOMMER	602039.8	3471485.9	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BRINDLEY	601262.7	3472095.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BULLARD	602078.7	3470901.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BURKE	602230.1	3473029.8	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
CAMPBELL	606412.6	3469396.8	2	2	55	-0.30	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHAMBERS	600097.0	3467460.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
CHASE	599695.3	3468062.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
CONNOR	600250.6	3472677.7	1	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COOPER	602668.4	3472105.0	2	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
COOPER_C	601350.0	3468910.0	1	1	55	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DODSON	605594.6	3469063.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DURAZO	602015.5	3471241.2	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
EAST	607076.4	3468712.2	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
EN-01	601752.6	3464463.1	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-02	601885.9	3465282.2	1	2	55	-3799.90	-1520.00	-1672.00	-1823.90	-1975.90	-2127.90	-2279.90	-2431.90	-2583.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90
EN-03	602355.8	3465212.4	1	2	55	-3799.90	-1520.00	-1672.00	-1823.90	-1975.90	-2127.90	-2279.90	-2431.90	-2583.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90
EN-05	602139.9	3466050.6	1	2	55	0.00	-1520.00	-1672.00	-1823.90	-1975.90	-2127.90	-2279.90	-2431.90	-2583.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90
EN-06	601962.1	3466114.1	1	2	55	0.00	-1520.00	-1672.00	-1823.90	-1975.90	-2127.90	-2279.90	-2431.90	-2583.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90
ENGLUND	602551.3	3471341.3	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_641	607165.4	3469229.9	2	3	55	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_643	607125.5	3469140.0	2	2	55	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FRANCO	602849.9	3468835.7	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
FULTZ	607153.3	3469063.9	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.80	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
GALLANT	607769.6	3468524.4	2	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
GARNER_557	602659.2	3468962.4	1	1	55	0.00	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GARNER_635	602665.4	3468967.9	2	2	55	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
GGOOSE_546	606156.2	3469550.5	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GGOOSE_547	606256.7	3469820.3	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602670.2	3468959.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602008.1	3468960.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602326.6	3468809.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602323.9	3468841.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602677.3	3468966.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602668.6	3468959.2	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_RANCH	602454.8	3468892.5	1	1	55	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_G2	602402.8	3468901.7	1	1	55	-99.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
GOAR_G4	601596.4	3468580.0	1	1	55	-99.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
GOAR_G7	602297.4	3468962.6	1	1	55	-99.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
GREGG	607023.8	3469240.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HAUBERT	601596.4	3468580.0	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
HECK	602076.6	3471101.0	1	2	55	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HOBAN	601705.9	3468880.3	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
HULL_854	601435.9	3470954.1	1	1	9059	-9.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HULL_855	601467.4	3471697.0	1	2	9060	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HUMPHREY	600395.0	3468170.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IRONS	602203.6	3468788.0	1	1	55	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JACKSON	602478.7	3471103.0	1	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
JALYN	601495.7	3468680.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KEEFER	599879.2	3468119.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
LUCERO	601282.8	3468051.8	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MCCONNELL_265	601463.1	3468840.1	1	1	55	-0.80	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MENDEZ	601096.0	3467470.0	1	1	55	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METZLER	602123.9	3471229.3	1	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MILLER_340	600090.0	3469470.0	1	1	55	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MILLER_341	601699.4	3467875.0	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MILLER_342	604439.3	3467569.4	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE G.3.1
Pumping Rates for Model Calibration and Predictive Runs (CMD)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 26	SP 27	SP 28	SP 29	SP 30	SP 31	SP 32	SP 33	SP 34	SP 35	SP 36	SP 37	SP 38	SP 39	SP 40	SP 41	SP 42	SP 43	SP 44	SP 45
						1992-1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016-2020
MINNERLY	607222.6	3469441.0	3	4	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MINOR_316	601173.1	3468486.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MINOR_317	601172.2	3468568.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MOORE	599494.9	3468060.0	1	1	55	-0.80	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MOROYOQUI	600395.0	3468170.0	1	1	55	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOBLE	602608.3	3468792.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NSD-02	598884.0	3468850.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
NSD-03	598076.9	3468637.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
NWC-01	599987.7	3467340.9	1	1	55	-340.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02	600183.0	3467460.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02R	600177.0	3467470.0	1	1	55	0.00	-84.90	-84.90	-84.90	-84.90	-84.90	-84.90	-84.90	-84.90	-84.90	-84.90	-84.80	-76.08	-61.57	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10
NWC-03	601153.0	3468340.0	1	1	55	-273.10	-5.80	-5.80	-5.80	-5.80	-5.80	-5.80	-5.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-03R	601154.0	3468350.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-5.80	-5.80	-5.80	-5.11	-5.42	-5.14	0.00	0.00	0.00	0.00	0.00	0.00
NWC-04	605829.8	3469072.0	3	3	55	0.00	-56.10	-56.10	-56.10	-56.10	-56.10	-56.10	-56.10	-56.10	-56.10	-56.10	-42.13	-40.51	-62.09	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60
NWC-04_CAPPED	605825.5	3469074.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-05	606980.1	3469445.6	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-06	599826.0	3467740.0	1	1	55	0.00	-193.10	-193.10	-193.10	-193.10	-193.10	-193.10	-193.10	-193.10	-193.10	-193.10	-192.43	-172.64	-139.71	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20
OLD_HOUSE_WELL	597619.2	3468714.0	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
OSBORN	607031.8	3470270.6	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PALMER_819	607724.4	3469545.0	4	4	55	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
PANAGAKOS	605311.7	3469321.0	2	2	55	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
PARRA	602170.7	3471263.6	1	2	55	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
PIONKE	600936.0	3468840.0	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
POOL	599683.6	3470013.8	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RAMIREZ	599730.7	3467584.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
RAY	607194.1	3468878.2	2	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
RODRIGUEZ	600696.6	3467464.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_596	600894.1	3468271.0	1	1	55	0.00	0.00	0.00	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_801	601092.4	3468676.0	1	1	55	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_803	600977.7	3468417.4	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ROGERS_E	599895.0	3468260.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ROLLINS	601096.0	3467670.0	1	1	55	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROSS	599665.9	3471480.0	2	2	55	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
RUIZ	602857.4	3471424.2	1	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
SCHWARTZ	600811.0	3468269.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
SHAFER	600496.7	3467463.0	1	1	55	0.00	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SILVESTRI	600251.4	3473493.0	2	2	55	0.00	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNBELT	605998.3	3471735.2	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNNYSIDE	601293.2	3468476.0	1	1	55	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TV_236	600552.2	3467978.4	1	1	55	-750.10	-550.60	-212.60	-212.60	-212.60	-212.60	-212.60	-212.60	-212.60	-212.60	-212.60	-274.64	-271.82	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80
TVI_875	600715.1	3468419.3	1	1	55	0.00	-338.00	-675.90	-675.90	-675.90	-675.90	-675.90	-675.90	-675.90	-675.90	-675.90	-873.14	-864.17	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24
TVI_SS2	600555.0	3467965.7	1	1	55	0.00	-212.60	-212.60	-212.60	-212.60	-212.60	-212.60	-212.60	-212.60	-212.60	-212.60	-274.64	-271.82	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80
UN-1	600000.0	3466342.7	1	1	55	-1990.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-2	600012.7	3465396.5	1	2	55	0.00	-1475.41	-1493.29	-1529.06	-1553.00	-1576.95	-1600.89	-1624.83	-1187.12	-1205.76	-1224.39	-1243.03	-1261.66	-1280.30	-1300.47	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64
UN-3	599949.2	3465796.6	1	1	55	-691.70	-1180.33	-1194.63	-1223.25	-1242.40	-1261.56	-1280.71	-1299.87	-791.41	-803.84	-816.26	-828.68	-841.11	-853.53	-866.98	-880.42	-880.42	-880.42	-880.42	-880.42
UN-4	601212.8	3466298.2	1	1	55	0.00	-295.08	-298.66	-305.81	-310.60	-315.39	-320.18	-324.97	-527.61	-535.89	-544.17	-552.46	-560.74	-569.02	-577.99	-586.95	-586.95	-586.95	-586.95	-586.95
UN-5	600742.9	3464444.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-791.41	-803.84	-816.26	-828.68	-841.11	-853.53	-866.98	-880.42	-880.42	-880.42	-880.42	-880.42
UNION_PACIFIC_RR	605916.3	3469131.0	2	2	9121	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VALENZUELA	600395.0	3468170.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
WALKER	607564.7	3468577.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
WEED	601434.4	3470924.5	2	2	55	-0.80	-1.70	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEISKOPF	601155.0	3468658.9	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILSON_361	602002.2	3468181.0	1	1	55	-1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILSON_362	601292.7	3468879.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ZANDER	599678.9	3467998.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70

TABLE G.3.1
Pumping Rates for Model Calibration and Predictive Runs (CMD)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 52	SP 53	SP 54	SP 55	SP 56	SP 57	SP 58	SP 59	SP 60	SP 61	SP 62	SP 63	SP 64	SP 65	SP 66	SP 67	SP 68	SP 69	SP 70	SP 71	SP 72
						2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070	2071-2075	2076-2080	2081-2085	2086-2090	2091-2095	2096-2100	2101-2105	2106-2110	2111-2115	2116-2120	2121-2125
ACKER	598847.4	3472874.0	3	3	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ANDERSON	601134.7	3468816.1	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ANDERSON_M	600793.0	3468570.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ANDERSON_M	600443.0	3467630.7	1	1	9004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ASLD	601488.0	3469690.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AWC-02	598907.0	3468550.0	1	1	55	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02	-351.02
AWC-03	599091.0	3468680.0	1	1	55	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64	-971.64
AWC-04	598950.0	3468720.0	1	1	55	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98	-739.98
AWC-05	599269.0	3468540.0	1	3	55	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20	-1665.20
BANKS_987	606981.9	3469206.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BARTON_010	606201.1	3469047.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BARTON_919	606243.9	3469076.7	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BERNAL	600795.7	3467767.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BIMA	606001.2	3471852.8	4	4	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
BINYON	608544.7	3468542.0	4	4	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
BLOMMER	602039.8	3471485.9	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BRINDLEY	601262.7	3472095.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BULLARD	602078.7	3470901.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BURKE	602230.1	3473029.8	4	4	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
CAMPBELL	606412.6	3469396.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHAMBERS	600097.0	3467460.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
CHASE	599695.3	3468062.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
CONNOR	600250.6	3472677.7	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COOPER	602668.4	3472105.0	2	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
COOPER_C	601350.0	3468910.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DODSON	605594.6	3469063.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DURAZO	602015.5	3471241.2	1	2	55	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
EAST	607076.4	3468712.2	2	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
EN-01	601752.6	3464463.1	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-02	601885.9	3465282.2	1	2	55	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90
EN-03	602355.8	3465212.4	1	2	55	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90
EN-05	602139.9	3466050.6	1	2	55	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90
EN-06	601962.1	3466114.1	1	2	55	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90	-2735.90
ENGLUND	602551.3	3471341.3	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_641	607165.4	3469229.9	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_643	607125.5	3469140.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FRANCO	602849.9	3468835.7	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
FULTZ	607153.3	3469063.9	2	3	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
GALLANT	607769.6	3468524.4	2	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
GARNER_557	602659.2	3468962.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GARNER_635	602665.4	3468967.9	2	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
GGOOSE_546	606156.2	3469550.5	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GGOOSE_547	606256.7	3469820.3	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602670.2	3468959.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602008.1	3468960.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602326.6	3468809.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602323.9	3468841.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602677.3	3468966.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602668.6	3468959.2	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_RANCH	602454.8	3468892.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_G2	602402.8	3468901.7	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
GOAR_G4	601596.4	3468580.0	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
GOAR_G7	602297.4	3468962.6	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
GREGG	607023.8	3469240.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HAUBERT	601596.4	3468580.0	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
HECK	602076.6	3471101.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HOBAN	601705.9	3468880.3	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
HULL_854	601435.9	3470954.1	1	1	9059	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HULL_855	601467.4	3471697.0	1	2	9060	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HUMPHREY	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IRONS	602203.6	3468788.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JACKSON	602478.7	3471103.0	1	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
JALYN	601495.7	3468680.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KEEFER	599879.2	3468119.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
LUCERO	601282.8	3468051.8	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MCCONNELL_265	601463.1	3468840.1	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MENDEZ	601096.0	3467470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METZLER	602123.9	3471229.3	1	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MILLER_340	600090.0	3469470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MILLER_341	601699.4	3467875.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MILLER_342	604439.3	3467569.4	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE G.3.1
Pumping Rates for Model Calibration and Predictive Runs (CMD)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 52	SP 53	SP 54	SP 55	SP 56	SP 57	SP 58	SP 59	SP 60	SP 61	SP 62	SP 63	SP 64	SP 65	SP 66	SP 67	SP 68	SP 69	SP 70	SP 71	SP 72
						2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070	2071-2075	2076-2080	2081-2085	2086-2090	2091-2095	2096-2100	2101-2105	2106-2110	2111-2115	2116-2120	2121-2125
MINNERLY	607222.6	3469441.0	3	4	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MINOR_316	601173.1	3468486.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MINOR_317	601172.2	3468568.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MOORE	599494.9	3468060.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
MOROYOQUI	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOBLE	602608.3	3468792.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NSD-02	598884.0	3468850.0	1	1	55	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
NSD-03	598076.9	3468637.5	1	1	55	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
NWC-01	599987.7	3467340.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02	600183.0	3467460.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02R	600177.0	3467470.0	1	1	55	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10	-98.10
NWC-03	601153.0	3468340.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-03R	601154.0	3468350.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-04	605829.8	3469072.0	3	3	55	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60	-43.60
NWC-04_CAPPED	605825.5	3469074.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-05	606980.1	3469445.6	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-06	599826.0	3467740.0	1	1	55	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20	-220.20
OLD_HOUSE_WELL	597619.2	3468714.0	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
OSBORN	607031.8	3470270.6	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PALMER_819	607724.4	3469545.0	4	4	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
PANAGAKOS	605311.7	3469321.0	2	2	55	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
PARRA	602170.7	3471263.6	1	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
PIONKE	600936.0	3468840.0	1	1	55	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80	-9.80
POOL	599683.6	3470013.8	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RAMIREZ	599730.7	3467584.4	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
RAY	607194.1	3468878.2	2	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
RODRIGUEZ	600696.6	3467464.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_596	600894.1	3468271.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_801	601092.4	3468676.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_803	600977.7	3468417.4	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ROGERS_E	599895.0	3468260.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ROLLINS	601096.0	3467670.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROSS	599665.9	3471480.0	2	2	55	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60	-1.60
RUIZ	602857.4	3471424.2	1	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
SCHWARTZ	600811.0	3468269.7	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
SHAFER	600496.7	3467463.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SILVESTRI	600251.4	3473493.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNBELT	605998.3	3471735.2	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNNYSIDE	601293.2	3468476.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TV_236	600552.2	3467978.4	1	1	55	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80
TVI_875	600715.1	3468419.3	1	1	55	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24	-813.24
TVI_SS2	600555.0	3467965.7	1	1	55	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80	-255.80
UN-1	600000.0	3466342.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-2	600012.7	3465396.5	1	2	55	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64	-1320.64
UN-3	599949.2	3465796.6	1	1	55	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42
UN-4	601212.8	3466298.2	1	1	55	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95	-586.95
UN-5	600742.9	3464444.0	1	2	55	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42	-880.42
UNION_PACIFIC_RR	605916.3	3469131.0	2	2	9121	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VALENZUELA	600395.0	3468170.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
WALKER	607564.7	3468577.5	2	2	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
WEED	601434.4	3470924.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEISKOPF	601155.0	3468658.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILSON_361	602002.2	3468181.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILSON_362	601292.7	3468879.0	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70
ZANDER	599678.9	3467998.5	1	1	55	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70	-1.70

NOTES:

Rates listed are in cubic meters per day as used in the model, as a continuous pumping rate.

CMD = cubic meters per day

TABLE G.3.2
Pumping Rates for Model Calibration and Predictive Runs (GPM)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	SP 14	SP 15	SP 16	SP 17	SP 18	SP 19	SP 20
						1905-1909	1910-1914	1915-1919	1920-1924	1925-1929	1930-1939	1940-1949	1950-1953	1954-1955	1956-1960	1961-1965	1966	1967	1968	1969-1973	1974	1975-1984	1985-1986	1987-1991	1992-1997
ACKER	598847.4	3472874.0	3	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANDERSON	601134.7	3468816.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ANDERSON_M	600793.0	3468570.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
ANDERSON_M	600443.0	3467630.7	1	1	9004	0.00	0.00	0.00	0.20	0.20	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.00	0.00	0.00
ASLD	601488.0	3469690.0	1	1	55	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
AWC-02	598907.0	3468550.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AWC-03	599091.0	3468680.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	340.51	340.51	340.51	340.51	340.51	340.51	340.51	340.51	340.51	366.91	366.91	366.91
AWC-04	598950.0	3468720.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	340.51	340.51	340.51	340.51	340.51	340.51	340.51	366.91	366.91	366.91
AWC-05	599269.0	3468540.0	1	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BANKS_987	606981.9	3469206.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00
BARTON_010	606201.1	3469047.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.29	0.29	0.29
BARTON_919	606243.9	3469076.7	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.29	0.29	0.29
BERNAL	600795.7	3467767.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.15	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
BIMA	606001.2	3471852.8	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BINYON	608544.7	3468542.0	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BLOMMER	602039.8	3471485.9	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00
BRINDLEY	601262.7	3472095.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BULLARD	602078.7	3470901.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00
BURKE	602230.1	3473029.8	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CAMPBELL	606412.6	3469396.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.06
CHAMBERS	600097.0	3467460.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31
CHASE	599695.3	3468062.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.11	0.11	0.11	0.31	0.31	0.31	0.31
CONNOR	600250.6	3472677.7	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
COOPER	602668.4	3472105.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.31	0.31	0.31
COOPER_C	601350.0	3468910.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.20	0.31	0.31	0.31	0.31
DODSON	605594.6	3469063.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DURAZO	602015.5	3471241.2	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EAST	607076.4	3468712.2	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-01	601752.6	3464463.1	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-02	601885.9	3465282.2	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	495.30	495.30	495.30	495.30	495.30	495.30	697.10	697.10	697.10	697.10
EN-03	602355.8	3465212.4	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	495.30	495.30	495.30	495.30	495.30	495.30	697.10	697.10	697.10	697.10
EN-05	602139.9	3466050.6	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-06	601962.1	3466114.1	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ENGLUND	602551.3	3471341.3	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_641	607165.4	3469229.9	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
EPPELE_643	607125.5	3469140.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
FRANCO	602849.9	3468835.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31
FULTZ	607153.3	3469063.9	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GALLANT	607769.6	3468524.4	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.31	0.31	0.31
GARNER_557	602659.2	3468962.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GARNER_635	602665.4	3468967.9	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GGOOSE_546	606156.2	3469550.5	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.90	76.90	76.90	76.90	76.90	76.90	100.00	0.00	0.00	0.00
GGOOSE_547	606256.7	3469820.3	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.90	76.90	76.90	76.90	76.90	76.90	100.00	0.00	0.00	0.00
GOAR	602670.2	3468959.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602008.1	3468960.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602326.6	3468809.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602323.9	3468841.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602677.3	3468966.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602668.6	3468959.2	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_RANCH	602454.8	3468892.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
GOAR_G2	602402.8	3468901.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	18.31	18.31	18.31
GOAR_G4	601596.4	3468580.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	18.31	18.31	18.31
GOAR_G7	602297.4	3468962.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	18.31	18.31	18.31
GREGG	607023.8	3469240.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HAUBERT	601596.4	3468580.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1.80	1.80	1.80
HECK	602076.6	3471101.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
HOBAN	601705.9	3468880.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
HULL_854	601435.9	3470954.1	1	1	9059	0.00	0.00	0.00	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
HULL_855	601467.4	3471697.0	1	2	9060	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.00	0.00	0.00
HUMPHREY	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
IRONS	602203.6	3468788.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
JACKSON	602478.7	3471103.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
JALYN	601495.7	3468680.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KEEFER	599879.2	3468119.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUCERO	601282.8	3468051.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31
MCCONNELL_265	601463.1	3468840.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.15
MENDEZ	601096.0	3467470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
METZLER	602123.9	3471229.3	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31
MILLER_340	600090.0	3469470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.15	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MILLER_341	601699.4	3467875.0	1	1	55	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
MILLER_342	604439.3	3467569.4	1	2	55	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	1.80	1.80	0.40	0.40	0.40	0.40	0.40	0.40	1.80	0.00	0.00	0.00
MINNERLY	607222.6	3469441.0	3	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.31	0.31	0.31
MINOR_316	601173.1	3468486.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.00	0.00	0.00
MINOR_317	601172.2	3468568.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31

TABLE G.3.2
Pumping Rates for Model Calibration and Predictive Runs (GPM)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	SP 14	SP 15	SP 16	SP 17	SP 18	SP 19	SP 20
						1905-1909	1910-1914	1915-1919	1920-1924	1925-1929	1930-1939	1940-1949	1950-1953	1954-1955	1956-1960	1961-1965	1966	1967	1968	1969-1973	1974	1975-1984	1985-1986	1987-1991	1992-1997
MOORE	599494.9	3468060.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.15
MOROYOQUI	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.15	0.15	0.15	0.15	0.31	0.31	0.31	0.31
NOBLE	602608.3	3468792.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.31	0.31	0.31
NSD-02	598884.0	3468850.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NSD-03	598076.9	3468637.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-01	599987.7	3467340.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.10	50.10	50.10	50.10	50.10	50.10	50.10	50.10	50.10	62.39	62.39	62.39
NWC-02	600183.0	3467460.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02R	600177.0	3467470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-03	601153.0	3468340.0	1	1	55	0.00	0.00	0.00	0.00	0.00	22.00	22.00	22.00	22.00	22.00	32.10	32.10	32.10	32.10	32.10	32.10	50.10	50.10	50.10	50.10
NWC-03R	601154.0	3468350.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-04	605829.8	3469072.0	3	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-04_CAPPED	605825.5	3469074.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-05	606980.1	3469445.6	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-06	599826.0	3467740.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OLD_HOUSE_WELL	597619.2	3468714.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
OSBORN	607031.8	3470270.6	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.00	0.00	0.00
PALMER_819	607724.4	3469545.0	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PANAGAKOS	605311.7	3469321.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
PARRA	602170.7	3471263.6	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIONKE	600936.0	3468840.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
POOL	599683.6	3470013.8	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00
RAMIREZ	599730.7	3467584.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RAY	607194.1	3468878.2	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
RODRIGUEZ	600696.6	3467464.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.00	0.00	0.00
ROGERS_596	600894.1	3468271.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_801	601092.4	3468676.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ROGERS_803	600977.7	3468417.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ROGERS_E	599895.0	3468260.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROLLINS	601096.0	3467670.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29
ROSS	599665.9	3471480.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29
RUIZ	602857.4	3471424.2	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31
SCHWARTZ	600811.0	3468269.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHAFER	600496.7	3467463.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SILVESTRI	600251.4	3473493.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNBELT	605998.3	3471735.2	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNNYSIDE	601293.2	3468476.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TV_236	600552.2	3467978.4	1	1	55	0.00	0.00	0.00	0.00	0.00	300.29	300.29	300.29	300.29	300.29	300.29	300.29	300.29	300.29	300.29	300.29	200.00	137.61	137.61	137.61
TVI_875	600715.1	3468419.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TVI_SS2	600555.0	3467965.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-1	600000.0	3466342.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	182.70	182.70	182.70	182.70	182.70	182.70	244.71	365.20	365.20	365.20
UN-2	600012.7	3465396.5	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-3	599949.2	3465796.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.49	63.49	63.49	63.49	63.49	63.49	85.40	126.89	126.89	126.89
UN-4	601212.8	3466298.2	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-5	600742.9	3464444.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNION_PACIFIC_RR	605916.3	3469131.0	2	2	9121	0.00	0.00	0.00	1.01	1.01	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	0.00	0.00	0.00
VALENZUELA	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
WALKER	607564.7	3468577.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEED	601434.4	3470924.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.15
WEISKOPF	601155.0	3468658.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
WILSON_361	602002.2	3468181.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
WILSON_362	601292.7	3468879.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ZANDER	599678.9	3467998.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE G.3.2
Pumping Rates for Model Calibration and Predictive Runs (GPM)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 27	SP 28	SP 29	SP 30	SP 31	SP 32	SP 33	SP 34	SP 35	SP 36	SP 37	SP 38	SP 39	SP 40	SP 41	SP 42	SP 43	SP 44	SP 45
						1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016-2020
ACKER	598847.4	3472874.0	3	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ANDERSON	601134.7	3468816.1	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ANDERSON_M	600793.0	3468570.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ANDERSON_M	600443.0	3467630.7	1	1	9004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ASLD	601488.0	3469690.0	1	1	55	1.80	1.80	1.80	1.80	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AWC-02	598907.0	3468550.0	1	1	55	26.91	29.26	42.58	28.25	39.77	48.95	38.87	78.88	71.34	63.82	65.09	61.88	61.74	69.44	64.40	64.40	64.40	64.40	64.40
AWC-03	599091.0	3468680.0	1	1	55	576.35	561.66	362.43	390.74	551.51	504.04	514.57	483.56	330.10	176.67	180.17	171.29	170.90	192.23	178.25	178.25	178.25	178.25	178.25
AWC-04	598950.0	3468720.0	1	1	55	80.57	101.56	345.96	285.64	166.26	144.14	21.61	17.39	75.97	134.54	137.22	130.45	130.15	146.39	135.75	135.75	135.75	135.75	135.75
AWC-05	599269.0	3468540.0	1	3	55	0.00	0.00	0.00	0.00	0.00	48.45	158.28	137.83	220.31	302.77	308.78	293.56	292.88	329.44	305.49	305.49	305.49	305.49	305.49
BANKS_987	606981.9	3469206.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BARTON_010	606201.1	3469047.5	2	2	55	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BARTON_919	606243.9	3469076.7	2	2	55	0.29	0.29	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BERNAL	600795.7	3467767.0	1	1	55	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BIMA	606001.2	3471852.8	4	4	55	0.00	0.00	0.22	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
BINYON	608544.7	3468542.0	4	4	55	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
BLOMMER	602039.8	3471485.9	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BRINDLEY	601262.7	3472095.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BULLARD	602078.7	3470901.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BURKE	602230.1	3473029.8	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
CAMPBELL	606412.6	3469396.8	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHAMBERS	600097.0	3467460.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
CHASE	599695.3	3468062.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
CONNOR	600250.6	3472677.7	1	2	55	0.31	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COOPER	602668.4	3472105.0	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
COOPER_C	601350.0	3468910.0	1	1	55	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DODSON	605594.6	3469063.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DURAZO	602015.5	3471241.2	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
EAST	607076.4	3468712.2	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
EN-01	601752.6	3464463.1	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-02	601885.9	3465282.2	1	2	55	278.85	306.73	334.60	362.48	390.37	418.25	446.14	474.02	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91
EN-03	602355.8	3465212.4	1	2	55	278.85	306.73	334.60	362.48	390.37	418.25	446.14	474.02	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91
EN-05	602139.9	3466050.6	1	2	55	278.85	306.73	334.60	362.48	390.37	418.25	446.14	474.02	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91
EN-06	601962.1	3466114.1	1	2	55	278.85	306.73	334.60	362.48	390.37	418.25	446.14	474.02	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91
ENGLUND	602551.3	3471341.3	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_641	607165.4	3469229.9	2	3	55	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_643	607125.5	3469140.0	2	2	55	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FRANCO	602849.9	3468835.7	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
FULTZ	607153.3	3469063.9	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
GALLANT	607769.6	3468524.4	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
GARNER_557	602659.2	3468962.4	1	1	55	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GARNER_635	602665.4	3468967.9	2	2	55	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
GGOOSE_546	606156.2	3469550.5	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GGOOSE_547	606256.7	3469820.3	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602670.2	3468959.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602008.1	3468960.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602326.6	3468809.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602323.9	3468841.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602677.3	3468966.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602668.6	3468959.2	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_RANCH	602454.8	3468892.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_G2	602402.8	3468901.7	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
GOAR_G4	601596.4	3468580.0	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
GOAR_G7	602297.4	3468962.6	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
GREGG	607023.8	3469240.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HAUBERT	601596.4	3468580.0	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
HECK	602076.6	3471101.0	1	2	55	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HOBAN	601705.9	3468880.3	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
HULL_854	601435.9	3470954.1	1	1	9059	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HULL_855	601467.4	3471697.0	1	2	9060	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HUMPHREY	600395.0	3468170.0	1	1	55	0.31	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IRONS	602203.6	3468788.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JACKSON	602478.7	3471103.0	1	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
JALYN	601495.7	3468680.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KEEFER	599879.2	3468119.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
LUCERO	601282.8	3468051.8	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MCCONNELL_265	601463.1	3468840.1	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MENDEZ	601096.0	3467470.0	1	1	55	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METZLER	602123.9	3471229.3	1	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MILLER_340	600090.0	3469470.0	1	1	55	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MILLER_341	601699.4	3467875.0	1	1	55	1.80	1.80	1.80	1.80	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MILLER_342	604439.3	3467569.4	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MINNERLY	607222.6	3469441.0	3	4	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MINOR_316	601173.1	3468486.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MINOR_317	601172.2	3468568.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31

CLEAR CREEK ASSOCIATES

TABLE G.3.2
Pumping Rates for Model Calibration and Predictive Runs (GPM)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 27	SP 28	SP 29	SP 30	SP 31	SP 32	SP 33	SP 34	SP 35	SP 36	SP 37	SP 38	SP 39	SP 40	SP 41	SP 42	SP 43	SP 44	SP 45
						1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016-2020
MOORE	599494.9	3468060.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MOROYOQUI	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOBLE	602608.3	3468792.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NSD-02	598884.0	3468850.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
NSD-03	598076.9	3468637.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
NWC-01	599987.7	3467340.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02	600183.0	3467460.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02R	600177.0	3467470.0	1	1	55	15.58	15.58	15.58	15.58	15.58	15.58	15.58	15.58	15.58	15.58	15.56	13.96	11.29	18.00	18.00	18.00	18.00	18.00	18.00
NWC-03	601153.0	3468340.0	1	1	55	1.06	1.06	1.06	1.06	1.06	1.06	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-03R	601154.0	3468350.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	1.06	1.06	0.94	0.99	0.94	0.00	0.00	0.00	0.00	0.00	0.00
NWC-04	605829.8	3469072.0	3	3	55	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	7.73	7.43	11.39	8.00	8.00	8.00	8.00	8.00	8.00
NWC-04_CAPPED	605825.5	3469074.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-05	606980.1	3469445.6	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-06	599826.0	3467740.0	1	1	55	35.42	35.42	35.42	35.42	35.42	35.42	35.42	35.42	35.42	35.42	35.30	31.67	25.63	40.40	40.40	40.40	40.40	40.40	40.40
OLD_HOUSE_WELL	597619.2	3468714.0	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
OSBORN	607031.8	3470270.6	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PALMER_819	607724.4	3469545.0	4	4	55	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
PANAGAKOS	605311.7	3469321.0	2	2	55	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
PARRA	602170.7	3471263.6	1	2	55	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
PIONKE	600936.0	3468840.0	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
POOL	599683.6	3470013.8	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RAMIREZ	599730.7	3467584.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
RAY	607194.1	3468878.2	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
RODRIGUEZ	600696.6	3467464.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_596	600894.1	3468271.0	1	1	55	0.00	0.00	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_801	601092.4	3468676.0	1	1	55	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_803	600977.7	3468417.4	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ROGERS_E	599895.0	3468260.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ROLLINS	601096.0	3467670.0	1	1	55	0.29	0.29	0.29	0.29	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROSS	599665.9	3471480.0	2	2	55	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
RUIZ	602857.4	3471424.2	1	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
SCHWARTZ	600811.0	3468269.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
SHAFER	600496.7	3467463.0	1	1	55	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SILVESTRI	600251.4	3473493.0	2	2	55	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNBELT	605998.3	3471735.2	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNNYSIDE	601293.2	3468476.0	1	1	55	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TV_236	600552.2	3467978.4	1	1	55	101.01	39.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00	50.38	49.87	46.93	46.93	46.93	46.93	46.93	46.93	46.93
TVI_875	600715.1	3468419.3	1	1	55	62.01	124.00	124.00	124.00	124.00	124.00	124.00	124.00	124.00	124.00	160.18	158.53	149.19	149.19	149.19	149.19	149.19	149.19	149.19
TVI_SS2	600555.0	3467965.7	1	1	55	39.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00	50.38	49.87	46.93	46.93	46.93	46.93	46.93	46.93	46.93
UN-1	600000.0	3466342.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-2	600012.7	3465396.5	1	2	55	270.67	273.95	280.51	284.90	289.30	293.69	298.08	217.78	221.20	224.62	228.04	231.46	234.87	238.57	242.27	242.27	242.27	242.27	242.27
UN-3	599949.2	3465796.6	1	1	55	216.53	219.16	224.41	227.92	231.44	234.95	238.46	145.19	147.47	149.75	152.02	154.30	156.58	159.05	161.52	161.52	161.52	161.52	161.52
UN-4	601212.8	3466298.2	1	1	55	54.13	54.79	56.10	56.98	57.86	58.74	59.62	96.79	98.31	99.83	101.35	102.87	104.39	106.03	107.68	107.68	107.68	107.68	107.68
UN-5	600742.9	3464444.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	145.19	147.47	149.75	152.02	154.30	156.58	159.05	161.52	161.52	161.52	161.52	161.52
UNION_PACIFIC_RR	605916.3	3469131.0	2	2	9121	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VALENZUELA	600395.0	3468170.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
WALKER	607564.7	3468577.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
WEED	601434.4	3470924.5	2	2	55	0.31	0.31	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEISKOPF	601155.0	3468658.9	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILSON_361	602002.2	3468181.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILSON_362	601292.7	3468879.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ZANDER	599678.9	3467998.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31

Rates listed are in gallor
GP

CLEAR CREEK ASSOCIATES

TABLE G.3.2
Pumping Rates for Model Calibration and Predictive Runs (GPM)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 52	SP 53	SP 54	SP 55	SP 56	SP 57	SP 58	SP 59	SP 60	SP 61	SP 62	SP 63	SP 64	SP 65	SP 66	SP 67	SP 68	SP 69	SP 70	SP 71	SP 72
						2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070	2071-2075	2076-2080	2081-2085	2086-2090	2091-2095	2096-2100	2101-2105	2106-2110	2111-2115	2116-2120	2121-2125
ACKER	598847.4	3472874.0	3	3	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ANDERSON	601134.7	3468816.1	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ANDERSON_M	600793.0	3468570.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ANDERSON_M	600443.0	3467630.7	1	1	9004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ASLD	601488.0	3469690.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AWC-02	598907.0	3468550.0	1	1	55	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40	64.40
AWC-03	599091.0	3468680.0	1	1	55	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25	178.25
AWC-04	598950.0	3468720.0	1	1	55	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75	135.75
AWC-05	599269.0	3468540.0	1	3	55	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49	305.49
BANKS_987	606981.9	3469206.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BARTON_010	606201.1	3469047.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BARTON_919	606243.9	3469076.7	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BERNAL	600795.7	3467767.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BIMA	606001.2	3471852.8	4	4	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
BINYON	608544.7	3468542.0	4	4	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
BLOMMER	602039.8	3471485.9	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BRINDLEY	601262.7	3472095.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BULLARD	602078.7	3470901.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BURKE	602230.1	3473029.8	4	4	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
CAMPBELL	606412.6	3469396.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHAMBERS	600097.0	3467460.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
CHASE	599695.3	3468062.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
CONNOR	600250.6	3472677.7	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COOPER	602668.4	3472105.0	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
COOPER_C	601350.0	3468910.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DODSON	605594.6	3469063.8	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DURAZO	602015.5	3471241.2	1	2	55	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
EAST	607076.4	3468712.2	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
EN-01	601752.6	3464463.1	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EN-02	601885.9	3465282.2	1	2	55	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91
EN-03	602355.8	3465212.4	1	2	55	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91
EN-05	602139.9	3466050.6	1	2	55	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91
EN-06	601962.1	3466114.1	1	2	55	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91	501.91
ENGLUND	602551.3	3471341.3	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_641	607165.4	3469229.9	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPPELE_643	607125.5	3469140.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FRANCO	602849.9	3468835.7	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
FULTZ	607153.3	3469063.9	2	3	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
GALLANT	607769.6	3468524.4	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
GARNER_557	602659.2	3468962.4	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GARNER_635	602665.4	3468967.9	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
GGOOSE_546	606156.2	3469550.5	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GGOOSE_547	606256.7	3469820.3	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602670.2	3468959.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602008.1	3468960.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602326.6	3468809.8	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602323.9	3468841.1	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602677.3	3468966.3	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR	602668.6	3468959.2	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_RANCH	602454.8	3468892.5	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GOAR_G2	602402.8	3468901.7	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
GOAR_G4	601596.4	3468580.0	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
GOAR_G7	602297.4	3468962.6	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
GREGG	607023.8	3469240.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HAUBERT	601596.4	3468580.0	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
HECK	602076.6	3471101.0	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HOBAN	601705.9	3468880.3	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
HULL_854	601435.9	3470954.1	1	1	9059	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HULL_855	601467.4	3471697.0	1	2	9060	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HUMPHREY	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IRONS	602203.6	3468788.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JACKSON	602478.7	3471103.0	1	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
JALYN	601495.7	3468680.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KEEFER	599879.2	3468119.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
LUCERO	601282.8	3468051.8	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MCCONNELL_265	601463.1	3468840.1	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MENDEZ	601096.0	3467470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METZLER	602123.9	3471229.3	1	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MILLER_340	600090.0	3469470.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MILLER_341	601699.4	3467875.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MILLER_342	604439.3	3467569.4	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MINNERLY	607222.6	3469441.0	3	4	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MINOR_316	601173.1	3468486.6	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MINOR_317	601172.2	3468568.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31

TABLE G.3.2
Pumping Rates for Model Calibration and Predictive Runs (GPM)

Well Name	Easting	Northing	Top Model Layer	Bottom Model Layer	Reach	SP 52	SP 53	SP 54	SP 55	SP 56	SP 57	SP 58	SP 59	SP 60	SP 61	SP 62	SP 63	SP 64	SP 65	SP 66	SP 67	SP 68	SP 69	SP 70	SP 71	SP 72
						2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070	2071-2075	2076-2080	2081-2085	2086-2090	2091-2095	2096-2100	2101-2105	2106-2110	2111-2115	2116-2120	2121-2125
MOORE	599494.9	3468060.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
MOROYOQUI	600395.0	3468170.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOBLE	602608.3	3468792.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NSD-02	598884.0	3468850.0	1	1	55	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
NSD-03	598076.9	3468637.5	1	1	55	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
NWC-01	599987.7	3467340.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02	600183.0	3467460.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-02R	600177.0	3467470.0	1	1	55	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
NWC-03	601153.0	3468340.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-03R	601154.0	3468350.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-04	605829.8	3469072.0	3	3	55	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
NWC-04_CAPPED	605825.5	3469074.2	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-05	606980.1	3469445.6	2	3	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NWC-06	599826.0	3467740.0	1	1	55	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40	40.40
OLD_HOUSE_WELL	597619.2	3468714.0	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
OSBORN	607031.8	3470270.6	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PALMER_819	607724.4	3469545.0	4	4	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
PANAGAKOS	605311.7	3469321.0	2	2	55	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
PARRA	602170.7	3471263.6	1	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
PIONKE	600936.0	3468840.0	1	1	55	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
POOL	599683.6	3470013.8	1	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RAMIREZ	599730.7	3467584.4	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
RAY	607194.1	3468878.2	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
RODRIGUEZ	600696.6	3467464.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_596	600894.1	3468271.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_801	601092.4	3468676.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROGERS_803	600977.7	3468417.4	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ROGERS_E	599895.0	3468260.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ROLLINS	601096.0	3467670.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROSS	599665.9	3471480.0	2	2	55	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
RUIZ	602857.4	3471424.2	1	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
SCHWARTZ	600811.0	3468269.7	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
SHAFER	600496.7	3467463.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SILVESTRI	600251.4	3473493.0	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNBELT	605998.3	3471735.2	4	4	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUNNYSIDE	601293.2	3468476.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TV_236	600552.2	3467978.4	1	1	55	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93
TVI_875	600715.1	3468419.3	1	1	55	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19	149.19
TVI_SS2	600555.0	3467965.7	1	1	55	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93	46.93
UN-1	600000.0	3466342.7	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UN-2	600012.7	3465396.5	1	2	55	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27	242.27
UN-3	599949.2	3465796.6	1	1	55	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52
UN-4	601212.8	3466298.2	1	1	55	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68	107.68
UN-5	600742.9	3464444.0	1	2	55	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52	161.52
UNION_PACIFIC_RR	605916.3	3469131.0	2	2	9121	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VALENZUELA	600395.0	3468170.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
WALKER	607564.7	3468577.5	2	2	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
WEED	601434.4	3470924.5	2	2	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WEISKOPF	601155.0	3468658.9	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILSON_361	602002.2	3468181.0	1	1	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WILSON_362	601292.7	3468879.0	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
ZANDER	599678.9	3467998.5	1	1	55	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31

NOTES:

ıs per minute, as a continuous pumping rate.

ʰM = gallons per minute

APPENDIX G.4

AQUIFER RECHARGE DATA

TABLE G.4.1 - Recharge Rates Used for Model Calibration

Zone	Type	Concentration (mg/L)	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	SP 14	SP 15	SP 16	SP 17	SP 18
			1905-1909	1910-1914	1915-1919	1920-1924	1925-1929	1930-1939	1940-1949	1950-1953	1954-1955	1956-1960	1961-1965	1966	1967	1968	1969-1973	1974	1975-1984	1985-1986
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000
4	Warren Ranch Irr West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027
5	COB WWTP	46, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0072000	0.0072000	0.0072000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000
6	TVI South	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
8	Naco Sonora WWTP East	46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0012900	0.0012900	0.0012900	0.0012900	0.0012900	0.0012900	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000
11	Warren Ranch Irr East	250	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027
12	Horseshoe Pond	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000
13	Elevated East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000
14	Naco Sonora WWTP West	46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
16	Greenbush Draw/TVI	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
17	Stormwater Ponds West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027
18	Ejido Naco Phase I Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
19	Ejido Naco Phase I Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
20	Ejido Naco Phase II Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
21	Ejido Naco Phase II Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
22	Ejido Naco Phase III Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
35	SJWWTP Ponds	250, 8, 46	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027
36	Stormwater Ponds East	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027
37	No Flow	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Notes:
mg/L = milligrams per Liter

Rates listed are meters per day per model cell.

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate

TABLE G.4.1 - Recharge Rates Used for Model Calibration

Zone	Type	Concentration (mg/L)	SP 19	SP 20	SP 21	SP 22	SP 23	SP 24	SP 25	SP 26	SP 27	SP 28	SP 29	SP 30	SP 31	SP 32	SP 33	SP 34	SP 35
			1987-1991	1992-1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0145000	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0002550	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0045000	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0145000	0.0145000	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0000060	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0013338	0.0057110	0.0054412	0.0053264	0.0054181	0.0034993	0.0014076
16	Greenbush Draw/TVI	8, 46	0.0002550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0027338	0.0071110	0.0068412	0.0067264	0.0068181	0.0048993	0.0028076
17	Stormwater Ponds West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
18	Ejido Naco Phase I Zone 2	8	0.0002550	0.0002550	0.0017500	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0000027	0.0000027	0.0017500	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0002550	0.0002550	0.0002550	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0000027	0.0000027	0.0000300	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0032667	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
37	No Flow	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Notes:
mg/L = milligrams per Liter

Rates listed are meters per day per model cell.

8 mg/l Sulfate
46 mg/l Sulfate
250 mg/l Sulfate
2,500 mg/l Sulfate

TABLE G.4.2 - Recharge Rates for Alternative 1

Zone	Type	Concentration (mg/L)	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	SP 14	SP 15
			1905-1909	1910-1914	1915-1919	1920-1924	1925-1929	1930-1939	1940-1949	1950-1953	1954-1955	1956-1960	1961-1965	1966	1967	1968	1969-1973
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000
4	Warren Ranch Irr West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800
5	COB WWTP	46, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0072000	0.0072000	0.0072000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000
6	TVI South	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
8	Naco Sonora WWTP East	46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0012900	0.0012900	0.0012900	0.0012900	0.0012900
10	Former Evap Pond East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000
11	Warren Ranch Irr East	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800
12	Horseshoe Pond	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000
13	Elevated East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000
14	Naco Sonora WWTP West	8, 46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
16	Greenbush Draw/TVI	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
17	Stormwater Ponds West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800
18	Ejido Naco Phase I Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
19	Ejido Naco Phase I Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
20	Ejido Naco Phase II Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
21	Ejido Naco Phase II Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
22	Ejido Naco Phase III Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
35	SJWWTP Ponds	250, 8, 46	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800
36	Stormwater Ponds East	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800
37	No Flow	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Notes:
mg/L = milligrams per Liter

Rates listed are in meters per day per model cell

	8 mg/l Sulfate
	46 mg/l Sulfate
	250 mg/l Sulfate
	2,500 mg/l Sulfate

TABLE G.4.2 - Recharge Rates for Alternative 1

Zone	Type	Concentration (mg/L)	SP 16	SP 17	SP 18	SP 19	SP 20	SP 21	SP 22	SP 23	SP 24	SP 25	SP 26	SP 27	SP 28	SP 29	SP 30
			1974	1975-1984	1985-1986	1987-1991	1992-1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0012900	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250, 8	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0045000	0.0045000	0.0045000	0.0000060	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	8, 46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0013338	0.0057110
16	Greenbush Draw/TVI	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0027338	0.0071110
17	Stormwater Ponds West	250, 8	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
18	Ejido Naco Phase I Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0017500	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0017500	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000300	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46	0.0007800	0.0007800	0.0000027	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0032667	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
37	No Flow	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Notes:
mg/L = milligrams per Liter

Rates listed are in meters per day per model cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate

TABLE G.4.2 - Recharge Rates for Alternative 1

Zone	Type	Concentration (mg/L)	SP 31	SP 32	SP 33	SP 34	SP 35	SP 36	SP 37	SP 38	SP 39	SP 40	SP 41	SP 42	SP 43	SP 44	SP 45
			2008	2009	2010	2011	2012	2013	2014	2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	8, 46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	8, 46	0.0054412	0.0053264	0.0054181	0.0034993	0.0014076	0.0014050	0.0014050	0.0014050	0.0014050	0.0014050	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770
16	Greenbush Draw/TVI	8, 46	0.0068412	0.0067264	0.0068181	0.0048993	0.0028076	0.0028050	0.0028050	0.0028050	0.0028050	0.0028050	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770
17	Stormwater Ponds West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
18	Ejido Naco Phase I Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
37	No Flow	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Notes:
mg/L = milligrams per Liter

Rates listed are in meters per day per model cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate

TABLE G.4.2 - Recharge Rates for Alternative 1

Zone	Type	Concentration (mg/L)	SP 46	SP 47	SP 48	SP 49	SP 50	SP 51	SP 52	SP 53	SP 54	SP 55	SP 56	SP 57	SP 58	SP 59	SP 60
			2051-2055	2056-2060	2061-2065	2066-2070	2071-2075	2076-2080	2081-2085	2086-2090	2091-2095	2096-2100	2101-2105	2106-2110	2111-2115	2116-2120	2121-2125
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	8, 46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	8, 46	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770
16	Greenbush Draw/TVI	8, 46	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770
17	Stormwater Ponds West	250, 8	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
18	Ejido Naco Phase I Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
37	No Flow	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Notes:
mg/L = milligrams per Liter

Rates listed are in meters per day per model cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate

TABLE G.4.3 - Recharge Rates for Alternative 2

Zone	Type	Concentration (mg/L)	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	SP 14	SP 15	SP 16	SP 17	SP 18	SP 19	SP 20
			1905-1909	1910-1914	1915-1919	1920-1924	1925-1929	1930-1939	1940-1949	1950-1953	1954-1955	1956-1960	1961-1965	1966	1967	1968	1969-1973	1974	1975-1984	1985-1986	1987-1991	1992-1997
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0002550
4	Warren Ranch Irr West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027
5	COB WWTP	8, 46, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0072000	0.0072000	0.0072000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000
6	TVI South	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0014000
8	Naco Sonora WWTP East	8, 46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0012900	0.0012900	0.0012900	0.0012900	0.0012900	0.0012900	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0002550
11	Warren Ranch Irr East	250	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000
13	Elevated East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0000060	0.0000027
14	Naco Sonora WWTP West	8, 46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
16	Greenbush Draw/TVI	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0016550
17	Stormwater Ponds West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027
18	Ejido Naco Phase I Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
19	Ejido Naco Phase I Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
20	Ejido Naco Phase II Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
21	Ejido Naco Phase II Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
22	Ejido Naco Phase III Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
35	SJWWTP Ponds	250, 8, 46, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0043583	0.0043583
36	Stormwater Ponds East	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027
37	ALT 2A Discharge	8, 250	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
38	No Flow Cells	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Notes:
mg/L = milligrams per Liter

Rates are in meters per day per model cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate

CLEAR CREEK ASSOCIATES

TABLE G.4.3 - Recharge Rates for Alternative 2

Zone	Type	Concentration (mg/L)	SP 21	SP 22	SP 23	SP 24	SP 25	SP 26	SP 27	SP 28	SP 29	SP 30	SP 31	SP 32	SP 33	SP 34	SP 35	SP 36	SP 37	SP 38	SP 39	SP 40
			1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016-2020	2021-2025
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	8, 46, 8	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	8, 46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	8, 46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0013338	0.0057110	0.0054412	0.0053264	0.0054181	0.0034993	0.0014076	0.0014050	0.0014050	0.0014050	0.0014050	0.0014050
16	Greenbush Draw/TVI	8, 46	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0027338	0.0071110	0.0068412	0.0067264	0.0068181	0.0048993	0.0028076	0.0028050	0.0028050	0.0028050	0.0028050	0.0028050
17	Stormwater Ponds West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
18	Ejido Naco Phase I Zone 2	8	0.0017500	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0017500	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0002550	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0000300	0.0017000	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0002550	0.0002550	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46, 8	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0032667	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
37	ALT 2A Discharge	8, 250	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0130824	0.0130824	0.0130824
38	No Flow Cells	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Notes:
mg/L = milligrams per Liter

Rates are in meters per day per model cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate

TABLE G.4.3 - Recharge Rates for Alternative 2

Zone	Type	Concentration (mg/L)	SP 41	SP 42	SP 43	SP 44	SP 45	SP 46	SP 47	SP 48	SP 49	SP 50	SP 51	SP 52	SP 53	SP 54	SP 55	SP 56	SP 57	SP 58	SP 59	SP 60
			2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070	2071-2075	2076-2080	2081-2085	2086-2090	2091-2095	2096-2100	2101-2105	2106-2110	2111-2115	2116-2120	2121-2125
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	8, 46, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	8, 46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	8, 46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	8, 46	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0130824	0.0130824	0.0130824	0.0130824	0.0130824	0.0130824	0.0130824
16	Greenbush Draw/TVI	8, 46	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0144824	0.0144824	0.0144824	0.0144824	0.0144824	0.0144824	0.0144824
17	Stormwater Ponds West	250, 8	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
18	Ejido Naco Phase I Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
37	ALT 2A Discharge	8, 250	0.0130824	0.0130824	0.0130824	0.0130824	0.0130824	0.0130824	0.0130824	0.0130824	0.0115250	0.0115250	0.0115250	0.0115250	0.0115250	0.0115250	0.0115250	0.0115250	0.0115250	0.0115250	0.0115250	0.0115250
38	No Flow Cells	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Notes:
mg/L = milligrams per Liter

Rates are in meters per day per model cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate

TABLE G.4.4 - Recharge Rates for Alternative 3

Zone	Type	Concentration (mg/L)	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	SP 14	SP 15	SP 16	SP 17	SP 18	SP 19	SP 20	SP 21	SP 22
			1905-1909	1910-1914	1915-1919	1920-1924	1925-1929	1930-1939	1940-1949	1950-1953	1954-1955	1956-1960	1961-1965	1966	1967	1968	1969-1973	1974	1975-1984	1985-1986	1987-1991	1992-1997	1998	1999
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0072000	0.0072000	0.0072000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000
6	TVI South	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0012900	0.0012900	0.0012900	0.0012900	0.0012900	0.0012900	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0000060	0.0000027	0.0000027
14	Naco Sonora WWTP West	46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
16	Greenbush Draw/TVI	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0016550	0.0016550	0.0016550
17	Stormwater Ponds West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
18	Ejido Naco Phase I Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0017500	0.0017000
19	Ejido Naco Phase I Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0017500	0.0017000
20	Ejido Naco Phase II Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0017000
21	Ejido Naco Phase II Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000300	0.0017000
22	Ejido Naco Phase III Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
35	SJWWTP Ponds	250, 8, 46	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0043583	0.0043583	0.0043583	0.0043583
36	Stormwater Ponds East	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
37	ALT 3 Center Pivot (Alfalfa 1)	8, 4293	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
38	ALT 3 Center Pivot (Alfalfa 2)	250, 8, 4293	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
39	ALT 3 Center Pivot (Alfalfa 4)	250, 8, 4293	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
40	ALT 3 Center Pivot (Grass 2)	250, 8, 4347	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
41	No Flow Cells	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
42	ALT 3 Center Pivot (Grass 4)	250, 8, 4347	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550

Notes:
mg/L = milligrams per Liter

Rates listed are meters per day per cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate
- 4,293 mg/l Sulfate (Alfalfa)
- 4,347 mg/l Sulfate (Grass)

TABLE G.4.4 - Recharge Rates for Alternative 3

Zone	Type	Concentration (mg/L)	SP 23	SP 24	SP 25	SP 26	SP 27	SP 28	SP 29	SP 30	SP 31	SP 32	SP 33	SP 34	SP 35	SP 36	SP 37	SP 38	SP 39	SP 40	SP 41	SP 42	SP 43	SP 44
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0013338	0.0057110	0.0054412	0.0053264	0.0054181	0.0034993	0.0014076	0.0014050	0.0014050	0.0014050	0.0014050	0.0014050	0.0053770	0.0053770	0.0053770	0.0053770
16	Greenbush Draw/TVI	8, 46	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0027338	0.0071110	0.0068412	0.0067264	0.0068181	0.0048993	0.0028076	0.0028050	0.0028050	0.0028050	0.0028050	0.0028050	0.0067770	0.0067770	0.0067770	0.0067770
17	Stormwater Ponds West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
18	Ejido Naco Phase I Zone 2	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0032667	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
37	ALT 3 Center Pivot (Alfalfa 1)	8, 4293	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0009159	0.0009159	0.0009159	0.0009159	0.0009159	0.0009159	0.0009159
38	ALT 3 Center Pivot (Alfalfa 2)	250, 8, 4293	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0009159	0.0009159	0.0009159	0.0009159	0.0009159	0.0009159	0.0009159
39	ALT 3 Center Pivot (Alfalfa 4)	250, 8, 4293	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0009159	0.0009159	0.0009159	0.0009159	0.0009159	0.0009159	0.0009159
40	ALT 3 Center Pivot (Grass 2)	250, 8, 4347	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0001991	0.0001991	0.0001991	0.0001991	0.0001991	0.0001991	0.0001991
41	No Flow Cells	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
42	ALT 3 Center Pivot (Grass 4)	250, 8, 4347	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0001991	0.0001991	0.0001991	0.0001991	0.0001991	0.0001991	0.0001991

Notes:
mg/L = milligrams per Liter

Rates listed are meters per day per cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate
- 4,293 mg/l Sulfate (Alfalfa)
- 4,347 mg/l Sulfate (Grass)

CLEAR CREEK ASSOCIATES

TABLE G.4.4 - Recharge Rates for Alternative 3

Zone	Type	Concentration (mg/L)	SP 45	SP 46	SP 47	SP 48	SP 49	SP 50	SP 51	SP 52	SP 53	SP 54	SP 55	SP 56	SP 57	SP 58	SP 59	SP 60
			2046-2050	2051-2055	2056-2060	2061-2065	2066-2070	2071-2075	2076-2080	2081-2085	2086-2090	2091-2095	2096-2100	2101-2105	2106-2110	2111-2115	2116-2120	2121-2125
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	46	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770	0.0053770
16	Greenbush Draw/TVI	8, 46	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770	0.0067770
17	Stormwater Ponds West	250, 8	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
18	Ejido Naco Phase I Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
37	ALT 3 Center Pivot (Alfalfa 1)	8, 4293	0.0009159	0.0009159	0.0009159	0.0009159	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650
38	ALT 3 Center Pivot (Alfalfa 2)	250, 8, 4293	0.0009159	0.0009159	0.0009159	0.0009159	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650
39	ALT 3 Center Pivot (Alfalfa 4)	250, 8, 4293	0.0009159	0.0009159	0.0009159	0.0009159	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650	0.0008650
40	ALT 3 Center Pivot (Grass 2)	250, 8, 4347	0.0001991	0.0001991	0.0001991	0.0001991	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880
41	No Flow Cells	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
42	ALT 3 Center Pivot (Grass 4)	250, 8, 4347	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880	0.0001880

Notes:
mg/L = milligrams per Liter

Rates listed are meters per day per cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate
- 4,293 mg/l Sulfate (Alfalfa)
- 4,347 mg/l Sulfate (Grass)

TABLE G.4.5 - Recharge Rates for Alternative 4

Zone	Type	Concentration (mg/L)	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	SP 14	SP 15	SP 16	SP 17	SP 18	SP 19	SP 20	SP 21	SP 22
			1905-1909	1910-1914	1915-1919	1920-1924	1925-1929	1930-1939	1940-1949	1950-1953	1954-1955	1956-1960	1961-1965	1966	1967	1968	1969-1973	1974	1975-1984	1985-1986	1987-1991	1992-1997	1998	1999
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0072000	0.0072000	0.0072000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000
6	TVI South	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0012900	0.0012900	0.0012900	0.0012900	0.0012900	0.0012900	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0145000	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0045000	0.0000060	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
16	Greenbush Draw/TVI	8, 46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0016550	0.0016550	0.0016550
17	Stormwater Ponds West	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
18	Ejido Naco Phase I Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0017500	0.0017000
19	Ejido Naco Phase I Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0017500	0.0017000
20	Ejido Naco Phase II Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0017000
21	Ejido Naco Phase II Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000300	0.0017000
22	Ejido Naco Phase III Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
35	SJWWTP Ponds	250, 8, 46	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0043583	0.0043583	0.0043583	0.0043583
36	Stormwater Ponds East	250, 8	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
37	ALT 4 Alfalfa Pivot (Zone 1)	8, 8146	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
38	ALT 4 Alfalfa Pivot (Zone 2)	8, 8146	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
39	ALT 4 Alfalfa Pivot (Zone 4)	250, 8, 8146	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
40	ALT 4 Grass Pivot (Zone 4)	250, 8, 8146	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
41	No Flow Cells	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
42	ALT 4 Grass Pivot/Off (Zone 11)	250, 8, 8146	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
43	ALT 4 Grass Pivot/Off (Zone 4)	250, 8, 8146	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
44	ALT 4 Alf/Grass Pivot (Zone 4)	250, 8, 8146	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0007800	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
45	Discharge to Greenbush Draw	8,250	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550

Notes:
mg/L = milligrams per Liter

Rates are meters per day per model cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate
- 4,293 mg/l Sulfate
- 4,347 mg/l Sulfate

CLEAR CREEK ASSOCIATES

TABLE G.4.5 - Recharge Rates for Alternative 4

Zone	Type	Concentration (mg/L)	SP 23	SP 24	SP 25	SP 26	SP 27	SP 28	SP 29	SP 30	SP 31	SP 32	SP 33	SP 34	SP 35	SP 36	SP 37	SP 38	SP 39	SP 40	SP 41	SP 42	SP 43	SP 44
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0108000	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	46	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0018673	0.0079954	0.0076177	0.0074569	0.0075853	0.0048991	0.0019706	0.0019671	0.0019671	0.0019671	0.0019671	0.0019671	0.0075278	0.0075278	0.0075278	0.0075278
16	Greenbush Draw/TVI	8, 46	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0016550	0.0032673	0.0093954	0.0090177	0.0088569	0.0089853	0.0062991	0.0033706	0.0033671	0.0033671	0.0033671	0.0033671	0.0033671	0.0089278	0.0089278	0.0089278	0.0089278
17	Stormwater Ponds West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
18	Ejido Naco Phase I Zone 2	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0017000	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0015500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46	0.0043583	0.0043583	0.0043583	0.0043583	0.0043583	0.0032667	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
37	ALT 4 Alfalfa Pivot (Zone 1)	8, 8146	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0008466	0.0008466	0.0008466	0.0008466	0.0008466	0.0008466
38	ALT 4 Alfalfa Pivot (Zone 2)	8, 8146	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0008466	0.0008466	0.0008466	0.0008466	0.0008466	0.0008466
39	ALT 4 Alfalfa Pivot (Zone 4)	250, 8, 8146	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0008466	0.0008466	0.0008466	0.0008466	0.0008466	0.0008466
40	ALT 4 Grass Pivot (Zone 4)	250, 8, 8146	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0001692	0.0001692	0.0001692	0.0001692	0.0001692	0.0001692
41	No Flow Cells	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
42	ALT 4 Grass Pivot/Off (Zone 11)	250, 8, 8146	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0001692	0.0001692	0.0001692	0.0001692	0.0001692	0.0001692
43	ALT 4 Grass Pivot/Off (Zone 4)	250, 8, 8146	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0001692	0.0001692	0.0001692	0.0001692	0.0001692	0.0001692
44	ALT 4 Alf/Grass Pivot (Zone 4)	250, 8, 8146	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0008466	0.0008466	0.0008466	0.0008466	0.0008466	0.0008466
45	Discharge to Greenbush Draw	8,250	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0249188	0.0249188	0.0249188	0.0249188	0.0249188	0.0249188

Notes:
mg/L = milligrams per Liter

Rates are meters per day per model cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate
- 4,293 mg/l Sulfate
- 4,347 mg/l Sulfate

TABLE G.4.5 - Recharge Rates for Alternative 4

Zone	Type	Concentration (mg/L)	SP 45	SP 46	SP 47	SP 48	SP 49	SP 50	SP 51	SP 52	SP 53	SP 54	SP 55	SP 56	SP 57	SP 58	SP 59	SP 60
			2046-2050	2051-2055	2056-2060	2061-2065	2066-2070	2071-2075	2076-2080	2081-2085	2086-2090	2091-2095	2096-2100	2101-2105	2106-2110	2111-2115	2116-2120	2121-2125
1	Washes	8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
2	Background	8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
3	Former Evap Pond West	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
4	Warren Ranch Irr West	250, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
5	COB WWTP	46, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
6	TVI South	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
7	TVI North	8	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000	0.0014000
8	Naco Sonora WWTP East	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
9	Ejido Naco Start	8	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000	0.0018000
10	Former Evap Pond East	2500, 8	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550
11	Warren Ranch Irr East	250	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
12	Horseshoe Pond	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
13	Elevated East	2500, 8	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
14	Naco Sonora WWTP West	46	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000	0.0068000
15	Greenbush Draw SJWWTP	46	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278	0.0075278
16	Greenbush Draw/TVI	8, 46	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278	0.0089278
17	Stormwater Ponds West	250, 8	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
18	Ejido Naco Phase I Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
19	Ejido Naco Phase I Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
20	Ejido Naco Phase II Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
21	Ejido Naco Phase II Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
22	Ejido Naco Phase III Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
23	Ejido Naco Phase IV Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
24	Ejido Naco Phase IV Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
25	Ejido Naco Phase V Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
26	Ejido Naco Phase V Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
27	Ejido Naco Phase VI Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
28	Ejido Naco Phase VI Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
29	Ejido Naco Phase VII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
30	Ejido Naco Phase VII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
31	Ejido Naco Phase VIII Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
32	Ejido Naco Phase VIII Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
33	Ejido Naco Phase IX Zone 2	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
34	Ejido Naco Phase IX Zone 1	8	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500	0.0014500
35	SJWWTP Ponds	250, 8, 46	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
36	Stormwater Ponds East	250, 8	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140	0.0006140
37	ALT 4 Alfalfa Pivot (Zone 1)	8, 8146	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777
38	ALT 4 Alfalfa Pivot (Zone 2)	8, 8146	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777
39	ALT 4 Alfalfa Pivot (Zone 4)	250, 8, 8146	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777	0.0006777
40	ALT 4 Grass Pivot (Zone 4)	250, 8, 8146	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555
41	No Flow Cells	0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
42	ALT 4 Grass Pivot/Off (Zone 11)	250, 8, 8146	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
43	ALT 4 Grass Pivot/Off (Zone 4)	250, 8, 8146	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
44	ALT 4 Alf/Grass Pivot (Zone 4)	250, 8, 8146	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555	0.0002555
45	Discharge to Greenbush Draw	8,250	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550	0.0002550

Notes:
mg/L = milligrams per Liter

Rates are meters per day per model cell

- 8 mg/l Sulfate
- 46 mg/l Sulfate
- 250 mg/l Sulfate
- 2,500 mg/l Sulfate
- 4,293 mg/l Sulfate
- 4,347 mg/l Sulfate

APPENDIX G.5

GROUNDWATER MODEL STATISTICS

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
2	29544	11/21/1985	601281.2	3468770.2	1	1366.70	1357.04	1	9.65
2	37684	3/5/2008	601281.2	3468770.2	1	1354.47	1352.81	1	1.67
2	37749	5/9/2008	601281.2	3468770.2	1	1354.29	1352.75	1	1.54
2	37816	7/15/2008	601281.2	3468770.2	1	1354.23	1352.70	1	1.53
2	37909	10/16/2008	601281.2	3468770.2	1	1354.30	1352.62	1	1.68
2	38014	1/29/2009	601281.2	3468770.2	1	1354.30	1352.54	1	1.75
2	38091	4/16/2009	601281.2	3468770.2	1	1354.15	1352.49	1	1.66
2	38182	7/16/2009	601281.2	3468770.2	1	1353.97	1352.42	1	1.54
2	38271	10/13/2009	601281.2	3468770.2	1	1353.87	1352.36	1	1.51
2	38378	1/28/2010	601281.2	3468770.2	1	1353.83	1352.29	1	1.54
2	38462	4/22/2010	601281.2	3468770.2	1	1353.80	1352.24	1	1.56
2	38551	7/20/2010	601281.2	3468770.2	1	1353.54	1352.19	1	1.35
2	38642	10/19/2010	601281.2	3468770.2	1	1353.43	1352.14	1	1.29
2	38733	1/18/2011	601281.2	3468770.2	1	1353.43	1352.08	1	1.35
2	38817	4/12/2011	601281.2	3468770.2	1	1353.21	1352.02	1	1.19
2	38954	8/27/2011	601281.2	3468770.2	1	1353.04	1351.92	1	1.12
2	39000	10/12/2011	601281.2	3468770.2	1	1352.97	1351.89	1	1.09
2	39113	2/2/2012	601281.2	3468770.2	1	1352.96	1351.80	1	1.15
2	39185	4/14/2012	601281.2	3468770.2	1	1352.86	1351.74	1	1.12
2	39338	9/14/2012	601281.2	3468770.2	1	1352.59	1351.62	1	0.97
2	39371	10/17/2012	601281.2	3468770.2	1	1352.54	1351.60	1	0.95
3	37664	2/14/2008	607378.6	3470648.3	4	1429.54	1411.71	1	17.83
3	37755	5/15/2008	607378.6	3470648.3	4	1428.26	1411.71	1	16.56
3	37826	7/25/2008	607378.6	3470648.3	4	1427.84	1411.70	1	16.14
3	37910	10/17/2008	607378.6	3470648.3	4	1429.23	1411.70	1	17.52
3	38006	1/21/2009	607378.6	3470648.3	4	1428.54	1411.70	1	16.84
3	38083	4/8/2009	607378.6	3470648.3	4	1428.02	1411.70	1	16.33
3	38175	7/9/2009	607378.6	3470648.3	4	1427.37	1411.69	1	15.68
3	38264	10/6/2009	607378.6	3470648.3	4	1426.91	1411.69	1	15.22
3	38372	1/22/2010	607378.6	3470648.3	4	1426.45	1411.69	1	14.76
3	38462	4/22/2010	607378.6	3470648.3	4	1426.02	1411.69	1	14.33
3	38551	7/20/2010	607378.6	3470648.3	4	1425.53	1411.68	1	13.84
3	38734	1/19/2011	607378.6	3470648.3	4	1426.93	1411.68	1	15.25
3	38909	7/13/2011	607378.6	3470648.3	4	1425.63	1411.67	1	13.96
3	39115	2/4/2012	607378.6	3470648.3	4	1426.08	1411.67	1	14.41
3	39273	7/11/2012	607378.6	3470648.3	4	1425.31	1411.66	1	13.64
101	37915	10/22/2008	601752.6	3464463.1	1	1388.90	1354.98	1	33.92
102	37915	10/22/2008	601885.9	3465282.2	1	1380.50	1351.90	1	28.60
103	29734	5/30/1986	602355.8	3465212.4	1	1374.40	1356.53	1	17.87
103	37915	10/22/2008	602355.8	3465212.4	1	1376.74	1353.88	1	22.86
105	37915	10/22/2008	602139.9	3466050.6	1	1362.84	1351.16	1	11.68
106	37915	10/22/2008	601962.1	3466114.1	1	1380.42	1351.03	1	29.39
201	37908	10/15/2008	600000.0	3466342.7	1	1349.06	1350.07	1	-1.01
202	29704	4/30/1986	600012.7	3465396.5	1	1365.40	1352.79	1	12.61
202	33312	3/16/1996	600012.7	3465396.5	1	1366.62	1353.06	1	13.56
203	33312	3/16/1996	599949.2	3465796.6	1	1376.54	1352.74	1	23.80
205	37908	10/15/2008	600742.9	3464444.0	1	1364.75	1349.67	1	15.08
1000	29545	11/22/1985	602015.5	3471241.2	1	1372.82	1362.01	1	10.81
1002	23829	3/30/1970	599662.0	3472012.3	1	1418.84	1392.10	1	26.74
1002	31384	12/5/1990	599662.0	3472012.3	1	1367.64	1392.10	1	-24.46
1002	35403	12/6/2001	599662.0	3472012.3	1	1367.94	1392.10	1	-24.16
1002	37222	11/29/2006	599662.0	3472012.3	1	1367.94	1392.10	1	-24.16
1004	31386	12/7/1990	599589.4	3467365.4	1	1360.93	1352.58	1	8.35
1004	33996	1/29/1998	599589.4	3467365.4	1	1356.97	1352.25	1	4.72
1004	35403	12/6/2001	599589.4	3467365.4	1	1354.23	1351.30	1	2.93
1004	37229	12/6/2006	599589.4	3467365.4	1	1352.70	1349.85	1	2.85
1005	31384	12/5/1990	602469.9	3471904.0	2	1372.82	1364.79	1	8.03
1005	35403	12/6/2001	602469.9	3471904.0	2	1372.51	1358.45	1	14.06
1005	37228	12/5/2006	602469.9	3471904.0	2	1372.82	1356.45	1	16.37
1006	26563	9/23/1977	602681.0	3470988.4	1	1371.90	1363.29	1	8.62
1006	31385	12/6/1990	602681.0	3470988.4	1	1369.16	1362.06	1	7.10
1006	35402	12/5/2001	602681.0	3470988.4	1	1359.41	1357.58	1	1.83
1006	37229	12/6/2006	602681.0	3470988.4	1	1357.27	1355.36	1	1.91
1007	24047	11/3/1970	602495.2	3471078.9	1	1370.99	1364.45	1	6.54

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
1008	16802	1/2/1951	602639.8	3469060.2	1	1391.41	1366.38	1	25.03
1010	4903	6/5/1918	605680.5	3468876.9	2	1385.93	1400.11	1	-14.18
1011	31385	12/6/1990	605386.8	3468962.6	2	1397.20	1393.29	1	3.91
1011	35397	11/30/2001	605386.8	3468962.6	2	1400.56	1386.65	1	13.91
1011	37222	11/29/2006	605386.8	3468962.6	2	1401.17	1384.31	1	16.85
1016	29346	5/7/1985	600555.0	3467965.7	1	1365.81	1354.12	1	11.68
1020	17533	1/2/1953	598964.8	3468753.7	1	1352.40	1357.77	1	-5.37
71891	31384	12/5/1990	602123.9	3471229.3	1	1365.67	1361.23	1	4.44
71891	34682	12/16/1999	602123.9	3471229.3	1	1358.05	1358.63	1	-0.59
71891	35397	11/30/2001	602123.9	3471229.3	1	1357.13	1357.78	1	-0.65
71891	37222	11/29/2006	602123.9	3471229.3	1	1357.44	1355.68	1	1.76
71891	37685	3/6/2008	602123.9	3471229.3	1	1353.38	1355.18	1	-1.79
71891	37756	5/16/2008	602123.9	3471229.3	1	1353.92	1355.11	1	-1.18
71891	37833	8/1/2008	602123.9	3471229.3	1	1353.83	1355.03	1	-1.20
71891	37914	10/21/2008	602123.9	3471229.3	1	1353.75	1354.95	1	-1.20
71891	38028	2/12/2009	602123.9	3471229.3	1	1353.55	1354.84	1	-1.29
71891	38096	4/21/2009	602123.9	3471229.3	1	1353.64	1354.78	1	-1.15
71891	38182	7/16/2009	602123.9	3471229.3	1	1353.60	1354.70	1	-1.10
71891	38273	10/15/2009	602123.9	3471229.3	1	1353.48	1354.62	1	-1.15
71891	38383	2/2/2010	602123.9	3471229.3	1	1353.36	1354.53	1	-1.17
71891	38489	5/19/2010	602123.9	3471229.3	1	1353.28	1354.44	1	-1.17
71891	38548	7/17/2010	602123.9	3471229.3	1	1353.21	1354.39	1	-1.19
71891	38643	10/20/2010	602123.9	3471229.3	1	1353.14	1354.32	1	-1.18
71891	38735	1/20/2011	602123.9	3471229.3	1	1353.00	1354.25	1	-1.24
71891	38810	4/5/2011	602123.9	3471229.3	1	1352.90	1354.19	1	-1.29
71891	38909	7/13/2011	602123.9	3471229.3	1	1352.87	1354.12	1	-1.25
71891	39001	10/13/2011	602123.9	3471229.3	1	1352.72	1354.05	1	-1.33
71891	39119	2/8/2012	602123.9	3471229.3	1	1352.58	1353.97	1	-1.38
71891	39184	4/13/2012	602123.9	3471229.3	1	1352.51	1353.92	1	-1.41
71891	39281	7/19/2012	602123.9	3471229.3	1	1352.45	1353.86	1	-1.41
71891	39359	10/5/2012	602123.9	3471229.3	1	1352.37	1353.80	1	-1.44
76413	38008	1/23/2009	605311.7	3469321.0	2	1382.61	1379.74	1	2.87
76413	38085	4/10/2009	605311.7	3469321.0	2	1382.34	1379.69	1	2.65
76413	38176	7/10/2009	605311.7	3469321.0	2	1380.68	1379.63	1	1.05
76413	38265	10/7/2009	605311.7	3469321.0	2	1378.98	1379.58	1	-0.60
76413	38372	1/22/2010	605311.7	3469321.0	2	1379.06	1379.51	1	-0.45
76413	38461	4/21/2010	605311.7	3469321.0	2	1379.00	1379.45	1	-0.44
76413	38552	7/21/2010	605311.7	3469321.0	2	1377.58	1379.39	1	-1.81
76413	38642	10/19/2010	605311.7	3469321.0	2	1376.18	1379.33	1	-3.16
76413	38911	7/15/2011	605311.7	3469321.0	2	1376.97	1379.21	1	-2.24
76413	38953	8/26/2011	605311.7	3469321.0	2	1377.24	1379.19	1	-1.94
76413	39118	2/7/2012	605311.7	3469321.0	2	1378.40	1379.11	1	-0.71
76413	39141	3/1/2012	605311.7	3469321.0	2	1378.33	1379.10	1	-0.77
76413	39156	3/16/2012	605311.7	3469321.0	2	1378.23	1379.09	1	-0.86
76413	39184	4/13/2012	605311.7	3469321.0	2	1378.47	1379.08	1	-0.61
76413	39272	7/10/2012	605311.7	3469321.0	2	1378.01	1379.04	1	-1.04
85010	27760	1/2/1981	606201.1	3469047.5	2	1377.99	1399.81	1	-21.83
85010	37753	5/13/2008	606201.1	3469047.5	2	1359.85	1395.46	1	-35.61
86091	27731	12/4/1980	598685.9	3468855.0	1	1351.27	1348.28	1	2.99
86775	27760	1/2/1981	601262.7	3472095.0	2	1366.76	1357.64	1	9.13
86775	30488	6/22/1988	601262.7	3472095.0	2	1369.53	1357.80	1	11.73
200393	36110	11/13/2003	607564.7	3468577.5	2	1390.97	1396.70	1	-5.73
200393	37664	2/14/2008	607564.7	3468577.5	2	1394.87	1396.25	1	-1.38
200393	37825	7/24/2008	607564.7	3468577.5	2	1389.55	1396.22	1	-6.67
200393	38048	3/4/2009	607564.7	3468577.5	2	1393.96	1396.19	1	-2.23
201531	36174	1/16/2004	605998.3	3471735.2	4	1374.81	1409.30	1	-34.49
201531	37657	2/7/2008	605998.3	3471735.2	4	1357.71	1408.13	1	-50.42
201531	37756	5/16/2008	605998.3	3471735.2	4	1355.61	1408.13	1	-52.51
201531	37910	10/17/2008	605998.3	3471735.2	4	1359.26	1408.12	1	-48.85
201531	38007	1/22/2009	605998.3	3471735.2	4	1359.94	1408.11	1	-48.17
201531	38086	4/11/2009	605998.3	3471735.2	4	1358.46	1408.11	1	-49.65
201531	38175	7/9/2009	605998.3	3471735.2	4	1356.22	1408.10	1	-51.88
203321	36333	6/23/2004	601153.9	3468350.8	1	1351.78	1353.61	1	-1.83
203321	37928	11/4/2008	601153.9	3468350.8	1	1354.38	1352.32	1	2.06

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
203321	38105	4/30/2009	601153.9	3468350.8	1	1354.83	1352.20	1	2.63
203321	38239	9/11/2009	601153.9	3468350.8	1	1356.05	1352.11	1	3.94
203321	38268	10/10/2009	601153.9	3468350.8	1	1356.36	1352.10	1	4.26
205126	36566	2/11/2005	599678.9	3467998.5	1	1345.98	1349.91	1	-3.93
205126	37655	2/5/2008	599678.9	3467998.5	1	1352.12	1349.59	1	2.53
205126	37747	5/7/2008	599678.9	3467998.5	1	1351.97	1349.55	1	2.42
205126	37818	7/17/2008	599678.9	3467998.5	1	1351.65	1349.52	1	2.13
205126	37922	10/29/2008	599678.9	3467998.5	1	1351.77	1349.47	1	2.29
205126	38027	2/11/2009	599678.9	3467998.5	1	1352.13	1349.43	1	2.70
205126	38092	4/17/2009	599678.9	3467998.5	1	1352.09	1349.40	1	2.69
205126	38181	7/15/2009	599678.9	3467998.5	1	1351.73	1349.37	1	2.36
205126	38272	10/14/2009	599678.9	3467998.5	1	1351.54	1349.33	1	2.20
205126	38377	1/27/2010	599678.9	3467998.5	1	1351.67	1349.29	1	2.38
205126	38463	4/23/2010	599678.9	3467998.5	1	1351.69	1349.26	1	2.42
205126	38553	7/22/2010	599678.9	3467998.5	1	1351.22	1349.23	1	1.99
205126	38643	10/20/2010	599678.9	3467998.5	1	1351.22	1349.19	1	2.03
205126	38734	1/19/2011	599678.9	3467998.5	1	1351.22	1349.14	1	2.08
205126	38812	4/7/2011	599678.9	3467998.5	1	1351.21	1349.06	1	2.15
205126	38910	7/14/2011	599678.9	3467998.5	1	1350.88	1348.96	1	1.92
205126	39001	10/13/2011	599678.9	3467998.5	1	1350.70	1348.88	1	1.82
205126	39112	2/1/2012	599678.9	3467998.5	1	1350.76	1348.79	1	1.97
205126	39182	4/11/2012	599678.9	3467998.5	1	1350.66	1348.72	1	1.94
205126	39280	7/18/2012	599678.9	3467998.5	1	1350.36	1348.63	1	1.73
205126	39363	10/9/2012	599678.9	3467998.5	1	1350.27	1348.56	1	1.71
209737	36845	11/17/2005	601495.7	3468680.0	1	1354.84	1353.71	1	1.13
209744	36844	11/16/2005	599879.2	3468119.0	1	1352.10	1350.05	1	2.05
209744	37657	2/7/2008	599879.2	3468119.0	1	1352.51	1349.97	1	2.54
209744	37747	5/7/2008	599879.2	3468119.0	1	1352.32	1349.92	1	2.40
209744	37818	7/17/2008	599879.2	3468119.0	1	1352.03	1349.89	1	2.14
209744	37922	10/29/2008	599879.2	3468119.0	1	1352.14	1349.84	1	2.31
209744	38014	1/29/2009	599879.2	3468119.0	1	1352.44	1349.79	1	2.65
209744	38092	4/17/2009	599879.2	3468119.0	1	1352.41	1349.76	1	2.65
209744	38181	7/15/2009	599879.2	3468119.0	1	1352.08	1349.72	1	2.36
209744	38272	10/14/2009	599879.2	3468119.0	1	1351.90	1349.68	1	2.22
209744	38377	1/27/2010	599879.2	3468119.0	1	1352.02	1349.64	1	2.38
209744	38461	4/21/2010	599879.2	3468119.0	1	1352.02	1349.61	1	2.41
209744	38547	7/16/2010	599879.2	3468119.0	1	1351.71	1349.58	1	2.13
209744	38643	10/20/2010	599879.2	3468119.0	1	1351.59	1349.54	1	2.05
209744	38734	1/19/2011	599879.2	3468119.0	1	1351.67	1349.49	1	2.18
209744	38812	4/7/2011	599879.2	3468119.0	1	1351.52	1349.39	1	2.13
209744	38915	7/19/2011	599879.2	3468119.0	1	1350.76	1349.28	1	1.48
209744	39000	10/12/2011	599879.2	3468119.0	1	1350.37	1349.21	1	1.16
209744	39118	2/7/2012	599879.2	3468119.0	1	1351.11	1349.10	1	2.00
209744	39195	4/24/2012	599879.2	3468119.0	1	1350.96	1349.01	1	1.95
209744	39280	7/18/2012	599879.2	3468119.0	1	1350.67	1348.92	1	1.75
209744	39364	10/10/2012	599879.2	3468119.0	1	1350.58	1348.85	1	1.73
210865	37052	6/12/2006	600811.0	3468269.7	1	1353.77	1352.30	1	1.46
210865	37659	2/9/2008	600811.0	3468269.7	1	1354.13	1352.02	1	2.12
210865	37760	5/20/2008	600811.0	3468269.7	1	1353.62	1351.90	1	1.71
210865	37831	7/30/2008	600811.0	3468269.7	1	1353.88	1351.84	1	2.03
210865	37916	10/23/2008	600811.0	3468269.7	1	1353.65	1351.79	1	1.86
210865	38015	1/30/2009	600811.0	3468269.7	1	1353.81	1351.72	1	2.08
210865	38040	2/24/2009	600811.0	3468269.7	1	1353.86	1351.71	1	2.15
210865	38093	4/18/2009	600811.0	3468269.7	1	1353.60	1351.67	1	1.93
210865	38177	7/11/2009	600811.0	3468269.7	1	1353.42	1351.62	1	1.80
210865	38265	10/7/2009	600811.0	3468269.7	1	1353.29	1351.57	1	1.73
210865	38373	1/23/2010	600811.0	3468269.7	1	1353.36	1351.51	1	1.86
210865	38462	4/22/2010	600811.0	3468269.7	1	1353.26	1351.47	1	1.79
210865	38553	7/22/2010	600811.0	3468269.7	1	1352.91	1351.43	1	1.48
210865	38643	10/20/2010	600811.0	3468269.7	1	1352.76	1351.38	1	1.38
210865	38733	1/18/2011	600811.0	3468269.7	1	1353.05	1351.33	1	1.72
210865	38817	4/12/2011	600811.0	3468269.7	1	1352.39	1351.24	1	1.15
210865	38915	7/19/2011	600811.0	3468269.7	1	1352.34	1351.16	1	1.18
210865	39001	10/13/2011	600811.0	3468269.7	1	1352.39	1351.10	1	1.29

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
210865	39118	2/7/2012	600811.0	3468269.7	1	1352.44	1351.00	1	1.45
210865	39182	4/11/2012	600811.0	3468269.7	1	1352.31	1350.92	1	1.39
210865	39279	7/17/2012	600811.0	3468269.7	1	1351.99	1350.83	1	1.16
210865	39372	10/18/2012	600811.0	3468269.7	1	1351.94	1350.76	1	1.19
211345	37292	2/7/2007	599722.5	3472503.3	3	1345.73	1345.74	1	-0.01
211345	37734	4/24/2008	599722.5	3472503.3	3	1301.20	1345.38	1	-44.18
211345	37838	8/6/2008	599722.5	3472503.3	3	1300.40	1345.30	1	-44.90
211345	38043	2/27/2009	599722.5	3472503.3	3	1300.37	1345.18	1	-44.81
211345	38527	6/26/2010	599722.5	3472503.3	3	1301.44	1344.90	1	-43.46
212268	37174	10/12/2006	602230.1	3473029.8	4	1293.36	1351.96	1	-58.61
212268	37733	4/23/2008	602230.1	3473029.8	4	1295.32	1351.83	1	-56.51
212268	37838	8/6/2008	602230.1	3473029.8	4	1295.53	1351.82	1	-56.28
212268	37914	10/21/2008	602230.1	3473029.8	4	1295.83	1351.81	1	-55.97
212268	37922	10/29/2008	602230.1	3473029.8	4	1295.83	1351.81	1	-55.98
212268	38028	2/12/2009	602230.1	3473029.8	4	1296.13	1351.81	1	-55.68
212268	38036	2/20/2009	602230.1	3473029.8	4	1296.13	1351.80	1	-55.67
212268	38104	4/29/2009	602230.1	3473029.8	4	1296.19	1351.79	1	-55.60
212268	38217	8/20/2009	602230.1	3473029.8	4	1296.51	1351.79	1	-55.28
212268	38412	3/3/2010	602230.1	3473029.8	4	1296.51	1351.79	1	-55.28
212447	37064	6/24/2006	607153.3	3469063.9	2	1377.37	1396.34	1	-18.97
212447	37916	10/23/2008	607153.3	3469063.9	2	1402.79	1396.13	1	6.66
212447	38007	1/22/2009	607153.3	3469063.9	2	1402.77	1396.11	1	6.65
212447	38085	4/10/2009	607153.3	3469063.9	2	1402.09	1396.10	1	5.99
212447	38180	7/14/2009	607153.3	3469063.9	2	1398.42	1396.09	1	2.33
212447	38267	10/9/2009	607153.3	3469063.9	2	1398.04	1396.07	1	1.97
212447	38376	1/26/2010	607153.3	3469063.9	2	1398.87	1396.05	1	2.82
212447	38461	4/21/2010	607153.3	3469063.9	2	1395.71	1396.03	1	-0.32
212447	38546	7/15/2010	607153.3	3469063.9	2	1378.63	1396.01	1	-17.38
214612	37414	6/9/2007	598847.4	3472874.0	3	1255.78	1344.99	1	-89.21
216018	37508	9/11/2007	599895.4	3468264.0	1	1355.04	1349.98	1	5.05
216018	37819	7/18/2008	599895.4	3468264.0	1	1353.62	1349.88	1	3.74
216018	37921	10/28/2008	599895.4	3468264.0	1	1353.47	1349.83	1	3.64
216018	37928	11/4/2008	599895.4	3468264.0	1	1353.47	1349.83	1	3.64
216018	38027	2/11/2009	599895.4	3468264.0	1	1353.81	1349.78	1	4.03
216018	38092	4/17/2009	599895.4	3468264.0	1	1353.66	1349.75	1	3.91
216018	38180	7/14/2009	599895.4	3468264.0	1	1353.42	1349.71	1	3.71
216018	38265	10/7/2009	599895.4	3468264.0	1	1353.28	1349.68	1	3.61
216018	38376	1/26/2010	599895.4	3468264.0	1	1353.32	1349.63	1	3.69
216018	38462	4/22/2010	599895.4	3468264.0	1	1353.22	1349.60	1	3.62
216018	38588	8/26/2010	599895.4	3468264.0	1	1353.16	1349.55	1	3.61
216018	38643	10/20/2010	599895.4	3468264.0	1	1353.03	1349.53	1	3.51
216018	39002	10/14/2011	599895.4	3468264.0	1	1352.36	1349.18	1	3.18
216018	39111	1/31/2012	599895.4	3468264.0	1	1352.43	1349.07	1	3.36
216018	39182	4/11/2012	599895.4	3468264.0	1	1352.25	1348.96	1	3.29
216018	39280	7/18/2012	599895.4	3468264.0	1	1351.96	1348.86	1	3.10
216425	37580	11/22/2007	599730.7	3467584.4	1	1309.61	1349.90	1	-40.29
216425	37921	10/28/2008	599730.7	3467584.4	1	1352.45	1349.77	1	2.68
216425	38015	1/30/2009	599730.7	3467584.4	1	1352.66	1349.73	1	2.93
216425	38092	4/17/2009	599730.7	3467584.4	1	1352.69	1349.70	1	2.99
216425	38177	7/11/2009	599730.7	3467584.4	1	1352.39	1349.67	1	2.72
216425	38265	10/7/2009	599730.7	3467584.4	1	1352.17	1349.63	1	2.54
216425	38376	1/26/2010	599730.7	3467584.4	1	1352.25	1349.58	1	2.66
216425	38462	4/22/2010	599730.7	3467584.4	1	1352.29	1349.56	1	2.73
216425	38553	7/22/2010	599730.7	3467584.4	1	1351.96	1349.52	1	2.43
216425	38643	10/20/2010	599730.7	3467584.4	1	1351.90	1349.49	1	2.42
216425	38734	1/19/2011	599730.7	3467584.4	1	1351.91	1349.44	1	2.46
216425	38817	4/12/2011	599730.7	3467584.4	1	1351.83	1349.37	1	2.46
216425	38915	7/19/2011	599730.7	3467584.4	1	1351.55	1349.29	1	2.26
216425	39001	10/13/2011	599730.7	3467584.4	1	1351.35	1349.22	1	2.13
216425	39182	4/11/2012	599730.7	3467584.4	1	1351.30	1349.08	1	2.22
216425	39269	7/7/2012	599730.7	3467584.4	1	1351.11	1349.01	1	2.10
216425	39363	10/9/2012	599730.7	3467584.4	1	1350.94	1348.93	1	2.01
218341	37880	9/17/2008	599293.9	3467453.0	1	1350.15	1349.24	1	0.90
218386	38024	2/8/2009	605714.0	3469330.0	2	1369.67	1384.38	1	-14.71

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
218386	38035	2/19/2009	605714.0	3469330.0	2	1339.41	1384.38	1	-44.97
218386	38064	3/20/2009	605714.0	3469330.0	2	1339.41	1384.36	1	-44.95
218386	38084	4/9/2009	605714.0	3469330.0	2	1338.64	1384.35	1	-45.71
218386	38174	7/8/2009	605714.0	3469330.0	2	1337.79	1384.30	1	-46.51
218386	38265	10/7/2009	605714.0	3469330.0	2	1336.80	1384.25	1	-47.45
218386	38372	1/22/2010	605714.0	3469330.0	2	1335.62	1384.20	1	-48.58
218386	38461	4/21/2010	605714.0	3469330.0	2	1334.54	1384.15	1	-49.60
218386	38547	7/16/2010	605714.0	3469330.0	2	1333.61	1384.10	1	-50.49
218386	38659	11/5/2010	605714.0	3469330.0	2	1324.07	1384.04	1	-59.97
218386	38669	11/15/2010	605714.0	3469330.0	2	1324.07	1384.03	1	-59.96
218386	38735	1/20/2011	605714.0	3469330.0	2	1321.85	1384.00	1	-62.15
218386	38909	7/13/2011	605714.0	3469330.0	2	1319.47	1383.93	1	-64.46
218386	39115	2/4/2012	605714.0	3469330.0	2	1317.60	1383.85	1	-66.25
218386	39272	7/10/2012	605714.0	3469330.0	2	1316.68	1383.79	1	-67.11
218671	38013	1/28/2009	598887.9	3468857.0	1	1326.64	1346.89	1	-20.25
219449	39113	2/2/2012	599698.0	3470167.2	1	1350.66	1348.33	1	2.33
219449	39364	10/10/2012	599698.0	3470167.2	1	1350.66	1348.16	1	2.49
219957	38601	9/8/2010	605581.3	3469935.8	2	1369.90	1382.32	1	-12.42
219957	38666	11/12/2010	605581.3	3469935.8	2	1370.25	1382.28	1	-12.02
219957	38758	2/12/2011	605581.3	3469935.8	2	1370.55	1382.22	1	-11.67
219957	38848	5/13/2011	605581.3	3469935.8	2	1370.22	1382.16	1	-11.94
219957	38959	9/1/2011	605581.3	3469935.8	2	1369.82	1382.09	1	-12.26
219957	39063	12/14/2011	605581.3	3469935.8	2	1370.29	1382.02	1	-11.74
219957	39120	2/9/2012	605581.3	3469935.8	2	1370.25	1381.99	1	-11.74
219957	39196	4/25/2012	605581.3	3469935.8	2	1369.98	1381.95	1	-11.97
219957	39272	7/10/2012	605581.3	3469935.8	2	1369.62	1381.91	1	-12.29
219958	38609	9/16/2010	605685.6	3470564.7	3	1366.12	1379.22	1	-13.09
219958	38666	11/12/2010	605685.6	3470564.7	3	1366.18	1379.18	1	-13.00
219958	38757	2/11/2011	605685.6	3470564.7	3	1330.81	1379.13	1	-48.32
219958	38848	5/13/2011	605685.6	3470564.7	3	1365.28	1379.08	1	-13.80
219958	38849	5/14/2011	605685.6	3470564.7	3	1365.26	1379.08	1	-13.82
219958	38911	7/15/2011	605685.6	3470564.7	3	1364.93	1379.04	1	-14.11
219958	39063	12/14/2011	605685.6	3470564.7	3	1364.03	1378.96	1	-14.92
219958	39111	1/31/2012	605685.6	3470564.7	3	1363.88	1378.93	1	-15.05
219958	39190	4/19/2012	605685.6	3470564.7	3	1363.63	1378.89	1	-15.26
219958	39272	7/10/2012	605685.6	3470564.7	3	1363.36	1378.84	1	-15.48
219969	38562	7/31/2010	599970.8	3468353.4	2	1350.89	1348.16	1	2.73
219969	38563	8/1/2010	599970.8	3468353.4	2	1350.84	1348.16	1	2.68
219969	38665	11/11/2010	599970.8	3468353.4	2	1350.81	1348.12	1	2.69
219969	38736	1/21/2011	599970.8	3468353.4	2	1350.94	1348.07	1	2.87
219969	38813	4/8/2011	599970.8	3468353.4	2	1350.70	1347.98	1	2.72
219969	38953	8/26/2011	599970.8	3468353.4	2	1350.20	1347.87	1	2.33
219969	39002	10/14/2011	599970.8	3468353.4	2	1350.22	1347.83	1	2.39
219969	39114	2/3/2012	599970.8	3468353.4	2	1350.45	1347.75	1	2.71
219969	39196	4/25/2012	599970.8	3468353.4	2	1350.14	1347.68	1	2.46
219969	39268	7/6/2012	599970.8	3468353.4	2	1349.80	1347.63	1	2.17
219969	39373	10/19/2012	599970.8	3468353.4	2	1349.80	1347.54	1	2.25
219970	38560	7/29/2010	599978.0	3468347.3	1	1351.90	1349.68	1	2.22
219970	38665	11/11/2010	599978.0	3468347.3	1	1351.72	1349.64	1	2.09
219970	38736	1/21/2011	599978.0	3468347.3	1	1351.83	1349.59	1	2.24
219970	38813	4/8/2011	599978.0	3468347.3	1	1351.63	1349.47	1	2.15
219970	38910	7/14/2011	599978.0	3468347.3	1	1351.27	1349.37	1	1.89
219970	39002	10/14/2011	599978.0	3468347.3	1	1351.14	1349.29	1	1.85
219970	39114	2/3/2012	599978.0	3468347.3	1	1351.30	1349.18	1	2.13
219970	39196	4/25/2012	599978.0	3468347.3	1	1351.08	1349.06	1	2.02
219970	39268	7/6/2012	599978.0	3468347.3	1	1350.80	1348.97	1	1.82
219970	39373	10/19/2012	599978.0	3468347.3	1	1350.71	1348.89	1	1.82
221312	39308	8/15/2012	601308.9	3468772.6	2	1343.12	1350.39	1	-7.26
221312	39371	10/17/2012	601308.9	3468772.6	2	1341.61	1350.34	1	-8.73
221383	39338	9/14/2012	602817.9	3468831.6	2	1353.83	1354.07	1	-0.24
221383	39360	10/6/2012	602817.9	3468831.6	2	1353.89	1354.05	1	-0.17
221458	39332	9/8/2012	601118.8	3468826.0	2	1344.66	1349.79	1	-5.13
221458	39365	10/11/2012	601118.8	3468826.0	2	1351.35	1349.76	1	1.58
221459	39290	7/28/2012	601471.7	3468840.7	2	1350.58	1350.80	1	-0.21

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
221459	39363	10/9/2012	601471.7	3468840.7	2	1351.71	1350.74	1	0.97
221517	39343	9/19/2012	600910.0	3468866.7	2	1351.85	1349.42	1	2.43
221517	39366	10/12/2012	600910.0	3468866.7	2	1351.81	1349.40	1	2.40
500101	27941	7/2/1981	602849.9	3468835.7	1	1376.48	1359.32	1	17.16
500220	27760	1/2/1981	608548.1	3467732.9	2	1374.95	1400.94	1	-25.99
500220	31385	12/6/1990	608548.1	3467732.9	2	1384.10	1402.89	1	-18.79
500220	32400	9/16/1993	608548.1	3467732.9	2	1382.88	1402.14	1	-19.27
500220	35403	12/6/2001	608548.1	3467732.9	2	1383.49	1397.96	1	-14.48
502527	28240	4/27/1982	607769.6	3468524.4	2	1394.33	1400.28	1	-5.95
502527	29543	11/20/1985	607769.6	3468524.4	2	1393.39	1400.88	1	-7.50
502527	37662	2/12/2008	607769.6	3468524.4	2	1393.32	1396.46	1	-3.14
502527	37825	7/24/2008	607769.6	3468524.4	2	1391.88	1396.44	1	-4.56
502527	38048	3/4/2009	607769.6	3468524.4	2	1392.32	1396.41	1	-4.08
503538	28324	7/20/1982	596790.7	3469638.6	1	1325.90	1336.86	1	-10.97
503538	29545	11/22/1985	596790.7	3469638.6	1	1326.50	1337.04	1	-10.54
503538	31386	12/7/1990	596790.7	3469638.6	1	1326.81	1337.51	1	-10.70
503538	33996	1/29/1998	596790.7	3469638.6	1	1320.71	1337.63	1	-16.92
503538	35396	11/29/2001	596790.7	3469638.6	1	1306.39	1337.01	1	-30.62
503538	38391	2/10/2010	596790.7	3469638.6	1	1302.70	1335.37	1	-32.67
503538	38469	4/29/2010	596790.7	3469638.6	1	1302.48	1335.34	1	-32.86
503538	38560	7/29/2010	596790.7	3469638.6	1	1302.41	1335.30	1	-32.89
503538	38693	12/9/2010	596790.7	3469638.6	1	1302.77	1335.25	1	-32.48
503538	38891	6/25/2011	596790.7	3469638.6	1	1292.06	1335.16	1	-43.10
503538	38988	9/30/2011	596790.7	3469638.6	1	1295.54	1335.12	1	-39.58
506034	28717	8/17/1983	602478.7	3471103.0	1	1376.17	1362.89	1	13.29
507823	28979	5/5/1984	602076.6	3471101.0	1	1373.73	1361.98	1	11.75
507823	29545	11/22/1985	602076.6	3471101.0	1	1372.21	1361.84	1	10.37
509394	29564	12/11/1985	602902.9	3469500.0	1	1378.00	1360.64	1	17.36
509518	29201	12/13/1984	599683.6	3470013.8	1	1360.96	1351.86	1	9.10
509518	29545	11/22/1985	599683.6	3470013.8	1	1362.18	1351.91	1	10.27
509518	31386	12/7/1990	599683.6	3470013.8	1	1360.05	1352.13	1	7.91
509518	35403	12/6/2001	599683.6	3470013.8	1	1326.52	1350.73	1	-24.22
509518	37222	11/29/2006	599683.6	3470013.8	1	1324.38	1349.24	1	-24.86
509518	37671	2/21/2008	599683.6	3470013.8	1	1351.75	1348.98	1	2.77
509518	37760	5/20/2008	599683.6	3470013.8	1	1351.60	1348.93	1	2.66
509518	37833	8/1/2008	599683.6	3470013.8	1	1351.34	1348.90	1	2.44
509518	37915	10/22/2008	599683.6	3470013.8	1	1351.49	1348.86	1	2.64
509518	38030	2/14/2009	599683.6	3470013.8	1	1351.59	1348.80	1	2.79
509518	38097	4/22/2009	599683.6	3470013.8	1	1351.55	1348.76	1	2.79
509518	38187	7/21/2009	599683.6	3470013.8	1	1351.30	1348.71	1	2.59
509518	38279	10/21/2009	599683.6	3470013.8	1	1351.19	1348.67	1	2.52
509518	38406	2/25/2010	599683.6	3470013.8	1	1351.33	1348.60	1	2.73
509518	38463	4/23/2010	599683.6	3470013.8	1	1351.36	1348.57	1	2.79
509518	38546	7/15/2010	599683.6	3470013.8	1	1351.03	1348.53	1	2.50
509518	38644	10/21/2010	599683.6	3470013.8	1	1350.98	1348.48	1	2.50
517526	30056	4/17/1987	599665.9	3471480.0	2	1328.25	1353.20	1	-24.95
522569	30607	10/19/1988	604096.2	3470517.0	1	1369.45	1365.37	1	4.08
522569	30621	11/2/1988	604096.2	3470517.0	1	1370.23	1365.36	1	4.87
522569	30713	2/2/1989	604096.2	3470517.0	1	1368.73	1365.31	1	3.41
522569	30742	3/3/1989	604096.2	3470517.0	1	1368.49	1365.30	1	3.19
522569	30788	4/18/1989	604096.2	3470517.0	1	1368.22	1365.27	1	2.94
522569	30818	5/18/1989	604096.2	3470517.0	1	1368.23	1365.26	1	2.97
522569	30855	6/24/1989	604096.2	3470517.0	1	1367.82	1365.24	1	2.58
522569	30881	7/20/1989	604096.2	3470517.0	1	1367.70	1365.23	1	2.47
522569	30930	9/7/1989	604096.2	3470517.0	1	1367.44	1365.21	1	2.23
522569	30976	10/23/1989	604096.2	3470517.0	1	1367.93	1365.19	1	2.74
522569	30991	11/7/1989	604096.2	3470517.0	1	1367.01	1365.19	1	1.83
522569	31016	12/2/1989	604096.2	3470517.0	1	1367.93	1365.18	1	2.75
522569	31047	1/2/1990	604096.2	3470517.0	1	1367.61	1365.16	1	2.44
522569	31078	2/2/1990	604096.2	3470517.0	1	1367.42	1365.15	1	2.27
522569	31106	3/2/1990	604096.2	3470517.0	1	1367.29	1365.14	1	2.14
522573	30607	10/19/1988	604077.6	3471921.0	1	1371.41	1373.54	1	-2.14
522573	30664	12/15/1988	604077.6	3471921.0	1	1373.04	1373.50	1	-0.47
522573	30708	1/28/1989	604077.6	3471921.0	1	1371.36	1373.48	1	-2.11

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522573	30739	2/28/1989	604077.6	3471921.0	1	1371.09	1373.46	1	-2.37
522573	30777	4/7/1989	604077.6	3471921.0	1	1370.83	1373.43	1	-2.60
522573	30802	5/2/1989	604077.6	3471921.0	1	1370.94	1373.42	1	-2.48
522573	30840	6/9/1989	604077.6	3471921.0	1	1370.37	1373.40	1	-3.02
522573	30875	7/14/1989	604077.6	3471921.0	1	1370.16	1373.38	1	-3.22
522573	30930	9/7/1989	604077.6	3471921.0	1	1369.85	1373.35	1	-3.49
522573	30976	10/23/1989	604077.6	3471921.0	1	1370.04	1373.32	1	-3.29
522573	30991	11/7/1989	604077.6	3471921.0	1	1370.91	1373.31	1	-2.41
522573	31047	1/2/1990	604077.6	3471921.0	1	1370.69	1373.29	1	-2.59
522573	31078	2/2/1990	604077.6	3471921.0	1	1370.43	1373.27	1	-2.84
522573	31106	3/2/1990	604077.6	3471921.0	1	1370.37	1373.26	1	-2.89
522573	32469	11/24/1993	604077.6	3471921.0	1	1362.93	1367.20	1	-4.27
522573	32511	1/5/1994	604077.6	3471921.0	1	1362.75	1367.00	1	-4.25
522573	33414	6/26/1996	604077.6	3471921.0	1	1359.93	1364.40	1	-4.47
522573	33472	8/23/1996	604077.6	3471921.0	1	1359.80	1364.29	1	-4.50
522573	33506	9/26/1996	604077.6	3471921.0	1	1359.71	1364.23	1	-4.53
522573	33540	10/30/1996	604077.6	3471921.0	1	1359.66	1364.17	1	-4.51
522573	33591	12/20/1996	604077.6	3471921.0	1	1359.54	1364.09	1	-4.55
522573	33632	1/30/1997	604077.6	3471921.0	1	1359.42	1364.02	1	-4.60
522573	33661	2/28/1997	604077.6	3471921.0	1	1359.39	1363.97	1	-4.59
522573	33709	4/17/1997	604077.6	3471921.0	1	1359.22	1363.90	1	-4.68
522573	33785	7/2/1997	604077.6	3471921.0	1	1358.97	1363.78	1	-4.81
522573	33886	10/11/1997	604077.6	3471921.0	1	1358.84	1363.64	1	-4.80
522573	33913	11/7/1997	604077.6	3471921.0	1	1358.78	1363.60	1	-4.82
522573	33973	1/6/1998	604077.6	3471921.0	1	1358.69	1363.49	1	-4.81
522573	34094	5/7/1998	604077.6	3471921.0	1	1359.93	1362.77	1	-2.84
522573	34242	10/2/1998	604077.6	3471921.0	1	1359.78	1361.89	1	-2.11
522573	34358	1/26/1999	604077.6	3471921.0	1	1359.41	1361.32	1	-1.90
522573	34485	6/2/1999	604077.6	3471921.0	1	1359.16	1360.79	1	-1.63
522573	34514	7/1/1999	604077.6	3471921.0	1	1359.16	1360.67	1	-1.52
522573	34759	3/2/2000	604077.6	3471921.0	1	1359.08	1359.88	1	-0.81
522573	34851	6/2/2000	604077.6	3471921.0	1	1358.96	1359.63	1	-0.68
522573	34943	9/2/2000	604077.6	3471921.0	1	1358.88	1359.40	1	-0.52
522573	35034	12/2/2000	604077.6	3471921.0	1	1358.79	1359.18	1	-0.39
522573	35096	2/2/2001	604077.6	3471921.0	1	1358.74	1359.05	1	-0.30
522573	35216	6/2/2001	604077.6	3471921.0	1	1358.67	1358.80	1	-0.13
522573	35338	10/2/2001	604077.6	3471921.0	1	1358.59	1358.56	1	0.03
522573	35461	2/2/2002	604077.6	3471921.0	1	1358.56	1358.34	1	0.22
522573	35581	6/2/2002	604077.6	3471921.0	1	1358.50	1358.13	1	0.37
522573	35673	9/2/2002	604077.6	3471921.0	1	1358.45	1357.99	1	0.47
522573	35734	11/2/2002	604077.6	3471921.0	1	1358.41	1357.89	1	0.52
522573	35795	1/2/2003	604077.6	3471921.0	1	1358.39	1357.80	1	0.59
522573	35915	5/2/2003	604077.6	3471921.0	1	1358.35	1357.63	1	0.72
522573	36007	8/2/2003	604077.6	3471921.0	1	1358.30	1357.50	1	0.80
522573	36129	12/2/2003	604077.6	3471921.0	1	1358.26	1357.33	1	0.92
522573	36191	2/2/2004	604077.6	3471921.0	1	1358.19	1357.25	1	0.94
522573	36281	5/2/2004	604077.6	3471921.0	1	1358.15	1357.13	1	1.02
522573	36373	8/2/2004	604077.6	3471921.0	1	1358.12	1357.01	1	1.11
522573	36465	11/2/2004	604077.6	3471921.0	1	1358.07	1356.89	1	1.18
522573	36557	2/2/2005	604077.6	3471921.0	1	1357.97	1356.78	1	1.19
522573	36677	6/2/2005	604077.6	3471921.0	1	1357.86	1356.63	1	1.23
522573	36769	9/2/2005	604077.6	3471921.0	1	1357.80	1356.52	1	1.27
522573	36830	11/2/2005	604077.6	3471921.0	1	1357.75	1356.45	1	1.30
522573	36922	2/2/2006	604077.6	3471921.0	1	1357.62	1356.35	1	1.27
522573	37011	5/2/2006	604077.6	3471921.0	1	1357.49	1356.25	1	1.25
522573	37103	8/2/2006	604077.6	3471921.0	1	1357.34	1356.14	1	1.20
522574	30722	2/11/1989	604152.1	3472008.8	4	1368.38	1378.88	1	-10.50
522574	30736	2/25/1989	604152.1	3472008.8	4	1367.07	1378.88	1	-11.81
522574	30743	3/4/1989	604152.1	3472008.8	4	1367.13	1378.88	1	-11.75
522574	30976	10/23/1989	604152.1	3472008.8	4	1367.13	1378.85	1	-11.72
522574	31015	12/1/1989	604152.1	3472008.8	4	1369.15	1378.85	1	-9.70
522574	31016	12/2/1989	604152.1	3472008.8	4	1370.51	1378.85	1	-8.34
522574	31047	1/2/1990	604152.1	3472008.8	4	1371.43	1378.85	1	-7.42
522574	31078	2/2/1990	604152.1	3472008.8	4	1372.31	1378.84	1	-6.53

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522574	31106	3/2/1990	604152.1	3472008.8	4	1370.65	1378.84	1	-8.19
522574	31137	4/2/1990	604152.1	3472008.8	4	1370.30	1378.84	1	-8.54
522574	32469	11/24/1993	604152.1	3472008.8	4	1358.77	1367.98	1	-9.22
522574	32511	1/5/1994	604152.1	3472008.8	4	1365.69	1367.92	1	-2.23
522574	33414	6/26/1996	604152.1	3472008.8	4	1366.25	1366.62	1	-0.37
522574	33472	8/23/1996	604152.1	3472008.8	4	1363.87	1366.54	1	-2.67
522574	33506	9/26/1996	604152.1	3472008.8	4	1364.07	1366.49	1	-2.42
522574	33540	10/30/1996	604152.1	3472008.8	4	1364.47	1366.45	1	-1.98
522574	33591	12/20/1996	604152.1	3472008.8	4	1364.76	1366.38	1	-1.62
522574	33632	1/30/1997	604152.1	3472008.8	4	1364.76	1366.32	1	-1.57
522574	33661	2/28/1997	604152.1	3472008.8	4	1364.68	1366.29	1	-1.61
522574	33709	4/17/1997	604152.1	3472008.8	4	1364.47	1366.22	1	-1.75
522574	33886	10/11/1997	604152.1	3472008.8	4	1363.98	1365.99	1	-2.01
522574	33973	1/6/1998	604152.1	3472008.8	4	1363.83	1365.86	1	-2.03
522574	34094	5/7/1998	604152.1	3472008.8	4	1364.67	1365.33	1	-0.65
522574	34242	10/2/1998	604152.1	3472008.8	4	1364.34	1364.62	1	-0.28
522574	34358	1/26/1999	604152.1	3472008.8	4	1363.62	1364.17	1	-0.54
522574	34485	6/2/1999	604152.1	3472008.8	4	1363.56	1364.07	1	-0.50
522574	34514	7/1/1999	604152.1	3472008.8	4	1363.56	1364.05	1	-0.49
522574	34759	3/2/2000	604152.1	3472008.8	4	1363.35	1363.95	1	-0.60
522574	34851	6/2/2000	604152.1	3472008.8	4	1363.44	1363.93	1	-0.49
522574	34943	9/2/2000	604152.1	3472008.8	4	1363.50	1363.90	1	-0.40
522574	35034	12/2/2000	604152.1	3472008.8	4	1363.55	1363.88	1	-0.33
522574	35096	2/2/2001	604152.1	3472008.8	4	1363.56	1363.85	1	-0.29
522574	35216	6/2/2001	604152.1	3472008.8	4	1363.56	1363.82	1	-0.25
522574	35338	10/2/2001	604152.1	3472008.8	4	1363.55	1363.79	1	-0.24
522574	35461	2/2/2002	604152.1	3472008.8	4	1363.56	1363.75	1	-0.19
522574	35581	6/2/2002	604152.1	3472008.8	4	1363.52	1363.72	1	-0.21
522574	35673	9/2/2002	604152.1	3472008.8	4	1363.44	1363.70	1	-0.26
522574	35734	11/2/2002	604152.1	3472008.8	4	1363.32	1363.69	1	-0.37
522574	35795	1/2/2003	604152.1	3472008.8	4	1363.32	1363.67	1	-0.35
522574	35915	5/2/2003	604152.1	3472008.8	4	1363.15	1363.64	1	-0.49
522574	36007	8/2/2003	604152.1	3472008.8	4	1362.89	1363.62	1	-0.72
522574	36129	12/2/2003	604152.1	3472008.8	4	1362.56	1363.59	1	-1.03
522574	36191	2/2/2004	604152.1	3472008.8	4	1362.43	1363.57	1	-1.14
522574	36281	5/2/2004	604152.1	3472008.8	4	1362.30	1363.54	1	-1.24
522574	36373	8/2/2004	604152.1	3472008.8	4	1362.11	1363.52	1	-1.40
522574	36465	11/2/2004	604152.1	3472008.8	4	1361.73	1363.50	1	-1.77
522574	36557	2/2/2005	604152.1	3472008.8	4	1361.66	1363.48	1	-1.83
522574	36677	6/2/2005	604152.1	3472008.8	4	1361.25	1363.46	1	-2.22
522574	36769	9/2/2005	604152.1	3472008.8	4	1361.03	1363.44	1	-2.41
522574	36830	11/2/2005	604152.1	3472008.8	4	1360.97	1363.43	1	-2.46
522574	36922	2/2/2006	604152.1	3472008.8	4	1360.97	1363.34	1	-2.36
522574	37011	5/2/2006	604152.1	3472008.8	4	1360.97	1363.15	1	-2.18
522574	37103	8/2/2006	604152.1	3472008.8	4	1360.73	1363.11	1	-2.38
522574	37195	11/2/2006	604152.1	3472008.8	4	1360.50	1363.10	1	-2.60
522574	37287	2/2/2007	604152.1	3472008.8	4	1360.45	1363.07	1	-2.62
522574	37407	6/2/2007	604152.1	3472008.8	4	1360.18	1363.04	1	-2.86
522574	37499	9/2/2007	604152.1	3472008.8	4	1360.12	1363.02	1	-2.90
522574	37590	12/2/2007	604152.1	3472008.8	4	1360.09	1363.01	1	-2.92
522574	37684	3/5/2008	604152.1	3472008.8	4	1359.96	1362.99	1	-3.03
522574	37764	5/24/2008	604152.1	3472008.8	4	1360.10	1362.98	1	-2.88
522574	37848	8/16/2008	604152.1	3472008.8	4	1357.74	1362.96	1	-5.23
522574	37924	10/31/2008	604152.1	3472008.8	4	1359.10	1362.96	1	-3.86
522574	38041	2/25/2009	604152.1	3472008.8	4	1359.34	1362.94	1	-3.60
522574	38112	5/7/2009	604152.1	3472008.8	4	1359.12	1362.93	1	-3.81
522574	38210	8/13/2009	604152.1	3472008.8	4	1359.19	1362.93	1	-3.73
522574	38294	11/5/2009	604152.1	3472008.8	4	1359.24	1362.93	1	-3.69
522574	38420	3/11/2010	604152.1	3472008.8	4	1359.48	1362.92	1	-3.44
522574	38447	4/7/2010	604152.1	3472008.8	4	1357.75	1362.91	1	-5.16
522574	38448	4/8/2010	604152.1	3472008.8	4	1357.75	1362.91	1	-5.16
522574	38538	7/7/2010	604152.1	3472008.8	4	1359.17	1362.90	1	-3.73
522574	38757	2/11/2011	604152.1	3472008.8	4	1359.66	1362.87	1	-3.21
522574	38910	7/14/2011	604152.1	3472008.8	4	1359.50	1362.85	1	-3.35

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Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522574	39114	2/3/2012	604152.1	3472008.8	4	1359.86	1362.82	1	-2.96
522574	39307	8/14/2012	604152.1	3472008.8	4	1360.60	1362.81	1	-2.21
522578	30607	10/19/1988	605588.3	3469842.1	2	1412.02	1399.96	1	12.06
522578	30665	12/16/1988	605588.3	3469842.1	2	1415.10	1399.62	1	15.48
522578	30708	1/28/1989	605588.3	3469842.1	2	1412.00	1399.37	1	12.63
522578	30741	3/2/1989	605588.3	3469842.1	2	1413.20	1399.19	1	14.01
522578	30777	4/7/1989	605588.3	3469842.1	2	1413.14	1398.99	1	14.14
522578	30804	5/4/1989	605588.3	3469842.1	2	1413.10	1398.86	1	14.25
522578	30833	6/2/1989	605588.3	3469842.1	2	1413.07	1398.71	1	14.37
522578	30875	7/14/1989	605588.3	3469842.1	2	1413.00	1398.49	1	14.51
522578	30901	8/9/1989	605588.3	3469842.1	2	1412.95	1398.37	1	14.59
522578	30932	9/9/1989	605588.3	3469842.1	2	1412.27	1398.22	1	14.05
522578	30965	10/12/1989	605588.3	3469842.1	2	1412.37	1398.06	1	14.31
522578	30976	10/23/1989	605588.3	3469842.1	2	1413.12	1398.01	1	15.11
522578	30991	11/7/1989	605588.3	3469842.1	2	1412.35	1397.94	1	14.41
522578	30994	11/10/1989	605588.3	3469842.1	2	1412.71	1397.93	1	14.78
522578	30998	11/14/1989	605588.3	3469842.1	2	1412.35	1397.91	1	14.44
522578	31022	12/8/1989	605588.3	3469842.1	2	1412.34	1397.80	1	14.54
522578	31050	1/5/1990	605588.3	3469842.1	2	1412.31	1397.67	1	14.64
522578	31084	2/8/1990	605588.3	3469842.1	2	1412.28	1397.52	1	14.77
522578	31112	3/8/1990	605588.3	3469842.1	2	1412.25	1397.39	1	14.86
522578	31139	4/4/1990	605588.3	3469842.1	2	1412.22	1397.27	1	14.95
522578	31238	7/12/1990	605588.3	3469842.1	2	1412.11	1396.86	1	15.26
522578	31336	10/18/1990	605588.3	3469842.1	2	1412.01	1396.48	1	15.53
522578	31384	12/5/1990	605588.3	3469842.1	2	1415.40	1396.30	1	19.10
522578	31440	1/30/1991	605588.3	3469842.1	2	1411.92	1396.10	1	15.82
522578	31517	4/17/1991	605588.3	3469842.1	2	1412.13	1395.83	1	16.30
522578	31608	7/17/1991	605588.3	3469842.1	2	1411.70	1395.52	1	16.18
522578	31698	10/15/1991	605588.3	3469842.1	2	1412.04	1395.23	1	16.80
522578	31791	1/16/1992	605588.3	3469842.1	2	1411.52	1394.95	1	16.57
522578	31873	4/7/1992	605588.3	3469842.1	2	1411.41	1394.67	1	16.74
522578	32153	1/12/1993	605588.3	3469842.1	2	1411.09	1393.78	1	17.31
522578	32251	4/20/1993	605588.3	3469842.1	2	1410.97	1393.49	1	17.48
522578	32344	7/22/1993	605588.3	3469842.1	2	1410.88	1393.21	1	17.67
522578	32434	10/20/1993	605588.3	3469842.1	2	1410.70	1392.95	1	17.75
522578	32512	1/6/1994	605588.3	3469842.1	2	1410.70	1392.72	1	17.97
522578	32531	1/25/1994	605588.3	3469842.1	2	1410.64	1392.67	1	17.97
522578	32609	4/13/1994	605588.3	3469842.1	2	1410.57	1392.45	1	18.12
522578	32707	7/20/1994	605588.3	3469842.1	2	1410.45	1392.18	1	18.27
522578	32889	1/18/1995	605588.3	3469842.1	2	1410.36	1391.69	1	18.67
522578	32980	4/19/1995	605588.3	3469842.1	2	1410.51	1391.45	1	19.06
522578	33080	7/28/1995	605588.3	3469842.1	2	1410.48	1391.19	1	19.29
522578	33162	10/18/1995	605588.3	3469842.1	2	1410.45	1390.99	1	19.47
522578	33414	6/26/1996	605588.3	3469842.1	2	1410.36	1390.37	1	20.00
522578	33472	8/23/1996	605588.3	3469842.1	2	1410.36	1390.23	1	20.13
522578	33506	9/26/1996	605588.3	3469842.1	2	1410.48	1390.15	1	20.33
522578	33540	10/30/1996	605588.3	3469842.1	2	1410.56	1390.07	1	20.49
522578	33591	12/20/1996	605588.3	3469842.1	2	1410.67	1389.95	1	20.71
522578	33632	1/30/1997	605588.3	3469842.1	2	1410.70	1389.86	1	20.84
522578	33661	2/28/1997	605588.3	3469842.1	2	1410.71	1389.79	1	20.92
522578	33709	4/17/1997	605588.3	3469842.1	2	1410.68	1389.69	1	20.99
522578	33785	7/2/1997	605588.3	3469842.1	2	1410.64	1389.52	1	21.12
522578	33886	10/11/1997	605588.3	3469842.1	2	1410.56	1389.30	1	21.26
522578	33913	11/7/1997	605588.3	3469842.1	2	1410.54	1389.24	1	21.30
522578	33973	1/6/1998	605588.3	3469842.1	2	1410.61	1389.11	1	21.50
522578	34094	5/7/1998	605588.3	3469842.1	2	1412.87	1388.83	1	24.04
522578	34242	10/2/1998	605588.3	3469842.1	2	1413.12	1388.48	1	24.64
522578	34358	1/26/1999	605588.3	3469842.1	2	1413.38	1388.20	1	25.17
522578	34485	6/2/1999	605588.3	3469842.1	2	1413.33	1387.91	1	25.42
522578	34514	7/1/1999	605588.3	3469842.1	2	1413.33	1387.84	1	25.49
522578	34759	3/2/2000	605588.3	3469842.1	2	1413.80	1387.29	1	26.51
522578	34851	6/2/2000	605588.3	3469842.1	2	1414.02	1387.09	1	26.93
522578	34943	9/2/2000	605588.3	3469842.1	2	1414.29	1386.89	1	27.40
522578	35034	12/2/2000	605588.3	3469842.1	2	1414.46	1386.70	1	27.76

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522578	35096	2/2/2001	605588.3	3469842.1	2	1414.50	1386.57	1	27.94
522578	35216	6/2/2001	605588.3	3469842.1	2	1414.63	1386.32	1	28.30
522578	35338	10/2/2001	605588.3	3469842.1	2	1414.73	1386.08	1	28.65
522578	35461	2/2/2002	605588.3	3469842.1	2	1414.79	1385.85	1	28.94
522578	35581	6/2/2002	605588.3	3469842.1	2	1414.66	1385.63	1	29.02
522578	35673	9/2/2002	605588.3	3469842.1	2	1414.64	1385.47	1	29.17
522578	35734	11/2/2002	605588.3	3469842.1	2	1414.61	1385.37	1	29.24
522578	35795	1/2/2003	605588.3	3469842.1	2	1414.61	1385.27	1	29.34
522578	35915	5/2/2003	605588.3	3469842.1	2	1414.40	1385.07	1	29.32
522578	36007	8/2/2003	605588.3	3469842.1	2	1414.23	1384.93	1	29.30
522578	36129	12/2/2003	605588.3	3469842.1	2	1414.15	1384.75	1	29.41
522578	36191	2/2/2004	605588.3	3469842.1	2	1414.05	1384.66	1	29.39
522578	36281	5/2/2004	605588.3	3469842.1	2	1413.94	1384.53	1	29.41
522578	36373	8/2/2004	605588.3	3469842.1	2	1413.88	1384.40	1	29.48
522578	36465	11/2/2004	605588.3	3469842.1	2	1413.79	1384.27	1	29.52
522578	36557	2/2/2005	605588.3	3469842.1	2	1413.73	1384.15	1	29.58
522578	36677	6/2/2005	605588.3	3469842.1	2	1413.63	1384.00	1	29.64
522578	36769	9/2/2005	605588.3	3469842.1	2	1413.65	1383.88	1	29.77
522578	36830	11/2/2005	605588.3	3469842.1	2	1413.65	1383.81	1	29.84
522578	36922	2/2/2006	605588.3	3469842.1	2	1413.60	1383.71	1	29.90
522578	37011	5/2/2006	605588.3	3469842.1	2	1413.48	1383.61	1	29.88
522578	37103	8/2/2006	605588.3	3469842.1	2	1414.23	1383.51	1	30.72
522578	37195	11/2/2006	605588.3	3469842.1	2	1413.33	1383.41	1	29.92
522578	37287	2/2/2007	605588.3	3469842.1	2	1413.35	1383.32	1	30.03
522578	37407	6/2/2007	605588.3	3469842.1	2	1413.33	1383.20	1	30.13
522578	37499	9/2/2007	605588.3	3469842.1	2	1413.30	1383.11	1	30.19
522578	37590	12/2/2007	605588.3	3469842.1	2	1413.30	1383.02	1	30.28
522578	37685	3/6/2008	605588.3	3469842.1	2	1413.27	1382.94	1	30.33
522578	37763	5/23/2008	605588.3	3469842.1	2	1413.20	1382.87	1	30.33
522578	37839	8/7/2008	605588.3	3469842.1	2	1413.07	1382.81	1	30.26
522578	37930	11/6/2008	605588.3	3469842.1	2	1413.04	1382.73	1	30.31
522578	38037	2/21/2009	605588.3	3469842.1	2	1413.00	1382.65	1	30.35
522578	38043	2/27/2009	605588.3	3469842.1	2	1413.00	1382.65	1	30.36
522578	38119	5/14/2009	605588.3	3469842.1	2	1412.96	1382.59	1	30.37
522578	38217	8/20/2009	605588.3	3469842.1	2	1412.85	1382.52	1	30.34
522578	38300	11/11/2009	605588.3	3469842.1	2	1412.71	1382.46	1	30.25
522578	38412	3/3/2010	605588.3	3469842.1	2	1412.63	1382.38	1	30.25
522578	38455	4/15/2010	605588.3	3469842.1	2	1412.59	1382.35	1	30.25
522578	38534	7/3/2010	605588.3	3469842.1	2	1412.50	1382.29	1	30.21
522578	38911	7/15/2011	605588.3	3469842.1	2	1413.45	1382.05	1	31.40
522578	39272	7/10/2012	605588.3	3469842.1	2	1415.84	1381.86	1	33.99
522580	30607	10/19/1988	602523.7	3469075.7	1	1363.52	1359.12	1	4.40
522580	30636	11/17/1988	602523.7	3469075.7	1	1362.25	1359.12	1	3.13
522580	30711	1/31/1989	602523.7	3469075.7	1	1363.20	1359.11	1	4.09
522580	30741	3/2/1989	602523.7	3469075.7	1	1363.04	1359.11	1	3.92
522580	30778	4/8/1989	602523.7	3469075.7	1	1362.99	1359.11	1	3.88
522580	30803	5/3/1989	602523.7	3469075.7	1	1362.91	1359.11	1	3.81
522580	30841	6/10/1989	602523.7	3469075.7	1	1362.73	1359.11	1	3.62
522580	30875	7/14/1989	602523.7	3469075.7	1	1362.56	1359.11	1	3.46
522580	30930	9/7/1989	602523.7	3469075.7	1	1362.35	1359.10	1	3.25
522580	30976	10/23/1989	602523.7	3469075.7	1	1362.61	1359.10	1	3.51
522580	30991	11/7/1989	602523.7	3469075.7	1	1362.40	1359.10	1	3.30
522580	31016	12/2/1989	602523.7	3469075.7	1	1362.37	1359.10	1	3.27
522580	31047	1/2/1990	602523.7	3469075.7	1	1362.46	1359.10	1	3.36
522580	31077	2/1/1990	602523.7	3469075.7	1	1360.65	1359.10	1	1.55
522580	31078	2/2/1990	602523.7	3469075.7	1	1362.43	1359.10	1	3.33
522580	31113	3/9/1990	602523.7	3469075.7	1	1361.73	1359.10	1	2.63
522580	31140	4/5/1990	602523.7	3469075.7	1	1361.62	1359.10	1	2.52
522580	31257	7/31/1990	602523.7	3469075.7	1	1361.18	1359.10	1	2.08
522580	31338	10/20/1990	602523.7	3469075.7	1	1360.94	1359.10	1	1.84
522580	31384	12/5/1990	602523.7	3469075.7	1	1362.55	1359.10	1	3.46
522580	31442	2/1/1991	602523.7	3469075.7	1	1360.65	1359.10	1	1.55
522580	31517	4/17/1991	602523.7	3469075.7	1	1360.46	1359.10	1	1.37
522580	31586	6/25/1991	602523.7	3469075.7	1	1360.23	1359.10	1	1.14

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522580	31589	6/28/1991	602523.7	3469075.7	1	1360.23	1359.10	1	1.14
522580	31608	7/17/1991	602523.7	3469075.7	1	1360.16	1359.10	1	1.06
522580	31698	10/15/1991	602523.7	3469075.7	1	1359.85	1359.10	1	0.75
522580	31791	1/16/1992	602523.7	3469075.7	1	1359.61	1359.10	1	0.51
522580	31873	4/7/1992	602523.7	3469075.7	1	1359.43	1359.10	1	0.33
522580	32153	1/12/1993	602523.7	3469075.7	1	1358.74	1359.05	1	-0.31
522580	32166	1/25/1993	602523.7	3469075.7	1	1357.89	1359.05	1	-1.16
522580	32251	4/20/1993	602523.7	3469075.7	1	1358.56	1359.02	1	-0.46
522580	32344	7/22/1993	602523.7	3469075.7	1	1358.33	1358.99	1	-0.66
522580	32434	10/20/1993	602523.7	3469075.7	1	1358.05	1358.94	1	-0.89
522580	32469	11/24/1993	602523.7	3469075.7	1	1358.02	1358.93	1	-0.90
522580	32511	1/5/1994	602523.7	3469075.7	1	1357.93	1358.91	1	-0.97
522580	32531	1/25/1994	602523.7	3469075.7	1	1357.90	1358.89	1	-0.99
522580	32609	4/13/1994	602523.7	3469075.7	1	1357.75	1358.85	1	-1.10
522580	32707	7/20/1994	602523.7	3469075.7	1	1357.51	1358.79	1	-1.29
522580	32798	10/19/1994	602523.7	3469075.7	1	1357.28	1358.74	1	-1.46
522580	32889	1/18/1995	602523.7	3469075.7	1	1357.11	1358.68	1	-1.57
522580	33162	10/18/1995	602523.7	3469075.7	1	1356.50	1358.49	1	-1.99
522580	33414	6/26/1996	602523.7	3469075.7	1	1355.92	1358.30	1	-2.38
522580	33472	8/23/1996	602523.7	3469075.7	1	1355.91	1358.26	1	-2.35
522580	33506	9/26/1996	602523.7	3469075.7	1	1355.65	1358.23	1	-2.59
522580	33540	10/30/1996	602523.7	3469075.7	1	1355.63	1358.21	1	-2.58
522580	36769	9/2/2005	602523.7	3469075.7	1	1350.38	1354.91	1	-4.53
522580	36830	11/2/2005	602523.7	3469075.7	1	1349.97	1354.84	1	-4.88
522580	36922	2/2/2006	602523.7	3469075.7	1	1350.36	1354.74	1	-4.38
522580	37011	5/2/2006	602523.7	3469075.7	1	1350.54	1354.64	1	-4.10
522580	37103	8/2/2006	602523.7	3469075.7	1	1350.36	1354.54	1	-4.18
522580	37195	11/2/2006	602523.7	3469075.7	1	1350.15	1354.44	1	-4.29
522580	37287	2/2/2007	602523.7	3469075.7	1	1350.06	1354.35	1	-4.29
522580	37407	6/2/2007	602523.7	3469075.7	1	1349.90	1354.23	1	-4.32
522580	37499	9/2/2007	602523.7	3469075.7	1	1349.60	1354.14	1	-4.54
522581	30637	11/18/1988	602458.7	3469189.8	2	1369.43	1360.28	1	9.15
522581	30711	1/31/1989	602458.7	3469189.8	2	1367.26	1360.27	1	6.99
522581	30741	3/2/1989	602458.7	3469189.8	2	1367.14	1360.26	1	6.88
522581	30778	4/8/1989	602458.7	3469189.8	2	1367.00	1360.26	1	6.74
522581	30803	5/3/1989	602458.7	3469189.8	2	1366.89	1360.25	1	6.64
522581	30841	6/10/1989	602458.7	3469189.8	2	1366.77	1360.25	1	6.52
522581	30875	7/14/1989	602458.7	3469189.8	2	1366.62	1360.25	1	6.37
522581	30930	9/7/1989	602458.7	3469189.8	2	1366.41	1360.24	1	6.17
522581	30976	10/23/1989	602458.7	3469189.8	2	1366.56	1360.23	1	6.32
522581	30991	11/7/1989	602458.7	3469189.8	2	1368.13	1360.23	1	7.90
522581	31016	12/2/1989	602458.7	3469189.8	2	1368.13	1360.23	1	7.90
522581	31047	1/2/1990	602458.7	3469189.8	2	1367.90	1360.23	1	7.67
522581	31078	2/2/1990	602458.7	3469189.8	2	1367.93	1360.22	1	7.71
522581	31106	3/2/1990	602458.7	3469189.8	2	1367.69	1360.22	1	7.47
522581	31137	4/2/1990	602458.7	3469189.8	2	1367.69	1360.22	1	7.47
522581	31384	12/5/1990	602458.7	3469189.8	2	1368.30	1360.20	1	8.10
522581	32511	1/5/1994	602458.7	3469189.8	2	1361.85	1359.38	1	2.47
522581	33414	6/26/1996	602458.7	3469189.8	2	1359.82	1358.51	1	1.31
522581	33472	8/23/1996	602458.7	3469189.8	2	1359.66	1358.46	1	1.20
522581	33506	9/26/1996	602458.7	3469189.8	2	1359.54	1358.43	1	1.11
522581	33540	10/30/1996	602458.7	3469189.8	2	1359.54	1358.40	1	1.14
522581	33591	12/20/1996	602458.7	3469189.8	2	1359.38	1358.35	1	1.03
522581	33632	1/30/1997	602458.7	3469189.8	2	1359.35	1358.32	1	1.04
522581	33661	2/28/1997	602458.7	3469189.8	2	1359.32	1358.29	1	1.03
522581	33709	4/17/1997	602458.7	3469189.8	2	1359.17	1358.25	1	0.92
522581	33886	10/11/1997	602458.7	3469189.8	2	1358.77	1358.09	1	0.68
522581	33973	1/6/1998	602458.7	3469189.8	2	1358.59	1358.01	1	0.58
522581	34094	5/7/1998	602458.7	3469189.8	2	1360.40	1357.85	1	2.55
522581	34242	10/2/1998	602458.7	3469189.8	2	1360.12	1357.65	1	2.46
522581	34358	1/26/1999	602458.7	3469189.8	2	1359.80	1357.49	1	2.31
522581	34485	6/2/1999	602458.7	3469189.8	2	1359.54	1357.33	1	2.21
522581	34514	7/1/1999	602458.7	3469189.8	2	1359.54	1357.29	1	2.24
522581	34759	3/2/2000	602458.7	3469189.8	2	1359.31	1356.99	1	2.32

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522581	34851	6/2/2000	602458.7	3469189.8	2	1359.08	1356.87	1	2.21
522581	34943	9/2/2000	602458.7	3469189.8	2	1358.88	1356.76	1	2.12
522581	35034	12/2/2000	602458.7	3469189.8	2	1358.76	1356.66	1	2.10
522581	35096	2/2/2001	602458.7	3469189.8	2	1358.64	1356.58	1	2.06
522581	35216	6/2/2001	602458.7	3469189.8	2	1358.47	1356.43	1	2.04
522581	35338	10/2/2001	602458.7	3469189.8	2	1358.29	1356.30	1	1.99
522581	35461	2/2/2002	602458.7	3469189.8	2	1358.07	1356.15	1	1.92
522581	35581	6/2/2002	602458.7	3469189.8	2	1357.75	1356.02	1	1.73
522581	35673	9/2/2002	602458.7	3469189.8	2	1357.69	1355.92	1	1.77
522581	35734	11/2/2002	602458.7	3469189.8	2	1357.57	1355.85	1	1.72
522581	35795	1/2/2003	602458.7	3469189.8	2	1357.54	1355.79	1	1.75
522581	35915	5/2/2003	602458.7	3469189.8	2	1357.42	1355.65	1	1.77
522581	36007	8/2/2003	602458.7	3469189.8	2	1357.28	1355.56	1	1.72
522581	36129	12/2/2003	602458.7	3469189.8	2	1357.17	1355.43	1	1.74
522581	36191	2/2/2004	602458.7	3469189.8	2	1356.99	1355.36	1	1.63
522581	36281	5/2/2004	602458.7	3469189.8	2	1356.91	1355.25	1	1.66
522581	36373	8/2/2004	602458.7	3469189.8	2	1356.69	1355.16	1	1.53
522581	36465	11/2/2004	602458.7	3469189.8	2	1356.41	1355.07	1	1.34
522581	36557	2/2/2005	602458.7	3469189.8	2	1356.35	1354.98	1	1.37
522581	36677	6/2/2005	602458.7	3469189.8	2	1356.26	1354.86	1	1.40
522581	37499	9/2/2007	602458.7	3469189.8	2	1355.25	1354.08	1	1.17
522581	37590	12/2/2007	602458.7	3469189.8	2	1355.53	1354.01	1	1.52
522581	37686	3/7/2008	602458.7	3469189.8	2	1355.15	1353.93	1	1.22
522581	37763	5/23/2008	602458.7	3469189.8	2	1355.25	1353.87	1	1.38
522581	37839	8/7/2008	602458.7	3469189.8	2	1355.35	1353.81	1	1.53
522581	37943	11/19/2008	602458.7	3469189.8	2	1355.27	1353.73	1	1.53
522581	38048	3/4/2009	602458.7	3469189.8	2	1355.16	1353.66	1	1.50
522581	38098	4/23/2009	602458.7	3469189.8	2	1354.93	1353.62	1	1.31
522581	38210	8/13/2009	602458.7	3469189.8	2	1354.66	1353.54	1	1.11
522581	38294	11/5/2009	602458.7	3469189.8	2	1354.75	1353.48	1	1.26
522581	38420	3/11/2010	602458.7	3469189.8	2	1354.69	1353.40	1	1.29
522581	38450	4/10/2010	602458.7	3469189.8	2	1354.63	1353.38	1	1.25
522581	38539	7/8/2010	602458.7	3469189.8	2	1354.38	1353.33	1	1.06
522581	38761	2/15/2011	602458.7	3469189.8	2	1354.19	1353.18	1	1.00
522581	38912	7/16/2011	602458.7	3469189.8	2	1354.10	1353.08	1	1.02
522581	39114	2/3/2012	602458.7	3469189.8	2	1353.93	1352.95	1	0.98
522581	39274	7/12/2012	602458.7	3469189.8	2	1353.65	1352.85	1	0.80
522581	39371	10/17/2012	602458.7	3469189.8	2	1353.57	1352.79	1	0.78
522693	30607	10/19/1988	606104.5	3471539.0	4	1426.46	1427.28	1	-0.81
522693	30698	1/18/1989	606104.5	3471539.0	4	1414.08	1427.27	1	-13.19
522693	30750	3/11/1989	606104.5	3471539.0	4	1426.10	1427.27	1	-1.17
522693	30753	3/14/1989	606104.5	3471539.0	4	1426.10	1427.27	1	-1.17
522693	30791	4/21/1989	606104.5	3471539.0	4	1425.97	1427.26	1	-1.30
522693	30824	5/24/1989	606104.5	3471539.0	4	1425.89	1427.26	1	-1.37
522693	30855	6/24/1989	606104.5	3471539.0	4	1425.76	1427.26	1	-1.50
522693	30886	7/25/1989	606104.5	3471539.0	4	1425.65	1427.26	1	-1.61
522693	30930	9/7/1989	606104.5	3471539.0	4	1426.16	1427.25	1	-1.10
522693	30976	10/23/1989	606104.5	3471539.0	4	1425.55	1427.25	1	-1.70
522693	30991	11/7/1989	606104.5	3471539.0	4	1426.79	1427.25	1	-0.46
522693	31016	12/2/1989	606104.5	3471539.0	4	1426.79	1427.25	1	-0.46
522693	31047	1/2/1990	606104.5	3471539.0	4	1426.41	1427.25	1	-0.83
522693	31078	2/2/1990	606104.5	3471539.0	4	1426.40	1427.24	1	-0.85
522693	31106	3/2/1990	606104.5	3471539.0	4	1426.21	1427.24	1	-1.03
522694	30607	10/19/1988	603896.9	3467185.2	1	1359.08	1364.27	1	-5.19
522694	30720	2/9/1989	603896.9	3467185.2	1	1359.06	1364.33	1	-5.27
522694	30749	3/10/1989	603896.9	3467185.2	1	1359.03	1364.34	1	-5.31
522694	30789	4/19/1989	603896.9	3467185.2	1	1359.01	1364.36	1	-5.35
522694	30819	5/19/1989	603896.9	3467185.2	1	1359.01	1364.38	1	-5.36
522694	30854	6/23/1989	603896.9	3467185.2	1	1358.98	1364.39	1	-5.42
522694	30881	7/20/1989	603896.9	3467185.2	1	1358.93	1364.41	1	-5.48
522694	30930	9/7/1989	603896.9	3467185.2	1	1358.76	1364.43	1	-5.67
522694	30976	10/23/1989	603896.9	3467185.2	1	1358.86	1364.45	1	-5.58
522694	30991	11/7/1989	603896.9	3467185.2	1	1361.00	1364.45	1	-3.46
522694	31016	12/2/1989	603896.9	3467185.2	1	1360.89	1364.46	1	-3.57

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522694	31137	4/2/1990	603896.9	3467185.2	1	1360.68	1364.51	1	-3.84
522694	33414	6/26/1996	603896.9	3467185.2	1	1354.30	1364.40	1	-10.10
522694	33472	8/23/1996	603896.9	3467185.2	1	1354.16	1364.37	1	-10.20
522694	33506	9/26/1996	603896.9	3467185.2	1	1354.09	1364.35	1	-10.26
522694	33540	10/30/1996	603896.9	3467185.2	1	1354.01	1364.33	1	-10.31
522694	33591	12/20/1996	603896.9	3467185.2	1	1353.91	1364.29	1	-10.39
522694	33632	1/30/1997	603896.9	3467185.2	1	1353.86	1364.27	1	-10.41
522694	33661	2/28/1997	603896.9	3467185.2	1	1353.86	1364.25	1	-10.39
522694	33709	4/17/1997	603896.9	3467185.2	1	1353.75	1364.22	1	-10.46
522694	33886	10/11/1997	603896.9	3467185.2	1	1353.40	1364.09	1	-10.69
522694	33973	1/6/1998	603896.9	3467185.2	1	1353.33	1364.03	1	-10.70
522694	34094	5/7/1998	603896.9	3467185.2	1	1355.59	1363.93	1	-8.34
522694	34242	10/2/1998	603896.9	3467185.2	1	1355.36	1363.79	1	-8.43
522694	34358	1/26/1999	603896.9	3467185.2	1	1355.08	1363.66	1	-8.58
522694	34485	6/2/1999	603896.9	3467185.2	1	1354.84	1363.52	1	-8.68
522694	34514	7/1/1999	603896.9	3467185.2	1	1354.84	1363.49	1	-8.65
522694	34759	3/2/2000	603896.9	3467185.2	1	1354.66	1363.20	1	-8.55
522694	34851	6/2/2000	603896.9	3467185.2	1	1353.86	1363.09	1	-9.23
522694	34943	9/2/2000	603896.9	3467185.2	1	1353.64	1362.98	1	-9.34
522695	30607	10/19/1988	606124.4	3468324.0	2	1384.96	1397.43	1	-12.47
522695	30705	1/25/1989	606124.4	3468324.0	2	1387.11	1397.46	1	-10.36
522695	30753	3/14/1989	606124.4	3468324.0	2	1384.93	1397.48	1	-12.55
522695	30791	4/21/1989	606124.4	3468324.0	2	1384.93	1397.49	1	-12.56
522695	30824	5/24/1989	606124.4	3468324.0	2	1384.91	1397.49	1	-12.58
522695	30855	6/24/1989	606124.4	3468324.0	2	1384.91	1397.50	1	-12.59
522695	30886	7/25/1989	606124.4	3468324.0	2	1384.93	1397.51	1	-12.58
522695	30930	9/7/1989	606124.4	3468324.0	2	1384.91	1397.51	1	-12.60
522695	30976	10/23/1989	606124.4	3468324.0	2	1384.93	1397.52	1	-12.59
522695	30991	11/7/1989	606124.4	3468324.0	2	1386.89	1397.52	1	-10.63
522695	31047	1/2/1990	606124.4	3468324.0	2	1386.94	1397.53	1	-10.59
522695	31137	4/2/1990	606124.4	3468324.0	2	1386.91	1397.53	1	-10.62
522695	33414	6/26/1996	606124.4	3468324.0	2	1384.71	1396.13	1	-11.41
522695	33472	8/23/1996	606124.4	3468324.0	2	1384.71	1396.06	1	-11.34
522695	33506	9/26/1996	606124.4	3468324.0	2	1384.70	1396.02	1	-11.32
522695	33540	10/30/1996	606124.4	3468324.0	2	1384.70	1395.98	1	-11.28
522695	33591	12/20/1996	606124.4	3468324.0	2	1384.69	1395.92	1	-11.23
522695	33632	1/30/1997	606124.4	3468324.0	2	1384.68	1395.87	1	-11.18
522695	33661	2/28/1997	606124.4	3468324.0	2	1384.70	1395.83	1	-11.13
522695	33709	4/17/1997	606124.4	3468324.0	2	1384.70	1395.78	1	-11.08
522695	33886	10/11/1997	606124.4	3468324.0	2	1384.69	1395.56	1	-10.87
522695	33973	1/6/1998	606124.4	3468324.0	2	1384.73	1395.45	1	-10.72
522695	34094	5/7/1998	606124.4	3468324.0	2	1386.68	1395.27	1	-8.59
522695	34242	10/2/1998	606124.4	3468324.0	2	1386.68	1395.02	1	-8.34
522695	34358	1/26/1999	606124.4	3468324.0	2	1386.68	1394.80	1	-8.11
522695	34485	6/2/1999	606124.4	3468324.0	2	1386.68	1394.56	1	-7.87
522695	34513	6/30/1999	606124.4	3468324.0	2	1386.68	1394.50	1	-7.82
522695	34514	7/1/1999	606124.4	3468324.0	2	1386.68	1394.50	1	-7.82
522695	34759	3/2/2000	606124.4	3468324.0	2	1386.74	1394.06	1	-7.31
522695	34851	6/2/2000	606124.4	3468324.0	2	1386.71	1393.90	1	-7.18
522695	34943	9/2/2000	606124.4	3468324.0	2	1386.68	1393.75	1	-7.06
522695	35034	12/2/2000	606124.4	3468324.0	2	1386.68	1393.60	1	-6.92
522695	35096	2/2/2001	606124.4	3468324.0	2	1386.71	1393.51	1	-6.80
522695	35216	6/2/2001	606124.4	3468324.0	2	1386.71	1393.34	1	-6.63
522695	35338	10/2/2001	606124.4	3468324.0	2	1386.73	1393.17	1	-6.45
522695	35461	2/2/2002	606124.4	3468324.0	2	1386.74	1393.02	1	-6.28
522695	35581	6/2/2002	606124.4	3468324.0	2	1386.71	1392.89	1	-6.17
522695	35673	9/2/2002	606124.4	3468324.0	2	1386.71	1392.79	1	-6.07
522695	35734	11/2/2002	606124.4	3468324.0	2	1386.73	1392.72	1	-6.00
522695	35795	1/2/2003	606124.4	3468324.0	2	1386.73	1392.66	1	-5.93
522695	35915	5/2/2003	606124.4	3468324.0	2	1386.71	1392.55	1	-5.84
522695	36007	8/2/2003	606124.4	3468324.0	2	1386.70	1392.47	1	-5.77
522695	36129	12/2/2003	606124.4	3468324.0	2	1386.68	1392.36	1	-5.68
522695	36769	9/2/2005	606124.4	3468324.0	2	1386.59	1391.92	1	-5.33
522695	36830	11/2/2005	606124.4	3468324.0	2	1386.65	1391.88	1	-5.23

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522695	37011	5/2/2006	606124.4	3468324.0	2	1386.59	1391.78	1	-5.19
522695	37103	8/2/2006	606124.4	3468324.0	2	1386.59	1391.74	1	-5.15
522695	37195	11/2/2006	606124.4	3468324.0	2	1386.56	1391.69	1	-5.13
522695	37287	2/2/2007	606124.4	3468324.0	2	1386.56	1391.64	1	-5.09
522695	37407	6/2/2007	606124.4	3468324.0	2	1386.56	1391.59	1	-5.03
522695	37590	12/2/2007	606124.4	3468324.0	2	1386.59	1391.51	1	-4.92
522695	37677	2/27/2008	606124.4	3468324.0	2	1386.57	1391.48	1	-4.91
522695	37761	5/21/2008	606124.4	3468324.0	2	1386.57	1391.44	1	-4.87
522695	37837	8/5/2008	606124.4	3468324.0	2	1386.56	1391.42	1	-4.86
522695	37839	8/7/2008	606124.4	3468324.0	2	1386.80	1391.41	1	-4.62
522695	37923	10/30/2008	606124.4	3468324.0	2	1386.54	1391.38	1	-4.84
522695	38033	2/17/2009	606124.4	3468324.0	2	1386.41	1391.35	1	-4.93
522695	38043	2/27/2009	606124.4	3468324.0	2	1386.41	1391.34	1	-4.93
522695	38119	5/14/2009	606124.4	3468324.0	2	1386.56	1391.32	1	-4.76
522695	38216	8/19/2009	606124.4	3468324.0	2	1386.53	1391.29	1	-4.76
522695	38302	11/13/2009	606124.4	3468324.0	2	1386.51	1391.26	1	-4.75
522695	38418	3/9/2010	606124.4	3468324.0	2	1386.50	1391.23	1	-4.73
522695	38455	4/15/2010	606124.4	3468324.0	2	1386.49	1391.22	1	-4.73
522695	38534	7/3/2010	606124.4	3468324.0	2	1386.46	1391.19	1	-4.74
522695	38918	7/22/2011	606124.4	3468324.0	2	1386.23	1391.09	1	-4.86
522695	39272	7/10/2012	606124.4	3468324.0	2	1385.77	1391.02	1	-5.25
522696	30607	10/19/1988	601666.4	3471898.0	2	1377.69	1360.57	1	17.12
522696	30628	11/9/1988	601666.4	3471898.0	2	1377.67	1360.57	1	17.11
522696	30711	1/31/1989	601666.4	3471898.0	2	1374.78	1360.56	1	14.22
522696	30742	3/3/1989	601666.4	3471898.0	2	1374.70	1360.55	1	14.15
522696	30778	4/8/1989	601666.4	3471898.0	2	1374.64	1360.55	1	14.09
522696	30803	5/3/1989	601666.4	3471898.0	2	1374.79	1360.54	1	14.25
522696	30839	6/8/1989	601666.4	3471898.0	2	1374.50	1360.54	1	13.96
522696	30876	7/15/1989	601666.4	3471898.0	2	1374.36	1360.53	1	13.83
522696	30930	9/7/1989	601666.4	3471898.0	2	1374.33	1360.53	1	13.81
522696	30976	10/23/1989	601666.4	3471898.0	2	1374.33	1360.52	1	13.81
522696	30991	11/7/1989	601666.4	3471898.0	2	1374.40	1360.52	1	13.88
522696	31016	12/2/1989	601666.4	3471898.0	2	1374.17	1360.52	1	13.65
522696	31047	1/2/1990	601666.4	3471898.0	2	1373.86	1360.51	1	13.35
522696	31078	2/2/1990	601666.4	3471898.0	2	1374.02	1360.51	1	13.51
522696	31106	3/2/1990	601666.4	3471898.0	2	1374.03	1360.51	1	13.53
522696	31137	4/2/1990	601666.4	3471898.0	2	1373.26	1360.50	1	12.75
522696	32532	1/26/1994	601666.4	3471898.0	2	1362.77	1359.49	1	3.28
522696	33409	6/21/1996	601666.4	3471898.0	2	1360.97	1358.49	1	2.48
522696	33414	6/26/1996	601666.4	3471898.0	2	1360.97	1358.48	1	2.49
522696	39156	3/16/2012	601666.4	3471898.0	2	1359.98	1352.82	1	7.16
522696	39196	4/25/2012	601666.4	3471898.0	2	1360.06	1352.79	1	7.27
522696	39338	9/14/2012	601666.4	3471898.0	2	1360.29	1352.71	1	7.58
522696	39374	10/20/2012	601666.4	3471898.0	2	1360.54	1352.68	1	7.86
522697	30607	10/19/1988	601576.8	3467164.3	1	1360.01	1357.28	1	2.74
522697	30693	1/13/1989	601576.8	3467164.3	1	1359.85	1357.30	1	2.54
522697	30720	2/9/1989	601576.8	3467164.3	1	1360.08	1357.31	1	2.77
522697	30756	3/17/1989	601576.8	3467164.3	1	1359.95	1357.32	1	2.63
522697	30789	4/19/1989	601576.8	3467164.3	1	1359.86	1357.33	1	2.53
522697	30819	5/19/1989	601576.8	3467164.3	1	1359.92	1357.34	1	2.59
522697	30854	6/23/1989	601576.8	3467164.3	1	1359.54	1357.35	1	2.19
522697	30881	7/20/1989	601576.8	3467164.3	1	1359.36	1357.35	1	2.01
522697	30930	9/7/1989	601576.8	3467164.3	1	1359.19	1357.37	1	1.83
522697	30976	10/23/1989	601576.8	3467164.3	1	1359.25	1357.38	1	1.88
522697	30991	11/7/1989	601576.8	3467164.3	1	1359.12	1357.38	1	1.74
522697	31047	1/2/1990	601576.8	3467164.3	1	1359.04	1357.39	1	1.65
522697	31137	4/2/1990	601576.8	3467164.3	1	1358.55	1357.41	1	1.14
522697	33414	6/26/1996	601576.8	3467164.3	1	1354.32	1357.18	1	-2.86
522697	33472	8/23/1996	601576.8	3467164.3	1	1354.27	1357.15	1	-2.87
522697	33506	9/26/1996	601576.8	3467164.3	1	1354.29	1357.13	1	-2.84
522697	33540	10/30/1996	601576.8	3467164.3	1	1354.20	1357.10	1	-2.91
522697	33591	12/20/1996	601576.8	3467164.3	1	1354.24	1357.07	1	-2.83
522697	33632	1/30/1997	601576.8	3467164.3	1	1354.32	1357.05	1	-2.73
522697	33661	2/28/1997	601576.8	3467164.3	1	1354.29	1357.03	1	-2.74

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522697	33709	4/17/1997	601576.8	3467164.3	1	1354.10	1357.00	1	-2.89
522697	33886	10/11/1997	601576.8	3467164.3	1	1353.53	1356.88	1	-3.36
522697	33973	1/6/1998	601576.8	3467164.3	1	1353.65	1356.82	1	-3.17
522697	34094	5/7/1998	601576.8	3467164.3	1	1353.77	1356.67	1	-2.90
522698	30607	10/19/1988	601283.9	3469891.0	1	1359.84	1358.13	1	1.71
522698	30686	1/6/1989	601283.9	3469891.0	1	1361.02	1358.13	1	2.89
522698	30713	2/2/1989	601283.9	3469891.0	1	1359.83	1358.12	1	1.70
522698	30742	3/3/1989	601283.9	3469891.0	1	1359.69	1358.12	1	1.57
522698	30788	4/18/1989	601283.9	3469891.0	1	1359.57	1358.12	1	1.45
522698	30818	5/18/1989	601283.9	3469891.0	1	1359.60	1358.12	1	1.48
522698	30851	6/20/1989	601283.9	3469891.0	1	1359.33	1358.11	1	1.21
522698	30880	7/19/1989	601283.9	3469891.0	1	1359.20	1358.11	1	1.09
522698	30930	9/7/1989	601283.9	3469891.0	1	1358.98	1358.11	1	0.87
522698	30976	10/23/1989	601283.9	3469891.0	1	1359.08	1358.11	1	0.98
522698	30991	11/7/1989	601283.9	3469891.0	1	1359.39	1358.11	1	1.28
522698	31047	1/2/1990	601283.9	3469891.0	1	1359.67	1358.10	1	1.57
522698	31137	4/2/1990	601283.9	3469891.0	1	1359.41	1358.10	1	1.32
522698	32533	1/27/1994	601283.9	3469891.0	1	1355.06	1357.94	1	-2.88
522698	35397	11/30/2001	601283.9	3469891.0	1	1351.57	1355.70	1	-4.13
522699	30607	10/19/1988	599617.3	3471427.5	2	1359.52	1353.20	1	6.32
522699	30692	1/12/1989	599617.3	3471427.5	2	1360.71	1353.21	1	7.49
522699	30720	2/9/1989	599617.3	3471427.5	2	1359.45	1353.22	1	6.23
522699	30749	3/10/1989	599617.3	3471427.5	2	1359.37	1353.22	1	6.15
522699	30789	4/19/1989	599617.3	3471427.5	2	1359.35	1353.22	1	6.13
522699	30820	5/20/1989	599617.3	3471427.5	2	1359.34	1353.23	1	6.12
522699	30851	6/20/1989	599617.3	3471427.5	2	1359.24	1353.23	1	6.01
522699	30882	7/21/1989	599617.3	3471427.5	2	1359.16	1353.23	1	5.92
522699	30930	9/7/1989	599617.3	3471427.5	2	1359.02	1353.24	1	5.78
522699	30976	10/23/1989	599617.3	3471427.5	2	1359.22	1353.24	1	5.97
522699	30991	11/7/1989	599617.3	3471427.5	2	1359.72	1353.24	1	6.48
522699	31016	12/2/1989	599617.3	3471427.5	2	1360.09	1353.25	1	6.84
522699	31078	2/2/1990	599617.3	3471427.5	2	1360.02	1353.25	1	6.77
522699	31137	4/2/1990	599617.3	3471427.5	2	1359.88	1353.26	1	6.63
522699	33414	6/26/1996	599617.3	3471427.5	2	1355.07	1352.57	1	2.50
522699	33540	10/30/1996	599617.3	3471427.5	2	1354.87	1352.49	1	2.38
522699	34485	6/2/1999	599617.3	3471427.5	2	1354.64	1351.73	1	2.91
522699	34514	7/1/1999	599617.3	3471427.5	2	1354.64	1351.70	1	2.94
522699	34759	3/2/2000	599617.3	3471427.5	2	1354.46	1351.46	1	3.00
522699	34851	6/2/2000	599617.3	3471427.5	2	1354.31	1351.37	1	2.93
522699	34943	9/2/2000	599617.3	3471427.5	2	1354.18	1351.28	1	2.90
522699	35034	12/2/2000	599617.3	3471427.5	2	1354.03	1351.20	1	2.83
522699	35096	2/2/2001	599617.3	3471427.5	2	1353.96	1351.14	1	2.82
522699	35216	6/2/2001	599617.3	3471427.5	2	1353.82	1351.03	1	2.79
522699	35338	10/2/2001	599617.3	3471427.5	2	1353.64	1350.91	1	2.72
522699	35461	2/2/2002	599617.3	3471427.5	2	1353.45	1350.80	1	2.65
522699	35581	6/2/2002	599617.3	3471427.5	2	1353.33	1350.69	1	2.64
522699	35673	9/2/2002	599617.3	3471427.5	2	1353.27	1350.61	1	2.66
522699	35734	11/2/2002	599617.3	3471427.5	2	1353.21	1350.56	1	2.65
522699	37011	5/2/2006	599617.3	3471427.5	2	1351.65	1349.40	1	2.25
522699	37103	8/2/2006	599617.3	3471427.5	2	1351.56	1349.32	1	2.24
522699	37195	11/2/2006	599617.3	3471427.5	2	1351.56	1349.24	1	2.32
522699	37287	2/2/2007	599617.3	3471427.5	2	1351.56	1349.16	1	2.40
522699	37407	6/2/2007	599617.3	3471427.5	2	1351.56	1349.06	1	2.51
522699	37590	12/2/2007	599617.3	3471427.5	2	1351.56	1348.90	1	2.66
522699	37678	2/28/2008	599617.3	3471427.5	2	1351.59	1348.83	1	2.77
522699	38043	2/27/2009	599617.3	3471427.5	2	1351.53	1348.54	1	2.99
522700	30607	10/19/1988	603914.7	3468504.0	2	1361.96	1369.06	1	-7.10
522700	30698	1/18/1989	603914.7	3468504.0	2	1363.07	1369.03	1	-5.96
522700	30718	2/7/1989	603914.7	3468504.0	2	1361.90	1369.02	1	-7.12
522700	30748	3/9/1989	603914.7	3468504.0	2	1361.81	1369.01	1	-7.20
522700	30788	4/18/1989	603914.7	3468504.0	2	1361.73	1369.00	1	-7.26
522700	30818	5/18/1989	603914.7	3468504.0	2	1361.75	1368.99	1	-7.24
522700	30854	6/23/1989	603914.7	3468504.0	2	1361.61	1368.98	1	-7.37
522700	30881	7/20/1989	603914.7	3468504.0	2	1361.55	1368.97	1	-7.42

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
522700	30930	9/7/1989	603914.7	3468504.0	2	1361.46	1368.96	1	-7.50
522700	30976	10/23/1989	603914.7	3468504.0	2	1361.41	1368.94	1	-7.53
522700	30991	11/7/1989	603914.7	3468504.0	2	1361.71	1368.94	1	-7.23
522700	31047	1/2/1990	603914.7	3468504.0	2	1362.11	1368.92	1	-6.82
522700	31137	4/2/1990	603914.7	3468504.0	2	1361.91	1368.90	1	-6.99
522700	32533	1/27/1994	603914.7	3468504.0	2	1357.91	1368.13	1	-10.22
522815	30607	10/19/1988	600892.3	3468876.0	1	1359.72	1356.36	1	3.36
522815	30638	11/19/1988	600892.3	3468876.0	1	1360.96	1356.36	1	4.60
522815	30705	1/25/1989	600892.3	3468876.0	1	1359.62	1356.37	1	3.25
522815	30739	2/28/1989	600892.3	3468876.0	1	1359.51	1356.37	1	3.14
522815	30775	4/5/1989	600892.3	3468876.0	1	1359.34	1356.37	1	2.97
522815	30802	5/2/1989	600892.3	3468876.0	1	1359.19	1356.38	1	2.81
522815	30838	6/7/1989	600892.3	3468876.0	1	1359.08	1356.38	1	2.70
522815	30874	7/13/1989	600892.3	3468876.0	1	1358.84	1356.38	1	2.46
522815	30930	9/7/1989	600892.3	3468876.0	1	1358.75	1356.39	1	2.36
522815	30976	10/23/1989	600892.3	3468876.0	1	1358.93	1356.39	1	2.54
522815	30991	11/7/1989	600892.3	3468876.0	1	1359.31	1356.39	1	2.92
522815	31016	12/2/1989	600892.3	3468876.0	1	1359.62	1356.40	1	3.23
522815	31047	1/2/1990	600892.3	3468876.0	1	1359.55	1356.40	1	3.15
522815	31078	2/2/1990	600892.3	3468876.0	1	1359.51	1356.40	1	3.11
522815	31106	3/2/1990	600892.3	3468876.0	1	1359.45	1356.40	1	3.05
522815	31137	4/2/1990	600892.3	3468876.0	1	1359.30	1356.41	1	2.90
522816	30607	10/19/1988	599687.6	3470076.0	1	1362.92	1352.15	1	10.77
522816	30693	1/13/1989	599687.6	3470076.0	1	1361.08	1352.16	1	8.92
522816	30750	3/11/1989	599687.6	3470076.0	1	1362.75	1352.17	1	10.58
522816	30789	4/19/1989	599687.6	3470076.0	1	1362.64	1352.17	1	10.47
522816	30819	5/19/1989	599687.6	3470076.0	1	1362.72	1352.17	1	10.55
522816	30851	6/20/1989	599687.6	3470076.0	1	1362.40	1352.18	1	10.23
522816	30880	7/19/1989	599687.6	3470076.0	1	1362.29	1352.18	1	10.11
522816	30930	9/7/1989	599687.6	3470076.0	1	1362.23	1352.18	1	10.05
522816	30976	10/23/1989	599687.6	3470076.0	1	1362.38	1352.19	1	10.19
522816	30991	11/7/1989	599687.6	3470076.0	1	1361.17	1352.19	1	8.98
522816	31047	1/2/1990	599687.6	3470076.0	1	1360.18	1352.20	1	7.98
522816	31137	4/2/1990	599687.6	3470076.0	1	1360.00	1352.21	1	7.79
522816	37659	2/9/2008	599687.6	3470076.0	1	1350.78	1349.05	1	1.73
522817	30701	1/21/1989	607769.7	3470649.1	4	1249.81	1422.18	1	-172.36
522817	30741	3/2/1989	607769.7	3470649.1	4	1240.78	1422.18	1	-181.40
522817	30772	4/2/1989	607769.7	3470649.1	4	1260.09	1422.18	1	-162.08
522817	30802	5/2/1989	607769.7	3470649.1	4	1259.87	1422.17	1	-162.30
522817	30833	6/2/1989	607769.7	3470649.1	4	1259.76	1422.17	1	-162.41
522817	30863	7/2/1989	607769.7	3470649.1	4	1259.64	1422.17	1	-162.53
522817	30894	8/2/1989	607769.7	3470649.1	4	1260.07	1422.17	1	-162.10
522817	30925	9/2/1989	607769.7	3470649.1	4	1260.02	1422.17	1	-162.15
522817	30986	11/2/1989	607769.7	3470649.1	4	1260.06	1422.17	1	-162.11
522817	30991	11/7/1989	607769.7	3470649.1	4	1260.04	1422.17	1	-162.13
522817	31137	4/2/1990	607769.7	3470649.1	4	1259.80	1422.17	1	-162.36
525136	30899	8/7/1989	604891.4	3471328.0	1	1422.38	1414.09	1	8.29
525136	30991	11/7/1989	604891.4	3471328.0	1	1424.01	1414.09	1	9.92
525137	30902	8/10/1989	604891.4	3471328.0	1	1423.14	1414.09	1	9.05
525137	30991	11/7/1989	604891.4	3471328.0	1	1424.01	1414.09	1	9.92
525139	30930	9/7/1989	607285.8	3473348.0	4	1413.63	1463.06	1	-49.43
525139	30957	10/4/1989	607285.8	3473348.0	4	1413.93	1463.06	1	-49.13
525139	30976	10/23/1989	607285.8	3473348.0	4	1413.81	1463.06	1	-49.25
525139	30991	11/7/1989	607285.8	3473348.0	4	1413.90	1463.06	1	-49.15
525139	31047	1/2/1990	607285.8	3473348.0	4	1413.73	1463.05	1	-49.32
525139	31137	4/2/1990	607285.8	3473348.0	4	1413.76	1463.05	1	-49.29
525141	30903	8/11/1989	604891.4	3471328.0	1	1423.61	1414.09	1	9.52
525141	30930	9/7/1989	604891.4	3471328.0	1	1422.63	1414.09	1	8.54
525141	30976	10/23/1989	604891.4	3471328.0	1	1422.59	1414.09	1	8.50
525141	30991	11/7/1989	604891.4	3471328.0	1	1424.20	1414.09	1	10.11
525141	31016	12/2/1989	604891.4	3471328.0	1	1424.03	1414.09	1	9.94
525141	31047	1/2/1990	604891.4	3471328.0	1	1423.70	1414.09	1	9.61
525141	31078	2/2/1990	604891.4	3471328.0	1	1423.38	1414.09	1	9.29
525141	31106	3/2/1990	604891.4	3471328.0	1	1423.11	1414.09	1	9.02

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
525141	31137	4/2/1990	604891.4	3471328.0	1	1422.80	1414.09	1	8.71
525143	30929	9/6/1989	603668.6	3472719.0	2	1382.77	1366.08	1	16.69
525143	30955	10/2/1989	603668.6	3472719.0	2	1383.34	1366.08	1	17.26
525143	30976	10/23/1989	603668.6	3472719.0	2	1381.71	1366.08	1	15.63
525143	30992	11/8/1989	603668.6	3472719.0	2	1382.62	1366.08	1	16.54
525143	31047	1/2/1990	603668.6	3472719.0	2	1382.65	1366.08	1	16.57
525143	31137	4/2/1990	603668.6	3472719.0	2	1382.47	1366.08	1	16.39
525548	30949	9/26/1989	602500.4	3469496.0	2	1363.64	1360.53	1	3.12
525548	30976	10/23/1989	602500.4	3469496.0	2	1364.89	1360.52	1	4.37
525548	30991	11/7/1989	602500.4	3469496.0	2	1363.79	1360.52	1	3.27
525548	30992	11/8/1989	602500.4	3469496.0	2	1363.39	1360.52	1	2.87
525552	30963	10/10/1989	602890.9	3470303.0	2	1365.77	1363.01	1	2.75
525552	30976	10/23/1989	602890.9	3470303.0	2	1363.12	1363.01	1	0.11
525552	30992	11/8/1989	602890.9	3470303.0	2	1365.19	1363.01	1	2.18
525552	31078	2/2/1990	602890.9	3470303.0	2	1365.08	1362.98	1	2.10
525553	30957	10/4/1989	603502.4	3469707.0	1	1366.10	1361.44	1	4.67
525553	30976	10/23/1989	603502.4	3469707.0	1	1364.73	1361.43	1	3.29
525553	30991	11/7/1989	603502.4	3469707.0	1	1365.21	1361.43	1	3.78
525553	31078	2/2/1990	603502.4	3469707.0	1	1365.27	1361.41	1	3.85
525554	30976	10/23/1989	604709.7	3469520.0	2	1367.79	1390.45	1	-22.66
525554	30991	11/7/1989	604709.7	3469520.0	2	1375.96	1390.40	1	-14.44
525554	31016	12/2/1989	604709.7	3469520.0	2	1375.81	1390.33	1	-14.52
525554	31106	3/2/1990	604709.7	3469520.0	2	1375.45	1390.06	1	-14.61
525556	30935	9/12/1989	604096.2	3470517.0	1	1369.70	1365.21	1	4.50
525556	30991	11/7/1989	604096.2	3470517.0	1	1368.32	1365.19	1	3.13
525557	30933	9/10/1989	604096.2	3470517.0	1	1368.38	1365.21	1	3.17
525557	30991	11/7/1989	604096.2	3470517.0	1	1367.75	1365.19	1	2.56
525558	30937	9/14/1989	602500.4	3469496.0	2	1363.65	1360.53	1	3.12
525558	30955	10/2/1989	602500.4	3469496.0	2	1363.96	1360.52	1	3.43
525558	30986	11/2/1989	602500.4	3469496.0	2	1364.50	1360.52	1	3.98
525558	30992	11/8/1989	602500.4	3469496.0	2	1364.45	1360.52	1	3.93
525558	31137	4/2/1990	602500.4	3469496.0	2	1364.17	1360.50	1	3.67
525559	30950	9/27/1989	602500.4	3469496.0	1	1358.41	1359.56	1	-1.14
525559	30992	11/8/1989	602500.4	3469496.0	1	1363.12	1359.55	1	3.57
525559	31016	12/2/1989	602500.4	3469496.0	1	1362.99	1359.55	1	3.44
525559	31106	3/2/1990	602500.4	3469496.0	1	1362.65	1359.54	1	3.11
526268	31000	11/16/1989	607870.3	3473953.0	4	1499.35	1471.12	1	28.23
527586	31178	5/13/1990	598076.9	3468637.5	1	1356.75	1348.91	1	7.84
527586	38266	10/8/2009	598076.9	3468637.5	1	1351.07	1346.55	1	4.53
527586	38426	3/17/2010	598076.9	3468637.5	1	1351.72	1346.49	1	5.23
527586	38496	5/26/2010	598076.9	3468637.5	1	1351.42	1346.47	1	4.95
527586	38588	8/26/2010	598076.9	3468637.5	1	1351.05	1346.43	1	4.62
527586	38884	6/18/2011	598076.9	3468637.5	1	1350.12	1346.28	1	3.84
527586	39057	12/8/2011	598076.9	3468637.5	1	1349.95	1346.16	1	3.79
527586	39147	3/7/2012	598076.9	3468637.5	1	1349.97	1346.10	1	3.87
531770	31560	5/30/1991	602857.4	3471424.2	1	1365.86	1364.30	1	1.56
531770	37656	2/6/2008	602857.4	3471424.2	1	1353.89	1360.74	1	-6.86
531770	37756	5/16/2008	602857.4	3471424.2	1	1353.80	1360.73	1	-6.93
531770	37832	7/31/2008	602857.4	3471424.2	1	1353.71	1360.73	1	-7.01
531770	37914	10/21/2008	602857.4	3471424.2	1	1353.62	1360.72	1	-7.10
531770	38029	2/13/2009	602857.4	3471424.2	1	1353.48	1360.71	1	-7.23
531770	38097	4/22/2009	602857.4	3471424.2	1	1353.47	1360.70	1	-7.23
531770	38201	8/4/2009	602857.4	3471424.2	1	1353.37	1360.70	1	-7.32
531770	38287	10/29/2009	602857.4	3471424.2	1	1353.27	1360.69	1	-7.43
531770	38383	2/2/2010	602857.4	3471424.2	1	1353.15	1360.68	1	-7.53
531770	38467	4/27/2010	602857.4	3471424.2	1	1353.07	1360.68	1	-7.61
531770	38552	7/21/2010	602857.4	3471424.2	1	1352.97	1360.68	1	-7.70
531770	38644	10/21/2010	602857.4	3471424.2	1	1352.97	1360.67	1	-7.70
531770	38814	4/9/2011	602857.4	3471424.2	1	1352.70	1360.67	1	-7.97
531770	39185	4/14/2012	602857.4	3471424.2	1	1352.31	1360.66	1	-8.36
538847	32256	4/25/1993	599494.9	3468060.0	1	1357.05	1351.86	1	5.19
538847	38015	1/30/2009	599494.9	3468060.0	1	1295.18	1349.03	1	-53.85
539265	32329	7/7/1993	601463.1	3468840.1	1	1352.00	1357.48	1	-5.47
539265	37671	2/21/2008	601463.1	3468840.1	1	1354.70	1353.05	1	1.65

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
539265	37747	5/7/2008	601463.1	3468840.1	1	1354.62	1352.99	1	1.63
539265	37817	7/16/2008	601463.1	3468840.1	1	1354.42	1352.93	1	1.49
539265	37944	11/20/2008	601463.1	3468840.1	1	1354.39	1352.83	1	1.56
539265	38014	1/29/2009	601463.1	3468840.1	1	1354.53	1352.78	1	1.76
539265	38091	4/16/2009	601463.1	3468840.1	1	1354.37	1352.72	1	1.65
539265	38182	7/16/2009	601463.1	3468840.1	1	1354.26	1352.65	1	1.61
539265	38271	10/13/2009	601463.1	3468840.1	1	1354.10	1352.59	1	1.51
539265	38377	1/27/2010	601463.1	3468840.1	1	1354.03	1352.52	1	1.51
539265	38463	4/23/2010	601463.1	3468840.1	1	1353.93	1352.46	1	1.47
539265	38553	7/22/2010	601463.1	3468840.1	1	1353.72	1352.41	1	1.31
539265	38642	10/19/2010	601463.1	3468840.1	1	1353.64	1352.35	1	1.29
539265	38735	1/20/2011	601463.1	3468840.1	1	1353.62	1352.29	1	1.33
539265	38814	4/9/2011	601463.1	3468840.1	1	1353.80	1352.24	1	1.56
539265	38909	7/13/2011	601463.1	3468840.1	1	1353.29	1352.17	1	1.12
539265	39000	10/12/2011	601463.1	3468840.1	1	1353.17	1352.11	1	1.06
539265	39119	2/8/2012	601463.1	3468840.1	1	1353.13	1352.02	1	1.11
539265	39183	4/12/2012	601463.1	3468840.1	1	1353.05	1351.97	1	1.08
539265	39269	7/7/2012	601463.1	3468840.1	1	1352.81	1351.90	1	0.90
539265	39363	10/9/2012	601463.1	3468840.1	1	1352.78	1351.83	1	0.96
539783	32401	9/17/1993	604169.1	3472151.6	1	1370.62	1368.75	1	1.86
539783	32421	10/7/1993	604169.1	3472151.6	1	1370.31	1368.64	1	1.67
539783	32469	11/24/1993	604169.1	3472151.6	1	1370.53	1368.40	1	2.12
539783	32511	1/5/1994	604169.1	3472151.6	1	1370.50	1368.19	1	2.30
539783	33414	6/26/1996	604169.1	3472151.6	1	1368.06	1365.53	1	2.53
539783	33472	8/23/1996	604169.1	3472151.6	1	1367.90	1365.42	1	2.48
539783	33506	9/26/1996	604169.1	3472151.6	1	1367.84	1365.36	1	2.49
539783	33540	10/30/1996	604169.1	3472151.6	1	1367.83	1365.30	1	2.53
539783	33591	12/20/1996	604169.1	3472151.6	1	1367.78	1365.21	1	2.57
539783	33632	1/30/1997	604169.1	3472151.6	1	1367.69	1365.14	1	2.55
539783	33661	2/28/1997	604169.1	3472151.6	1	1367.71	1365.09	1	2.61
539783	33709	4/17/1997	604169.1	3472151.6	1	1367.58	1365.02	1	2.57
539783	33886	10/11/1997	604169.1	3472151.6	1	1369.63	1364.75	1	4.88
539783	33973	1/6/1998	604169.1	3472151.6	1	1368.03	1364.59	1	3.44
539783	34485	6/2/1999	604169.1	3472151.6	1	1368.91	1361.33	1	7.58
539783	34514	7/1/1999	604169.1	3472151.6	1	1368.91	1361.23	1	7.68
539783	34759	3/2/2000	604169.1	3472151.6	1	1368.41	1361.23	1	7.18
539783	34851	6/2/2000	604169.1	3472151.6	1	1368.15	1361.23	1	6.92
539783	34943	9/2/2000	604169.1	3472151.6	1	1367.95	1361.23	1	6.72
539783	35034	12/2/2000	604169.1	3472151.6	1	1367.68	1361.23	1	6.45
539783	35096	2/2/2001	604169.1	3472151.6	1	1367.65	1361.23	1	6.42
539783	35216	6/2/2001	604169.1	3472151.6	1	1367.63	1361.23	1	6.40
539783	35338	10/2/2001	604169.1	3472151.6	1	1367.62	1361.23	1	6.39
539783	35461	2/2/2002	604169.1	3472151.6	1	1367.60	1361.23	1	6.37
539783	35581	6/2/2002	604169.1	3472151.6	1	1367.65	1361.23	1	6.42
539783	35673	9/2/2002	604169.1	3472151.6	1	1367.63	1361.23	1	6.40
539783	35734	11/2/2002	604169.1	3472151.6	1	1367.62	1361.23	1	6.39
539783	35795	1/2/2003	604169.1	3472151.6	1	1367.68	1361.23	1	6.45
539783	35915	5/2/2003	604169.1	3472151.6	1	1367.77	1361.23	1	6.54
539783	36007	8/2/2003	604169.1	3472151.6	1	1367.89	1361.23	1	6.66
539783	36129	12/2/2003	604169.1	3472151.6	1	1367.92	1361.23	1	6.69
539783	36191	2/2/2004	604169.1	3472151.6	1	1367.92	1361.23	1	6.69
539783	36281	5/2/2004	604169.1	3472151.6	1	1367.91	1361.23	1	6.68
539783	36373	8/2/2004	604169.1	3472151.6	1	1367.92	1361.23	1	6.69
539783	36465	11/2/2004	604169.1	3472151.6	1	1367.92	1361.23	1	6.69
539783	36557	2/2/2005	604169.1	3472151.6	1	1367.83	1361.23	1	6.60
539783	36677	6/2/2005	604169.1	3472151.6	1	1367.81	1361.23	1	6.58
539783	36769	9/2/2005	604169.1	3472151.6	1	1367.77	1361.23	1	6.54
539783	36830	11/2/2005	604169.1	3472151.6	1	1367.71	1361.23	1	6.48
539783	36922	2/2/2006	604169.1	3472151.6	1	1367.68	1361.23	1	6.45
539783	37011	5/2/2006	604169.1	3472151.6	1	1367.65	1361.23	1	6.42
539783	37103	8/2/2006	604169.1	3472151.6	1	1367.62	1361.23	1	6.39
539783	37195	11/2/2006	604169.1	3472151.6	1	1367.57	1361.23	1	6.34
539783	37287	2/2/2007	604169.1	3472151.6	1	1367.52	1361.23	1	6.29
539783	37407	6/2/2007	604169.1	3472151.6	1	1367.49	1361.23	1	6.26

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
539783	37499	9/2/2007	604169.1	3472151.6	1	1367.52	1361.23	1	6.29
539783	37590	12/2/2007	604169.1	3472151.6	1	1367.43	1361.23	1	6.20
539783	37684	3/5/2008	604169.1	3472151.6	1	1367.41	1361.23	1	6.18
539783	37764	5/24/2008	604169.1	3472151.6	1	1367.46	1361.23	1	6.23
539783	37838	8/6/2008	604169.1	3472151.6	1	1367.51	1361.23	1	6.28
539783	37930	11/6/2008	604169.1	3472151.6	1	1367.42	1361.23	1	6.19
539783	38037	2/21/2009	604169.1	3472151.6	1	1367.47	1361.23	1	6.24
539783	38112	5/7/2009	604169.1	3472151.6	1	1367.49	1361.23	1	6.26
539783	38215	8/18/2009	604169.1	3472151.6	1	1367.49	1361.23	1	6.26
539783	38294	11/5/2009	604169.1	3472151.6	1	1367.51	1361.23	1	6.28
539783	38411	3/2/2010	604169.1	3472151.6	1	1367.45	1361.23	1	6.22
539783	38448	4/8/2010	604169.1	3472151.6	1	1367.49	1361.23	1	6.26
539783	38538	7/7/2010	604169.1	3472151.6	1	1367.50	1361.23	1	6.27
539783	38910	7/14/2011	604169.1	3472151.6	1	1367.50	1361.23	1	6.27
539783	39113	2/2/2012	604169.1	3472151.6	1	1367.76	1361.23	1	6.53
539783	39307	8/14/2012	604169.1	3472151.6	1	1368.94	1361.23	1	7.71
539786	32359	8/6/1993	603479.9	3471513.0	1	1364.09	1364.66	1	-0.57
539786	32401	9/17/1993	603479.9	3471513.0	1	1362.15	1364.51	1	-2.35
539786	32421	10/7/1993	603479.9	3471513.0	1	1361.97	1364.43	1	-2.47
539786	32469	11/24/1993	603479.9	3471513.0	1	1361.85	1364.27	1	-2.42
539786	32511	1/5/1994	603479.9	3471513.0	1	1361.69	1364.13	1	-2.43
539786	33414	6/26/1996	603479.9	3471513.0	1	1359.10	1361.97	1	-2.87
539786	33472	8/23/1996	603479.9	3471513.0	1	1358.94	1361.87	1	-2.94
539786	33506	9/26/1996	603479.9	3471513.0	1	1358.80	1361.82	1	-3.02
539786	33540	10/30/1996	603479.9	3471513.0	1	1358.77	1361.76	1	-2.99
539786	33591	12/20/1996	603479.9	3471513.0	1	1358.60	1361.68	1	-3.08
539786	33632	1/30/1997	603479.9	3471513.0	1	1358.51	1361.62	1	-3.11
539786	33661	2/28/1997	603479.9	3471513.0	1	1358.46	1361.57	1	-3.11
539786	33709	4/17/1997	603479.9	3471513.0	1	1358.30	1361.50	1	-3.21
539786	33886	10/11/1997	603479.9	3471513.0	1	1358.40	1361.26	1	-2.85
539786	33973	1/6/1998	603479.9	3471513.0	1	1358.22	1361.14	1	-2.92
544535	32697	7/10/1994	601434.4	3470924.5	2	1357.31	1356.65	1	0.65
544535	37914	10/21/2008	601434.4	3470924.5	2	1343.29	1351.55	1	-8.26
551849	33108	8/25/1995	605829.8	3469072.0	3	1315.45	1393.40	1	-77.96
551849	37957	12/3/2008	605829.8	3469072.0	3	1322.42	1387.21	1	-64.79
551849	38099	4/24/2009	605829.8	3469072.0	3	1329.77	1387.20	1	-57.43
551849	38105	4/30/2009	605829.8	3469072.0	3	1329.77	1387.20	1	-57.43
551849	38239	9/11/2009	605829.8	3469072.0	3	1330.99	1387.16	1	-56.17
551849	38442	4/2/2010	605829.8	3469072.0	3	1363.91	1386.60	1	-22.69
557737	33396	6/8/1996	607740.1	3467535.0	2	1399.30	1399.42	1	-0.13
557742	33429	7/11/1996	600251.4	3473493.0	2	1420.43	1353.37	1	67.05
558557	33485	9/5/1996	602659.2	3468962.4	1	1361.98	1358.35	1	3.63
558557	33632	1/30/1997	602659.2	3468962.4	1	1361.25	1358.24	1	3.01
558557	33709	4/17/1997	602659.2	3468962.4	1	1361.10	1358.18	1	2.92
558557	33785	7/2/1997	602659.2	3468962.4	1	1360.86	1358.12	1	2.73
558557	33886	10/11/1997	602659.2	3468962.4	1	1360.69	1358.04	1	2.64
558557	33989	1/22/1998	602659.2	3468962.4	1	1360.49	1357.97	1	2.52
558557	34094	5/7/1998	602659.2	3468962.4	1	1360.34	1357.91	1	2.42
558557	34358	1/26/1999	602659.2	3468962.4	1	1361.31	1357.70	1	3.62
558557	34485	6/2/1999	602659.2	3468962.4	1	1359.48	1357.58	1	1.91
558557	34514	7/1/1999	602659.2	3468962.4	1	1359.48	1357.55	1	1.93
558557	34759	3/2/2000	602659.2	3468962.4	1	1359.33	1357.29	1	2.04
558557	34851	6/2/2000	602659.2	3468962.4	1	1358.97	1357.19	1	1.78
558557	34943	9/2/2000	602659.2	3468962.4	1	1358.78	1357.08	1	1.70
558557	35034	12/2/2000	602659.2	3468962.4	1	1358.63	1356.98	1	1.65
558557	35461	2/2/2002	602659.2	3468962.4	1	1358.10	1356.48	1	1.62
558557	35581	6/2/2002	602659.2	3468962.4	1	1357.96	1356.34	1	1.62
558557	35673	9/2/2002	602659.2	3468962.4	1	1357.78	1356.23	1	1.55
558557	35734	11/2/2002	602659.2	3468962.4	1	1357.70	1356.16	1	1.54
558557	35795	1/2/2003	602659.2	3468962.4	1	1357.62	1356.09	1	1.53
558557	35915	5/2/2003	602659.2	3468962.4	1	1357.32	1355.95	1	1.37
558557	36129	12/2/2003	602659.2	3468962.4	1	1357.20	1355.71	1	1.49
558557	36191	2/2/2004	602659.2	3468962.4	1	1357.10	1355.64	1	1.46
558557	36373	8/2/2004	602659.2	3468962.4	1	1356.83	1355.43	1	1.40

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
558557	36465	11/2/2004	602659.2	3468962.4	1	1356.80	1355.33	1	1.47
558557	36557	2/2/2005	602659.2	3468962.4	1	1356.74	1355.23	1	1.51
558557	36677	6/2/2005	602659.2	3468962.4	1	1356.56	1355.09	1	1.46
558557	36769	9/2/2005	602659.2	3468962.4	1	1356.79	1354.99	1	1.79
558557	36830	11/2/2005	602659.2	3468962.4	1	1356.41	1354.92	1	1.48
558557	37011	5/2/2006	602659.2	3468962.4	1	1356.22	1354.72	1	1.50
558557	37103	8/2/2006	602659.2	3468962.4	1	1356.07	1354.62	1	1.45
558557	37672	2/22/2008	602659.2	3468962.4	1	1355.57	1354.07	1	1.50
558557	37746	5/6/2008	602659.2	3468962.4	1	1355.50	1354.01	1	1.49
558557	37817	7/16/2008	602659.2	3468962.4	1	1355.45	1353.95	1	1.50
558557	37910	10/17/2008	602659.2	3468962.4	1	1355.33	1353.87	1	1.46
558557	38014	1/29/2009	602659.2	3468962.4	1	1355.30	1353.78	1	1.52
558557	38091	4/16/2009	602659.2	3468962.4	1	1355.25	1353.72	1	1.53
558557	38183	7/17/2009	602659.2	3468962.4	1	1355.12	1353.64	1	1.48
558557	38273	10/15/2009	602659.2	3468962.4	1	1355.03	1353.57	1	1.46
558557	38384	2/3/2010	602659.2	3468962.4	1	1354.87	1353.49	1	1.38
558557	38463	4/23/2010	602659.2	3468962.4	1	1354.82	1353.43	1	1.39
558557	38552	7/21/2010	602659.2	3468962.4	1	1354.69	1353.37	1	1.32
558557	38643	10/20/2010	602659.2	3468962.4	1	1354.58	1353.30	1	1.28
558557	38735	1/20/2011	602659.2	3468962.4	1	1354.48	1353.24	1	1.24
558557	38812	4/7/2011	602659.2	3468962.4	1	1354.41	1353.19	1	1.21
558557	38912	7/16/2011	602659.2	3468962.4	1	1354.29	1353.12	1	1.17
558557	39000	10/12/2011	602659.2	3468962.4	1	1354.14	1353.06	1	1.08
558557	39114	2/3/2012	602659.2	3468962.4	1	1354.03	1352.98	1	1.05
558557	39185	4/14/2012	602659.2	3468962.4	1	1353.97	1352.93	1	1.04
558557	39274	7/12/2012	602659.2	3468962.4	1	1353.84	1352.87	1	0.97
558557	39360	10/6/2012	602659.2	3468962.4	1	1353.73	1352.81	1	0.92
561144	33668	3/7/1997	608301.1	3472749.0	4	1422.53	1457.93	1	-35.41
562554	33767	6/14/1997	603698.3	3469104.9	2	1365.71	1366.27	1	-0.56
562554	33785	7/2/1997	603698.3	3469104.9	2	1362.99	1366.24	1	-3.25
562554	33886	10/11/1997	603698.3	3469104.9	2	1364.36	1366.08	1	-1.72
562554	33913	11/7/1997	603698.3	3469104.9	2	1362.42	1366.04	1	-3.61
562554	33973	1/6/1998	603698.3	3469104.9	2	1362.36	1365.94	1	-3.58
562554	34094	5/7/1998	603698.3	3469104.9	2	1363.89	1365.74	1	-1.84
562554	34251	10/11/1998	603698.3	3469104.9	2	1362.54	1365.45	1	-2.91
562554	34358	1/26/1999	603698.3	3469104.9	2	1363.42	1365.24	1	-1.82
562554	34485	6/2/1999	603698.3	3469104.9	2	1362.57	1365.01	1	-2.44
562554	34514	7/1/1999	603698.3	3469104.9	2	1362.57	1364.95	1	-2.39
562554	34759	3/2/2000	603698.3	3469104.9	2	1362.32	1364.52	1	-2.20
562554	34851	6/2/2000	603698.3	3469104.9	2	1362.02	1364.36	1	-2.34
562554	34943	9/2/2000	603698.3	3469104.9	2	1361.85	1364.21	1	-2.36
562554	35034	12/2/2000	603698.3	3469104.9	2	1361.75	1364.07	1	-2.32
562554	35096	2/2/2001	603698.3	3469104.9	2	1361.65	1363.97	1	-2.32
562554	35216	6/2/2001	603698.3	3469104.9	2	1361.46	1363.79	1	-2.33
562554	35338	10/2/2001	603698.3	3469104.9	2	1361.18	1363.61	1	-2.43
562554	35461	2/2/2002	603698.3	3469104.9	2	1361.00	1363.44	1	-2.44
562554	35581	6/2/2002	603698.3	3469104.9	2	1360.72	1363.28	1	-2.55
562554	35673	9/2/2002	603698.3	3469104.9	2	1360.59	1363.16	1	-2.57
562554	35734	11/2/2002	603698.3	3469104.9	2	1360.53	1363.08	1	-2.56
562554	35795	1/2/2003	603698.3	3469104.9	2	1360.50	1363.01	1	-2.51
562554	35915	5/2/2003	603698.3	3469104.9	2	1360.31	1362.86	1	-2.55
562554	36007	8/2/2003	603698.3	3469104.9	2	1360.19	1362.76	1	-2.56
562554	36129	12/2/2003	603698.3	3469104.9	2	1359.98	1362.62	1	-2.64
562554	36191	2/2/2004	603698.3	3469104.9	2	1359.89	1362.55	1	-2.66
562554	36281	5/2/2004	603698.3	3469104.9	2	1359.73	1362.44	1	-2.71
562554	36373	8/2/2004	603698.3	3469104.9	2	1359.63	1362.34	1	-2.71
562554	36465	11/2/2004	603698.3	3469104.9	2	1359.57	1362.24	1	-2.67
562554	36557	2/2/2005	603698.3	3469104.9	2	1359.52	1362.14	1	-2.62
562554	36677	6/2/2005	603698.3	3469104.9	2	1359.40	1362.02	1	-2.62
562554	36769	9/2/2005	603698.3	3469104.9	2	1359.31	1361.93	1	-2.62
562554	36830	11/2/2005	603698.3	3469104.9	2	1359.12	1361.87	1	-2.75
562554	36922	2/2/2006	603698.3	3469104.9	2	1359.00	1361.78	1	-2.78
562554	37011	5/2/2006	603698.3	3469104.9	2	1358.88	1361.70	1	-2.82
562554	37103	8/2/2006	603698.3	3469104.9	2	1358.73	1361.61	1	-2.88

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
562554	37195	11/2/2006	603698.3	3469104.9	2	1358.59	1361.52	1	-2.93
562554	37287	2/2/2007	603698.3	3469104.9	2	1358.51	1361.44	1	-2.92
562554	37407	6/2/2007	603698.3	3469104.9	2	1358.42	1361.32	1	-2.90
562554	37526	9/29/2007	603698.3	3469104.9	2	1358.32	1361.21	1	-2.90
562554	37590	12/2/2007	603698.3	3469104.9	2	1358.19	1361.16	1	-2.96
562554	37685	3/6/2008	603698.3	3469104.9	2	1358.08	1361.08	1	-3.00
562554	37763	5/23/2008	603698.3	3469104.9	2	1358.09	1361.01	1	-2.92
562554	37839	8/7/2008	603698.3	3469104.9	2	1357.92	1360.95	1	-3.03
562554	37931	11/7/2008	603698.3	3469104.9	2	1359.29	1360.87	1	-1.58
562554	38035	2/19/2009	603698.3	3469104.9	2	1357.69	1360.79	1	-3.10
562554	38113	5/8/2009	603698.3	3469104.9	2	1357.67	1360.73	1	-3.06
562554	38216	8/19/2009	603698.3	3469104.9	2	1357.55	1360.66	1	-3.11
562554	38293	11/4/2009	603698.3	3469104.9	2	1357.46	1360.60	1	-3.14
562554	38406	2/25/2010	603698.3	3469104.9	2	1357.37	1360.52	1	-3.16
562554	38460	4/20/2010	603698.3	3469104.9	2	1357.32	1360.49	1	-3.16
562554	38534	7/3/2010	603698.3	3469104.9	2	1357.32	1360.44	1	-3.12
562554	38539	7/8/2010	603698.3	3469104.9	2	1357.32	1360.44	1	-3.11
562554	38909	7/13/2011	603698.3	3469104.9	2	1356.98	1360.20	1	-3.21
562554	39274	7/12/2012	603698.3	3469104.9	2	1356.53	1359.98	1	-3.45
562555	33766	6/13/1997	604839.6	3471299.4	2	1407.44	1372.84	1	34.60
562555	33785	7/2/1997	604839.6	3471299.4	2	1407.45	1372.79	1	34.66
562555	33886	10/11/1997	604839.6	3471299.4	2	1405.98	1372.57	1	33.41
562555	33913	11/7/1997	604839.6	3471299.4	2	1406.01	1372.51	1	33.49
562555	33973	1/6/1998	604839.6	3471299.4	2	1405.58	1372.38	1	33.20
562555	34094	5/7/1998	604839.6	3471299.4	2	1404.94	1372.09	1	32.85
562555	34242	10/2/1998	604839.6	3471299.4	2	1404.50	1371.68	1	32.82
562555	34358	1/26/1999	604839.6	3471299.4	2	1404.12	1371.22	1	32.89
562555	34485	6/2/1999	604839.6	3471299.4	2	1403.35	1370.80	1	32.56
562555	34514	7/1/1999	604839.6	3471299.4	2	1403.35	1370.70	1	32.65
562555	34759	3/2/2000	604839.6	3471299.4	2	1403.02	1370.06	1	32.96
562555	34851	6/2/2000	604839.6	3471299.4	2	1403.32	1369.86	1	33.46
562555	34943	9/2/2000	604839.6	3471299.4	2	1403.75	1369.67	1	34.08
562555	35034	12/2/2000	604839.6	3471299.4	2	1404.39	1369.49	1	34.90
562555	35096	2/2/2001	604839.6	3471299.4	2	1404.94	1369.37	1	35.56
562555	35216	6/2/2001	604839.6	3471299.4	2	1405.14	1369.17	1	35.97
562555	35338	10/2/2001	604839.6	3471299.4	2	1405.38	1368.98	1	36.40
562555	35461	2/2/2002	604839.6	3471299.4	2	1405.78	1368.80	1	36.97
562555	35581	6/2/2002	604839.6	3471299.4	2	1405.00	1368.64	1	36.36
562555	35673	9/2/2002	604839.6	3471299.4	2	1404.27	1368.51	1	35.76
562555	35734	11/2/2002	604839.6	3471299.4	2	1404.02	1368.43	1	35.59
562555	35795	1/2/2003	604839.6	3471299.4	2	1403.54	1368.36	1	35.18
562555	35915	5/2/2003	604839.6	3471299.4	2	1402.99	1368.21	1	34.78
562555	36007	8/2/2003	604839.6	3471299.4	2	1402.55	1368.10	1	34.45
562555	36129	12/2/2003	604839.6	3471299.4	2	1401.07	1367.96	1	33.11
562555	36191	2/2/2004	604839.6	3471299.4	2	1400.46	1367.89	1	32.57
562555	36281	5/2/2004	604839.6	3471299.4	2	1399.61	1367.79	1	31.81
562555	36373	8/2/2004	604839.6	3471299.4	2	1398.84	1367.73	1	31.11
562555	36465	11/2/2004	604839.6	3471299.4	2	1397.96	1367.73	1	30.23
562555	36557	2/2/2005	604839.6	3471299.4	2	1397.87	1367.70	1	30.17
562555	36677	6/2/2005	604839.6	3471299.4	2	1397.76	1367.63	1	30.13
562555	36769	9/2/2005	604839.6	3471299.4	2	1397.73	1367.56	1	30.17
562555	36830	11/2/2005	604839.6	3471299.4	2	1397.62	1367.52	1	30.10
562555	36922	2/2/2006	604839.6	3471299.4	2	1397.33	1367.45	1	29.89
562555	37011	5/2/2006	604839.6	3471299.4	2	1396.44	1367.36	1	29.07
562944	33765	6/12/1997	600177.4	3467474.7	1	1356.49	1353.52	1	2.97
562944	37921	10/28/2008	600177.4	3467474.7	1	1353.29	1350.52	1	2.77
562944	38105	4/30/2009	600177.4	3467474.7	1	1353.29	1350.43	1	2.86
562944	38239	9/11/2009	600177.4	3467474.7	1	1354.97	1350.37	1	4.60
562944	38442	4/2/2010	600177.4	3467474.7	1	1362.29	1350.29	1	11.99
564859	33947	12/11/1997	608342.1	3468542.0	2	1400.24	1400.29	1	-0.05
565260	33953	12/17/1997	602551.3	3471341.3	1	1366.64	1360.30	1	6.34
565260	37663	2/13/2008	602551.3	3471341.3	1	1354.61	1356.52	1	-1.91
565260	37770	5/30/2008	602551.3	3471341.3	1	1354.89	1356.44	1	-1.54
565260	37833	8/1/2008	602551.3	3471341.3	1	1354.42	1356.39	1	-1.97

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
565260	37914	10/21/2008	602551.3	3471341.3	1	1354.40	1356.33	1	-1.93
565260	38097	4/22/2009	602551.3	3471341.3	1	1354.24	1356.21	1	-1.96
565260	38187	7/21/2009	602551.3	3471341.3	1	1354.21	1356.15	1	-1.94
565260	38279	10/21/2009	602551.3	3471341.3	1	1354.29	1356.09	1	-1.81
565260	38384	2/3/2010	602551.3	3471341.3	1	1353.95	1356.03	1	-2.08
565260	38464	4/24/2010	602551.3	3471341.3	1	1353.85	1355.98	1	-2.14
565260	38552	7/21/2010	602551.3	3471341.3	1	1353.77	1355.94	1	-2.16
567713	34072	4/15/1998	600729.1	3468413.0	1	1361.61	1355.01	1	6.60
567713	37748	5/8/2008	600729.1	3468413.0	1	1353.35	1351.56	1	1.79
567713	37816	7/15/2008	600729.1	3468413.0	1	1353.59	1351.50	1	2.09
567713	37909	10/16/2008	600729.1	3468413.0	1	1352.46	1351.44	1	1.03
567713	38028	2/12/2009	600729.1	3468413.0	1	1346.41	1351.36	1	-4.95
567713	38093	4/18/2009	600729.1	3468413.0	1	1353.46	1351.32	1	2.14
567713	38175	7/9/2009	600729.1	3468413.0	1	1353.27	1351.27	1	2.00
567713	38188	7/22/2009	600729.1	3468413.0	1	1353.27	1351.26	1	2.01
567713	38278	10/20/2009	600729.1	3468413.0	1	1353.14	1351.20	1	1.93
567713	38384	2/3/2010	600729.1	3468413.0	1	1353.47	1351.15	1	2.31
567713	38464	4/24/2010	600729.1	3468413.0	1	1353.22	1351.13	1	2.08
567713	38547	7/16/2010	600729.1	3468413.0	1	1352.73	1351.09	1	1.64
567713	38644	10/21/2010	600729.1	3468413.0	1	1352.21	1351.04	1	1.17
567713	38736	1/21/2011	600729.1	3468413.0	1	1351.14	1350.98	1	0.15
567713	38817	4/12/2011	600729.1	3468413.0	1	1350.72	1350.91	1	-0.19
567713	38912	7/16/2011	600729.1	3468413.0	1	1351.97	1350.83	1	1.14
567713	39001	10/13/2011	600729.1	3468413.0	1	1352.36	1350.76	1	1.60
567713	39115	2/4/2012	600729.1	3468413.0	1	1352.46	1350.67	1	1.80
567713	39197	4/26/2012	600729.1	3468413.0	1	1352.06	1350.58	1	1.48
567713	39279	7/17/2012	600729.1	3468413.0	1	1351.86	1350.50	1	1.36
567713	39364	10/10/2012	600729.1	3468413.0	1	1351.81	1350.43	1	1.37
568875	34133	6/15/1998	600715.1	3468419.3	1	1349.63	1354.93	1	-5.29
568875	37817	7/16/2008	600715.1	3468419.3	1	1353.81	1351.48	1	2.33
569841	34198	8/19/1998	608754.4	3468139.0	2	1387.90	1399.68	1	-11.78
570012	34211	9/1/1998	607673.3	3473952.0	4	1480.67	1461.60	1	19.07
573596	34592	9/17/1999	600894.1	3468271.0	1	1352.50	1354.92	1	-2.41
573596	38301	11/12/2009	600894.1	3468271.0	1	1353.89	1351.68	1	2.21
573596	38407	2/26/2010	600894.1	3468271.0	1	1353.76	1351.63	1	2.13
573596	38463	4/23/2010	600894.1	3468271.0	1	1353.84	1351.61	1	2.23
573596	38548	7/17/2010	600894.1	3468271.0	1	1353.53	1351.57	1	1.97
573596	38643	10/20/2010	600894.1	3468271.0	1	1353.54	1351.51	1	2.02
573596	38666	11/12/2010	600894.1	3468271.0	1	1353.89	1351.50	1	2.39
573596	38736	1/21/2011	600894.1	3468271.0	1	1354.27	1351.46	1	2.81
573596	38811	4/6/2011	600894.1	3468271.0	1	1353.21	1351.38	1	1.83
573596	38911	7/15/2011	600894.1	3468271.0	1	1353.09	1351.30	1	1.78
573596	39001	10/13/2011	600894.1	3468271.0	1	1353.09	1351.24	1	1.85
573596	39111	1/31/2012	600894.1	3468271.0	1	1353.14	1351.14	1	2.00
573596	39195	4/24/2012	600894.1	3468271.0	1	1352.93	1351.05	1	1.88
573596	39276	7/14/2012	600894.1	3468271.0	1	1352.61	1350.98	1	1.63
573596	39365	10/11/2012	600894.1	3468271.0	1	1352.64	1350.91	1	1.74
575700	103	4/14/1905	599825.8	3467741.7	1	1371.14	1358.30	1	12.84
575700	133	5/14/1905	599825.8	3467741.7	1	1370.84	1358.30	1	12.54
575700	34591	9/16/1999	599825.8	3467741.7	1	1357.12	1352.13	1	4.99
575700	35402	12/5/2001	599825.8	3467741.7	1	1352.25	1351.42	1	0.82
575700	36220	3/2/2004	599825.8	3467741.7	1	1362.91	1350.64	1	12.27
575700	36251	4/2/2004	599825.8	3467741.7	1	1362.91	1350.61	1	12.30
575700	36312	6/2/2004	599825.8	3467741.7	1	1357.12	1350.56	1	6.56
575700	37222	11/29/2006	599825.8	3467741.7	1	1353.16	1349.94	1	3.22
575700	37749	5/9/2008	599825.8	3467741.7	1	1352.55	1349.88	1	2.67
575700	37810	7/9/2008	599825.8	3467741.7	1	1351.94	1349.86	1	2.08
575700	38099	4/24/2009	599825.8	3467741.7	1	1352.25	1349.73	1	2.51
575700	38105	4/30/2009	599825.8	3467741.7	1	1352.25	1349.73	1	2.51
575700	38239	9/11/2009	599825.8	3467741.7	1	1352.55	1349.68	1	2.87
575700	38268	10/10/2009	599825.8	3467741.7	1	1354.68	1349.66	1	5.02
575700	38442	4/2/2010	599825.8	3467741.7	1	1357.12	1349.61	1	7.51
576415	34612	10/7/1999	602170.7	3471263.6	1	1360.69	1358.89	1	1.80
576415	37756	5/16/2008	602170.7	3471263.6	1	1355.58	1355.43	1	0.15

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
576415	37851	8/19/2008	602170.7	3471263.6	1	1355.49	1355.34	1	0.15
576415	37914	10/21/2008	602170.7	3471263.6	1	1355.39	1355.28	1	0.11
576415	37928	11/4/2008	602170.7	3471263.6	1	1355.39	1355.27	1	0.12
576415	38030	2/14/2009	602170.7	3471263.6	1	1355.28	1355.18	1	0.10
576415	38096	4/21/2009	602170.7	3471263.6	1	1355.24	1355.13	1	0.11
576415	38104	4/29/2009	602170.7	3471263.6	1	1355.24	1355.12	1	0.12
576415	38187	7/21/2009	602170.7	3471263.6	1	1355.21	1355.05	1	0.16
577927	34761	3/4/2000	606001.2	3471852.8	4	1359.73	1411.37	1	-51.64
577927	35403	12/6/2001	606001.2	3471852.8	4	1423.74	1411.27	1	12.46
577927	37754	5/14/2008	606001.2	3471852.8	4	1351.71	1409.93	1	-58.22
577927	37851	8/19/2008	606001.2	3471852.8	4	1350.82	1409.93	1	-59.11
577927	37916	10/23/2008	606001.2	3471852.8	4	1355.78	1409.92	1	-54.15
577927	37917	10/24/2008	606001.2	3471852.8	4	1355.78	1409.92	1	-54.15
577927	38006	1/21/2009	606001.2	3471852.8	4	1356.05	1409.92	1	-53.87
577927	38083	4/8/2009	606001.2	3471852.8	4	1354.62	1409.91	1	-55.29
577927	38175	7/9/2009	606001.2	3471852.8	4	1352.28	1409.91	1	-57.63
577927	38264	10/6/2009	606001.2	3471852.8	4	1350.86	1409.91	1	-59.05
577927	38460	4/20/2010	606001.2	3471852.8	4	1347.16	1409.90	1	-62.75
577927	38544	7/13/2010	606001.2	3471852.8	4	1345.74	1409.90	1	-64.16
577927	38553	7/22/2010	606001.2	3471852.8	4	1345.74	1409.90	1	-64.15
577927	38642	10/19/2010	606001.2	3471852.8	4	1345.59	1409.89	1	-64.30
577927	38735	1/20/2011	606001.2	3471852.8	4	1344.34	1409.89	1	-65.54
577927	38810	4/5/2011	606001.2	3471852.8	4	1343.20	1409.88	1	-66.68
578819	34708	1/11/2000	607724.4	3469545.0	4	1400.43	1404.39	1	-3.96
587635	35349	10/13/2001	602665.4	3468967.9	2	1359.63	1356.89	1	2.75
587635	35461	2/2/2002	602665.4	3468967.9	2	1358.22	1356.76	1	1.46
587635	35581	6/2/2002	602665.4	3468967.9	2	1358.02	1356.62	1	1.39
587635	35673	9/2/2002	602665.4	3468967.9	2	1357.80	1356.52	1	1.28
587635	35734	11/2/2002	602665.4	3468967.9	2	1357.65	1356.46	1	1.20
587635	35795	1/2/2003	602665.4	3468967.9	2	1357.71	1356.39	1	1.32
587635	35915	5/2/2003	602665.4	3468967.9	2	1357.35	1356.26	1	1.09
587635	36129	12/2/2003	602665.4	3468967.9	2	1357.29	1356.04	1	1.25
587635	36191	2/2/2004	602665.4	3468967.9	2	1357.19	1355.97	1	1.22
587635	36373	8/2/2004	602665.4	3468967.9	2	1356.92	1355.77	1	1.15
587635	36465	11/2/2004	602665.4	3468967.9	2	1356.84	1355.68	1	1.16
587635	36557	2/2/2005	602665.4	3468967.9	2	1356.86	1355.59	1	1.27
587635	36677	6/2/2005	602665.4	3468967.9	2	1355.27	1355.47	1	-0.20
587635	36769	9/2/2005	602665.4	3468967.9	2	1356.78	1355.38	1	1.40
587635	36830	11/2/2005	602665.4	3468967.9	2	1356.66	1355.33	1	1.34
587635	37011	5/2/2006	602665.4	3468967.9	2	1356.40	1355.14	1	1.26
587635	37103	8/2/2006	602665.4	3468967.9	2	1355.67	1355.05	1	0.62
587635	37655	2/5/2008	602665.4	3468967.9	2	1355.61	1354.58	1	1.03
587635	37746	5/6/2008	602665.4	3468967.9	2	1354.79	1354.51	1	0.28
587635	37817	7/16/2008	602665.4	3468967.9	2	1355.49	1354.46	1	1.03
587635	37909	10/16/2008	602665.4	3468967.9	2	1355.26	1354.39	1	0.87
587635	38014	1/29/2009	602665.4	3468967.9	2	1355.12	1354.31	1	0.81
587635	38091	4/16/2009	602665.4	3468967.9	2	1354.90	1354.26	1	0.64
587635	38183	7/17/2009	602665.4	3468967.9	2	1355.10	1354.20	1	0.90
587635	38273	10/15/2009	602665.4	3468967.9	2	1354.65	1354.13	1	0.52
587635	38384	2/3/2010	602665.4	3468967.9	2	1354.96	1354.06	1	0.90
587635	38463	4/23/2010	602665.4	3468967.9	2	1354.75	1354.01	1	0.74
587635	38588	8/26/2010	602665.4	3468967.9	2	1354.89	1353.93	1	0.96
587635	38643	10/20/2010	602665.4	3468967.9	2	1345.66	1353.90	1	-8.23
587635	38735	1/20/2011	602665.4	3468967.9	2	1354.49	1353.84	1	0.64
587635	38812	4/7/2011	602665.4	3468967.9	2	1354.33	1353.79	1	0.54
587635	38912	7/16/2011	602665.4	3468967.9	2	1354.13	1353.72	1	0.40
587635	39000	10/12/2011	602665.4	3468967.9	2	1354.22	1353.67	1	0.56
587635	39114	2/3/2012	602665.4	3468967.9	2	1353.69	1353.60	1	0.09
587635	39185	4/14/2012	602665.4	3468967.9	2	1353.42	1353.55	1	-0.14
587635	39274	7/12/2012	602665.4	3468967.9	2	1353.80	1353.51	1	0.29
587635	39360	10/6/2012	602665.4	3468967.9	2	1352.71	1353.45	1	-0.73
587749	35553	5/5/2002	607516.1	3470145.0	4	1320.27	1408.15	1	-87.88
588270	35304	8/29/2001	601293.2	3468476.0	1	1362.08	1354.99	1	7.09
590620	35703	10/2/2002	599269.3	3468541.6	1	1350.72	1348.49	1	2.23

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
590620	35885	4/2/2003	599269.3	3468541.6	1	1348.90	1348.33	1	0.56
590620	36068	10/2/2003	599269.3	3468541.6	1	1349.05	1348.20	1	0.85
590620	36251	4/2/2004	599269.3	3468541.6	1	1347.68	1348.04	1	-0.36
590620	36434	10/2/2004	599269.3	3468541.6	1	1342.65	1347.94	1	-5.29
590620	36616	4/2/2005	599269.3	3468541.6	1	1348.29	1347.84	1	0.45
590620	36799	10/2/2005	599269.3	3468541.6	1	1345.85	1347.71	1	-1.86
590620	36981	4/2/2006	599269.3	3468541.6	1	1349.81	1347.69	1	2.12
590620	37164	10/2/2006	599269.3	3468541.6	1	1345.54	1347.66	1	-2.12
590620	37346	4/2/2007	599269.3	3468541.6	1	1349.05	1347.78	1	1.27
590620	38140	6/4/2009	599269.3	3468541.6	1	1346.46	1347.71	1	-1.25
592792	35691	9/20/2002	607607.5	3469829.1	4	1393.46	1406.02	1	-12.56
592792	37664	2/14/2008	607607.5	3469829.1	4	1400.24	1405.62	1	-5.37
592792	37754	5/14/2008	607607.5	3469829.1	4	1400.41	1405.62	1	-5.21
592792	37824	7/23/2008	607607.5	3469829.1	4	1400.50	1405.61	1	-5.11
592792	37910	10/17/2008	607607.5	3469829.1	4	1400.64	1405.61	1	-4.97
592792	38006	1/21/2009	607607.5	3469829.1	4	1400.70	1405.61	1	-4.91
592792	38084	4/9/2009	607607.5	3469829.1	4	1400.77	1405.61	1	-4.84
592792	38174	7/8/2009	607607.5	3469829.1	4	1400.73	1405.60	1	-4.87
592792	38264	10/6/2009	607607.5	3469829.1	4	1400.72	1405.60	1	-4.88
592792	38372	1/22/2010	607607.5	3469829.1	4	1400.64	1405.60	1	-4.96
592792	38460	4/20/2010	607607.5	3469829.1	4	1400.42	1405.60	1	-5.18
592792	38544	7/13/2010	607607.5	3469829.1	4	1400.31	1405.60	1	-5.29
592792	38734	1/19/2011	607607.5	3469829.1	4	1400.23	1405.59	1	-5.36
592792	38909	7/13/2011	607607.5	3469829.1	4	1400.05	1405.59	1	-5.54
592792	39111	1/31/2012	607607.5	3469829.1	4	1399.89	1405.58	1	-5.70
592792	39183	4/12/2012	607607.5	3469829.1	4	1399.81	1405.58	1	-5.77
592792	39268	7/6/2012	607607.5	3469829.1	4	1397.84	1405.58	1	-7.74
599381	36090	10/24/2003	608761.5	3467736.0	2	1362.52	1398.38	1	-35.86
599796	36097	10/31/2003	607076.4	3468712.2	2	1399.34	1396.59	1	2.75
599796	37659	2/9/2008	607076.4	3468712.2	2	1394.71	1396.04	1	-1.33
599796	37755	5/15/2008	607076.4	3468712.2	2	1394.02	1396.02	1	-2.00
599796	37825	7/24/2008	607076.4	3468712.2	2	1394.11	1396.01	1	-1.90
599796	37908	10/15/2008	607076.4	3468712.2	2	1394.10	1395.99	1	-1.89
599796	38006	1/21/2009	607076.4	3468712.2	2	1394.61	1395.98	1	-1.37
599796	38084	4/9/2009	607076.4	3468712.2	2	1394.19	1395.96	1	-1.78
599796	38180	7/14/2009	607076.4	3468712.2	2	1392.66	1395.95	1	-3.29
599796	38267	10/9/2009	607076.4	3468712.2	2	1391.43	1395.93	1	-4.50
599796	38376	1/26/2010	607076.4	3468712.2	2	1391.92	1395.92	1	-4.00
599796	38462	4/22/2010	607076.4	3468712.2	2	1392.06	1395.90	1	-3.84
599796	38546	7/15/2010	607076.4	3468712.2	2	1391.15	1395.88	1	-4.73
599796	38644	10/21/2010	607076.4	3468712.2	2	1391.35	1395.86	1	-4.51
599796	38734	1/19/2011	607076.4	3468712.2	2	1391.78	1395.85	1	-4.06
599796	38811	4/6/2011	607076.4	3468712.2	2	1391.80	1395.84	1	-4.04
599796	38909	7/13/2011	607076.4	3468712.2	2	1390.56	1395.83	1	-5.26
599796	39001	10/13/2011	607076.4	3468712.2	2	1390.61	1395.82	1	-5.21
599796	39112	2/1/2012	607076.4	3468712.2	2	1390.56	1395.81	1	-5.25
599796	39183	4/12/2012	607076.4	3468712.2	2	1389.98	1395.80	1	-5.82
599796	39272	7/10/2012	607076.4	3468712.2	2	1388.52	1395.79	1	-7.27
599796	39359	10/5/2012	607076.4	3468712.2	2	1387.65	1395.78	1	-8.12
602081	23102	4/2/1968	607944.4	3467736.0	2	1391.42	1395.18	1	-3.75
602134	25451	9/7/1974	602078.7	3470901.0	1	1408.10	1362.00	1	46.10
602134	30483	6/17/1988	602078.7	3470901.0	1	1365.35	1360.89	1	4.45
606854	3653	1/2/1915	601435.9	3470954.1	1	1363.37	1364.00	1	-0.62
606854	30547	8/20/1988	601435.9	3470954.1	1	1366.65	1359.09	1	7.56
606855	3653	1/2/1915	601467.4	3471697.0	1	1374.51	1372.54	1	1.97
610686	16437	1/2/1950	602670.2	3468959.9	1	1359.41	1366.26	1	-6.86
610686	26563	9/23/1977	602670.2	3468959.9	1	1368.86	1358.90	1	9.95
610686	30482	6/16/1988	602670.2	3468959.9	1	1363.80	1359.22	1	4.58
610686	31385	12/6/1990	602670.2	3468959.9	1	1365.81	1359.20	1	6.61
610686	35402	12/5/2001	602670.2	3468959.9	1	1357.58	1356.56	1	1.02
610686	37229	12/6/2006	602670.2	3468959.9	1	1355.45	1354.49	1	0.95
610686	38013	1/28/2009	602670.2	3468959.9	1	1356.40	1353.79	1	2.61
610686	38545	7/14/2010	602670.2	3468959.9	1	1355.82	1353.38	1	2.44
610686	38735	1/20/2011	602670.2	3468959.9	1	1355.59	1353.25	1	2.34

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
610687	16437	1/2/1950	602297.4	3468962.6	1	1355.45	1365.72	1	-10.27
610687	29544	11/21/1985	602297.4	3468962.6	1	1364.89	1358.85	1	6.05
610687	35402	12/5/2001	602297.4	3468962.6	1	1357.27	1356.24	1	1.04
610688	16437	1/2/1950	602008.1	3468960.8	1	1353.31	1365.28	1	-11.97
610688	31385	12/6/1990	602008.1	3468960.8	1	1364.89	1358.33	1	6.56
610688	35397	11/30/2001	602008.1	3468960.8	1	1363.07	1355.97	1	7.10
610688	37229	12/6/2006	602008.1	3468960.8	1	1363.37	1353.97	1	9.40
610689	16437	1/2/1950	602326.6	3468809.8	1	1354.84	1365.54	1	-10.70
610689	30482	6/16/1988	602326.6	3468809.8	1	1363.80	1358.64	1	5.16
610689	31385	12/6/1990	602326.6	3468809.8	1	1365.20	1358.65	1	6.55
610689	35403	12/6/2001	602326.6	3468809.8	1	1357.58	1356.23	1	1.35
610689	37229	12/6/2006	602326.6	3468809.8	1	1355.45	1354.21	1	1.23
610690	16437	1/2/1950	601596.4	3468580.0	1	1347.90	1364.11	1	-16.22
610691	16437	1/2/1950	602323.9	3468841.1	1	1354.84	1365.58	1	-10.74
610691	31385	12/6/1990	602323.9	3468841.1	1	1365.81	1358.66	1	7.15
610691	35402	12/5/2001	602323.9	3468841.1	1	1357.58	1356.24	1	1.34
610691	37229	12/6/2006	602323.9	3468841.1	1	1355.45	1354.21	1	1.23
610692	16437	1/2/1950	602677.3	3468966.3	1	1360.00	1366.28	1	-6.29
610693	16437	1/2/1950	602668.6	3468959.2	1	1359.41	1366.26	1	-6.85
610693	35402	12/5/2001	602668.6	3468959.2	1	1357.58	1356.56	1	1.02
610693	37229	12/6/2006	602668.6	3468959.2	1	1355.75	1354.49	1	1.26
610694	16437	1/2/1950	602402.8	3468901.7	1	1356.97	1365.78	1	-8.81
610694	31385	12/6/1990	602402.8	3468901.7	1	1368.55	1358.79	1	9.76
610694	35402	12/5/2001	602402.8	3468901.7	1	1360.02	1356.32	1	3.70
610695	16437	1/2/1950	602454.8	3468892.5	1	1358.23	1365.84	1	-7.62
610695	31385	12/6/1990	602454.8	3468892.5	1	1366.76	1358.85	1	7.91
610695	35402	12/5/2001	602454.8	3468892.5	1	1358.23	1356.36	1	1.86
610695	37242	12/19/2006	602454.8	3468892.5	1	1356.40	1354.31	1	2.09
610695	37672	2/22/2008	602454.8	3468892.5	1	1355.52	1353.92	1	1.59
610695	37746	5/6/2008	602454.8	3468892.5	1	1354.23	1353.86	1	0.37
610695	37818	7/17/2008	602454.8	3468892.5	1	1355.36	1353.80	1	1.56
610695	37916	10/23/2008	602454.8	3468892.5	1	1355.28	1353.72	1	1.56
610695	38013	1/28/2009	602454.8	3468892.5	1	1355.22	1353.64	1	1.58
610695	38091	4/16/2009	602454.8	3468892.5	1	1355.19	1353.58	1	1.62
610695	38174	7/8/2009	602454.8	3468892.5	1	1355.07	1353.51	1	1.56
610695	38271	10/13/2009	602454.8	3468892.5	1	1354.96	1353.44	1	1.52
610695	38384	2/3/2010	602454.8	3468892.5	1	1354.80	1353.35	1	1.45
610695	38463	4/23/2010	602454.8	3468892.5	1	1354.74	1353.30	1	1.45
610695	38545	7/14/2010	602454.8	3468892.5	1	1354.64	1353.24	1	1.40
610695	38909	7/13/2011	602454.8	3468892.5	1	1354.19	1352.99	1	1.20
610695	39118	2/7/2012	602454.8	3468892.5	1	1353.96	1352.85	1	1.11
610695	39338	9/14/2012	602454.8	3468892.5	1	1353.63	1352.69	1	0.94
613395	37819	7/18/2008	600936.3	3468836.7	1	1354.00	1352.23	1	1.76
613395	37845	8/13/2008	600936.3	3468836.7	1	1354.00	1352.21	1	1.78
613395	37921	10/28/2008	600936.3	3468836.7	1	1353.66	1352.16	1	1.50
613395	37928	11/4/2008	600936.3	3468836.7	1	1353.66	1352.15	1	1.51
613395	38015	1/30/2009	600936.3	3468836.7	1	1354.06	1352.09	1	1.97
613395	38042	2/26/2009	600936.3	3468836.7	1	1354.06	1352.07	1	1.99
613395	38090	4/15/2009	600936.3	3468836.7	1	1353.96	1352.04	1	1.92
613395	38180	7/14/2009	600936.3	3468836.7	1	1353.82	1351.98	1	1.84
613395	38266	10/8/2009	600936.3	3468836.7	1	1353.67	1351.92	1	1.75
613395	38418	3/9/2010	600936.3	3468836.7	1	1353.62	1351.83	1	1.80
613395	38467	4/27/2010	600936.3	3468836.7	1	1353.56	1351.80	1	1.76
613395	38547	7/16/2010	600936.3	3468836.7	1	1353.38	1351.76	1	1.63
613395	38642	10/19/2010	600936.3	3468836.7	1	1353.24	1351.70	1	1.54
613395	38735	1/20/2011	600936.3	3468836.7	1	1353.24	1351.64	1	1.59
613395	38814	4/9/2011	600936.3	3468836.7	1	1353.03	1351.59	1	1.45
613395	38909	7/13/2011	600936.3	3468836.7	1	1352.87	1351.51	1	1.36
613395	39000	10/12/2011	600936.3	3468836.7	1	1352.78	1351.45	1	1.33
613395	39113	2/2/2012	600936.3	3468836.7	1	1352.77	1351.36	1	1.41
613395	39184	4/13/2012	600936.3	3468836.7	1	1352.64	1351.30	1	1.34
613395	39274	7/12/2012	600936.3	3468836.7	1	1352.45	1351.23	1	1.22
613395	39372	10/18/2012	600936.3	3468836.7	1	1352.34	1351.15	1	1.20
613396	17898	1/2/1954	601134.7	3468816.1	1	1360.17	1363.55	1	-3.38

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
613396	31386	12/7/1990	601134.7	3468816.1	1	1363.22	1356.90	1	6.32
613396	35402	12/5/2001	601134.7	3468816.1	1	1355.60	1354.82	1	0.79
613396	37222	11/29/2006	601134.7	3468816.1	1	1353.47	1352.94	1	0.52
613396	37700	3/21/2008	601134.7	3468816.1	1	1354.24	1352.62	1	1.62
613396	37746	5/6/2008	601134.7	3468816.1	1	1354.13	1352.59	1	1.54
613396	37816	7/15/2008	601134.7	3468816.1	1	1354.03	1352.53	1	1.50
613396	37909	10/16/2008	601134.7	3468816.1	1	1354.01	1352.45	1	1.56
613396	38013	1/28/2009	601134.7	3468816.1	1	1354.09	1352.38	1	1.71
613396	38090	4/15/2009	601134.7	3468816.1	1	1354.01	1352.32	1	1.69
613396	38181	7/15/2009	601134.7	3468816.1	1	1353.81	1352.26	1	1.55
613396	38271	10/13/2009	601134.7	3468816.1	1	1353.68	1352.20	1	1.48
613396	38378	1/28/2010	601134.7	3468816.1	1	1353.68	1352.13	1	1.55
613396	38462	4/22/2010	601134.7	3468816.1	1	1353.60	1352.08	1	1.52
613396	38551	7/20/2010	601134.7	3468816.1	1	1353.36	1352.03	1	1.33
613396	38643	10/20/2010	601134.7	3468816.1	1	1353.54	1351.97	1	1.57
613396	38733	1/18/2011	601134.7	3468816.1	1	1353.28	1351.92	1	1.36
613396	38817	4/12/2011	601134.7	3468816.1	1	1353.02	1351.86	1	1.16
613396	38911	7/15/2011	601134.7	3468816.1	1	1352.88	1351.79	1	1.09
613396	39000	10/12/2011	601134.7	3468816.1	1	1352.80	1351.72	1	1.08
613396	39113	2/2/2012	601134.7	3468816.1	1	1352.80	1351.64	1	1.16
613396	39197	4/26/2012	601134.7	3468816.1	1	1352.65	1351.57	1	1.08
613396	39275	7/13/2012	601134.7	3468816.1	1	1352.45	1351.51	1	0.94
613396	39365	10/11/2012	601134.7	3468816.1	1	1352.40	1351.43	1	0.97
616436	5675	7/16/1920	601488.2	3469690.0	1	1377.09	1364.82	1	12.27
616436	29543	11/20/1985	601488.2	3469690.0	1	1369.47	1358.55	1	10.92
616436	30455	5/20/1988	601488.2	3469690.0	1	1361.74	1358.34	1	3.40
616436	31385	12/6/1990	601488.2	3469690.0	1	1363.98	1358.29	1	5.69
616436	34682	12/16/1999	601488.2	3469690.0	1	1358.49	1356.61	1	1.89
616436	35397	11/30/2001	601488.2	3469690.0	1	1358.80	1355.84	1	2.96
616436	37222	11/29/2006	601488.2	3469690.0	1	1358.80	1353.86	1	4.94
616584	29635	2/20/1986	598949.7	3468717.5	1	1357.97	1347.01	1	10.96
616584	31384	12/5/1990	598949.7	3468717.5	1	1354.95	1347.35	1	7.60
616584	32233	4/2/1993	598949.7	3468717.5	1	1362.30	1347.47	1	14.83
616584	32598	4/2/1994	598949.7	3468717.5	1	1354.38	1347.48	1	6.90
616584	32781	10/2/1994	598949.7	3468717.5	1	1353.62	1347.47	1	6.15
616584	32963	4/2/1995	598949.7	3468717.5	1	1341.58	1347.44	1	-5.87
616584	33146	10/2/1995	598949.7	3468717.5	1	1352.70	1347.41	1	5.29
616584	33329	4/2/1996	598949.7	3468717.5	1	1351.79	1347.36	1	4.43
616584	33512	10/2/1996	598949.7	3468717.5	1	1351.18	1347.30	1	3.87
616584	33694	4/2/1997	598949.7	3468717.5	1	1347.85	1347.24	1	0.61
616584	33877	10/2/1997	598949.7	3468717.5	1	1350.84	1347.16	1	3.68
616584	33996	1/29/1998	598949.7	3468717.5	1	1352.27	1347.39	1	4.88
616584	34059	4/2/1998	598949.7	3468717.5	1	1351.17	1347.99	1	3.18
616584	34242	10/2/1998	598949.7	3468717.5	1	1349.80	1347.99	1	1.81
616584	34424	4/2/1999	598949.7	3468717.5	1	1353.46	1347.84	1	5.62
616584	34607	10/2/1999	598949.7	3468717.5	1	1358.03	1347.74	1	10.29
616584	34682	12/16/1999	598949.7	3468717.5	1	1351.26	1347.69	1	3.57
616584	34790	4/2/2000	598949.7	3468717.5	1	1354.07	1346.82	1	7.25
616584	34973	10/2/2000	598949.7	3468717.5	1	1351.02	1346.60	1	4.42
616584	35155	4/2/2001	598949.7	3468717.5	1	1345.84	1346.70	1	-0.86
616584	35338	10/2/2001	598949.7	3468717.5	1	1345.53	1346.59	1	-1.06
616584	35402	12/5/2001	598949.7	3468717.5	1	1348.73	1346.54	1	2.19
616584	35520	4/2/2002	598949.7	3468717.5	1	1347.67	1346.67	1	1.00
616584	35703	10/2/2002	598949.7	3468717.5	1	1347.67	1346.48	1	1.19
616584	35885	4/2/2003	598949.7	3468717.5	1	1348.35	1346.49	1	1.86
616584	36068	10/2/2003	598949.7	3468717.5	1	1345.53	1346.38	1	-0.84
616584	36251	4/2/2004	598949.7	3468717.5	1	1349.04	1346.80	1	2.23
616584	36434	10/2/2004	598949.7	3468717.5	1	1349.04	1346.77	1	2.27
616584	36616	4/2/2005	598949.7	3468717.5	1	1349.50	1346.68	1	2.82
616584	36799	10/2/2005	598949.7	3468717.5	1	1348.58	1346.55	1	2.03
616584	36981	4/2/2006	598949.7	3468717.5	1	1349.19	1346.49	1	2.70
616584	37164	10/2/2006	598949.7	3468717.5	1	1348.73	1346.46	1	2.27
616584	37224	12/1/2006	598949.7	3468717.5	1	1347.67	1346.44	1	1.23
616584	37346	4/2/2007	598949.7	3468717.5	1	1346.14	1346.52	1	-0.38

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
616584	37529	10/2/2007	598949.7	3468717.5	1	1351.02	1346.60	1	4.42
616584	37712	4/2/2008	598949.7	3468717.5	1	1351.02	1346.56	1	4.46
616584	37719	4/9/2008	598949.7	3468717.5	1	1351.02	1346.55	1	4.47
616584	37851	8/19/2008	598949.7	3468717.5	1	1349.63	1346.51	1	3.12
616584	37917	10/24/2008	598949.7	3468717.5	1	1350.01	1346.49	1	3.52
616584	38098	4/23/2009	598949.7	3468717.5	1	1350.41	1346.48	1	3.93
616584	38268	10/10/2009	598949.7	3468717.5	1	1350.41	1346.43	1	3.98
616584	38290	11/1/2009	598949.7	3468717.5	1	1350.41	1346.42	1	3.99
616584	38464	4/24/2010	598949.7	3468717.5	1	1350.72	1346.37	1	4.35
616585	18829	7/21/1956	599091.1	3468680.2	1	1350.73	1355.93	1	-5.20
616585	22797	6/2/1967	599091.1	3468680.2	1	1342.50	1350.13	1	-7.63
616585	23090	3/21/1968	599091.1	3468680.2	1	1356.09	1349.78	1	6.31
616585	29635	2/20/1986	599091.1	3468680.2	1	1356.27	1347.84	1	8.43
616585	32233	4/2/1993	599091.1	3468680.2	1	1358.65	1348.30	1	10.34
616585	32598	4/2/1994	599091.1	3468680.2	1	1353.46	1348.31	1	5.16
616585	32781	10/2/1994	599091.1	3468680.2	1	1351.94	1348.30	1	3.64
616585	32963	4/2/1995	599091.1	3468680.2	1	1354.68	1348.27	1	6.41
616585	33146	10/2/1995	599091.1	3468680.2	1	1344.63	1348.23	1	-3.61
616585	33329	4/2/1996	599091.1	3468680.2	1	1350.87	1348.18	1	2.69
616585	33512	10/2/1996	599091.1	3468680.2	1	1350.57	1348.13	1	2.44
616585	33694	4/2/1997	599091.1	3468680.2	1	1349.97	1348.06	1	1.91
616585	33877	10/2/1997	599091.1	3468680.2	1	1350.42	1347.98	1	2.44
616585	34059	4/2/1998	599091.1	3468680.2	1	1350.12	1347.63	1	2.49
616585	34242	10/2/1998	599091.1	3468680.2	1	1349.81	1347.58	1	2.23
616585	34424	4/2/1999	599091.1	3468680.2	1	1351.95	1347.51	1	4.44
616585	34607	10/2/1999	599091.1	3468680.2	1	1354.08	1347.41	1	6.67
616585	34682	12/16/1999	599091.1	3468680.2	1	1349.29	1347.36	1	1.93
616585	34790	4/2/2000	599091.1	3468680.2	1	1356.82	1347.54	1	9.29
616585	34973	10/2/2000	599091.1	3468680.2	1	1356.82	1347.36	1	9.47
616585	35121	2/27/2001	599091.1	3468680.2	1	1353.04	1347.24	1	5.80
616585	35155	4/2/2001	599091.1	3468680.2	1	1351.64	1347.22	1	4.42
616585	35338	10/2/2001	599091.1	3468680.2	1	1350.12	1347.11	1	3.01
616585	35520	4/2/2002	599091.1	3468680.2	1	1350.12	1346.57	1	3.55
616585	35703	10/2/2002	599091.1	3468680.2	1	1348.29	1346.36	1	1.93
616585	35885	4/2/2003	599091.1	3468680.2	1	1348.14	1346.37	1	1.77
616585	36068	10/2/2003	599091.1	3468680.2	1	1347.53	1346.25	1	1.28
616585	36251	4/2/2004	599091.1	3468680.2	1	1347.68	1346.28	1	1.40
616585	36434	10/2/2004	599091.1	3468680.2	1	1346.76	1346.22	1	0.55
616585	36616	4/2/2005	599091.1	3468680.2	1	1347.37	1346.17	1	1.20
616585	36799	10/2/2005	599091.1	3468680.2	1	1346.76	1346.05	1	0.72
616585	36981	4/2/2006	599091.1	3468680.2	1	1347.07	1346.40	1	0.67
616585	37164	10/2/2006	599091.1	3468680.2	1	1346.61	1346.39	1	0.23
616585	37224	12/1/2006	599091.1	3468680.2	1	1347.07	1346.36	1	0.71
616585	37346	4/2/2007	599091.1	3468680.2	1	1349.81	1346.87	1	2.94
616585	37529	10/2/2007	599091.1	3468680.2	1	1348.29	1346.97	1	1.32
616585	37712	4/2/2008	599091.1	3468680.2	1	1349.51	1346.93	1	2.58
616585	37719	4/9/2008	599091.1	3468680.2	1	1349.51	1346.93	1	2.58
616585	37860	8/28/2008	599091.1	3468680.2	1	1347.25	1346.88	1	0.38
616585	37917	10/24/2008	599091.1	3468680.2	1	1351.34	1346.86	1	4.48
616585	38098	4/23/2009	599091.1	3468680.2	1	1348.90	1346.84	1	2.05
616585	38268	10/10/2009	599091.1	3468680.2	1	1348.29	1346.79	1	1.50
616585	38290	11/1/2009	599091.1	3468680.2	1	1348.29	1346.79	1	1.50
616585	38464	4/24/2010	599091.1	3468680.2	1	1348.29	1346.73	1	1.56
616586	18263	1/2/1955	598907.1	3468549.4	1	1355.64	1356.89	1	-1.25
616586	19014	1/22/1957	598907.1	3468549.4	1	1360.21	1356.33	1	3.88
616586	26542	9/2/1977	598907.1	3468549.4	1	1358.54	1348.32	1	10.22
616586	29545	11/22/1985	598907.1	3468549.4	1	1358.20	1348.75	1	9.45
616586	31384	12/5/1990	598907.1	3468549.4	1	1358.66	1349.10	1	9.56
616586	33146	10/2/1995	598907.1	3468549.4	1	1352.85	1349.17	1	3.69
616586	33329	4/2/1996	598907.1	3468549.4	1	1352.25	1349.12	1	3.13
616586	33512	10/2/1996	598907.1	3468549.4	1	1352.55	1349.06	1	3.49
616586	33694	4/2/1997	598907.1	3468549.4	1	1351.86	1349.00	1	2.86
616586	33877	10/2/1997	598907.1	3468549.4	1	1351.68	1348.92	1	2.76
616586	33996	1/29/1998	598907.1	3468549.4	1	1355.88	1348.86	1	7.03

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
616586	34059	4/2/1998	598907.1	3468549.4	1	1357.93	1348.81	1	9.12
616586	34242	10/2/1998	598907.1	3468549.4	1	1351.68	1348.76	1	2.92
616586	34424	4/2/1999	598907.1	3468549.4	1	1348.02	1348.67	1	-0.65
616586	34607	10/2/1999	598907.1	3468549.4	1	1357.77	1348.58	1	9.20
616586	34682	12/16/1999	598907.1	3468549.4	1	1354.42	1348.53	1	5.89
616586	34790	4/2/2000	598907.1	3468549.4	1	1356.56	1348.40	1	8.15
616586	34973	10/2/2000	598907.1	3468549.4	1	1352.29	1348.23	1	4.06
616586	35155	4/2/2001	598907.1	3468549.4	1	1349.24	1348.14	1	1.10
616586	35338	10/2/2001	598907.1	3468549.4	1	1350.76	1348.02	1	2.74
616586	35402	12/5/2001	598907.1	3468549.4	1	1350.98	1347.97	1	3.00
616586	35520	4/2/2002	598907.1	3468549.4	1	1351.83	1347.75	1	4.08
616586	35703	10/2/2002	598907.1	3468549.4	1	1350.76	1347.55	1	3.21
616586	35885	4/2/2003	598907.1	3468549.4	1	1348.33	1347.44	1	0.88
616586	36068	10/2/2003	598907.1	3468549.4	1	1347.11	1347.32	1	-0.21
616586	36251	4/2/2004	598907.1	3468549.4	1	1350.31	1347.32	1	2.99
616586	36434	10/2/2004	598907.1	3468549.4	1	1346.80	1347.25	1	-0.45
616586	36616	4/2/2005	598907.1	3468549.4	1	1348.78	1347.07	1	1.71
616586	36799	10/2/2005	598907.1	3468549.4	1	1348.48	1346.94	1	1.53
616586	36981	4/2/2006	598907.1	3468549.4	1	1349.54	1347.00	1	2.55
616586	37164	10/2/2006	598907.1	3468549.4	1	1349.54	1346.97	1	2.57
616586	37224	12/1/2006	598907.1	3468549.4	1	1352.90	1346.95	1	5.95
616586	37346	4/2/2007	598907.1	3468549.4	1	1348.63	1347.12	1	1.51
616586	37529	10/2/2007	598907.1	3468549.4	1	1350.46	1347.19	1	3.27
616586	37712	4/2/2008	598907.1	3468549.4	1	1350.76	1347.16	1	3.61
616586	37719	4/9/2008	598907.1	3468549.4	1	1350.76	1347.16	1	3.61
616586	37860	8/28/2008	598907.1	3468549.4	1	1349.20	1347.11	1	2.09
616586	37917	10/24/2008	598907.1	3468549.4	1	1351.07	1347.09	1	3.98
616586	38098	4/23/2009	598907.1	3468549.4	1	1350.15	1347.06	1	3.09
616586	38268	10/10/2009	598907.1	3468549.4	1	1350.46	1347.01	1	3.45
616586	38290	11/1/2009	598907.1	3468549.4	1	1350.46	1347.00	1	3.46
616586	38464	4/24/2010	598907.1	3468549.4	1	1349.85	1346.94	1	2.91
616776	4018	1/2/1916	600443.0	3467630.7	1	1337.40	1360.20	1	-22.80
616776	16413	12/9/1949	600443.0	3467630.7	1	1367.57	1360.69	1	6.88
616776	16441	1/6/1950	600443.0	3467630.7	1	1367.27	1360.69	1	6.58
616776	16700	9/22/1950	600443.0	3467630.7	1	1367.57	1360.65	1	6.92
616776	16789	12/20/1950	600443.0	3467630.7	1	1367.27	1360.65	1	6.61
616776	16903	4/13/1951	600443.0	3467630.7	1	1367.57	1360.65	1	6.92
616776	26563	9/23/1977	600443.0	3467630.7	1	1358.43	1353.27	1	5.16
616776	31386	12/7/1990	600443.0	3467630.7	1	1370.92	1354.49	1	16.43
616776	34682	12/16/1999	600443.0	3467630.7	1	1364.83	1353.62	1	11.21
616776	35402	12/5/2001	600443.0	3467630.7	1	1363.91	1352.91	1	11.00
616776	37222	11/29/2006	600443.0	3467630.7	1	1361.78	1351.27	1	10.50
618175	24635	6/13/1972	601312.1	3468274.0	1	1365.81	1356.32	1	9.49
618175	24649	6/27/1972	601312.1	3468274.0	1	1365.81	1356.31	1	9.50
618175	31386	12/7/1990	601312.1	3468274.0	1	1363.07	1356.85	1	6.22
618175	35402	12/5/2001	601312.1	3468274.0	1	1355.45	1354.85	1	0.60
623280	28283	6/9/1982	607838.5	3468038.0	2	1391.67	1400.14	1	-8.47
623564	27382	12/21/1979	602668.4	3472105.0	2	1383.49	1366.93	1	16.56
623564	38642	10/19/2010	602668.4	3472105.0	2	1412.62	1355.84	1	56.78
626702	4779	2/1/1918	605916.3	3469131.0	2	1362.94	1405.14	1	-42.20
627682	124	5/5/1905	599987.7	3467340.9	1	1360.32	1358.65	1	1.68
627682	170	6/20/1905	599987.7	3467340.9	1	1356.66	1358.64	1	-1.98
627682	17068	9/25/1951	599987.7	3467340.9	1	1360.32	1359.85	1	0.47
627682	29544	11/21/1985	599987.7	3467340.9	1	1360.93	1352.83	1	8.10
627682	30455	5/20/1988	599987.7	3467340.9	1	1358.57	1353.05	1	5.52
627682	31386	12/7/1990	599987.7	3467340.9	1	1356.66	1353.30	1	3.37
627682	32993	5/2/1995	599987.7	3467340.9	1	1356.66	1353.34	1	3.32
627682	33359	5/2/1996	599987.7	3467340.9	1	1355.75	1353.21	1	2.54
627683	170	6/20/1905	600182.7	3467464.6	1	1356.36	1359.02	1	-2.66
627683	19937	8/3/1959	600182.7	3467464.6	1	1362.15	1358.63	1	3.52
627683	26563	9/23/1977	600182.7	3467464.6	1	1361.54	1352.66	1	8.88
627683	29544	11/21/1985	600182.7	3467464.6	1	1360.02	1353.39	1	6.63
627683	33755	6/2/1997	600182.7	3467464.6	1	1356.36	1353.54	1	2.82
627683	36251	4/2/2004	600182.7	3467464.6	1	1356.36	1351.51	1	4.85

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
627683	37921	10/28/2008	600182.7	3467464.6	1	1353.16	1350.53	1	2.63
627683	38099	4/24/2009	600182.7	3467464.6	1	1353.16	1350.44	1	2.72
627684	103	4/14/1905	601153.2	3468344.5	1	1365.14	1361.51	1	3.64
627684	133	5/14/1905	601153.2	3468344.5	1	1364.84	1361.48	1	3.36
627684	9132	1/2/1930	601153.2	3468344.5	1	1365.14	1363.34	1	1.81
627684	23090	3/21/1968	601153.2	3468344.5	1	1366.06	1357.49	1	8.57
627684	26563	9/23/1977	601153.2	3468344.5	1	1364.53	1355.46	1	9.08
627684	29566	12/13/1985	601153.2	3468344.5	1	1363.53	1356.34	1	7.19
627684	30454	5/19/1988	601153.2	3468344.5	1	1365.21	1356.41	1	8.80
627684	36220	3/2/2004	601153.2	3468344.5	1	1356.91	1353.73	1	3.18
627684	36251	4/2/2004	601153.2	3468344.5	1	1356.91	1353.70	1	3.22
627684	36312	6/2/2004	601153.2	3468344.5	1	1351.12	1353.63	1	-2.51
627684	37921	10/28/2008	601153.2	3468344.5	1	1353.72	1352.33	1	1.39
627684	38019	2/3/2009	601153.2	3468344.5	1	1354.16	1352.26	1	1.90
627684	38098	4/23/2009	601153.2	3468344.5	1	1353.98	1352.21	1	1.78
627684	38099	4/24/2009	601153.2	3468344.5	1	1354.17	1352.21	1	1.97
627684	38188	7/22/2009	601153.2	3468344.5	1	1353.79	1352.15	1	1.64
627684	38280	10/22/2009	601153.2	3468344.5	1	1353.68	1352.09	1	1.60
627684	38385	2/4/2010	601153.2	3468344.5	1	1353.76	1352.03	1	1.74
627684	38462	4/22/2010	601153.2	3468344.5	1	1353.60	1351.99	1	1.62
627684	38552	7/21/2010	601153.2	3468344.5	1	1353.71	1351.94	1	1.77
627684	38734	1/19/2011	601153.2	3468344.5	1	1353.28	1351.83	1	1.45
627684	38912	7/16/2011	601153.2	3468344.5	1	1352.82	1351.69	1	1.13
627684	39002	10/14/2011	601153.2	3468344.5	1	1352.73	1351.63	1	1.10
627684	39112	2/1/2012	601153.2	3468344.5	1	1352.80	1351.54	1	1.26
627684	39197	4/26/2012	601153.2	3468344.5	1	1352.62	1351.46	1	1.16
627684	39281	7/19/2012	601153.2	3468344.5	1	1352.43	1351.38	1	1.04
627684	39365	10/11/2012	601153.2	3468344.5	1	1352.35	1351.32	1	1.03
627685	8035	1/1/1927	605825.5	3469074.2	2	1363.98	1405.69	1	-41.71
627685	23456	3/22/1969	605825.5	3469074.2	2	1389.89	1398.68	1	-8.79
627685	26563	9/23/1977	605825.5	3469074.2	2	1363.86	1399.31	1	-35.45
627685	29543	11/20/1985	605825.5	3469074.2	2	1378.00	1399.95	1	-21.95
627685	31385	12/6/1990	605825.5	3469074.2	2	1369.77	1397.76	1	-27.99
627685	36423	9/21/2004	605825.5	3469074.2	2	1377.09	1390.59	1	-13.51
627685	36799	10/2/2005	605825.5	3469074.2	2	1387.14	1390.30	1	-3.15
627685	38099	4/24/2009	605825.5	3469074.2	2	1390.00	1389.58	1	0.43
627696	20089	1/2/1960	606980.1	3469445.6	2	1394.76	1405.17	1	-10.41
627696	20210	5/2/1960	606980.1	3469445.6	2	1394.76	1404.93	1	-10.17
627696	30454	5/19/1988	606980.1	3469445.6	2	1397.82	1406.03	1	-8.21
628546	21226	2/12/1963	606156.2	3469550.5	2	1395.07	1390.09	1	4.98
628546	29543	11/20/1985	606156.2	3469550.5	2	1414.33	1404.90	1	9.44
628546	30446	5/11/1988	606156.2	3469550.5	2	1400.54	1403.50	1	-2.96
628546	31386	12/7/1990	606156.2	3469550.5	2	1396.29	1401.78	1	-5.49
628546	35403	12/6/2001	606156.2	3469550.5	2	1377.09	1395.17	1	-18.08
628546	37229	12/6/2006	606156.2	3469550.5	2	1374.95	1393.48	1	-18.53
628547	20684	8/19/1961	606256.7	3469820.3	4	1406.08	1399.18	1	6.89
628547	29543	11/20/1985	606256.7	3469820.3	4	1411.07	1406.85	1	4.23
628547	30446	5/11/1988	606256.7	3469820.3	4	1400.10	1407.75	1	-7.65
628547	37762	5/22/2008	606256.7	3469820.3	4	1370.44	1396.97	1	-26.53
628547	37848	8/16/2008	606256.7	3469820.3	4	1365.09	1396.97	1	-31.88
628547	37923	10/30/2008	606256.7	3469820.3	4	1365.87	1396.97	1	-31.09
628547	38041	2/25/2009	606256.7	3469820.3	4	1365.80	1396.96	1	-31.16
628547	38120	5/15/2009	606256.7	3469820.3	4	1365.79	1396.96	1	-31.17
628547	38217	8/20/2009	606256.7	3469820.3	4	1365.84	1396.95	1	-31.12
628547	38301	11/12/2009	606256.7	3469820.3	4	1365.34	1396.95	1	-31.62
628547	38419	3/10/2010	606256.7	3469820.3	4	1364.98	1396.95	1	-31.97
628547	38468	4/28/2010	606256.7	3469820.3	4	1364.88	1396.94	1	-32.07
629807	26299	1/2/1977	600096.9	3467462.0	1	1359.92	1352.35	1	7.57
630852	29543	11/20/1985	607023.8	3469240.0	2	1409.27	1401.23	1	8.04
630852	30510	7/14/1988	607023.8	3469240.0	2	1398.92	1402.25	1	-3.33
630852	30561	9/3/1988	607023.8	3469240.0	2	1405.56	1402.26	1	3.31
632924	18608	12/13/1955	602203.6	3468788.0	1	1398.07	1364.47	1	33.60
633316	18263	1/2/1955	601173.1	3468486.6	1	1367.87	1362.73	1	5.14
633316	30490	6/24/1988	601173.1	3468486.6	1	1360.66	1356.60	1	4.05

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
633317	18628	1/2/1956	601172.2	3468568.0	1	1366.68	1362.56	1	4.12
633317	37663	2/13/2008	601172.2	3468568.0	1	1354.40	1352.61	1	1.78
633472	26968	11/2/1978	602039.8	3471485.9	2	1353.50	1362.21	1	-8.70
633472	29543	11/20/1985	602039.8	3471485.9	2	1368.13	1362.28	1	5.85
637069	22490	7/30/1966	601350.0	3468913.0	1	1351.53	1359.51	1	-7.98
637069	37684	3/5/2008	601350.0	3468913.0	1	1354.55	1352.95	1	1.60
637069	37746	5/6/2008	601350.0	3468913.0	1	1354.47	1352.90	1	1.57
637069	37817	7/16/2008	601350.0	3468913.0	1	1354.27	1352.84	1	1.43
637069	37910	10/17/2008	601350.0	3468913.0	1	1354.31	1352.76	1	1.55
637069	38013	1/28/2009	601350.0	3468913.0	1	1354.38	1352.68	1	1.70
637069	38090	4/15/2009	601350.0	3468913.0	1	1354.31	1352.63	1	1.69
637069	38181	7/15/2009	601350.0	3468913.0	1	1354.12	1352.56	1	1.56
637069	38271	10/13/2009	601350.0	3468913.0	1	1354.00	1352.50	1	1.50
637069	38378	1/28/2010	601350.0	3468913.0	1	1353.96	1352.42	1	1.53
637069	38463	4/23/2010	601350.0	3468913.0	1	1353.87	1352.37	1	1.50
637069	38553	7/22/2010	601350.0	3468913.0	1	1353.66	1352.32	1	1.34
637069	38644	10/21/2010	601350.0	3468913.0	1	1353.53	1352.26	1	1.27
637069	38733	1/18/2011	601350.0	3468913.0	1	1353.55	1352.20	1	1.34
637069	38817	4/12/2011	601350.0	3468913.0	1	1353.43	1352.15	1	1.29
637069	38954	8/27/2011	601350.0	3468913.0	1	1353.20	1352.05	1	1.15
637069	39002	10/14/2011	601350.0	3468913.0	1	1353.11	1352.01	1	1.10
637069	39113	2/2/2012	601350.0	3468913.0	1	1353.11	1351.93	1	1.18
637069	39197	4/26/2012	601350.0	3468913.0	1	1352.97	1351.86	1	1.11
637069	39275	7/13/2012	601350.0	3468913.0	1	1352.78	1351.80	1	0.98
637069	39365	10/11/2012	601350.0	3468913.0	1	1352.71	1351.73	1	0.98
641340	12784	1/2/1940	600090.4	3469474.0	1	1357.58	1360.17	1	-2.59
641340	29544	11/21/1985	600090.4	3469474.0	1	1362.76	1352.97	1	9.79
641340	31386	12/7/1990	600090.4	3469474.0	1	1361.54	1353.17	1	8.38
641340	35403	12/6/2001	600090.4	3469474.0	1	1354.53	1351.61	1	2.92
641341	5479	1/2/1920	601876.7	3467711.0	1	1377.70	1363.23	1	14.47
641341	29544	11/21/1985	601876.7	3467711.0	1	1366.78	1357.55	1	9.23
641341	31385	12/6/1990	601876.7	3467711.0	1	1363.98	1357.89	1	6.09
641341	35397	11/30/2001	601876.7	3467711.0	1	1363.68	1355.72	1	7.96
641341	37223	11/30/2006	601876.7	3467711.0	1	1363.68	1353.77	1	9.90
641342	18994	1/2/1957	604439.3	3467569.4	2	1361.78	1370.19	1	-8.41
641342	29544	11/21/1985	604439.3	3467569.4	2	1368.18	1367.71	1	0.48
641342	30468	6/2/1988	604439.3	3467569.4	2	1369.94	1368.16	1	1.78
641750	37658	2/8/2008	601095.7	3467667.0	1	1356.11	1352.34	1	3.77
641750	37831	7/30/2008	601095.7	3467667.0	1	1355.49	1352.21	1	3.29
641750	37916	10/23/2008	601095.7	3467667.0	1	1355.43	1352.15	1	3.28
641750	38027	2/11/2009	601095.7	3467667.0	1	1355.87	1352.08	1	3.79
641750	38105	4/30/2009	601095.7	3467667.0	1	1355.66	1352.03	1	3.62
641750	38201	8/4/2009	601095.7	3467667.0	1	1354.52	1351.98	1	2.54
641801	20089	1/2/1960	600991.1	3468691.4	1	1368.58	1361.41	1	7.16
641802	37666	2/16/2008	601155.0	3468658.9	1	1354.40	1352.62	1	1.78
641802	37748	5/8/2008	601155.0	3468658.9	1	1354.22	1352.55	1	1.68
641802	37818	7/17/2008	601155.0	3468658.9	1	1354.13	1352.49	1	1.64
641802	37922	10/29/2008	601155.0	3468658.9	1	1353.64	1352.41	1	1.23
641802	38015	1/30/2009	601155.0	3468658.9	1	1354.20	1352.34	1	1.86
641802	38091	4/16/2009	601155.0	3468658.9	1	1354.08	1352.29	1	1.79
641802	38182	7/16/2009	601155.0	3468658.9	1	1353.89	1352.22	1	1.67
641802	38274	10/16/2009	601155.0	3468658.9	1	1353.69	1352.16	1	1.53
641802	38384	2/3/2010	601155.0	3468658.9	1	1353.80	1352.09	1	1.71
641802	38463	4/23/2010	601155.0	3468658.9	1	1353.67	1352.05	1	1.62
641802	38551	7/20/2010	601155.0	3468658.9	1	1353.44	1352.00	1	1.44
641802	38644	10/21/2010	601155.0	3468658.9	1	1353.24	1351.95	1	1.30
641802	38733	1/18/2011	601155.0	3468658.9	1	1353.36	1351.89	1	1.47
641802	38817	4/12/2011	601155.0	3468658.9	1	1353.49	1351.83	1	1.66
641802	38954	8/27/2011	601155.0	3468658.9	1	1352.96	1351.73	1	1.23
641802	39002	10/14/2011	601155.0	3468658.9	1	1352.88	1351.69	1	1.19
641802	39113	2/2/2012	601155.0	3468658.9	1	1352.90	1351.61	1	1.30
641802	39197	4/26/2012	601155.0	3468658.9	1	1352.72	1351.53	1	1.19
641802	39276	7/14/2012	601155.0	3468658.9	1	1352.43	1351.47	1	0.96
641802	39366	10/12/2012	601155.0	3468658.9	1	1352.45	1351.40	1	1.05

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
641803	20089	1/2/1960	601003.2	3468480.0	1	1366.77	1361.16	1	5.61
641803	37658	2/8/2008	601003.2	3468480.0	1	1355.24	1352.34	1	2.90
641803	37831	7/30/2008	601003.2	3468480.0	1	1354.62	1352.17	1	2.45
641803	37916	10/23/2008	601003.2	3468480.0	1	1354.56	1352.11	1	2.44
641803	38027	2/11/2009	601003.2	3468480.0	1	1355.00	1352.04	1	2.97
641803	38105	4/30/2009	601003.2	3468480.0	1	1354.78	1351.98	1	2.80
641803	38201	8/4/2009	601003.2	3468480.0	1	1353.64	1351.92	1	1.72
641803	38278	10/20/2009	601003.2	3468480.0	1	1354.46	1351.87	1	2.59
641803	38295	11/6/2009	601003.2	3468480.0	1	1354.43	1351.86	1	2.57
641803	38643	10/20/2010	601003.2	3468480.0	1	1352.23	1351.67	1	0.56
642937	7306	1/2/1925	607926.1	3469546.0	4	1404.23	1410.32	1	-6.09
642976	16437	1/2/1950	596790.0	3469727.9	1	1352.70	1346.17	1	6.54
642976	23638	9/20/1969	596790.0	3469727.9	1	1350.57	1341.94	1	8.63
642976	26563	9/23/1977	596790.0	3469727.9	1	1349.35	1339.97	1	9.38
642976	29545	11/22/1985	596790.0	3469727.9	1	1349.35	1340.08	1	9.27
642977	23638	9/20/1969	597619.2	3468714.0	1	1355.63	1349.50	1	6.13
642977	26563	9/23/1977	597619.2	3468714.0	1	1356.18	1347.74	1	8.44
642977	28268	5/25/1982	597619.2	3468714.0	1	1355.87	1347.98	1	7.89
642977	31386	12/7/1990	597619.2	3468714.0	1	1356.18	1348.51	1	7.67
642977	33996	1/29/1998	597619.2	3468714.0	1	1354.04	1348.36	1	5.68
642977	34681	12/15/1999	597619.2	3468714.0	1	1353.13	1348.09	1	5.04
642977	35396	11/29/2001	597619.2	3468714.0	1	1351.61	1347.57	1	4.04
642977	37230	12/7/2006	597619.2	3468714.0	1	1351.91	1346.34	1	5.57
642977	38391	2/10/2010	597619.2	3468714.0	1	1353.13	1346.01	1	7.12
642977	38891	6/25/2011	597619.2	3468714.0	1	1350.08	1345.80	1	4.28
642977	38988	9/30/2011	597619.2	3468714.0	1	1350.20	1345.74	1	4.46
643436	29544	11/21/1985	607031.8	3470270.6	4	1431.84	1416.18	1	15.66
643436	30494	6/28/1988	607031.8	3470270.6	4	1417.50	1417.13	1	0.37
643436	32359	8/6/1993	607031.8	3470270.6	4	1407.55	1411.63	1	-4.08
643436	37754	5/14/2008	607031.8	3470270.6	4	1415.28	1406.72	1	8.55
643436	37838	8/6/2008	607031.8	3470270.6	4	1415.01	1406.72	1	8.29
643436	37910	10/17/2008	607031.8	3470270.6	4	1414.92	1406.72	1	8.20
643436	38006	1/21/2009	607031.8	3470270.6	4	1415.10	1406.72	1	8.39
643436	38083	4/8/2009	607031.8	3470270.6	4	1414.99	1406.71	1	8.28
643436	38175	7/9/2009	607031.8	3470270.6	4	1406.76	1406.71	1	0.05
643436	38216	8/19/2009	607031.8	3470270.6	4	1406.76	1406.71	1	0.05
643436	38264	10/6/2009	607031.8	3470270.6	4	1413.31	1406.71	1	6.61
643436	38372	1/22/2010	607031.8	3470270.6	4	1413.23	1406.71	1	6.52
643436	38460	4/20/2010	607031.8	3470270.6	4	1411.33	1406.70	1	4.63
643436	38544	7/13/2010	607031.8	3470270.6	4	1410.90	1406.70	1	4.20
643436	38909	7/13/2011	607031.8	3470270.6	4	1413.46	1406.69	1	6.78
643436	39115	2/4/2012	607031.8	3470270.6	4	1413.47	1406.68	1	6.79
643436	39272	7/10/2012	607031.8	3470270.6	4	1413.46	1406.68	1	6.78
643481	23456	3/22/1969	606412.6	3469396.8	2	1377.70	1397.38	1	-19.68
644919	23314	10/31/1968	606243.9	3469076.7	2	1418.04	1396.34	1	21.70
644919	28277	6/3/1982	606243.9	3469076.7	2	1402.80	1400.03	1	2.77
644919	37753	5/13/2008	606243.9	3469076.7	2	1395.57	1395.54	1	0.03
644919	37825	7/24/2008	606243.9	3469076.7	2	1395.62	1395.53	1	0.09
644919	37910	10/17/2008	606243.9	3469076.7	2	1395.73	1395.51	1	0.22
644919	38056	3/12/2009	606243.9	3469076.7	2	1395.81	1395.48	1	0.34
644919	38086	4/11/2009	606243.9	3469076.7	2	1395.82	1395.47	1	0.35
644919	38174	7/8/2009	606243.9	3469076.7	2	1395.83	1395.45	1	0.38
644927	19997	10/2/1959	605594.6	3469063.8	2	1399.14	1406.53	1	-7.39
644927	29543	11/20/1985	605594.6	3469063.8	2	1387.86	1399.12	1	-11.27
644927	30489	6/23/1988	605594.6	3469063.8	2	1387.84	1395.91	1	-8.06
644927	31385	12/6/1990	605594.6	3469063.8	2	1387.25	1394.11	1	-6.86
644927	35402	12/5/2001	605594.6	3469063.8	2	1382.37	1386.91	1	-4.53
644927	37229	12/6/2006	605594.6	3469063.8	2	1380.24	1384.80	1	-4.57
644927	37753	5/13/2008	605594.6	3469063.8	2	1403.59	1384.41	1	19.18
644927	37826	7/25/2008	605594.6	3469063.8	2	1403.34	1384.37	1	18.97
644927	37907	10/14/2008	605594.6	3469063.8	2	1403.46	1384.32	1	19.14
644927	38008	1/23/2009	605594.6	3469063.8	2	1403.30	1384.26	1	19.05
644927	38085	4/10/2009	605594.6	3469063.8	2	1403.15	1384.21	1	18.93
644927	38175	7/9/2009	605594.6	3469063.8	2	1401.92	1384.16	1	17.75

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
644927	38265	10/7/2009	605594.6	3469063.8	2	1401.80	1384.11	1	17.69
644927	38372	1/22/2010	605594.6	3469063.8	2	1401.41	1384.05	1	17.36
644927	38460	4/20/2010	605594.6	3469063.8	2	1401.11	1384.00	1	17.11
644927	38552	7/21/2010	605594.6	3469063.8	2	1400.72	1383.95	1	16.78
644927	38642	10/19/2010	605594.6	3469063.8	2	1400.86	1383.90	1	16.97
644927	38735	1/20/2011	605594.6	3469063.8	2	1400.86	1383.85	1	17.01
644927	38811	4/6/2011	605594.6	3469063.8	2	1400.64	1383.82	1	16.83
644927	38909	7/13/2011	605594.6	3469063.8	2	1400.33	1383.78	1	16.56
644927	38999	10/11/2011	605594.6	3469063.8	2	1400.02	1383.74	1	16.28
644927	39112	2/1/2012	605594.6	3469063.8	2	1399.84	1383.69	1	16.15
644927	39184	4/13/2012	605594.6	3469063.8	2	1399.69	1383.66	1	16.02
644927	39359	10/5/2012	605594.6	3469063.8	2	1398.59	1383.60	1	14.99
645050	15341	1/2/1947	600395.4	3468167.0	1	1354.06	1360.72	1	-6.65
645536	26980	11/14/1978	602725.9	3471529.1	1	1374.55	1365.74	1	8.81
645536	29545	11/22/1985	602725.9	3471529.1	1	1380.34	1365.66	1	14.68
645536	30469	6/3/1988	602725.9	3471529.1	1	1371.25	1365.37	1	5.88
645536	37916	10/23/2008	602725.9	3471529.1	1	1357.25	1364.20	1	-6.96
645913	7306	1/2/1925	608557.3	3467736.0	2	1379.22	1401.50	1	-22.28
645913	31385	12/6/1990	608557.3	3467736.0	2	1385.62	1402.91	1	-17.29
645913	35403	12/6/2001	608557.3	3467736.0	2	1385.62	1397.98	1	-12.36
647003	28284	6/10/1982	601485.9	3469892.0	1	1395.45	1358.81	1	36.64
647847	23545	6/19/1969	600395.4	3468167.0	1	1349.49	1354.49	1	-5.00
647987	28287	6/13/1982	606981.9	3469206.2	2	1325.33	1400.42	1	-75.09
647987	37678	2/28/2008	606981.9	3469206.2	2	1353.37	1396.17	1	-42.81
647987	37753	5/13/2008	606981.9	3469206.2	2	1350.84	1396.16	1	-45.32
647987	37823	7/22/2008	606981.9	3469206.2	2	1346.98	1396.15	1	-49.17
647987	37907	10/14/2008	606981.9	3469206.2	2	1347.21	1396.13	1	-48.92
647987	38007	1/22/2009	606981.9	3469206.2	2	1353.78	1396.12	1	-42.33
647987	38084	4/9/2009	606981.9	3469206.2	2	1354.13	1396.10	1	-41.97
647987	38176	7/10/2009	606981.9	3469206.2	2	1344.93	1396.09	1	-51.16
647987	38189	7/23/2009	606981.9	3469206.2	2	1344.93	1396.08	1	-51.15
647987	38266	10/8/2009	606981.9	3469206.2	2	1344.62	1396.07	1	-51.45
647987	38407	2/26/2010	606981.9	3469206.2	2	1350.63	1396.04	1	-45.41
647987	38461	4/21/2010	606981.9	3469206.2	2	1349.91	1396.03	1	-46.12
647987	38552	7/21/2010	606981.9	3469206.2	2	1344.95	1396.01	1	-51.05
647987	38644	10/21/2010	606981.9	3469206.2	2	1346.59	1395.99	1	-49.40
647987	38733	1/18/2011	606981.9	3469206.2	2	1351.15	1395.97	1	-44.83
647987	38811	4/6/2011	606981.9	3469206.2	2	1349.20	1395.97	1	-46.77
647987	38908	7/12/2011	606981.9	3469206.2	2	1344.41	1395.96	1	-51.55
647987	39001	10/13/2011	606981.9	3469206.2	2	1344.42	1395.95	1	-51.52
647987	39112	2/1/2012	606981.9	3469206.2	2	1346.98	1395.93	1	-48.95
647987	39183	4/12/2012	606981.9	3469206.2	2	1349.90	1395.92	1	-46.03
647987	39269	7/7/2012	606981.9	3469206.2	2	1345.87	1395.92	1	-50.04
647987	39359	10/5/2012	606981.9	3469206.2	2	1344.48	1395.90	1	-51.43
649153	12054	1/2/1938	600395.4	3468167.0	1	1352.54	1360.72	1	-8.18
649994	22401	5/2/1966	600496.7	3467463.0	1	1366.11	1355.75	1	10.36
649994	22476	7/16/1966	600496.7	3467463.0	1	1365.50	1355.66	1	9.84
650255	12054	1/2/1938	601096.3	3467466.0	1	1361.89	1362.07	1	-0.18
650256	12054	1/2/1938	601096.3	3467466.0	1	1361.89	1362.07	1	-0.18
651116	28319	7/15/1982	600196.7	3467563.0	1	1357.40	1353.16	1	4.23
801607	18263	1/2/1955	601596.4	3468580.0	1	1366.49	1363.35	1	3.13
801607	30453	5/18/1988	601596.4	3468580.0	1	1361.83	1357.41	1	4.42
802236	10637	2/15/1934	600552.2	3467978.4	1	1360.01	1360.54	1	-0.53
802236	17651	4/30/1953	600552.2	3467978.4	1	1372.20	1360.50	1	11.70
802236	17756	8/13/1953	600552.2	3467978.4	1	1372.20	1360.50	1	11.70
802236	17869	12/4/1953	600552.2	3467978.4	1	1372.20	1360.50	1	11.70
802236	17952	2/25/1954	600552.2	3467978.4	1	1372.20	1360.46	1	11.75
802236	18135	8/27/1954	600552.2	3467978.4	1	1372.20	1360.29	1	11.91
802236	18651	1/25/1956	600552.2	3467978.4	1	1371.29	1359.90	1	11.39
802236	18770	5/23/1956	600552.2	3467978.4	1	1370.98	1359.82	1	11.16
802236	18827	7/19/1956	600552.2	3467978.4	1	1370.37	1359.79	1	10.59
802236	18881	9/11/1956	600552.2	3467978.4	1	1368.55	1359.75	1	8.79
802236	18917	10/17/1956	600552.2	3467978.4	1	1368.55	1359.73	1	8.82
802236	18951	11/20/1956	600552.2	3467978.4	1	1372.51	1359.71	1	12.80

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
802236	18979	12/18/1956	600552.2	3467978.4	1	1370.68	1359.69	1	10.99
802236	19057	3/6/1957	600552.2	3467978.4	1	1369.77	1359.64	1	10.12
802236	19184	7/11/1957	600552.2	3467978.4	1	1370.07	1359.56	1	10.51
802236	31386	12/7/1990	600552.2	3467978.4	1	1362.88	1354.58	1	8.30
802236	34682	12/16/1999	600552.2	3467978.4	1	1356.90	1353.76	1	3.14
802236	35402	12/5/2001	600552.2	3467978.4	1	1355.74	1353.05	1	2.69
802236	37222	11/29/2006	600552.2	3467978.4	1	1353.92	1351.38	1	2.53
802236	37748	5/8/2008	600552.2	3467978.4	1	1352.91	1351.19	1	1.72
802236	37817	7/16/2008	600552.2	3467978.4	1	1353.44	1351.13	1	2.31
802236	37909	10/16/2008	600552.2	3467978.4	1	1353.20	1351.08	1	2.12
802236	38028	2/12/2009	600552.2	3467978.4	1	1353.53	1351.01	1	2.52
802236	38093	4/18/2009	600552.2	3467978.4	1	1353.08	1350.97	1	2.11
802236	38188	7/22/2009	600552.2	3467978.4	1	1352.71	1350.92	1	1.79
802236	38278	10/20/2009	600552.2	3467978.4	1	1352.73	1350.87	1	1.86
802236	38384	2/3/2010	600552.2	3467978.4	1	1353.23	1350.83	1	2.40
802236	38464	4/24/2010	600552.2	3467978.4	1	1353.09	1350.81	1	2.29
802236	38547	7/16/2010	600552.2	3467978.4	1	1352.37	1350.77	1	1.60
802236	38912	7/16/2011	600552.2	3467978.4	1	1351.71	1350.50	1	1.21
802236	39279	7/17/2012	600552.2	3467978.4	1	1351.54	1350.16	1	1.38
802236	39364	10/10/2012	600552.2	3467978.4	1	1351.34	1350.09	1	1.25
803772	28311	7/7/1982	607194.1	3468878.2	2	1398.39	1400.26	1	-1.86
803772	31385	12/6/1990	607194.1	3468878.2	2	1406.93	1402.01	1	4.92
803772	37666	2/16/2008	607194.1	3468878.2	2	1404.23	1396.12	1	8.11
803772	37754	5/14/2008	607194.1	3468878.2	2	1403.33	1396.11	1	7.22
803772	37831	7/30/2008	607194.1	3468878.2	2	1402.89	1396.10	1	6.80
803772	37916	10/23/2008	607194.1	3468878.2	2	1403.11	1396.08	1	7.03
803772	38006	1/21/2009	607194.1	3468878.2	2	1403.18	1396.06	1	7.11
803772	38084	4/9/2009	607194.1	3468878.2	2	1403.06	1396.05	1	7.01
803772	38176	7/10/2009	607194.1	3468878.2	2	1401.75	1396.04	1	5.71
803772	38266	10/8/2009	607194.1	3468878.2	2	1401.48	1396.02	1	5.46
803772	38377	1/27/2010	607194.1	3468878.2	2	1402.17	1396.00	1	6.17
803772	38461	4/21/2010	607194.1	3468878.2	2	1401.51	1395.99	1	5.52
803772	38546	7/15/2010	607194.1	3468878.2	2	1401.03	1395.97	1	5.06
803772	38644	10/21/2010	607194.1	3468878.2	2	1401.49	1395.95	1	5.54
803772	38733	1/18/2011	607194.1	3468878.2	2	1401.29	1395.94	1	5.35
803772	38811	4/6/2011	607194.1	3468878.2	2	1400.88	1395.93	1	4.95
803772	38908	7/12/2011	607194.1	3468878.2	2	1399.69	1395.92	1	3.78
803772	39001	10/13/2011	607194.1	3468878.2	2	1400.34	1395.91	1	4.43
803772	39112	2/1/2012	607194.1	3468878.2	2	1400.46	1395.89	1	4.57
803772	39183	4/12/2012	607194.1	3468878.2	2	1400.07	1395.89	1	4.18
803772	39269	7/7/2012	607194.1	3468878.2	2	1398.78	1395.88	1	2.90
803772	39358	10/4/2012	607194.1	3468878.2	2	1398.10	1395.87	1	2.23
805290	21611	3/3/1964	601705.9	3468880.3	1	1361.61	1361.17	1	0.43
805290	37678	2/28/2008	601705.9	3468880.3	1	1351.53	1353.30	1	-1.77
805290	37748	5/8/2008	601705.9	3468880.3	1	1351.46	1353.24	1	-1.78
805290	37816	7/15/2008	601705.9	3468880.3	1	1351.28	1353.19	1	-1.91
805290	37910	10/17/2008	601705.9	3468880.3	1	1351.26	1353.11	1	-1.85
805290	38014	1/29/2009	601705.9	3468880.3	1	1351.30	1353.03	1	-1.73
805290	38091	4/16/2009	601705.9	3468880.3	1	1351.19	1352.97	1	-1.78
805290	38181	7/15/2009	601705.9	3468880.3	1	1351.06	1352.90	1	-1.84
805290	38274	10/16/2009	601705.9	3468880.3	1	1350.94	1352.83	1	-1.90
805290	38412	3/3/2010	601705.9	3468880.3	1	1350.84	1352.74	1	-1.90
805290	38489	5/19/2010	601705.9	3468880.3	1	1350.72	1352.69	1	-1.97
805290	38552	7/21/2010	601705.9	3468880.3	1	1350.58	1352.65	1	-2.07
805290	38643	10/20/2010	601705.9	3468880.3	1	1350.50	1352.59	1	-2.09
805290	38959	9/1/2011	601705.9	3468880.3	1	1350.10	1352.38	1	-2.28
805290	39064	12/15/2011	601705.9	3468880.3	1	1349.98	1352.30	1	-2.32
805290	39113	2/2/2012	601705.9	3468880.3	1	1353.16	1352.26	1	0.90
805290	39191	4/20/2012	601705.9	3468880.3	1	1353.09	1352.21	1	0.89
805290	39274	7/12/2012	601705.9	3468880.3	1	1352.85	1352.14	1	0.71
805290	39372	10/18/2012	601705.9	3468880.3	1	1352.76	1352.07	1	0.69
805326	18193	10/24/1954	604681.9	3472329.0	1	1421.46	1378.33	1	43.13
805641	29543	11/20/1985	607165.4	3469229.9	2	1411.76	1401.25	1	10.51
805641	31000	11/16/1989	607165.4	3469229.9	2	1406.00	1402.31	1	3.69

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
805641	37691	3/12/2008	607165.4	3469229.9	2	1406.15	1396.29	1	9.85
805641	37753	5/13/2008	607165.4	3469229.9	2	1405.80	1396.28	1	9.52
805641	37823	7/22/2008	607165.4	3469229.9	2	1407.34	1396.27	1	11.07
805641	37908	10/15/2008	607165.4	3469229.9	2	1407.67	1396.25	1	11.41
805641	38007	1/22/2009	607165.4	3469229.9	2	1406.81	1396.24	1	10.57
805641	38084	4/9/2009	607165.4	3469229.9	2	1406.28	1396.22	1	10.06
805641	38176	7/10/2009	607165.4	3469229.9	2	1405.54	1396.21	1	9.33
805641	38266	10/8/2009	607165.4	3469229.9	2	1406.02	1396.19	1	9.83
805641	38552	7/21/2010	607165.4	3469229.9	2	1399.79	1396.13	1	3.66
805641	38644	10/21/2010	607165.4	3469229.9	2	1400.25	1396.11	1	4.13
805641	38733	1/18/2011	607165.4	3469229.9	2	1399.56	1396.10	1	3.46
805641	38811	4/6/2011	607165.4	3469229.9	2	1398.74	1396.09	1	2.65
805641	38908	7/12/2011	607165.4	3469229.9	2	1397.82	1396.08	1	1.74
805641	39001	10/13/2011	607165.4	3469229.9	2	1403.68	1396.07	1	7.60
805641	39112	2/1/2012	607165.4	3469229.9	2	1400.88	1396.06	1	4.82
805641	39183	4/12/2012	607165.4	3469229.9	2	1399.27	1396.05	1	3.22
805641	39269	7/7/2012	607165.4	3469229.9	2	1396.13	1396.04	1	0.08
805641	39358	10/4/2012	607165.4	3469229.9	2	1393.30	1396.03	1	-2.73
805643	31000	11/16/1989	607125.5	3469140.0	2	1403.66	1402.21	1	1.45
808560	37754	5/14/2008	606981.8	3469072.8	2	1403.99	1396.09	1	7.90
808560	37838	8/6/2008	606981.8	3469072.8	2	1403.49	1396.07	1	7.41
808560	37910	10/17/2008	606981.8	3469072.8	2	1403.49	1396.06	1	7.43
808560	38007	1/22/2009	606981.8	3469072.8	2	1403.31	1396.04	1	7.26
808560	38084	4/9/2009	606981.8	3469072.8	2	1402.92	1396.03	1	6.89
808560	38174	7/8/2009	606981.8	3469072.8	2	1402.63	1396.02	1	6.62
808560	38266	10/8/2009	606981.8	3469072.8	2	1402.35	1396.00	1	6.35
808560	38377	1/27/2010	606981.8	3469072.8	2	1402.11	1395.98	1	6.13
808560	38461	4/21/2010	606981.8	3469072.8	2	1402.07	1395.96	1	6.12
808560	38546	7/15/2010	606981.8	3469072.8	2	1401.87	1395.94	1	5.93
808560	38734	1/19/2011	606981.8	3469072.8	2	1401.54	1395.91	1	5.64
808560	38908	7/12/2011	606981.8	3469072.8	2	1401.10	1395.89	1	5.21
808560	39112	2/1/2012	606981.8	3469072.8	2	1400.73	1395.86	1	4.87
808560	39272	7/10/2012	606981.8	3469072.8	2	1414.43	1395.84	1	18.59
903984	36910	1/21/2006	600973.3	3468114.8	1	1355.81	1352.68	1	3.14
903984	37673	2/23/2008	600973.3	3468114.8	1	1354.34	1352.27	1	2.07
903984	37761	5/21/2008	600973.3	3468114.8	1	1354.29	1352.18	1	2.11
903984	37832	7/31/2008	600973.3	3468114.8	1	1354.13	1352.13	1	2.00
903984	37917	10/24/2008	600973.3	3468114.8	1	1353.98	1352.07	1	1.91
903984	38029	2/13/2009	600973.3	3468114.8	1	1354.17	1352.00	1	2.18
903984	38099	4/24/2009	600973.3	3468114.8	1	1353.94	1351.95	1	1.99
903984	38189	7/23/2009	600973.3	3468114.8	1	1353.71	1351.89	1	1.81
903984	38281	10/23/2009	600973.3	3468114.8	1	1353.58	1351.84	1	1.74
903984	38413	3/4/2010	600973.3	3468114.8	1	1353.70	1351.77	1	1.93
903984	38467	4/27/2010	600973.3	3468114.8	1	1353.54	1351.75	1	1.79
903984	38545	7/14/2010	600973.3	3468114.8	1	1353.21	1351.71	1	1.50
903984	38736	1/21/2011	600973.3	3468114.8	1	1353.24	1351.60	1	1.64
903984	38911	7/15/2011	600973.3	3468114.8	1	1352.71	1351.44	1	1.27
903984	39112	2/1/2012	600973.3	3468114.8	1	1352.75	1351.28	1	1.47
903984	39275	7/13/2012	600973.3	3468114.8	1	1352.28	1351.11	1	1.17
903992	36951	3/3/2006	603153.3	3469889.9	1	1354.31	1355.36	1	-1.05
903992	37673	2/23/2008	603153.3	3469889.9	1	1356.60	1354.52	1	2.08
903992	37761	5/21/2008	603153.3	3469889.9	1	1356.40	1354.44	1	1.96
903992	37832	7/31/2008	603153.3	3469889.9	1	1356.33	1354.37	1	1.95
903992	37917	10/24/2008	603153.3	3469889.9	1	1356.25	1354.29	1	1.96
903992	38029	2/13/2009	603153.3	3469889.9	1	1356.12	1354.19	1	1.93
903992	38097	4/22/2009	603153.3	3469889.9	1	1355.83	1354.13	1	1.70
903992	38189	7/23/2009	603153.3	3469889.9	1	1356.03	1354.05	1	1.98
903992	38281	10/23/2009	603153.3	3469889.9	1	1355.92	1353.97	1	1.95
903992	38386	2/5/2010	603153.3	3469889.9	1	1355.78	1353.88	1	1.90
903992	38461	4/21/2010	603153.3	3469889.9	1	1355.69	1353.82	1	1.87
903992	38545	7/14/2010	603153.3	3469889.9	1	1355.62	1353.75	1	1.87
903992	38911	7/15/2011	603153.3	3469889.9	1	1355.23	1353.48	1	1.75
903992	39275	7/13/2012	603153.3	3469889.9	1	1354.84	1353.21	1	1.63
908794	37755	5/15/2008	603099.2	3470029.3	2	1356.77	1354.53	1	2.23

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
908794	37816	7/15/2008	603099.2	3470029.3	2	1356.37	1354.48	1	1.89
908794	37931	11/7/2008	603099.2	3470029.3	2	1355.95	1354.38	1	1.57
908794	38035	2/19/2009	603099.2	3470029.3	2	1356.19	1354.29	1	1.90
908794	38117	5/12/2009	603099.2	3470029.3	2	1356.15	1354.22	1	1.92
908794	38204	8/7/2009	603099.2	3470029.3	2	1356.10	1354.15	1	1.95
908794	38286	10/28/2009	603099.2	3470029.3	2	1355.99	1354.09	1	1.90
908794	38399	2/18/2010	603099.2	3470029.3	2	1355.86	1354.00	1	1.85
908794	38456	4/16/2010	603099.2	3470029.3	2	1355.81	1353.96	1	1.85
908794	38538	7/7/2010	603099.2	3470029.3	2	1355.77	1353.90	1	1.86
908794	38761	2/15/2011	603099.2	3470029.3	2	1355.47	1353.74	1	1.73
908794	38912	7/16/2011	603099.2	3470029.3	2	1355.30	1353.63	1	1.67
908794	39111	1/31/2012	603099.2	3470029.3	2	1355.11	1353.49	1	1.61
908794	39274	7/12/2012	603099.2	3470029.3	2	1354.94	1353.39	1	1.54
909019	37763	5/23/2008	600367.9	3469813.9	2	1352.06	1349.47	1	2.59
909019	37812	7/11/2008	600367.9	3469813.9	2	1351.87	1349.44	1	2.43
909019	37929	11/5/2008	600367.9	3469813.9	2	1352.29	1349.36	1	2.93
909019	38037	2/21/2009	600367.9	3469813.9	2	1352.15	1349.30	1	2.85
909019	38104	4/29/2009	600367.9	3469813.9	2	1352.07	1349.26	1	2.81
909019	38202	8/5/2009	600367.9	3469813.9	2	1351.83	1349.20	1	2.62
909019	38285	10/27/2009	600367.9	3469813.9	2	1351.71	1349.15	1	2.56
909019	38397	2/16/2010	600367.9	3469813.9	2	1351.82	1349.09	1	2.73
909019	38456	4/16/2010	600367.9	3469813.9	2	1351.87	1349.06	1	2.81
909019	38533	7/2/2010	600367.9	3469813.9	2	1351.60	1349.01	1	2.58
909019	38629	10/6/2010	600367.9	3469813.9	2	1351.46	1348.96	1	2.51
909019	38761	2/15/2011	600367.9	3469813.9	2	1273.12	1348.88	1	-75.76
909019	38848	5/13/2011	600367.9	3469813.9	2	1351.25	1348.82	1	2.43
909019	38909	7/13/2011	600367.9	3469813.9	2	1351.00	1348.77	1	2.23
909019	39057	12/8/2011	600367.9	3469813.9	2	1350.87	1348.67	1	2.20
909019	39115	2/4/2012	600367.9	3469813.9	2	1350.95	1348.63	1	2.32
909019	39190	4/19/2012	600367.9	3469813.9	2	1350.84	1348.59	1	2.26
909019	39273	7/11/2012	600367.9	3469813.9	2	1350.51	1348.53	1	1.98
909019	39371	10/17/2012	600367.9	3469813.9	2	1350.38	1348.46	1	1.92
909146	37772	6/1/2008	600366.5	3469820.6	1	1352.53	1350.54	1	1.99
909146	37818	7/17/2008	600366.5	3469820.6	1	1352.49	1350.51	1	1.98
909146	37929	11/5/2008	600366.5	3469820.6	1	1352.46	1350.44	1	2.02
909146	38036	2/20/2009	600366.5	3469820.6	1	1352.62	1350.37	1	2.25
909146	38103	4/28/2009	600366.5	3469820.6	1	1352.53	1350.33	1	2.20
909146	38202	8/5/2009	600366.5	3469820.6	1	1352.29	1350.27	1	2.02
909146	38285	10/27/2009	600366.5	3469820.6	1	1352.21	1350.21	1	2.00
909146	38397	2/16/2010	600366.5	3469820.6	1	1352.28	1350.14	1	2.14
909146	38456	4/16/2010	600366.5	3469820.6	1	1352.30	1350.11	1	2.19
909146	38533	7/2/2010	600366.5	3469820.6	1	1352.10	1350.06	1	2.03
909146	38629	10/6/2010	600366.5	3469820.6	1	1351.77	1350.00	1	1.77
909146	38761	2/15/2011	600366.5	3469820.6	1	1329.67	1349.93	1	-20.25
909146	38848	5/13/2011	600366.5	3469820.6	1	1351.71	1349.87	1	1.84
909146	38909	7/13/2011	600366.5	3469820.6	1	1351.53	1349.83	1	1.69
909146	39057	12/8/2011	600366.5	3469820.6	1	1351.36	1349.73	1	1.63
909146	39115	2/4/2012	600366.5	3469820.6	1	1351.43	1349.69	1	1.75
909146	39190	4/19/2012	600366.5	3469820.6	1	1351.34	1349.64	1	1.71
909146	39273	7/11/2012	600366.5	3469820.6	1	1351.08	1349.58	1	1.51
909146	39371	10/17/2012	600366.5	3469820.6	1	1350.79	1349.51	1	1.28
909147	37787	6/16/2008	602012.9	3467919.6	1	1355.13	1353.51	1	1.62
909147	37820	7/19/2008	602012.9	3467919.6	1	1355.12	1353.49	1	1.63
909147	37929	11/5/2008	602012.9	3467919.6	1	1355.15	1353.41	1	1.74
909147	38036	2/20/2009	602012.9	3467919.6	1	1355.07	1353.33	1	1.74
909147	38117	5/12/2009	602012.9	3467919.6	1	1354.99	1353.27	1	1.72
909147	38204	8/7/2009	602012.9	3467919.6	1	1354.82	1353.21	1	1.61
909147	38285	10/27/2009	602012.9	3467919.6	1	1354.64	1353.16	1	1.48
909147	38413	3/4/2010	602012.9	3467919.6	1	1354.51	1353.08	1	1.43
909147	38449	4/9/2010	602012.9	3467919.6	1	1354.50	1353.06	1	1.44
909147	38533	7/2/2010	602012.9	3467919.6	1	1354.31	1353.01	1	1.30
909147	38761	2/15/2011	602012.9	3467919.6	1	1317.95	1352.87	1	-34.93
909147	38909	7/13/2011	602012.9	3467919.6	1	1353.85	1352.78	1	1.07
909147	39135	2/24/2012	602012.9	3467919.6	1	1353.33	1352.63	1	0.70

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
909147	39273	7/11/2012	602012.9	3467919.6	1	1353.39	1352.53	1	0.86
909255	37818	7/17/2008	604668.7	3471121.7	3	1364.47	1366.60	1	-2.13
909255	37840	8/8/2008	604668.7	3471121.7	3	1364.11	1366.59	1	-2.47
909255	37841	8/9/2008	604668.7	3471121.7	3	1364.11	1366.58	1	-2.47
909255	37930	11/6/2008	604668.7	3471121.7	3	1363.97	1366.51	1	-2.55
909255	38043	2/27/2009	604668.7	3471121.7	3	1364.58	1366.43	1	-1.85
909255	38118	5/13/2009	604668.7	3471121.7	3	1364.69	1366.38	1	-1.69
909255	38215	8/18/2009	604668.7	3471121.7	3	1364.44	1366.33	1	-1.88
909255	38293	11/4/2009	604668.7	3471121.7	3	1364.30	1366.27	1	-1.97
909255	38414	3/5/2010	604668.7	3471121.7	3	1364.03	1366.19	1	-2.16
909255	38447	4/7/2010	604668.7	3471121.7	3	1363.92	1366.17	1	-2.25
909255	38533	7/2/2010	604668.7	3471121.7	3	1363.78	1366.10	1	-2.32
909255	38757	2/11/2011	604668.7	3471121.7	3	1363.32	1365.99	1	-2.67
909255	38849	5/14/2011	604668.7	3471121.7	3	1363.11	1365.93	1	-2.82
909255	38912	7/16/2011	604668.7	3471121.7	3	1362.96	1365.89	1	-2.93
909255	39113	2/2/2012	604668.7	3471121.7	3	1362.20	1365.78	1	-3.58
909255	39275	7/13/2012	604668.7	3471121.7	3	1361.83	1365.67	1	-3.83
909272	37810	7/9/2008	605267.6	3471731.9	4	1370.82	1393.50	1	-22.67
909272	37837	8/5/2008	605267.6	3471731.9	4	1369.82	1393.49	1	-23.67
909272	37930	11/6/2008	605267.6	3471731.9	4	1370.86	1393.49	1	-22.63
909272	38042	2/26/2009	605267.6	3471731.9	4	1372.70	1393.48	1	-20.78
909272	38112	5/7/2009	605267.6	3471731.9	4	1372.85	1393.47	1	-20.62
909272	38209	8/12/2009	605267.6	3471731.9	4	1372.93	1393.47	1	-20.54
909272	38292	11/3/2009	605267.6	3471731.9	4	1372.72	1393.47	1	-20.74
909272	38420	3/11/2010	605267.6	3471731.9	4	1372.78	1393.46	1	-20.68
909272	38448	4/8/2010	605267.6	3471731.9	4	1372.80	1393.45	1	-20.65
909272	38538	7/7/2010	605267.6	3471731.9	4	1372.98	1393.45	1	-20.47
909272	38910	7/14/2011	605267.6	3471731.9	4	1369.29	1393.41	1	-24.12
909272	39113	2/2/2012	605267.6	3471731.9	4	1361.52	1393.40	1	-31.87
909272	39276	7/14/2012	605267.6	3471731.9	4	1360.86	1393.39	1	-32.54
909434	37840	8/8/2008	603801.0	3472626.5	4	1300.79	1359.76	1	-58.98
909434	37855	8/23/2008	603801.0	3472626.5	4	1300.55	1359.76	1	-59.21
909434	37937	11/13/2008	603801.0	3472626.5	4	1300.85	1359.75	1	-58.91
909434	38043	2/27/2009	603801.0	3472626.5	4	1301.12	1359.74	1	-58.62
909434	38084	4/9/2009	603801.0	3472626.5	4	1301.26	1359.73	1	-58.48
909434	38104	4/29/2009	603801.0	3472626.5	4	1301.26	1359.73	1	-58.48
909434	38210	8/13/2009	603801.0	3472626.5	4	1301.44	1359.73	1	-58.29
909434	38299	11/10/2009	603801.0	3472626.5	4	1301.88	1359.74	1	-57.86
909434	38411	3/2/2010	603801.0	3472626.5	4	1301.80	1359.72	1	-57.92
909434	38450	4/10/2010	603801.0	3472626.5	4	1301.83	1359.72	1	-57.88
909434	38533	7/2/2010	603801.0	3472626.5	4	1302.01	1359.71	1	-57.69
909434	38757	2/11/2011	603801.0	3472626.5	4	1302.43	1359.67	1	-57.24
909434	38919	7/23/2011	603801.0	3472626.5	4	1302.55	1359.65	1	-57.09
909434	39112	2/1/2012	603801.0	3472626.5	4	1302.97	1359.62	1	-56.65
909434	39308	8/15/2012	603801.0	3472626.5	4	1303.01	1359.61	1	-56.60
909435	37830	7/29/2008	605264.1	3471702.0	4	1301.86	1393.40	1	-91.54
909435	37853	8/21/2008	605264.1	3471702.0	4	1301.64	1393.40	1	-91.77
909435	37930	11/6/2008	605264.1	3471702.0	4	1302.02	1393.40	1	-91.38
909435	38042	2/26/2009	605264.1	3471702.0	4	1303.17	1393.39	1	-90.22
909435	38118	5/13/2009	605264.1	3471702.0	4	1303.79	1393.38	1	-89.59
909435	38209	8/12/2009	605264.1	3471702.0	4	1304.23	1393.38	1	-89.14
909435	38292	11/3/2009	605264.1	3471702.0	4	1305.39	1393.38	1	-87.98
909435	38414	3/5/2010	605264.1	3471702.0	4	1304.95	1393.37	1	-88.42
909435	38449	4/9/2010	605264.1	3471702.0	4	1306.34	1393.36	1	-87.02
909435	38534	7/3/2010	605264.1	3471702.0	4	1304.67	1393.36	1	-88.69
909435	38910	7/14/2011	605264.1	3471702.0	4	1304.56	1393.32	1	-88.76
909435	39114	2/3/2012	605264.1	3471702.0	4	1304.81	1393.31	1	-88.50
909435	39276	7/14/2012	605264.1	3471702.0	4	1304.94	1393.30	1	-88.36
909474	37842	8/10/2008	606467.7	3471723.6	4	1446.00	1417.21	1	28.80
909474	37860	8/28/2008	606467.7	3471723.6	4	1445.68	1417.20	1	28.48
909474	37936	11/12/2008	606467.7	3471723.6	4	1446.02	1417.20	1	28.81
909474	38042	2/26/2009	606467.7	3471723.6	4	1445.87	1417.20	1	28.67
909474	38104	4/29/2009	606467.7	3471723.6	4	1445.69	1417.19	1	28.50
909474	38202	8/5/2009	606467.7	3471723.6	4	1445.40	1417.19	1	28.21

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
909474	38286	10/28/2009	606467.7	3471723.6	4	1445.21	1417.19	1	28.01
909474	38399	2/18/2010	606467.7	3471723.6	4	1444.93	1417.19	1	27.74
909474	38456	4/16/2010	606467.7	3471723.6	4	1444.77	1417.19	1	27.58
909474	38539	7/8/2010	606467.7	3471723.6	4	1444.53	1417.18	1	27.35
909474	38909	7/13/2011	606467.7	3471723.6	4	1443.45	1417.16	1	26.29
909474	39120	2/9/2012	606467.7	3471723.6	4	1443.16	1417.16	1	26.00
909474	39308	8/15/2012	606467.7	3471723.6	4	1442.73	1417.15	1	25.58
909551	37880	9/17/2008	601580.0	3469829.0	1	1353.99	1353.42	1	0.57
909551	37897	10/4/2008	601580.0	3469829.0	1	1354.16	1353.40	1	0.76
909551	38034	2/18/2009	601580.0	3469829.0	1	1354.26	1353.29	1	0.97
909551	38112	5/7/2009	601580.0	3469829.0	1	1354.19	1353.22	1	0.97
909551	38203	8/6/2009	601580.0	3469829.0	1	1354.05	1353.15	1	0.90
909551	38287	10/29/2009	601580.0	3469829.0	1	1353.96	1353.08	1	0.88
909551	38398	2/17/2010	601580.0	3469829.0	1	1353.91	1353.00	1	0.91
909551	38455	4/15/2010	601580.0	3469829.0	1	1353.90	1352.95	1	0.95
909551	38538	7/7/2010	601580.0	3469829.0	1	1353.78	1352.89	1	0.88
909551	38757	2/11/2011	601580.0	3469829.0	1	1353.53	1352.74	1	0.79
909551	38849	5/14/2011	601580.0	3469829.0	1	1353.39	1352.68	1	0.72
909551	38912	7/16/2011	601580.0	3469829.0	1	1353.27	1352.63	1	0.64
909551	39121	2/10/2012	601580.0	3469829.0	1	1353.14	1352.48	1	0.66
909551	39274	7/12/2012	601580.0	3469829.0	1	1352.89	1352.37	1	0.52
909552	37855	8/23/2008	600445.3	3468994.0	2	1352.71	1349.57	1	3.14
909552	37896	10/3/2008	600445.3	3468994.0	2	1352.82	1349.55	1	3.27
909552	38035	2/19/2009	600445.3	3468994.0	2	1353.02	1349.47	1	3.55
909552	38103	4/28/2009	600445.3	3468994.0	2	1352.87	1349.43	1	3.44
909552	38202	8/5/2009	600445.3	3468994.0	2	1352.67	1349.38	1	3.29
909552	38288	10/30/2009	600445.3	3468994.0	2	1352.50	1349.33	1	3.17
909552	38397	2/16/2010	600445.3	3468994.0	2	1352.69	1349.28	1	3.41
909552	38457	4/17/2010	600445.3	3468994.0	2	1352.60	1349.25	1	3.36
909552	38539	7/8/2010	600445.3	3468994.0	2	1352.32	1349.21	1	3.11
909552	38629	10/6/2010	600445.3	3468994.0	2	1352.20	1349.16	1	3.04
909552	38761	2/15/2011	600445.3	3468994.0	2	1260.35	1349.08	1	-88.72
909552	38848	5/13/2011	600445.3	3468994.0	2	1351.90	1349.01	1	2.89
909552	38909	7/13/2011	600445.3	3468994.0	2	1351.73	1348.96	1	2.77
909552	39057	12/8/2011	600445.3	3468994.0	2	1351.70	1348.85	1	2.85
909552	39115	2/4/2012	600445.3	3468994.0	2	1351.78	1348.81	1	2.97
909552	39190	4/19/2012	600445.3	3468994.0	2	1351.58	1348.76	1	2.82
909552	39273	7/11/2012	600445.3	3468994.0	2	1351.29	1348.70	1	2.59
909552	39371	10/17/2012	600445.3	3468994.0	2	1351.25	1348.62	1	2.63
909653	37860	8/28/2008	600449.7	3468994.4	1	1353.34	1350.83	1	2.51
909653	37894	10/1/2008	600449.7	3468994.4	1	1353.31	1350.81	1	2.50
909653	38035	2/19/2009	600449.7	3468994.4	1	1353.54	1350.73	1	2.82
909653	38103	4/28/2009	600449.7	3468994.4	1	1353.41	1350.68	1	2.73
909653	38202	8/5/2009	600449.7	3468994.4	1	1353.23	1350.63	1	2.61
909653	38288	10/30/2009	600449.7	3468994.4	1	1353.07	1350.57	1	2.50
909653	38397	2/16/2010	600449.7	3468994.4	1	1353.21	1350.51	1	2.70
909653	38456	4/16/2010	600449.7	3468994.4	1	1353.10	1350.48	1	2.61
909653	38539	7/8/2010	600449.7	3468994.4	1	1352.86	1350.44	1	2.42
909653	38629	10/6/2010	600449.7	3468994.4	1	1352.73	1350.39	1	2.34
909653	38761	2/15/2011	600449.7	3468994.4	1	1310.67	1350.32	1	-39.65
909653	38848	5/13/2011	600449.7	3468994.4	1	1352.42	1350.26	1	2.16
909653	38910	7/14/2011	600449.7	3468994.4	1	1352.33	1350.21	1	2.12
909653	39057	12/8/2011	600449.7	3468994.4	1	1352.29	1350.10	1	2.20
909653	39115	2/4/2012	600449.7	3468994.4	1	1352.28	1350.05	1	2.24
909653	39190	4/19/2012	600449.7	3468994.4	1	1352.12	1349.98	1	2.13
909653	39273	7/11/2012	600449.7	3468994.4	1	1352.23	1349.91	1	2.32
909653	39371	10/17/2012	600449.7	3468994.4	1	1351.85	1349.83	1	2.01
909711	37929	11/5/2008	604167.9	3471127.9	3	1357.11	1354.17	1	2.94
909711	37964	12/10/2008	604167.9	3471127.9	3	1357.17	1354.14	1	3.03
909711	38036	2/20/2009	604167.9	3471127.9	3	1357.62	1354.09	1	3.53
909711	38111	5/6/2009	604167.9	3471127.9	3	1357.63	1354.04	1	3.59
909711	38208	8/11/2009	604167.9	3471127.9	3	1357.54	1353.98	1	3.57
909711	38295	11/6/2009	604167.9	3471127.9	3	1357.47	1353.91	1	3.55
909711	38413	3/4/2010	604167.9	3471127.9	3	1357.36	1353.84	1	3.52

Table G.5.1
Flow Model Calibration Statistics

ADWR Number	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (meters)	Computed (meters)	Weight	Residual
909711	38457	4/17/2010	604167.9	3471127.9	3	1357.28	1353.81	1	3.47
909711	38533	7/2/2010	604167.9	3471127.9	3	1357.20	1353.76	1	3.44
909711	38740	1/25/2011	604167.9	3471127.9	3	1356.97	1353.62	1	3.34
909711	38849	5/14/2011	604167.9	3471127.9	3	1356.80	1353.55	1	3.26
909711	38912	7/16/2011	604167.9	3471127.9	3	1356.81	1353.50	1	3.31
909711	39111	1/31/2012	604167.9	3471127.9	3	1356.62	1353.39	1	3.23
909711	39275	7/13/2012	604167.9	3471127.9	3	1356.36	1353.30	1	3.06
909760	37942	11/18/2008	601483.6	3470094.0	3	1353.66	1347.07	1	6.60
909760	37958	12/4/2008	601483.6	3470094.0	3	1353.66	1347.06	1	6.60
909760	38034	2/18/2009	601483.6	3470094.0	3	1352.83	1347.03	1	5.80
909760	38105	4/30/2009	601483.6	3470094.0	3	1352.89	1347.00	1	5.89
909760	38203	8/6/2009	601483.6	3470094.0	3	1352.79	1346.96	1	5.84
909760	38287	10/29/2009	601483.6	3470094.0	3	1352.78	1346.92	1	5.86
909760	38398	2/17/2010	601483.6	3470094.0	3	1352.70	1346.87	1	5.83
909760	38454	4/14/2010	601483.6	3470094.0	3	1352.69	1346.84	1	5.85
909760	38534	7/3/2010	601483.6	3470094.0	3	1352.66	1346.81	1	5.85
909760	38757	2/11/2011	601483.6	3470094.0	3	1352.33	1346.68	1	5.65
909760	38849	5/14/2011	601483.6	3470094.0	3	1352.29	1346.60	1	5.69
909760	38912	7/16/2011	601483.6	3470094.0	3	1352.24	1346.57	1	5.67
909760	39118	2/7/2012	601483.6	3470094.0	3	1352.17	1346.49	1	5.68
909760	39307	8/14/2012	601483.6	3470094.0	3	1352.01	1346.43	1	5.58
910096	37962	12/8/2008	601099.4	3468383.4	1	1353.97	1352.22	1	1.75
910096	37966	12/12/2008	601099.4	3468383.4	1	1354.04	1352.22	1	1.82
910096	38035	2/19/2009	601099.4	3468383.4	1	1354.10	1352.17	1	1.93
910096	38106	5/1/2009	601099.4	3468383.4	1	1353.90	1352.13	1	1.77
910096	38204	8/7/2009	601099.4	3468383.4	1	1353.68	1352.06	1	1.62
910096	38286	10/28/2009	601099.4	3468383.4	1	1353.66	1352.01	1	1.65
910096	38406	2/25/2010	601099.4	3468383.4	1	1353.72	1351.94	1	1.78
910096	38457	4/17/2010	601099.4	3468383.4	1	1353.47	1351.92	1	1.55
910096	38534	7/3/2010	601099.4	3468383.4	1	1353.30	1351.88	1	1.43
910096	38762	2/16/2011	601099.4	3468383.4	1	1207.97	1351.74	1	-143.76
910096	38919	7/23/2011	601099.4	3468383.4	1	1352.82	1351.61	1	1.20
910096	39135	2/24/2012	601099.4	3468383.4	1	1352.86	1351.44	1	1.42
910096	39342	9/18/2012	601099.4	3468383.4	1	1352.40	1351.26	1	1.14
910097	37943	11/19/2008	604171.4	3471141.7	1	1357.96	1355.02	1	2.94
910097	37960	12/6/2008	604171.4	3471141.7	1	1357.98	1355.01	1	2.97
910097	38036	2/20/2009	604171.4	3471141.7	1	1358.07	1354.93	1	3.14
910097	38111	5/6/2009	604171.4	3471141.7	1	1358.15	1354.86	1	3.29
910097	38208	8/11/2009	604171.4	3471141.7	1	1358.10	1354.77	1	3.33
910097	38299	11/10/2009	604171.4	3471141.7	1	1358.01	1354.69	1	3.31
910097	38413	3/4/2010	604171.4	3471141.7	1	1357.85	1354.59	1	3.25
910097	38457	4/17/2010	604171.4	3471141.7	1	1357.82	1354.56	1	3.26
910097	38533	7/2/2010	604171.4	3471141.7	1	1357.77	1354.49	1	3.27
910097	38758	2/12/2011	604171.4	3471141.7	1	1357.48	1354.31	1	3.17
910097	38849	5/14/2011	604171.4	3471141.7	1	1357.42	1354.24	1	3.18
910097	38912	7/16/2011	604171.4	3471141.7	1	1357.35	1354.19	1	3.16
910097	39111	1/31/2012	604171.4	3471141.7	1	1357.19	1354.04	1	3.15
910097	39275	7/13/2012	604171.4	3471141.7	1	1357.00	1353.92	1	3.08
913037	39114	2/3/2012	605366.9	3470677.4	2	1377.58	1376.63	1	0.95

Notes:
ADWR = Arizona Department of Water Resources
UTM = Universal Transverse Mercator Zone 12, North American Datum 1983 (NAD83)
mg/l = milligrams per liter

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
ANDERSON	37700	3/20/2008	601134.73	3468816.06	1	431.00	544.46	1	-113.46
ANDERSON	37746	5/5/2008	601134.73	3468816.06	1	452.00	545.66	1	-93.66
ANDERSON	37816	7/14/2008	601134.73	3468816.06	1	472.00	547.49	1	-75.49
ANDERSON	37909	10/15/2008	601134.73	3468816.06	1	475.00	549.92	1	-74.92
ANDERSON	38013	1/27/2009	601134.73	3468816.06	1	488.00	552.60	1	-64.60
ANDERSON	38090	4/14/2009	601134.73	3468816.06	1	534.00	554.56	1	-20.56
ANDERSON	38181	7/14/2009	601134.73	3468816.06	1	550.00	556.85	1	-6.85
ANDERSON	38271	10/12/2009	601134.73	3468816.06	1	510.00	559.09	1	-49.09
ANDERSON	38378	1/27/2010	601134.73	3468816.06	1	523.00	561.72	1	-38.72
ANDERSON	38462	4/21/2010	601134.73	3468816.06	1	627.00	563.75	1	63.25
ANDERSON	38551	7/19/2010	601134.73	3468816.06	1	648.00	565.84	1	82.16
ANDERSON	38643	10/19/2010	601134.73	3468816.06	1	416.00	567.98	1	-151.98
ANDERSON	38733	1/17/2011	601134.73	3468816.06	1	562.00	570.05	1	-8.05
ANDERSON	38817	4/11/2011	601134.73	3468816.06	1	609.00	572.00	1	37.00
ANDERSON	38911	7/14/2011	601134.73	3468816.06	1	678.00	574.22	1	103.79
ANDERSON	39000	10/11/2011	601134.73	3468816.06	1	543.00	576.32	1	-33.32
ANDERSON	39113	2/1/2012	601134.73	3468816.06	1	551.00	579.00	1	-28.00
ANDERSON	39197	4/25/2012	601134.73	3468816.06	1	657.00	581.02	1	75.98
ANDERSON	39275	7/12/2012	601134.73	3468816.06	1	667.00	582.90	1	84.10
ANDERSON	39365	10/10/2012	601134.73	3468816.06	1	574.00	585.12	1	-11.12
ANDERSON_458	39334	9/9/2012	601118.8	3468826.02	2	31.00	52.88	1	-21.88
ANDERSON_458	39365	10/10/2012	601118.8	3468826.02	2	30.30	52.99	1	-22.69
ASLD	29592	1/7/1986	601488.2	3469690	1	650.00	815.79	1	-165.79
AWC-01	18975	12/13/1956	598964.8	3468753.65	1	11.00	7.97	1	3.03
AWC-01	20432	12/9/1960	598964.8	3468753.65	1	8.00	7.97	1	0.03
AWC-01	21572	1/23/1964	598964.8	3468753.65	1	6.00	7.98	1	-1.98
AWC-02	18183	10/13/1954	598907.12	3468549.43	1	50.00	7.95	1	42.05
AWC-02	18975	12/13/1956	598907.12	3468549.43	1	7.00	7.94	1	-0.94
AWC-02	32958	3/27/1995	598907.12	3468549.43	1	15.10	9.37	1	5.73
AWC-02	33456	8/6/1996	598907.12	3468549.43	1	19.40	9.55	1	9.85
AWC-02	34788	3/30/2000	598907.12	3468549.43	1	-5.00	9.84	1	-14.84
AWC-02	34802	4/13/2000	598907.12	3468549.43	1	6.60	9.85	1	-3.25
AWC-02	34816	4/27/2000	598907.12	3468549.43	1	7.10	9.86	1	-2.76
AWC-02	34823	5/4/2000	598907.12	3468549.43	1	6.00	9.86	1	-3.86
AWC-02	34830	5/11/2000	598907.12	3468549.43	1	6.00	9.87	1	-3.87
AWC-02	34885	7/5/2000	598907.12	3468549.43	1	7.20	9.91	1	-2.71
AWC-02	35128	3/5/2001	598907.12	3468549.43	1	7.00	10.03	1	-3.03
AWC-02	35282	8/6/2001	598907.12	3468549.43	1	-5.00	10.07	1	-15.07
AWC-02	35317	9/10/2001	598907.12	3468549.43	1	7.30	10.07	1	-2.77
AWC-02	35401	12/3/2001	598907.12	3468549.43	1	6.80	10.10	1	-3.30
AWC-02	35473	2/13/2002	598907.12	3468549.43	1	7.20	10.10	1	-2.90
AWC-02	35520	4/1/2002	598907.12	3468549.43	1	5.70	10.10	1	-4.40
AWC-02	35647	8/6/2002	598907.12	3468549.43	1	7.30	10.10	1	-2.80
AWC-02	35709	10/7/2002	598907.12	3468549.43	1	6.80	10.10	1	-3.30
AWC-02	35775	12/12/2002	598907.12	3468549.43	1	7.40	10.09	1	-2.69
AWC-02	35828	2/3/2003	598907.12	3468549.43	1	7.00	10.10	1	-3.10
AWC-02	35891	4/7/2003	598907.12	3468549.43	1	6.70	10.10	1	-3.40
AWC-02	35982	7/7/2003	598907.12	3468549.43	1	7.60	10.10	1	-2.50
AWC-02	36045	9/8/2003	598907.12	3468549.43	1	7.20	10.11	1	-2.91
AWC-02	36101	11/3/2003	598907.12	3468549.43	1	7.50	10.11	1	-2.61
AWC-02	36129	12/1/2003	598907.12	3468549.43	1	8.00	10.11	1	-2.11
AWC-02	36318	6/7/2004	598907.12	3468549.43	1	7.30	10.14	1	-2.84
AWC-02	36353	7/12/2004	598907.12	3468549.43	1	7.70	10.14	1	-2.44
AWC-02	36424	9/21/2004	598907.12	3468549.43	1	7.80	10.15	1	-2.35
AWC-02	36465	11/1/2004	598907.12	3468549.43	1	9.10	10.16	1	-1.06
AWC-02	36591	3/7/2005	598907.12	3468549.43	1	15.60	10.15	1	5.45
AWC-02	36647	5/2/2005	598907.12	3468549.43	1	9.30	10.14	1	-0.84
AWC-02	36717	7/11/2005	598907.12	3468549.43	1	12.00	10.13	1	1.87
AWC-02	36780	9/12/2005	598907.12	3468549.43	1	12.60	10.13	1	2.47
AWC-02	36794	9/26/2005	598907.12	3468549.43	1	12.50	10.13	1	2.37
AWC-02	36837	11/8/2005	598907.12	3468549.43	1	14.00	10.13	1	3.87
AWC-02	36899	1/9/2006	598907.12	3468549.43	1	14.00	10.15	1	3.85
AWC-02	37012	5/2/2006	598907.12	3468549.43	1	13.00	10.25	1	2.75
AWC-02	37082	7/11/2006	598907.12	3468549.43	1	11.40	10.31	1	1.09
AWC-02	37144	9/11/2006	598907.12	3468549.43	1	12.40	10.36	1	2.04
AWC-02	37200	11/6/2006	598907.12	3468549.43	1	12.80	10.40	1	2.40
AWC-02	37279	1/24/2007	598907.12	3468549.43	1	13.10	10.51	1	2.59
AWC-02	37319	3/5/2007	598907.12	3468549.43	1	13.50	10.61	1	2.89
AWC-02	37382	5/7/2007	598907.12	3468549.43	1	7.80	10.76	1	-2.96
AWC-02	37445	7/9/2007	598907.12	3468549.43	1	7.30	10.90	1	-3.60
AWC-02	37508	9/10/2007	598907.12	3468549.43	1	10.00	11.03	1	-1.03
AWC-02	37515	9/17/2007	598907.12	3468549.43	1	10.00	11.04	1	-1.04
AWC-02	37564	11/5/2007	598907.12	3468549.43	1	11.00	11.14	1	-0.14
AWC-02	37627	1/7/2008	598907.12	3468549.43	1	14.00	11.25	1	2.75
AWC-02	37683	3/3/2008	598907.12	3468549.43	1	16.00	11.35	1	4.65
AWC-02	37746	5/5/2008	598907.12	3468549.43	1	13.30	11.45	1	1.85
AWC-02	37845	8/12/2008	598907.12	3468549.43	1	14.30	11.59	1	2.71
AWC-02	37917	10/23/2008	598907.12	3468549.43	1	15.90	11.68	1	4.22
AWC-02	38056	3/11/2009	598907.12	3468549.43	1	15.50	11.86	1	3.64
AWC-02	38098	4/22/2009	598907.12	3468549.43	1	14.70	11.92	1	2.78
AWC-02	38189	7/22/2009	598907.12	3468549.43	1	14.20	12.03	1	2.17
AWC-02	38280	10/21/2009	598907.12	3468549.43	1	16.80	12.14	1	4.66
AWC-02	38385	2/3/2010	598907.12	3468549.43	1	18.60	12.25	1	6.35
AWC-02	38464	4/23/2010	598907.12	3468549.43	1	18.30	12.34	1	5.96

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
AWC-02	38552	7/20/2010	598907.12	3468549.43	1	18.20	12.44	1	5.76
AWC-02	38659	11/4/2010	598907.12	3468549.43	1	18.80	12.55	1	6.25
AWC-02	38735	1/19/2011	598907.12	3468549.43	1	18.40	12.61	1	5.79
AWC-02	38813	4/7/2011	598907.12	3468549.43	1	17.30	12.65	1	4.65
AWC-02	38910	7/13/2011	598907.12	3468549.43	1	12.90	12.69	1	0.21
AWC-02	39002	10/13/2011	598907.12	3468549.43	1	17.40	12.74	1	4.66
AWC-02	39114	2/2/2012	598907.12	3468549.43	1	19.40	12.79	1	6.61
AWC-02	39196	4/24/2012	598907.12	3468549.43	1	15.50	12.84	1	2.66
AWC-02	39268	7/5/2012	598907.12	3468549.43	1	10.10	12.88	1	-2.78
AWC-02	39373	10/18/2012	598907.12	3468549.43	1	13.00	12.93	1	0.07
AWC-03	18840	7/31/1956	599091.12	3468680.18	1	10.00	7.96	1	2.04
AWC-03	20432	12/9/1960	599091.12	3468680.18	1	7.00	7.96	1	-0.96
AWC-03	22570	10/17/1966	599091.12	3468680.18	1	8.00	8.05	1	-0.05
AWC-03	29326	4/16/1985	599091.12	3468680.18	1	13.00	11.13	1	1.87
AWC-03	29565	12/11/1985	599091.12	3468680.18	1	11.00	11.39	1	-0.39
AWC-03	32513	1/6/1994	599091.12	3468680.18	1	22.50	15.49	1	7.01
AWC-03	33456	8/6/1996	599091.12	3468680.18	1	-10.00	17.15	1	-27.15
AWC-03	34722	1/24/2000	599091.12	3468680.18	1	22.60	19.79	1	2.81
AWC-03	34746	2/17/2000	599091.12	3468680.18	1	29.00	19.83	1	9.17
AWC-03	34753	2/24/2000	599091.12	3468680.18	1	26.00	19.85	1	6.15
AWC-03	34767	3/9/2000	599091.12	3468680.18	1	24.00	19.87	1	4.13
AWC-03	34781	3/23/2000	599091.12	3468680.18	1	26.10	19.90	1	6.20
AWC-03	34788	3/30/2000	599091.12	3468680.18	1	-5.00	19.91	1	-24.91
AWC-03	34802	4/13/2000	599091.12	3468680.18	1	21.60	19.94	1	1.66
AWC-03	34816	4/27/2000	599091.12	3468680.18	1	23.10	19.97	1	3.13
AWC-03	34823	5/4/2000	599091.12	3468680.18	1	21.70	19.98	1	1.72
AWC-03	34830	5/11/2000	599091.12	3468680.18	1	26.80	19.99	1	6.81
AWC-03	34885	7/5/2000	599091.12	3468680.18	1	27.30	20.09	1	7.21
AWC-03	35045	12/12/2000	599091.12	3468680.18	1	17.40	20.40	1	-3.00
AWC-03	35100	2/5/2001	599091.12	3468680.18	1	13.50	20.51	1	-7.01
AWC-03	35185	5/1/2001	599091.12	3468680.18	1	25.00	20.67	1	4.33
AWC-03	35219	6/4/2001	599091.12	3468680.18	1	21.10	20.74	1	0.36
AWC-03	35282	8/6/2001	599091.12	3468680.18	1	20.80	20.87	1	-0.07
AWC-03	35373	11/5/2001	599091.12	3468680.18	1	21.60	21.05	1	0.55
AWC-03	35436	1/7/2002	599091.12	3468680.18	1	23.20	21.18	1	2.02
AWC-03	35506	3/18/2002	599091.12	3468680.18	1	22.90	21.35	1	1.55
AWC-03	35555	5/6/2002	599091.12	3468680.18	1	24.30	21.48	1	2.82
AWC-03	35646	8/5/2002	599091.12	3468680.18	1	23.50	21.71	1	1.79
AWC-03	35681	9/9/2002	599091.12	3468680.18	1	23.80	21.79	1	2.01
AWC-03	35737	11/4/2002	599091.12	3468680.18	1	23.30	21.92	1	1.38
AWC-03	35800	1/6/2003	599091.12	3468680.18	1	23.90	22.07	1	1.83
AWC-03	35856	3/3/2003	599091.12	3468680.18	1	34.40	22.21	1	12.19
AWC-03	35919	5/5/2003	599091.12	3468680.18	1	24.90	22.35	1	2.55
AWC-03	36010	8/4/2003	599091.12	3468680.18	1	28.20	22.56	1	5.64
AWC-03	36073	10/6/2003	599091.12	3468680.18	1	26.30	22.71	1	3.59
AWC-03	36164	1/5/2004	599091.12	3468680.18	1	26.90	22.89	1	4.01
AWC-03	36192	2/2/2004	599091.12	3468680.18	1	34.30	22.93	1	11.37
AWC-03	36220	3/1/2004	599091.12	3468680.18	1	29.40	22.96	1	6.44
AWC-03	36255	4/5/2004	599091.12	3468680.18	1	29.10	23.00	1	6.10
AWC-03	36283	5/3/2004	599091.12	3468680.18	1	28.80	23.04	1	5.76
AWC-03	36318	6/7/2004	599091.12	3468680.18	1	30.60	23.08	1	7.52
AWC-03	36388	8/16/2004	599091.12	3468680.18	1	30.40	23.17	1	7.23
AWC-03	36437	10/4/2004	599091.12	3468680.18	1	30.60	23.24	1	7.36
AWC-03	36500	12/6/2004	599091.12	3468680.18	1	32.20	23.33	1	8.87
AWC-03	36591	3/7/2005	599091.12	3468680.18	1	28.30	23.50	1	4.80
AWC-03	36647	5/2/2005	599091.12	3468680.18	1	28.80	23.61	1	5.19
AWC-03	36717	7/11/2005	599091.12	3468680.18	1	35.40	23.75	1	11.65
AWC-03	36780	9/12/2005	599091.12	3468680.18	1	35.80	23.88	1	11.92
AWC-03	36794	9/26/2005	599091.12	3468680.18	1	36.50	23.91	1	12.59
AWC-03	36837	11/8/2005	599091.12	3468680.18	1	38.40	23.99	1	14.41
AWC-03	36899	1/9/2006	599091.12	3468680.18	1	36.00	24.12	1	11.88
AWC-03	37012	5/2/2006	599091.12	3468680.18	1	36.00	24.44	1	11.56
AWC-03	37082	7/11/2006	599091.12	3468680.18	1	36.70	24.61	1	12.09
AWC-03	37144	9/11/2006	599091.12	3468680.18	1	36.70	24.78	1	11.92
AWC-03	37200	11/6/2006	599091.12	3468680.18	1	37.20	24.92	1	12.28
AWC-03	37279	1/24/2007	599091.12	3468680.18	1	38.30	25.13	1	13.17
AWC-03	37319	3/5/2007	599091.12	3468680.18	1	50.60	25.26	1	25.34
AWC-03	37347	4/2/2007	599091.12	3468680.18	1	55.90	25.34	1	30.56
AWC-03	37382	5/7/2007	599091.12	3468680.18	1	36.90	25.44	1	11.46
AWC-03	37445	7/9/2007	599091.12	3468680.18	1	36.00	25.62	1	10.38
AWC-03	37508	9/10/2007	599091.12	3468680.18	1	35.00	25.79	1	9.21
AWC-03	37515	9/17/2007	599091.12	3468680.18	1	38.00	25.81	1	12.19
AWC-03	37564	11/5/2007	599091.12	3468680.18	1	34.00	25.94	1	8.06
AWC-03	37627	1/7/2008	599091.12	3468680.18	1	41.00	26.11	1	14.89
AWC-03	37683	3/3/2008	599091.12	3468680.18	1	38.00	26.26	1	11.74
AWC-03	37746	5/5/2008	599091.12	3468680.18	1	37.30	26.42	1	10.88
AWC-03	37845	8/12/2008	599091.12	3468680.18	1	38.80	26.67	1	12.13
AWC-03	37917	10/23/2008	599091.12	3468680.18	1	41.80	26.85	1	14.95
AWC-03	38056	3/11/2009	599091.12	3468680.18	1	64.20	27.20	1	37.00
AWC-03	38098	4/22/2009	599091.12	3468680.18	1	42.40	27.30	1	15.10
AWC-03	38189	7/22/2009	599091.12	3468680.18	1	41.80	27.51	1	14.29
AWC-03	38280	10/21/2009	599091.12	3468680.18	1	50.50	27.73	1	22.77
AWC-03	38385	2/3/2010	599091.12	3468680.18	1	42.00	27.98	1	14.02
AWC-03	38464	4/23/2010	599091.12	3468680.18	1	44.40	28.17	1	16.23

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
AWC-03	38552	7/20/2010	599091.12	3468680.18	1	46.70	28.38	1	18.32
AWC-03	38659	11/4/2010	599091.12	3468680.18	1	46.30	28.63	1	17.67
AWC-03	38735	1/19/2011	599091.12	3468680.18	1	49.00	28.80	1	20.20
AWC-03	38813	4/7/2011	599091.12	3468680.18	1	46.80	28.94	1	17.86
AWC-03	38910	7/13/2011	599091.12	3468680.18	1	47.60	29.12	1	18.48
AWC-03	39002	10/13/2011	599091.12	3468680.18	1	48.80	29.30	1	19.50
AWC-03	39114	2/2/2012	599091.12	3468680.18	1	47.70	29.50	1	18.20
AWC-03	39196	4/24/2012	599091.12	3468680.18	1	51.80	29.61	1	22.19
AWC-03	39268	7/5/2012	599091.12	3468680.18	1	50.70	29.71	1	20.99
AWC-03	39373	10/18/2012	599091.12	3468680.18	1	51.30	29.86	1	21.44
AWC-04	21572	1/23/1964	598949.67	3468717.54	1	8.00	7.96	1	0.04
AWC-04	29321	4/11/1985	598949.67	3468717.54	1	7.00	9.41	1	-2.41
AWC-04	31563	6/1/1991	598949.67	3468717.54	1	20.00	10.71	1	9.29
AWC-04	34344	1/11/1999	598949.67	3468717.54	1	18.00	12.24	1	5.76
AWC-04	34443	4/20/1999	598949.67	3468717.54	1	20.00	12.19	1	7.81
AWC-04	34715	1/17/2000	598949.67	3468717.54	1	19.00	12.27	1	6.73
AWC-04	34723	1/25/2000	598949.67	3468717.54	1	17.80	12.33	1	5.47
AWC-04	34746	2/17/2000	598949.67	3468717.54	1	19.00	12.48	1	6.52
AWC-04	34753	2/24/2000	598949.67	3468717.54	1	21.00	12.52	1	8.48
AWC-04	34767	3/9/2000	598949.67	3468717.54	1	20.00	12.59	1	7.41
AWC-04	34781	3/23/2000	598949.67	3468717.54	1	20.80	12.66	1	8.14
AWC-04	34788	3/30/2000	598949.67	3468717.54	1	-5.00	12.69	1	-17.69
AWC-04	34802	4/13/2000	598949.67	3468717.54	1	18.70	12.76	1	5.94
AWC-04	34816	4/27/2000	598949.67	3468717.54	1	20.40	12.81	1	7.59
AWC-04	34823	5/4/2000	598949.67	3468717.54	1	18.10	12.84	1	5.26
AWC-04	34830	5/11/2000	598949.67	3468717.54	1	19.30	12.86	1	6.44
AWC-04	34885	7/5/2000	598949.67	3468717.54	1	23.10	13.03	1	10.07
AWC-04	34919	8/8/2000	598949.67	3468717.54	1	30.30	13.11	1	17.19
AWC-04	34932	8/21/2000	598949.67	3468717.54	1	23.80	13.14	1	10.66
AWC-04	34939	8/28/2000	598949.67	3468717.54	1	26.50	13.15	1	13.35
AWC-04	34947	9/5/2000	598949.67	3468717.54	1	27.70	13.17	1	14.53
AWC-04	35009	11/6/2000	598949.67	3468717.54	1	23.80	13.28	1	10.52
AWC-04	35037	12/4/2000	598949.67	3468717.54	1	24.60	13.32	1	11.28
AWC-04	35100	2/5/2001	598949.67	3468717.54	1	24.00	13.39	1	10.61
AWC-04	35128	3/5/2001	598949.67	3468717.54	1	24.00	13.41	1	10.59
AWC-04	35156	4/2/2001	598949.67	3468717.54	1	24.80	13.43	1	11.37
AWC-04	35185	5/1/2001	598949.67	3468717.54	1	17.80	13.46	1	4.34
AWC-04	35219	6/4/2001	598949.67	3468717.54	1	26.70	13.49	1	13.21
AWC-04	35317	9/10/2001	598949.67	3468717.54	1	23.90	13.58	1	10.32
AWC-04	35373	11/5/2001	598949.67	3468717.54	1	22.50	13.63	1	8.87
AWC-04	35401	12/3/2001	598949.67	3468717.54	1	22.70	13.66	1	9.04
AWC-04	35402	12/4/2001	598949.67	3468717.54	1	16.00	13.66	1	2.34
AWC-04	35436	1/7/2002	598949.67	3468717.54	1	24.10	13.67	1	10.43
AWC-04	35473	2/13/2002	598949.67	3468717.54	1	22.70	13.62	1	9.08
AWC-04	35506	3/18/2002	598949.67	3468717.54	1	20.50	13.59	1	6.91
AWC-04	35520	4/1/2002	598949.67	3468717.54	1	19.30	13.57	1	5.73
AWC-04	35555	5/6/2002	598949.67	3468717.54	1	23.40	13.53	1	9.87
AWC-04	35646	8/5/2002	598949.67	3468717.54	1	26.60	13.46	1	13.14
AWC-04	35681	9/9/2002	598949.67	3468717.54	1	29.00	13.45	1	15.55
AWC-04	35709	10/7/2002	598949.67	3468717.54	1	33.60	13.44	1	20.16
AWC-04	35737	11/4/2002	598949.67	3468717.54	1	26.10	13.43	1	12.67
AWC-04	35775	12/12/2002	598949.67	3468717.54	1	30.90	13.42	1	17.48
AWC-04	37655	2/4/2008	598949.67	3468717.54	1	18.00	16.13	1	1.87
AWC-04	37718	4/7/2008	598949.67	3468717.54	1	18.00	16.36	1	1.64
AWC-04	37774	6/2/2008	598949.67	3468717.54	1	14.30	16.56	1	-2.26
AWC-04	37845	8/12/2008	598949.67	3468717.54	1	21.60	16.80	1	4.80
AWC-04	37917	10/23/2008	598949.67	3468717.54	1	24.00	17.03	1	6.97
AWC-04	37959	12/4/2008	598949.67	3468717.54	1	16.00	17.16	1	-1.16
AWC-04	38056	3/11/2009	598949.67	3468717.54	1	27.20	17.45	1	9.75
AWC-04	38098	4/22/2009	598949.67	3468717.54	1	26.10	17.57	1	8.53
AWC-04	38189	7/22/2009	598949.67	3468717.54	1	26.20	17.83	1	8.37
AWC-04	38280	10/21/2009	598949.67	3468717.54	1	25.70	18.07	1	7.63
AWC-04	38385	2/3/2010	598949.67	3468717.54	1	26.50	18.34	1	8.16
AWC-04	38464	4/23/2010	598949.67	3468717.54	1	27.40	18.54	1	8.86
AWC-04	38552	7/20/2010	598949.67	3468717.54	1	26.60	18.76	1	7.84
AWC-04	38659	11/4/2010	598949.67	3468717.54	1	24.00	19.01	1	4.99
AWC-04	38735	1/19/2011	598949.67	3468717.54	1	26.20	19.17	1	7.03
AWC-04	38813	4/7/2011	598949.67	3468717.54	1	25.80	19.27	1	6.53
AWC-04	38910	7/13/2011	598949.67	3468717.54	1	25.70	19.39	1	6.31
AWC-04	39002	10/13/2011	598949.67	3468717.54	1	27.60	19.51	1	8.09
AWC-04	39114	2/2/2012	598949.67	3468717.54	1	27.20	19.62	1	7.58
AWC-04	39196	4/24/2012	598949.67	3468717.54	1	25.20	19.68	1	5.52
AWC-04	39268	7/5/2012	598949.67	3468717.54	1	28.20	19.71	1	8.49
AWC-04	39373	10/18/2012	598949.67	3468717.54	1	26.60	19.78	1	6.82
AWC-05	35646	8/5/2002	599269.32	3468541.62	1	9.60	24.69	1	-15.09
AWC-05	36465	11/1/2004	599269.32	3468541.62	1	10.40	26.85	1	-16.45
AWC-05	36563	2/7/2005	599269.32	3468541.62	1	19.50	27.10	1	-7.60
AWC-05	36619	4/4/2005	599269.32	3468541.62	1	12.20	27.24	1	-15.04
AWC-05	36682	6/6/2005	599269.32	3468541.62	1	10.10	27.39	1	-17.29
AWC-05	36738	8/1/2005	599269.32	3468541.62	1	9.80	27.53	1	-17.73
AWC-05	36801	10/3/2005	599269.32	3468541.62	1	11.70	27.69	1	-15.99
AWC-05	36864	12/5/2005	599269.32	3468541.62	1	36.00	27.84	1	8.16
AWC-05	36927	2/6/2006	599269.32	3468541.62	1	11.00	28.00	1	-17.00
AWC-05	36983	4/3/2006	599269.32	3468541.62	1	12.00	28.14	1	-16.14

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
AWC-05	37046	6/5/2006	599269.32	3468541.62	1	12.50	28.29	1	-15.79
AWC-05	37109	8/7/2006	599269.32	3468541.62	1	10.40	28.45	1	-18.05
AWC-05	37165	10/2/2006	599269.32	3468541.62	1	11.60	28.59	1	-16.99
AWC-05	37228	12/4/2006	599269.32	3468541.62	1	9.00	28.75	1	-19.75
AWC-05	37291	2/5/2007	599269.32	3468541.62	1	11.60	28.92	1	-17.32
AWC-05	37347	4/2/2007	599269.32	3468541.62	1	10.50	29.08	1	-18.58
AWC-05	37410	6/4/2007	599269.32	3468541.62	1	29.10	29.26	1	-0.16
AWC-05	37473	8/6/2007	599269.32	3468541.62	1	14.00	29.44	1	-15.44
AWC-05	37593	12/4/2007	599269.32	3468541.62	1	12.00	29.79	1	-17.79
AWC-05	37655	2/4/2008	599269.32	3468541.62	1	13.00	29.98	1	-16.98
AWC-05	37718	4/7/2008	599269.32	3468541.62	1	14.00	30.16	1	-16.16
AWC-05	37774	6/2/2008	599269.32	3468541.62	1	14.30	30.33	1	-16.03
AWC-05	37845	8/12/2008	599269.32	3468541.62	1	14.90	30.55	1	-15.65
AWC-05	37917	10/23/2008	599269.32	3468541.62	1	15.40	30.76	1	-15.36
AWC-05	38056	3/11/2009	599269.32	3468541.62	1	16.50	31.17	1	-14.67
AWC-05	38140	6/3/2009	599269.32	3468541.62	1	12.10	31.41	1	-19.31
AWC-05	38189	7/22/2009	599269.32	3468541.62	1	14.10	31.55	1	-17.45
AWC-05	38280	10/21/2009	599269.32	3468541.62	1	16.50	31.81	1	-15.31
AWC-05	38385	2/3/2010	599269.32	3468541.62	1	16.30	32.11	1	-15.81
AWC-05	38464	4/23/2010	599269.32	3468541.62	1	17.60	32.33	1	-14.73
AWC-05	38552	7/20/2010	599269.32	3468541.62	1	19.10	32.58	1	-13.48
AWC-05	38659	11/4/2010	599269.32	3468541.62	1	18.40	32.88	1	-14.48
AWC-05	38735	1/19/2011	599269.32	3468541.62	1	17.00	33.10	1	-16.10
AWC-05	38813	4/7/2011	599269.32	3468541.62	1	17.60	33.31	1	-15.71
AWC-05	38910	7/13/2011	599269.32	3468541.62	1	17.90	33.58	1	-15.68
AWC-05	39002	10/13/2011	599269.32	3468541.62	1	19.00	33.83	1	-14.83
AWC-05	39114	2/2/2012	599269.32	3468541.62	1	19.50	34.12	1	-14.62
AWC-05	39196	4/24/2012	599269.32	3468541.62	1	15.40	34.31	1	-18.91
AWC-05	39268	7/5/2012	599269.32	3468541.62	1	19.10	34.47	1	-15.37
AWC-05	39373	10/18/2012	599269.32	3468541.62	1	20.10	34.70	1	-14.60
BF-01	32421	10/6/1993	604169.08	3472151.59	1	1400.00	2405.45	1	-1005.45
BF-01	32470	11/24/1993	604169.08	3472151.59	1	1500.00	2402.58	1	-902.58
BF-01	33414	6/25/1996	604169.08	3472151.59	1	1400.00	2392.66	1	-992.66
BF-01	37684	3/4/2008	604169.08	3472151.59	1	1320.00	-1.00	1	1321.00
BF-01	37764	5/23/2008	604169.08	3472151.59	1	1450.00	-1.00	1	1451.00
BF-01	37838	8/5/2008	604169.08	3472151.59	1	1330.00	-1.00	1	1331.00
BF-01	37930	11/5/2008	604169.08	3472151.59	1	1490.00	-1.00	1	1491.00
BF-01	38037	2/20/2009	604169.08	3472151.59	1	1330.00	-1.00	1	1331.00
BF-01	38112	5/6/2009	604169.08	3472151.59	1	1280.00	-1.00	1	1281.00
BF-01	38215	8/17/2009	604169.08	3472151.59	1	1250.00	-1.00	1	1251.00
BF-01	38294	11/4/2009	604169.08	3472151.59	1	1280.00	-1.00	1	1281.00
BF-01	38411	3/1/2010	604169.08	3472151.59	1	1260.00	-1.00	1	1261.00
BF-01	38448	4/7/2010	604169.08	3472151.59	1	1450.00	-1.00	1	1451.00
BF-01	38538	7/6/2010	604169.08	3472151.59	1	1310.00	-1.00	1	1311.00
BF-01	38910	7/13/2011	604169.08	3472151.59	1	1350.00	-1.00	1	1351.00
BF-01	39113	2/1/2012	604169.08	3472151.59	1	1480.00	-1.00	1	1481.00
BF-01	39308	8/14/2012	604169.08	3472151.59	1	1500.00	-1.00	1	1501.00
BF-02	32421	10/6/1993	603479.9	3471513	1	1900.00	2435.71	1	-535.71
BF-02	32469	11/23/1993	603479.9	3471513	1	1900.00	2435.05	1	-535.05
BF-02	33414	6/25/1996	603479.9	3471513	1	2000.00	2425.43	1	-425.43
BF-02	33456	8/6/1996	603479.9	3471513	1	1280.00	2425.00	1	-1145.00
BIMA	37657	2/6/2008	606001.24	3471852.8	4	210.00	23.67	1	186.33
BIMA	37736	4/25/2008	606001.24	3471852.8	4	190.00	23.51	1	166.49
BIMA	37754	5/13/2008	606001.24	3471852.8	4	195.00	23.47	1	171.53
BIMA	37795	6/23/2008	606001.24	3471852.8	4	225.00	23.39	1	201.61
BIMA	37831	7/29/2008	606001.24	3471852.8	4	204.00	23.31	1	180.69
BIMA	37861	8/28/2008	606001.24	3471852.8	4	256.00	23.25	1	232.75
BIMA	37887	9/23/2008	606001.24	3471852.8	4	296.00	23.20	1	272.80
BIMA	37916	10/22/2008	606001.24	3471852.8	4	285.00	23.14	1	261.86
BIMA	38006	1/20/2009	606001.24	3471852.8	4	190.00	22.95	1	167.05
BIMA	38083	4/7/2009	606001.24	3471852.8	4	212.00	22.80	1	189.20
BIMA	38175	7/8/2009	606001.24	3471852.8	4	189.00	22.61	1	166.39
BIMA	38264	10/5/2009	606001.24	3471852.8	4	233.00	22.44	1	210.56
BIMA	38371	1/20/2010	606001.24	3471852.8	4	222.00	22.23	1	199.77
BIMA	38460	4/19/2010	606001.24	3471852.8	4	256.00	22.06	1	233.94
BIMA	38460	4/19/2010	606001.24	3471852.8	4	256.00	22.06	1	233.94
BIMA	38544	7/12/2010	606001.24	3471852.8	4	273.00	21.90	1	251.10
BIMA	38642	10/18/2010	606001.24	3471852.8	4	296.00	21.72	1	274.28
BIMA	38735	1/19/2011	606001.24	3471852.8	4	283.00	21.55	1	261.45
BIMA	38810	4/4/2011	606001.24	3471852.8	4	282.00	21.42	1	260.58
BIMA	38953	8/25/2011	606001.24	3471852.8	4	300.00	21.17	1	278.83
BIMA	38999	10/10/2011	606001.24	3471852.8	4	322.00	21.09	1	300.91
BIMA	39115	2/3/2012	606001.24	3471852.8	4	312.00	20.89	1	291.11
BIMA	39195	4/23/2012	606001.24	3471852.8	4	303.00	20.75	1	282.25
BIMA	39273	7/10/2012	606001.24	3471852.8	4	301.00	20.62	1	280.38
BINYON	37851	8/18/2008	608544.7	3468542	4	13.00	8.00	1	5.00
BLOMMER	33455	8/5/1996	602725.88	3471529.09	1	308.00	34.51	1	273.49
BLOMMER	33456	8/6/1996	602725.88	3471529.09	1	276.00	34.51	1	241.49
BLOMMER	37916	10/22/2008	602725.88	3471529.09	1	200.00	24.67	1	175.33
BLOMMER	37656	2/5/2008	602039.81	3471485.92	2	206.00	8.10	1	197.90
BLOMMER	37732	4/21/2008	602039.81	3471485.92	2	201.00	8.10	1	192.90
BLOMMER	37754	5/13/2008	602039.81	3471485.92	2	211.00	8.10	1	202.90
BLOMMER	37756	5/15/2008	602039.81	3471485.92	2	211.00	8.10	1	202.90
BLOMMER	37795	6/23/2008	602039.81	3471485.92	2	193.00	8.10	1	184.90

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
BLOMMER	37831	7/29/2008	602039.81	3471485.92	2	203.00	8.10	1	194.90
BLOMMER	37860	8/27/2008	602039.81	3471485.92	2	189.00	8.10	1	180.90
BLOMMER	37887	9/23/2008	602039.81	3471485.92	2	193.00	8.10	1	184.90
BLOMMER	37916	10/22/2008	602039.81	3471485.92	2	200.00	8.10	1	191.90
BMO-2008-10GL	37853	8/20/2008	605264.07	3471702.04	4	1320.00	1294.92	1	25.08
BMO-2008-10GL	37930	11/5/2008	605264.07	3471702.04	4	1290.00	1295.27	1	-5.27
BMO-2008-10GL	38042	2/25/2009	605264.07	3471702.04	4	1180.00	1295.77	1	-115.77
BMO-2008-10GL	38118	5/12/2009	605264.07	3471702.04	4	1120.00	1296.11	1	-176.11
BMO-2008-10GL	38209	8/11/2009	605264.07	3471702.04	4	1030.00	1296.51	1	-266.51
BMO-2008-10GL	38292	11/2/2009	605264.07	3471702.04	4	1100.00	1296.87	1	-196.87
BMO-2008-10GL	38414	3/4/2010	605264.07	3471702.04	4	1080.00	1297.39	1	-217.39
BMO-2008-10GL	38449	4/8/2010	605264.07	3471702.04	4	1260.00	1297.54	1	-37.54
BMO-2008-10GL	38534	7/2/2010	605264.07	3471702.04	4	1020.00	1297.90	1	-277.90
BMO-2008-10GL	38910	7/13/2011	605264.07	3471702.04	4	644.00	1299.44	1	-655.44
BMO-2008-10GL	39114	2/2/2012	605264.07	3471702.04	4	624.00	1300.24	1	-676.24
BMO-2008-10GL	39276	7/13/2012	605264.07	3471702.04	4	545.00	1300.85	1	-755.85
BMO-2008-10GU	37837	8/4/2008	605267.55	3471731.87	4	2210.00	1303.76	1	906.24
BMO-2008-10GU	37930	11/5/2008	605267.55	3471731.87	4	1890.00	1304.19	1	585.81
BMO-2008-10GU	38042	2/25/2009	605267.55	3471731.87	4	1740.00	1304.70	1	435.30
BMO-2008-10GU	38112	5/6/2009	605267.55	3471731.87	4	1710.00	1305.01	1	404.99
BMO-2008-10GU	38209	8/11/2009	605267.55	3471731.87	4	1690.00	1305.45	1	384.55
BMO-2008-10GU	38292	11/2/2009	605267.55	3471731.87	4	1730.00	1305.81	1	424.19
BMO-2008-10GU	38420	3/10/2010	605267.55	3471731.87	4	1700.00	1306.36	1	393.64
BMO-2008-10GU	38448	4/7/2010	605267.55	3471731.87	4	1510.00	1306.48	1	203.52
BMO-2008-10GU	38538	7/6/2010	605267.55	3471731.87	4	1670.00	1306.87	1	363.14
BMO-2008-10GU	38910	7/13/2011	605267.55	3471731.87	4	1670.00	1308.39	1	361.61
BMO-2008-10GU	39113	2/1/2012	605267.55	3471731.87	4	1870.00	1309.17	1	560.83
BMO-2008-11G	37855	8/22/2008	603800.99	3472626.48	4	14.20	10.31	1	3.89
BMO-2008-11G	37937	11/12/2008	603800.99	3472626.48	4	13.90	10.33	1	3.57
BMO-2008-11G	38043	2/26/2009	603800.99	3472626.48	4	12.30	10.35	1	1.95
BMO-2008-11G	38104	4/28/2009	603800.99	3472626.48	4	11.80	10.36	1	1.44
BMO-2008-11G	38210	8/12/2009	603800.99	3472626.48	4	11.20	10.39	1	0.81
BMO-2008-11G	38299	11/9/2009	603800.99	3472626.48	4	13.90	10.40	1	3.50
BMO-2008-11G	38411	3/1/2010	603800.99	3472626.48	4	13.00	10.43	1	2.57
BMO-2008-11G	38450	4/9/2010	603800.99	3472626.48	4	13.00	10.44	1	2.56
BMO-2008-11G	38533	7/1/2010	603800.99	3472626.48	4	12.30	10.45	1	1.85
BMO-2008-11G	38757	2/10/2011	603800.99	3472626.48	4	11.70	10.50	1	1.20
BMO-2008-11G	38919	7/22/2011	603800.99	3472626.48	4	12.10	10.54	1	1.56
BMO-2008-11G	39112	1/31/2012	603800.99	3472626.48	4	11.90	10.58	1	1.32
BMO-2008-11G	39308	8/14/2012	603800.99	3472626.48	4	12.30	10.62	1	1.68
BMO-2008-13B	37897	10/3/2008	601580	3469829	1	980.00	1219.90	1	-239.89
BMO-2008-13B	38034	2/17/2009	601580	3469829	1	1000.00	1222.01	1	-222.01
BMO-2008-13B	38112	5/6/2009	601580	3469829	1	930.00	1223.21	1	-293.21
BMO-2008-13B	38203	8/5/2009	601580	3469829	1	950.00	1224.60	1	-274.60
BMO-2008-13B	38287	10/28/2009	601580	3469829	1	1010.00	1225.86	1	-215.86
BMO-2008-13B	38398	2/16/2010	601580	3469829	1	997.00	1227.50	1	-230.50
BMO-2008-13B	38455	4/14/2010	601580	3469829	1	974.00	1228.32	1	-254.32
BMO-2008-13B	38538	7/6/2010	601580	3469829	1	972.00	1229.51	1	-257.51
BMO-2008-13B	38912	7/15/2011	601580	3469829	1	1010.00	1234.67	1	-224.67
BMO-2008-13B	39121	2/9/2012	601580	3469829	1	1060.00	1237.52	1	-177.52
BMO-2008-13B	39274	7/11/2012	601580	3469829	1	1080.00	1239.55	1	-159.55
BMO-2008-13M	37958	12/3/2008	601483.6	3470094	3	494.00	8.02	1	485.98
BMO-2008-13M	38034	2/17/2009	601483.6	3470094	3	441.00	8.02	1	432.98
BMO-2008-13M	38105	4/29/2009	601483.6	3470094	3	217.00	8.02	1	208.98
BMO-2008-13M	38203	8/5/2009	601483.6	3470094	3	387.00	8.02	1	378.98
BMO-2008-13M	38287	10/28/2009	601483.6	3470094	3	403.00	8.02	1	394.98
BMO-2008-13M	38398	2/16/2010	601483.6	3470094	3	375.00	8.02	1	366.98
BMO-2008-13M	38454	4/13/2010	601483.6	3470094	3	398.00	8.02	1	389.98
BMO-2008-13M	38534	7/2/2010	601483.6	3470094	3	386.00	8.02	1	377.98
BMO-2008-13M	38912	7/15/2011	601483.6	3470094	3	388.00	8.02	1	379.98
BMO-2008-13M	39118	2/6/2012	601483.6	3470094	3	0.00	8.02	1	-8.02
BMO-2008-13M	39307	8/13/2012	601483.6	3470094	3	397.00	8.02	1	388.98
BMO-2008-1G	37860	8/27/2008	606467.68	3471723.64	4	107.00	8.01	1	98.99
BMO-2008-1G	37936	11/11/2008	606467.68	3471723.64	4	143.00	8.01	1	134.99
BMO-2008-1G	38042	2/25/2009	606467.68	3471723.64	4	109.00	8.01	1	100.99
BMO-2008-1G	38104	4/28/2009	606467.68	3471723.64	4	198.00	8.01	1	189.99
BMO-2008-1G	38202	8/4/2009	606467.68	3471723.64	4	104.00	8.01	1	95.99
BMO-2008-1G	38286	10/27/2009	606467.68	3471723.64	4	103.00	8.01	1	94.99
BMO-2008-1G	38399	2/17/2010	606467.68	3471723.64	4	98.40	8.01	1	90.39
BMO-2008-1G	38456	4/15/2010	606467.68	3471723.64	4	95.20	8.01	1	87.19
BMO-2008-1G	38539	7/7/2010	606467.68	3471723.64	4	87.10	8.01	1	79.09
BMO-2008-1G	38757	2/10/2011	606467.68	3471723.64	4	105.00	8.01	1	96.99
BMO-2008-1G	38909	7/12/2011	606467.68	3471723.64	4	121.00	8.01	1	112.99
BMO-2008-1G	39120	2/8/2012	606467.68	3471723.64	4	116.00	8.01	1	107.99
BMO-2008-1G	39308	8/14/2012	606467.68	3471723.64	4	120.00	8.01	1	111.99
BMO-2008-3B	37820	7/18/2008	602012.92	3467919.58	1	106.00	72.68	1	33.32
BMO-2008-3B	37929	11/4/2008	602012.92	3467919.58	1	179.00	71.96	1	107.04
BMO-2008-3B	38036	2/19/2009	602012.92	3467919.58	1	155.00	71.24	1	83.76
BMO-2008-3B	38117	5/11/2009	602012.92	3467919.58	1	149.00	70.69	1	78.31
BMO-2008-3B	38204	8/6/2009	602012.92	3467919.58	1	151.00	70.09	1	80.91
BMO-2008-3B	38285	10/26/2009	602012.92	3467919.58	1	153.00	69.52	1	83.48
BMO-2008-3B	38413	3/3/2010	602012.92	3467919.58	1	164.00	68.62	1	95.38
BMO-2008-3B	38449	4/8/2010	602012.92	3467919.58	1	162.00	68.37	1	93.63
BMO-2008-3B	38533	7/1/2010	602012.92	3467919.58	1	157.00	67.77	1	89.23

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
BMO-2008-3B	38761	2/14/2011	602012.92	3467919.58	1	169.00	66.13	1	102.87
BMO-2008-3B	38909	7/12/2011	602012.92	3467919.58	1	148.00	65.04	1	82.96
BMO-2008-3B	39135	2/23/2012	602012.92	3467919.58	1	173.00	63.35	1	109.65
BMO-2008-3B	39273	7/10/2012	602012.92	3467919.58	1	150.00	62.30	1	87.70
BMO-2008-4B	37966	12/11/2008	601099.41	3468383.43	1	9.40	310.74	1	-301.34
BMO-2008-4B	38035	2/18/2009	601099.41	3468383.43	1	13.40	311.69	1	-298.29
BMO-2008-4B	38106	4/30/2009	601099.41	3468383.43	1	11.40	312.66	1	-301.26
BMO-2008-4B	38204	8/6/2009	601099.41	3468383.43	1	11.50	313.95	1	-302.45
BMO-2008-4B	38286	10/27/2009	601099.41	3468383.43	1	11.20	315.01	1	-303.81
BMO-2008-4B	38406	2/24/2010	601099.41	3468383.43	1	9.70	316.48	1	-306.78
BMO-2008-4B	38457	4/16/2010	601099.41	3468383.43	1	9.73	317.08	1	-307.35
BMO-2008-4B	38534	7/2/2010	601099.41	3468383.43	1	10.10	317.96	1	-307.86
BMO-2008-4B	38762	2/15/2011	601099.41	3468383.43	1	8.90	320.57	1	-311.67
BMO-2008-4B	38919	7/22/2011	601099.41	3468383.43	1	10.20	322.66	1	-312.46
BMO-2008-4B	39135	2/23/2012	601099.41	3468383.43	1	10.50	325.63	1	-315.13
BMO-2008-4B	39309	8/15/2012	601099.41	3468383.43	1	9.50	328.33	1	-318.83
BMO-2008-5B	37894	9/30/2008	600449.65	3468994.4	1	193.00	299.01	1	-106.01
BMO-2008-5B	38035	2/18/2009	600449.65	3468994.4	1	192.00	302.14	1	-110.14
BMO-2008-5B	38103	4/27/2009	600449.65	3468994.4	1	177.00	303.64	1	-126.64
BMO-2008-5B	38202	8/4/2009	600449.65	3468994.4	1	174.00	305.82	1	-131.82
BMO-2008-5B	38288	10/29/2009	600449.65	3468994.4	1	181.00	307.71	1	-126.71
BMO-2008-5B	38397	2/15/2010	600449.65	3468994.4	1	185.00	310.09	1	-125.09
BMO-2008-5B	38456	4/15/2010	600449.65	3468994.4	1	194.00	311.37	1	-117.37
BMO-2008-5B	38539	7/7/2010	600449.65	3468994.4	1	183.00	313.17	1	-130.17
BMO-2008-5B	38629	10/5/2010	600449.65	3468994.4	1	201.00	315.11	1	-114.11
BMO-2008-5B	38761	2/14/2011	600449.65	3468994.4	1	203.00	317.95	1	-114.95
BMO-2008-5B	38848	5/12/2011	600449.65	3468994.4	1	195.00	319.84	1	-124.84
BMO-2008-5B	38910	7/13/2011	600449.65	3468994.4	1	200.00	321.22	1	-121.22
BMO-2008-5B	39057	12/7/2011	600449.65	3468994.4	1	213.00	324.53	1	-111.53
BMO-2008-5B	39115	2/3/2012	600449.65	3468994.4	1	215.00	325.85	1	-110.85
BMO-2008-5B	39190	4/18/2012	600449.65	3468994.4	1	192.00	327.58	1	-135.58
BMO-2008-5B	39273	7/10/2012	600449.65	3468994.4	1	218.00	329.49	1	-111.49
BMO-2008-5B	39371	10/16/2012	600449.65	3468994.4	1	207.00	331.81	1	-124.81
BMO-2008-5M	37896	10/2/2008	600445.3	3468993.96	2	107.00	81.29	1	25.71
BMO-2008-5M	38035	2/18/2009	600445.3	3468993.96	2	122.00	82.36	1	39.64
BMO-2008-5M	38103	4/27/2009	600445.3	3468993.96	2	111.00	82.89	1	28.11
BMO-2008-5M	38202	8/4/2009	600445.3	3468993.96	2	122.00	83.65	1	38.35
BMO-2008-5M	38288	10/29/2009	600445.3	3468993.96	2	123.00	84.32	1	38.68
BMO-2008-5M	38397	2/15/2010	600445.3	3468993.96	2	123.00	85.17	1	37.83
BMO-2008-5M	38457	4/16/2010	600445.3	3468993.96	2	125.00	85.63	1	39.37
BMO-2008-5M	38539	7/7/2010	600445.3	3468993.96	2	123.00	86.28	1	36.72
BMO-2008-5M	38629	10/5/2010	600445.3	3468993.96	2	127.00	86.98	1	40.02
BMO-2008-5M	38761	2/14/2011	600445.3	3468993.96	2	124.00	88.03	1	35.97
BMO-2008-5M	38848	5/12/2011	600445.3	3468993.96	2	119.00	88.73	1	30.27
BMO-2008-5M	38909	7/12/2011	600445.3	3468993.96	2	126.00	89.23	1	36.77
BMO-2008-5M	39057	12/7/2011	600445.3	3468993.96	2	129.00	90.43	1	38.57
BMO-2008-5M	39115	2/3/2012	600445.3	3468993.96	2	130.00	90.91	1	39.09
BMO-2008-5M	39190	4/18/2012	600445.3	3468993.96	2	120.00	91.52	1	28.48
BMO-2008-5M	39273	7/10/2012	600445.3	3468993.96	2	135.00	92.20	1	42.80
BMO-2008-5M	39371	10/16/2012	600445.3	3468993.96	2	134.00	93.01	1	40.99
BMO-2008-6B	37818	7/16/2008	600366.52	3469820.64	1	53.30	371.38	1	-318.08
BMO-2008-6B	37929	11/4/2008	600366.52	3469820.64	1	60.30	375.30	1	-315.00
BMO-2008-6B	38036	2/19/2009	600366.52	3469820.64	1	54.30	379.05	1	-324.75
BMO-2008-6B	38103	4/27/2009	600366.52	3469820.64	1	52.70	381.39	1	-328.69
BMO-2008-6B	38202	8/4/2009	600366.52	3469820.64	1	48.50	384.83	1	-336.33
BMO-2008-6B	38285	10/26/2009	600366.52	3469820.64	1	48.70	387.71	1	-339.01
BMO-2008-6B	38397	2/15/2010	600366.52	3469820.64	1	33.50	391.56	1	-358.06
BMO-2008-6B	38456	4/15/2010	600366.52	3469820.64	1	37.00	393.57	1	-356.57
BMO-2008-6B	38533	7/1/2010	600366.52	3469820.64	1	40.10	396.20	1	-356.10
BMO-2008-6B	38629	10/5/2010	600366.52	3469820.64	1	37.20	399.49	1	-362.29
BMO-2008-6B	38761	2/14/2011	600366.52	3469820.64	1	40.20	403.95	1	-363.75
BMO-2008-6B	38848	5/12/2011	600366.52	3469820.64	1	35.00	406.88	1	-371.88
BMO-2008-6B	38909	7/12/2011	600366.52	3469820.64	1	37.80	408.96	1	-371.16
BMO-2008-6B	39057	12/7/2011	600366.52	3469820.64	1	21.80	414.00	1	-392.20
BMO-2008-6B	39115	2/3/2012	600366.52	3469820.64	1	23.00	415.98	1	-392.98
BMO-2008-6B	39190	4/18/2012	600366.52	3469820.64	1	19.70	418.53	1	-398.83
BMO-2008-6B	39273	7/10/2012	600366.52	3469820.64	1	21.90	421.33	1	-399.43
BMO-2008-6B	39371	10/16/2012	600366.52	3469820.64	1	19.90	424.69	1	-404.79
BMO-2008-6M	37812	7/10/2008	600367.94	3469813.88	2	182.00	67.29	1	114.71
BMO-2008-6M	37929	11/4/2008	600367.94	3469813.88	2	199.00	68.32	1	130.68
BMO-2008-6M	38037	2/20/2009	600367.94	3469813.88	2	193.00	69.28	1	123.72
BMO-2008-6M	38104	4/28/2009	600367.94	3469813.88	2	119.00	69.87	1	49.13
BMO-2008-6M	38202	8/4/2009	600367.94	3469813.88	2	189.00	70.74	1	118.26
BMO-2008-6M	38285	10/26/2009	600367.94	3469813.88	2	187.00	71.48	1	115.52
BMO-2008-6M	38397	2/15/2010	600367.94	3469813.88	2	193.00	72.48	1	120.52
BMO-2008-6M	38456	4/15/2010	600367.94	3469813.88	2	208.00	73.01	1	134.99
BMO-2008-6M	38533	7/1/2010	600367.94	3469813.88	2	198.00	73.70	1	124.30
BMO-2008-6M	38629	10/5/2010	600367.94	3469813.88	2	202.00	74.57	1	127.43
BMO-2008-6M	38761	2/14/2011	600367.94	3469813.88	2	202.00	75.77	1	126.23
BMO-2008-6M	38848	5/12/2011	600367.94	3469813.88	2	189.00	76.58	1	112.42
BMO-2008-6M	38909	7/12/2011	600367.94	3469813.88	2	194.00	77.15	1	116.85
BMO-2008-6M	39057	12/7/2011	600367.94	3469813.88	2	200.00	78.54	1	121.46
BMO-2008-6M	39115	2/3/2012	600367.94	3469813.88	2	206.00	79.09	1	126.91
BMO-2008-6M	39190	4/18/2012	600367.94	3469813.88	2	188.00	79.80	1	108.20

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
BMO-2008-6M	39273	7/10/2012	600367.94	3469813.88	2	208.00	80.59	1	127.41
BMO-2008-6M	39371	10/16/2012	600367.94	3469813.88	2	207.00	81.52	1	125.48
BMO-2008-7M	37816	7/14/2008	603099.17	3470029.28	2	31.40	28.25	1	3.15
BMO-2008-7M	37931	11/6/2008	603099.17	3470029.28	2	34.50	28.27	1	6.23
BMO-2008-7M	38035	2/18/2009	603099.17	3470029.28	2	27.60	28.28	1	-0.68
BMO-2008-7M	38117	5/11/2009	603099.17	3470029.28	2	26.00	28.29	1	-2.29
BMO-2008-7M	38204	8/6/2009	603099.17	3470029.28	2	25.10	28.30	1	-3.20
BMO-2008-7M	38286	10/27/2009	603099.17	3470029.28	2	26.10	28.31	1	-2.21
BMO-2008-7M	38399	2/17/2010	603099.17	3470029.28	2	25.40	28.33	1	-2.93
BMO-2008-7M	38456	4/15/2010	603099.17	3470029.28	2	26.00	28.34	1	-2.34
BMO-2008-7M	38538	7/6/2010	603099.17	3470029.28	2	22.80	28.35	1	-5.55
BMO-2008-7M	38761	2/14/2011	603099.17	3470029.28	2	27.50	28.37	1	-0.87
BMO-2008-7M	38912	7/15/2011	603099.17	3470029.28	2	26.50	28.39	1	-1.89
BMO-2008-7M	39111	1/30/2012	603099.17	3470029.28	2	26.40	28.42	1	-2.02
BMO-2008-7M	39274	7/11/2012	603099.17	3470029.28	2	28.10	28.43	1	-0.33
BMO-2008-8B	37960	12/5/2008	604171.35	3471141.72	1	1890.00	2428.37	1	-538.37
BMO-2008-8B	38036	2/19/2009	604171.35	3471141.72	1	1570.00	2427.21	1	-857.21
BMO-2008-8B	38111	5/5/2009	604171.35	3471141.72	1	1370.00	2426.04	1	-1056.04
BMO-2008-8B	38208	8/10/2009	604171.35	3471141.72	1	1250.00	2424.49	1	-1174.49
BMO-2008-8B	38299	11/9/2009	604171.35	3471141.72	1	1510.00	2423.01	1	-913.00
BMO-2008-8B	38413	3/3/2010	604171.35	3471141.72	1	1320.00	2421.13	1	-1101.13
BMO-2008-8B	38457	4/16/2010	604171.35	3471141.72	1	1470.00	2420.39	1	-950.39
BMO-2008-8B	38533	7/1/2010	604171.35	3471141.72	1	1440.00	2419.10	1	-979.10
BMO-2008-8B	38912	7/15/2011	604171.35	3471141.72	1	1380.00	2412.27	1	-1032.27
BMO-2008-8B	39111	1/30/2012	604171.35	3471141.72	1	1480.00	2408.50	1	-928.50
BMO-2008-8B	39275	7/12/2012	604171.35	3471141.72	1	1440.00	2405.35	1	-965.35
BMO-2008-8M	37964	12/9/2008	604167.91	3471127.9	3	197.00	2209.06	1	-2012.06
BMO-2008-8M	38036	2/19/2009	604167.91	3471127.9	3	147.00	2208.51	1	-2061.51
BMO-2008-8M	38111	5/5/2009	604167.91	3471127.9	3	122.00	2207.94	1	-2085.94
BMO-2008-8M	38208	8/10/2009	604167.91	3471127.9	3	107.00	2207.18	1	-2100.18
BMO-2008-8M	38295	11/5/2009	604167.91	3471127.9	3	104.00	2206.49	1	-2102.49
BMO-2008-8M	38413	3/3/2010	604167.91	3471127.9	3	99.50	2205.54	1	-2106.04
BMO-2008-8M	38457	4/16/2010	604167.91	3471127.9	3	97.00	2205.18	1	-2108.18
BMO-2008-8M	38533	7/1/2010	604167.91	3471127.9	3	94.70	2204.51	1	-2109.81
BMO-2008-8M	38740	1/24/2011	604167.91	3471127.9	3	98.20	2202.66	1	-2104.46
BMO-2008-8M	38912	7/15/2011	604167.91	3471127.9	3	79.90	2201.10	1	-2121.20
BMO-2008-8M	39111	1/30/2012	604167.91	3471127.9	3	77.60	2199.21	1	-2121.61
BMO-2008-8M	39275	7/12/2012	604167.91	3471127.9	3	73.10	2197.59	1	-2124.49
BMO-2008-9M	37841	8/8/2008	604668.67	3471121.67	3	47.30	1261.98	1	-1214.68
BMO-2008-9M	37930	11/5/2008	604668.67	3471121.67	3	54.40	1248.84	1	-1194.44
BMO-2008-9M	38043	2/26/2009	604668.67	3471121.67	3	28.80	1232.22	1	-1203.42
BMO-2008-9M	38118	5/12/2009	604668.67	3471121.67	3	51.70	1221.83	1	-1170.13
BMO-2008-9M	38215	8/17/2009	604668.67	3471121.67	3	53.40	1208.75	1	-1155.35
BMO-2008-9M	38293	11/3/2009	604668.67	3471121.67	3	56.90	1197.73	1	-1140.83
BMO-2008-9M	38414	3/4/2010	604668.67	3471121.67	3	58.60	1181.12	1	-1122.52
BMO-2008-9M	38447	4/6/2010	604668.67	3471121.67	3	60.10	1176.85	1	-1116.75
BMO-2008-9M	38533	7/1/2010	604668.67	3471121.67	3	61.00	1165.18	1	-1104.18
BMO-2008-9M	38757	2/10/2011	604668.67	3471121.67	3	64.20	1135.93	1	-1071.73
BMO-2008-9M	38912	7/15/2011	604668.67	3471121.67	3	67.00	1115.91	1	-1048.91
BMO-2008-9M	39113	2/1/2012	604668.67	3471121.67	3	67.40	1090.64	1	-1023.24
BMO-2008-9M	39275	7/12/2012	604668.67	3471121.67	3	68.90	1072.31	1	-1003.41
BMO-2010-1M	38603	9/9/2010	605581.26	3469935.75	2	150.00	53.10	1	96.90
BMO-2010-1M	38666	11/11/2010	605581.26	3469935.75	2	98.00	52.26	1	45.74
BMO-2010-1M	38758	2/11/2011	605581.26	3469935.75	2	138.00	51.08	1	86.92
BMO-2010-1M	38848	5/12/2011	605581.26	3469935.75	2	129.00	49.98	1	79.02
BMO-2010-1M	38959	8/31/2011	605581.26	3469935.75	2	154.00	48.69	1	105.31
BMO-2010-1M	39063	12/13/2011	605581.26	3469935.75	2	149.00	47.56	1	101.44
BMO-2010-1M	39120	2/8/2012	605581.26	3469935.75	2	158.00	46.96	1	111.04
BMO-2010-1M	39196	4/24/2012	605581.26	3469935.75	2	150.00	46.19	1	103.81
BMO-2010-1M	39272	7/9/2012	605581.26	3469935.75	2	161.00	45.46	1	115.54
BMO-2010-2M	38609	9/15/2010	605685.55	3470564.65	3	915.00	44.33	1	870.67
BMO-2010-2M	38666	11/11/2010	605685.55	3470564.65	3	935.00	43.48	1	891.52
BMO-2010-2M	38757	2/10/2011	605685.55	3470564.65	3	950.00	42.16	1	907.84
BMO-2010-2M	38849	5/13/2011	605685.55	3470564.65	3	887.00	40.85	1	846.15
BMO-2010-2M	38911	7/14/2011	605685.55	3470564.65	3	917.00	39.99	1	877.01
BMO-2010-2M	39063	12/13/2011	605685.55	3470564.65	3	984.00	37.96	1	946.04
BMO-2010-2M	39111	1/30/2012	605685.55	3470564.65	3	989.00	37.33	1	951.67
BMO-2010-2M	39190	4/18/2012	605685.55	3470564.65	3	893.00	36.33	1	856.67
BMO-2010-2M	39272	7/9/2012	605685.55	3470564.65	3	1030.00	35.31	1	994.69
BMO-2010-3B	38561	7/29/2010	599977.97	3468347.34	1	16.00	66.92	1	-50.92
BMO-2010-3B	38665	11/10/2010	599977.97	3468347.34	1	14.90	66.96	1	-52.06
BMO-2010-3B	38736	1/20/2011	599977.97	3468347.34	1	14.40	67.02	1	-52.62
BMO-2010-3B	38813	4/7/2011	599977.97	3468347.34	1	14.90	67.15	1	-52.25
BMO-2010-3B	38910	7/13/2011	599977.97	3468347.34	1	13.80	67.34	1	-53.54
BMO-2010-3B	39002	10/13/2011	599977.97	3468347.34	1	15.90	67.52	1	-51.62
BMO-2010-3B	39114	2/2/2012	599977.97	3468347.34	1	16.90	67.77	1	-50.87
BMO-2010-3B	39196	4/24/2012	599977.97	3468347.34	1	16.00	68.06	1	-52.06
BMO-2010-3B	39268	7/5/2012	599977.97	3468347.34	1	15.70	68.32	1	-52.62
BMO-2010-3B	39373	10/18/2012	599977.97	3468347.34	1	17.00	68.63	1	-51.63
BMO-2010-3M	38563	7/31/2010	599970.81	3468353.42	2	14.80	19.66	1	-4.86
BMO-2010-3M	38665	11/10/2010	599970.81	3468353.42	2	12.60	19.81	1	-7.21
BMO-2010-3M	38736	1/20/2011	599970.81	3468353.42	2	11.50	19.92	1	-8.42
BMO-2010-3M	38813	4/7/2011	599970.81	3468353.42	2	12.30	20.03	1	-7.73
BMO-2010-3M	38953	8/25/2011	599970.81	3468353.42	2	10.40	20.24	1	-9.84

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
BMO-2010-3M	39002	10/13/2011	599970.81	3468353.42	2	10.50	20.31	1	-9.81
BMO-2010-3M	39114	2/2/2012	599970.81	3468353.42	2	10.60	20.47	1	-9.87
BMO-2010-3M	39196	4/24/2012	599970.81	3468353.42	2	10.10	20.59	1	-10.49
BMO-2010-3M	39268	7/5/2012	599970.81	3468353.42	2	10.30	20.69	1	-10.39
BMO-2010-3M	39373	10/18/2012	599970.81	3468353.42	2	10.40	20.83	1	-10.43
BURKE	37658	2/7/2008	602230.09	3473029.82	4	29.50	8.00	1	21.50
BURKE	37733	4/22/2008	602230.09	3473029.82	4	26.00	8.00	1	18.00
BURKE	37838	8/5/2008	602230.09	3473029.82	4	21.90	8.00	1	13.90
BURKE	37914	10/20/2008	602230.09	3473029.82	4	20.50	8.00	1	12.50
BURKE	38028	2/11/2009	602230.09	3473029.82	4	23.90	8.00	1	15.90
BURKE	38104	4/28/2009	602230.09	3473029.82	4	24.20	8.00	1	16.20
BURKE	38217	8/19/2009	602230.09	3473029.82	4	22.50	8.00	1	14.50
BURKE	38336	12/16/2009	602230.09	3473029.82	4	26.00	8.00	1	18.00
BURKE	38412	3/2/2010	602230.09	3473029.82	4	23.80	8.00	1	15.80
BURKE	38463	4/22/2010	602230.09	3473029.82	4	24.80	8.00	1	16.80
BURKE	38553	7/21/2010	602230.09	3473029.82	4	33.10	8.00	1	25.10
CAMPBELL	37656	2/5/2008	606420.84	3469320.34	1	211.00	-1.00	1	212.00
CHAMBERS	37686	3/6/2008	600096.9	3467462	1	7.70	10.02	1	-2.32
CHAMBERS	37746	5/5/2008	600096.9	3467462	1	6.00	10.03	1	-4.03
CHAMBERS	37816	7/14/2008	600096.9	3467462	1	5.80	10.04	1	-4.24
CHAMBERS	37909	10/15/2008	600096.9	3467462	1	4.00	10.06	1	-6.06
CHAMBERS	38013	1/27/2009	600096.9	3467462	1	5.30	10.08	1	-4.78
CHAMBERS	38090	4/14/2009	600096.9	3467462	1	6.80	10.09	1	-3.29
CHAMBERS	38090	4/14/2009	600096.9	3467462	1	6.80	10.09	1	-3.29
CHAMBERS	38182	7/15/2009	600096.9	3467462	1	4.30	10.10	1	-5.80
CHAMBERS	38272	10/13/2009	600096.9	3467462	1	6.50	10.12	1	-3.62
CHAMBERS	38377	1/26/2010	600096.9	3467462	1	5.70	10.13	1	-4.43
CHAMBERS	38464	4/23/2010	600096.9	3467462	1	8.34	10.14	1	-1.80
CHAMBERS	38553	7/21/2010	600096.9	3467462	1	7.75	10.16	1	-2.41
CHAMBERS	38643	10/19/2010	600096.9	3467462	1	7.04	10.17	1	-3.13
CHAMBERS	38734	1/18/2011	600096.9	3467462	1	7.30	10.18	1	-2.88
CHAMBERS	38817	4/11/2011	600096.9	3467462	1	7.74	10.19	1	-2.45
CHAMBERS	38915	7/18/2011	600096.9	3467462	1	8.18	10.20	1	-2.02
CHAMBERS	39001	10/12/2011	600096.9	3467462	1	7.80	10.21	1	-2.41
CHAMBERS	39118	2/6/2012	600096.9	3467462	1	9.08	10.21	1	-1.13
CHAMBERS	39195	4/23/2012	600096.9	3467462	1	8.84	10.22	1	-1.38
CHAMBERS	39280	7/17/2012	600096.9	3467462	1	8.41	10.22	1	-1.81
CHAMBERS	39363	10/8/2012	600096.9	3467462	1	10.10	10.23	1	-0.13
COB_MW-1	36979	3/30/2006	603153.26	3469889.89	1	1260.00	1267.11	1	-7.11
COB_MW-1	36992	4/12/2006	603153.26	3469889.89	1	1260.00	1266.79	1	-6.79
COB_MW-1	37673	2/22/2008	603153.26	3469889.89	1	720.00	1252.04	1	-532.04
COB_MW-1	37761	5/20/2008	603153.26	3469889.89	1	980.00	1250.47	1	-270.47
COB_MW-1	37832	7/30/2008	603153.26	3469889.89	1	730.00	1249.27	1	-519.27
COB_MW-1	37917	10/23/2008	603153.26	3469889.89	1	750.00	1247.89	1	-497.89
COB_MW-1	38029	2/12/2009	603153.26	3469889.89	1	750.00	1246.17	1	-496.17
COB_MW-1	38097	4/21/2009	603153.26	3469889.89	1	720.00	1245.18	1	-525.18
COB_MW-1	38189	7/22/2009	603153.26	3469889.89	1	680.00	1243.92	1	-563.92
COB_MW-1	38281	10/22/2009	603153.26	3469889.89	1	820.00	1242.75	1	-422.75
COB_MW-1	38386	2/4/2010	603153.26	3469889.89	1	680.00	1241.49	1	-561.49
COB_MW-1	38461	4/20/2010	603153.26	3469889.89	1	783.00	1240.63	1	-457.63
COB_MW-1	38545	7/13/2010	603153.26	3469889.89	1	919.00	1239.74	1	-320.74
COB_MW-1	38911	7/14/2011	603153.26	3469889.89	1	927.00	1236.59	1	-309.59
COB_MW-1	39275	7/12/2012	603153.26	3469889.89	1	805.00	1234.49	1	-429.49
COB_MW-2	37673	2/22/2008	600973.26	3468114.84	1	41.00	116.87	1	-75.87
COB_MW-2	37761	5/20/2008	600973.26	3468114.84	1	40.50	116.67	1	-76.17
COB_MW-2	37832	7/30/2008	600973.26	3468114.84	1	37.60	116.51	1	-78.91
COB_MW-2	37917	10/23/2008	600973.26	3468114.84	1	34.90	116.29	1	-81.39
COB_MW-2	38029	2/12/2009	600973.26	3468114.84	1	35.60	116.00	1	-80.40
COB_MW-2	38099	4/23/2009	600973.26	3468114.84	1	34.00	115.82	1	-81.82
COB_MW-2	38189	7/22/2009	600973.26	3468114.84	1	33.50	115.60	1	-82.10
COB_MW-2	38281	10/22/2009	600973.26	3468114.84	1	32.20	115.36	1	-83.16
COB_MW-2	38413	3/3/2010	600973.26	3468114.84	1	33.50	115.00	1	-81.50
COB_MW-2	38467	4/26/2010	600973.26	3468114.84	1	34.80	114.85	1	-80.05
COB_MW-2	38545	7/13/2010	600973.26	3468114.84	1	30.60	114.63	1	-84.03
COB_MW-2	38736	1/20/2011	600973.26	3468114.84	1	29.60	114.13	1	-84.53
COB_MW-2	38911	7/14/2011	600973.26	3468114.84	1	29.80	114.12	1	-84.32
COB_MW-2	39112	1/31/2012	600973.26	3468114.84	1	30.00	114.22	1	-84.22
COB_MW-2	39275	7/12/2012	600973.26	3468114.84	1	29.20	114.76	1	-85.56
COB_MW-3	37679	2/28/2008	599169.26	3468726.06	1	57.80	32.56	1	25.24
COB_MW-3	37707	3/27/2008	599169.26	3468726.06	1	57.70	32.65	1	25.05
COB_MW-3	37741	4/30/2008	599169.26	3468726.06	1	37.00	32.77	1	4.23
COB_MW-3	37761	5/20/2008	599169.26	3468726.06	1	35.80	32.83	1	2.97
COB_MW-3	37826	7/24/2008	599169.26	3468726.06	1	64.90	33.04	1	31.86
COB_MW-3	37832	7/30/2008	599169.26	3468726.06	1	67.30	33.06	1	34.24
COB_MW-3	37903	10/9/2008	599169.26	3468726.06	1	52.50	33.28	1	19.22
COB_MW-3	37917	10/23/2008	599169.26	3468726.06	1	76.60	33.33	1	43.27
COB_MW-3	38029	2/12/2009	599169.26	3468726.06	1	112.00	33.67	1	78.33
COB_MW-3	38099	4/23/2009	599169.26	3468726.06	1	43.70	33.87	1	9.83
COB_MW-3	38189	7/22/2009	599169.26	3468726.06	1	52.30	34.12	1	18.18
COB_MW-3	38281	10/22/2009	599169.26	3468726.06	1	74.20	34.38	1	39.82
COB_MW-3	38413	3/3/2010	599169.26	3468726.06	1	102.00	34.73	1	67.27
COB_MW-3	38467	4/26/2010	599169.26	3468726.06	1	77.60	34.87	1	42.73
COB_MW-3	38545	7/13/2010	599169.26	3468726.06	1	46.50	35.08	1	11.42
COB_MW-3	38911	7/14/2011	599169.26	3468726.06	1	40.10	35.91	1	4.19

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
COB_MW-3	39275	7/12/2012	599169.26	3468726.06	1	39.50	36.57	1	2.93
COOPER	29591	1/6/1986	602668.4	3472105	2	11.00	8.03	1	2.97
COOPER	37665	2/14/2008	602668.4	3472105	2	33.00	8.06	1	24.94
COOPER	37755	5/14/2008	602668.4	3472105	2	34.20	8.06	1	26.14
COOPER	37833	7/31/2008	602668.4	3472105	2	33.70	8.06	1	25.64
COOPER	37914	10/20/2008	602668.4	3472105	2	31.20	8.06	1	23.14
COOPER	38028	2/11/2009	602668.4	3472105	2	34.30	8.06	1	26.24
COOPER	38097	4/21/2009	602668.4	3472105	2	33.40	8.06	1	25.34
COOPER	38187	7/20/2009	602668.4	3472105	2	32.30	8.06	1	24.24
COOPER	38273	10/14/2009	602668.4	3472105	2	33.60	8.06	1	25.54
COOPER	38383	2/1/2010	602668.4	3472105	2	32.40	8.06	1	24.34
COOPER	38463	4/22/2010	602668.4	3472105	2	34.50	8.06	1	26.44
COOPER	38551	7/19/2010	602668.4	3472105	2	35.00	8.06	1	26.94
COOPER	38642	10/18/2010	602668.4	3472105	2	33.10	8.06	1	25.04
COOPER	38735	1/19/2011	602668.4	3472105	2	32.10	8.06	1	24.04
COOPER	38817	4/11/2011	602668.4	3472105	2	34.30	8.06	1	26.24
COOPER	38908	7/11/2011	602668.4	3472105	2	32.10	8.06	1	24.04
COOPER	39042	11/22/2011	602668.4	3472105	2	33.70	8.06	1	25.64
COOPER	39113	2/1/2012	602668.4	3472105	2	34.10	8.06	1	26.04
COOPER	39182	4/10/2012	602668.4	3472105	2	32.50	8.06	1	24.44
COOPER	39281	7/18/2012	602668.4	3472105	2	33.40	8.06	1	25.34
COOPER	39364	10/9/2012	602668.4	3472105	2	34.30	8.06	1	26.24
COOPER_C	37684	3/4/2008	601349.99	3468913.01	1	880.00	691.90	1	188.10
COOPER_C	37700	3/20/2008	601349.99	3468913.01	1	990.00	692.31	1	297.69
COOPER_C	37746	5/5/2008	601349.99	3468913.01	1	990.00	693.42	1	296.58
COOPER_C	37817	7/15/2008	601349.99	3468913.01	1	1040.00	695.13	1	344.87
COOPER_C	37910	10/16/2008	601349.99	3468913.01	1	1020.00	697.43	1	322.57
COOPER_C	38013	1/27/2009	601349.99	3468913.01	1	950.00	699.96	1	250.04
COOPER_C	38090	4/14/2009	601349.99	3468913.01	1	930.00	701.81	1	228.19
COOPER_C	38181	7/14/2009	601349.99	3468913.01	1	910.00	703.98	1	206.02
COOPER_C	38271	10/12/2009	601349.99	3468913.01	1	830.00	706.10	1	123.90
COOPER_C	38378	1/27/2010	601349.99	3468913.01	1	620.00	708.59	1	-88.59
COOPER_C	38463	4/22/2010	601349.99	3468913.01	1	884.00	710.54	1	173.46
COOPER_C	38553	7/21/2010	601349.99	3468913.01	1	921.00	712.54	1	208.46
COOPER_C	38644	10/20/2010	601349.99	3468913.01	1	829.00	714.55	1	114.45
COOPER_C	38733	1/17/2011	601349.99	3468913.01	1	756.00	716.49	1	39.51
COOPER_C	38817	4/11/2011	601349.99	3468913.01	1	834.00	718.32	1	115.68
COOPER_C	38954	8/26/2011	601349.99	3468913.01	1	847.00	721.33	1	125.67
COOPER_C	39113	2/1/2012	601349.99	3468913.01	1	867.00	724.83	1	142.17
COOPER_C	39197	4/25/2012	601349.99	3468913.01	1	817.00	726.69	1	90.31
COOPER_C	39274	7/11/2012	601349.99	3468913.01	1	834.00	728.38	1	105.62
COOPER_C	39365	10/10/2012	601349.99	3468913.01	1	863.00	730.42	1	132.58
DODSON	29563	12/9/1985	605594.56	3469063.77	2	710.00	225.54	1	484.46
DODSON	37671	2/20/2008	605594.56	3469063.77	2	54.00	117.58	1	-63.58
DODSON	37753	5/12/2008	605594.56	3469063.77	2	34.20	117.18	1	-82.98
DODSON	37826	7/24/2008	605594.56	3469063.77	2	49.30	116.84	1	-67.54
DODSON	37907	10/13/2008	605594.56	3469063.77	2	56.90	116.46	1	-59.56
DODSON	38008	1/22/2009	605594.56	3469063.77	2	51.80	116.00	1	-64.20
DODSON	38085	4/9/2009	605594.56	3469063.77	2	50.10	115.65	1	-65.55
DODSON	38175	7/8/2009	605594.56	3469063.77	2	55.90	115.26	1	-59.36
DODSON	38265	10/6/2009	605594.56	3469063.77	2	49.30	114.87	1	-65.57
DODSON	38372	1/21/2010	605594.56	3469063.77	2	44.60	114.43	1	-69.83
DODSON	38460	4/19/2010	605594.56	3469063.77	2	48.80	114.06	1	-65.26
DODSON	38552	7/20/2010	605594.56	3469063.77	2	47.50	113.69	1	-66.19
DODSON	38642	10/18/2010	605594.56	3469063.77	2	49.30	113.32	1	-64.02
DODSON	38735	1/19/2011	605594.56	3469063.77	2	57.90	112.96	1	-55.06
DODSON	38811	4/5/2011	605594.56	3469063.77	2	49.00	112.67	1	-63.67
DODSON	38909	7/12/2011	605594.56	3469063.77	2	52.90	112.30	1	-59.40
DODSON	38999	10/10/2011	605594.56	3469063.77	2	50.90	111.98	1	-61.08
DODSON	39112	1/31/2012	605594.56	3469063.77	2	50.40	111.58	1	-61.18
DODSON	39184	4/12/2012	605594.56	3469063.77	2	45.40	111.33	1	-65.93
DODSON	39274	7/11/2012	605594.56	3469063.77	2	54.00	111.03	1	-57.03
DODSON	39359	10/4/2012	605594.56	3469063.77	2	48.70	110.74	1	-62.04
DURAZO	38027	2/10/2009	602015.52	3471241.23	1	386.00	29.78	1	356.22
DURAZO	38083	4/7/2009	602015.52	3471241.23	1	19.90	29.38	1	-9.48
DURAZO	38091	4/15/2009	602015.52	3471241.23	1	620.00	29.33	1	590.67
DURAZO	38096	4/20/2009	602015.52	3471241.23	1	367.00	29.29	1	337.71
DURAZO	38175	7/8/2009	602015.52	3471241.23	1	18.50	28.75	1	-10.25
DURAZO	38182	7/15/2009	602015.52	3471241.23	1	332.00	28.70	1	303.30
DURAZO	38264	10/5/2009	602015.52	3471241.23	1	19.70	28.12	1	-8.42
DURAZO	38271	10/12/2009	602015.52	3471241.23	1	600.00	28.08	1	571.92
DURAZO	38273	10/14/2009	602015.52	3471241.23	1	377.00	28.06	1	348.94
DURAZO	38372	1/21/2010	602015.52	3471241.23	1	18.40	27.43	1	-9.03
DURAZO	38378	1/27/2010	602015.52	3471241.23	1	440.00	27.40	1	412.60
DURAZO	38383	2/1/2010	602015.52	3471241.23	1	344.00	27.36	1	316.64
DURAZO	38462	4/21/2010	602015.52	3471241.23	1	710.00	26.87	1	683.13
DURAZO	38467	4/26/2010	602015.52	3471241.23	1	388.00	26.84	1	361.16
DURAZO	38551	7/19/2010	602015.52	3471241.23	1	22.20	26.31	1	-4.11
DURAZO	38552	7/20/2010	602015.52	3471241.23	1	405.00	26.31	1	378.69
DURAZO	38642	10/18/2010	602015.52	3471241.23	1	568.00	25.74	1	542.26
DURAZO	38643	10/19/2010	602015.52	3471241.23	1	398.00	25.73	1	372.27
DURAZO	38735	1/19/2011	602015.52	3471241.23	1	360.00	25.21	1	334.79
DURAZO	38810	4/4/2011	602015.52	3471241.23	1	383.00	24.76	1	358.24
DURAZO	38911	7/14/2011	602015.52	3471241.23	1	409.00	24.17	1	384.83

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
DURAZO	39001	10/12/2011	602015.52	3471241.23	1	396.00	23.68	1	372.32
DURAZO	39119	2/7/2012	602015.52	3471241.23	1	404.00	23.08	1	380.92
DURAZO	39184	4/12/2012	602015.52	3471241.23	1	407.00	22.77	1	384.23
EAST	37659	2/8/2008	607076.36	3468712.21	2	10.60	9.19	1	1.41
EAST	37755	5/14/2008	607076.36	3468712.21	2	14.80	9.19	1	5.61
EAST	37825	7/23/2008	607076.36	3468712.21	2	11.80	9.19	1	2.61
EAST	37908	10/14/2008	607076.36	3468712.21	2	8.90	9.19	1	-0.29
EAST	38006	1/20/2009	607076.36	3468712.21	2	12.50	9.19	1	3.31
EAST	38084	4/8/2009	607076.36	3468712.21	2	15.90	9.19	1	6.71
EAST	38180	7/13/2009	607076.36	3468712.21	2	13.80	9.19	1	4.61
EAST	38267	10/8/2009	607076.36	3468712.21	2	13.40	9.19	1	4.21
EAST	38376	1/25/2010	607076.36	3468712.21	2	10.70	9.19	1	1.51
EAST	38462	4/21/2010	607076.36	3468712.21	2	14.40	9.19	1	5.21
EAST	38546	7/14/2010	607076.36	3468712.21	2	12.10	9.19	1	2.91
EAST	38644	10/20/2010	607076.36	3468712.21	2	12.10	9.18	1	2.92
EAST	38734	1/18/2011	607076.36	3468712.21	2	13.10	9.18	1	3.92
EAST	38811	4/5/2011	607076.36	3468712.21	2	13.80	9.18	1	4.62
EAST	38909	7/12/2011	607076.36	3468712.21	2	12.70	9.18	1	3.52
EAST	39001	10/12/2011	607076.36	3468712.21	2	15.10	9.18	1	5.92
EAST	39112	1/31/2012	607076.36	3468712.21	2	12.80	9.18	1	3.62
EAST	39183	4/11/2012	607076.36	3468712.21	2	14.60	9.18	1	5.42
EAST	39272	7/9/2012	607076.36	3468712.21	2	14.20	9.18	1	5.02
EAST	39359	10/4/2012	607076.36	3468712.21	2	15.00	9.18	1	5.82
ECHAVE	39113	2/1/2012	599698.02	3470167.15	1	26.70	14.15	1	12.55
ECHAVE	39195	4/23/2012	599698.02	3470167.15	1	26.40	14.20	1	12.20
ECHAVE	39280	7/17/2012	599698.02	3470167.15	1	26.10	14.26	1	11.84
ECHAVE	39364	10/9/2012	599698.02	3470167.15	1	26.10	14.32	1	11.78
ENGLUND	37663	2/12/2008	602551.29	3471341.33	1	520.00	79.11	1	440.89
ENGLUND	37770	5/29/2008	602551.29	3471341.33	1	520.00	76.81	1	443.19
ENGLUND	37833	7/31/2008	602551.29	3471341.33	1	536.00	75.47	1	460.53
ENGLUND	37914	10/20/2008	602551.29	3471341.33	1	518.00	73.77	1	444.23
ENGLUND	38028	2/11/2009	602551.29	3471341.33	1	567.00	71.45	1	495.55
ENGLUND	38097	4/21/2009	602551.29	3471341.33	1	499.00	70.07	1	428.93
ENGLUND	38187	7/20/2009	602551.29	3471341.33	1	460.00	68.34	1	391.66
ENGLUND	38189	7/22/2009	602551.29	3471341.33	1	460.00	68.30	1	391.70
ENGLUND	38279	10/20/2009	602551.29	3471341.33	1	513.00	66.57	1	446.43
ENGLUND	38384	2/2/2010	602551.29	3471341.33	1	471.00	64.67	1	406.33
ENGLUND	38464	4/23/2010	602551.29	3471341.33	1	561.00	63.25	1	497.75
ENGLUND	38552	7/20/2010	602551.29	3471341.33	1	569.00	61.71	1	507.29
EPPELE_641	37691	3/11/2008	607165.35	3469229.94	2	21.70	7.92	1	13.78
EPPELE_641	37753	5/12/2008	607165.35	3469229.94	2	24.70	7.92	1	16.78
EPPELE_641	37823	7/21/2008	607165.35	3469229.94	2	19.00	7.93	1	11.07
EPPELE_641	37908	10/14/2008	607165.35	3469229.94	2	21.80	7.93	1	13.87
EPPELE_641	38007	1/21/2009	607165.35	3469229.94	2	22.70	7.93	1	14.77
EPPELE_641	38084	4/8/2009	607165.35	3469229.94	2	19.70	7.94	1	11.76
EPPELE_641	38176	7/9/2009	607165.35	3469229.94	2	17.50	7.94	1	9.56
EPPELE_641	38552	7/20/2010	607165.35	3469229.94	2	21.10	7.96	1	13.14
EPPELE_641	38644	10/20/2010	607165.35	3469229.94	2	17.20	7.97	1	9.23
EPPELE_641	38733	1/17/2011	607165.35	3469229.94	2	17.30	7.97	1	9.33
EPPELE_641	38811	4/5/2011	607165.35	3469229.94	2	16.70	7.97	1	8.73
EPPELE_641	38908	7/11/2011	607165.35	3469229.94	2	18.60	7.98	1	10.62
EPPELE_641	39001	10/12/2011	607165.35	3469229.94	2	19.60	7.98	1	11.62
EPPELE_641	39112	1/31/2012	607165.35	3469229.94	2	18.20	7.99	1	10.21
EPPELE_641	39183	4/11/2012	607165.35	3469229.94	2	19.50	7.99	1	11.51
EPPELE_641	39269	7/6/2012	607165.35	3469229.94	2	18.80	7.99	1	10.81
EPPELE_641	39358	10/3/2012	607165.35	3469229.94	2	19.50	8.00	1	11.50
FLEMING	38547	7/15/2010	605714	3469330	2	573.00	27.64	1	545.36
FRANCO	37657	2/6/2008	602849.9	3468835.68	1	670.00	874.23	1	-204.23
FRANCO	37746	5/5/2008	602849.9	3468835.68	1	680.00	873.45	1	-193.45
FRANCO	37816	7/14/2008	602849.9	3468835.68	1	680.00	872.83	1	-192.83
FRANCO	37909	10/15/2008	602849.9	3468835.68	1	680.00	871.99	1	-191.99
FRANCO	38008	1/22/2009	602849.9	3468835.68	1	740.00	871.06	1	-131.06
FRANCO	38090	4/14/2009	602849.9	3468835.68	1	690.00	870.29	1	-180.29
FRANCO	38180	7/13/2009	602849.9	3468835.68	1	670.00	869.43	1	-199.43
FRANCO	38271	10/12/2009	602849.9	3468835.68	1	650.00	868.55	1	-218.55
FRANCO	38377	1/26/2010	602849.9	3468835.68	1	640.00	867.49	1	-227.49
FRANCO	38464	4/23/2010	602849.9	3468835.68	1	699.00	866.61	1	-167.61
FRANCO	38545	7/13/2010	602849.9	3468835.68	1	188.00	865.78	1	-677.78
FRANCO_383	39338	9/13/2012	602817.85	3468831.56	2	318.00	20.87	1	297.13
FRANCO_383	39360	10/5/2012	602817.85	3468831.56	2	324.00	20.87	1	303.13
FULTZ	37678	2/27/2008	607153.31	3469063.89	2	152.00	7.96	1	144.04
FULTZ	37732	4/21/2008	607153.31	3469063.89	2	137.00	7.96	1	129.04
FULTZ	37754	5/13/2008	607153.31	3469063.89	2	131.00	7.96	1	123.04
FULTZ	37755	5/14/2008	607153.31	3469063.89	2	131.00	7.96	1	123.04
FULTZ	37795	6/23/2008	607153.31	3469063.89	2	111.00	7.95	1	103.05
FULTZ	37831	7/29/2008	607153.31	3469063.89	2	152.00	7.95	1	144.05
FULTZ	37861	8/28/2008	607153.31	3469063.89	2	137.00	7.95	1	129.05
FULTZ	37887	9/23/2008	607153.31	3469063.89	2	137.00	7.94	1	129.06
FULTZ	37916	10/22/2008	607153.31	3469063.89	2	145.00	7.94	1	137.06
FULTZ	38007	1/21/2009	607153.31	3469063.89	2	82.00	7.94	1	74.06
FULTZ	38085	4/9/2009	607153.31	3469063.89	2	138.00	7.94	1	130.06
FULTZ	38180	7/13/2009	607153.31	3469063.89	2	81.00	7.94	1	73.06
FULTZ	38267	10/8/2009	607153.31	3469063.89	2	72.00	7.94	1	64.06
FULTZ	38376	1/25/2010	607153.31	3469063.89	2	66.70	7.94	1	58.76

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
FULTZ	38461	4/20/2010	607153.31	3469063.89	2	68.30	7.94	1	60.36
FULTZ	38546	7/14/2010	607153.31	3469063.89	2	57.00	7.94	1	49.06
FULTZ	38644	10/20/2010	607153.31	3469063.89	2	54.70	7.94	1	46.76
FULTZ	38734	1/18/2011	607153.31	3469063.89	2	56.90	7.95	1	48.95
FULTZ	38811	4/5/2011	607153.31	3469063.89	2	49.50	7.95	1	41.55
FULTZ	38953	8/25/2011	607153.31	3469063.89	2	50.60	7.95	1	42.65
FULTZ	39001	10/12/2011	607153.31	3469063.89	2	48.50	7.96	1	40.54
GALLANT	37662	2/11/2008	607769.64	3468524.36	2	17.90	8.00	1	9.90
GALLANT	37825	7/23/2008	607769.64	3468524.36	2	20.90	8.00	1	12.90
GARNER_557	37672	2/21/2008	602659.24	3468962.42	1	123.00	986.71	1	-863.71
GARNER_635	37655	2/4/2008	602665.35	3468967.9	2	37.80	20.54	1	17.26
GARNER_635	37746	5/5/2008	602665.35	3468967.9	2	35.80	20.57	1	15.23
GARNER_635	37817	7/15/2008	602665.35	3468967.9	2	37.40	20.58	1	16.82
GARNER_635	37909	10/15/2008	602665.35	3468967.9	2	36.00	20.60	1	15.40
GARNER_635	38014	1/28/2009	602665.35	3468967.9	2	37.40	20.63	1	16.77
GARNER_635	38091	4/15/2009	602665.35	3468967.9	2	36.90	20.64	1	16.26
GARNER_635	38183	7/16/2009	602665.35	3468967.9	2	35.70	20.67	1	15.03
GARNER_635	38273	10/14/2009	602665.35	3468967.9	2	36.10	20.69	1	15.41
GARNER_635	38384	2/2/2010	602665.35	3468967.9	2	35.10	20.71	1	14.39
GARNER_635	38463	4/22/2010	602665.35	3468967.9	2	36.90	20.73	1	16.17
GARNER_635	38552	7/20/2010	602665.35	3468967.9	2	38.80	20.75	1	18.05
GARNER_635	38643	10/19/2010	602665.35	3468967.9	2	37.90	20.77	1	17.13
GARNER_635	38735	1/19/2011	602665.35	3468967.9	2	35.70	20.79	1	14.91
GARNER_635	38812	4/6/2011	602665.35	3468967.9	2	35.83	20.80	1	15.03
GARNER_635	38912	7/15/2011	602665.35	3468967.9	2	37.70	20.83	1	16.87
GARNER_635	39000	10/11/2011	602665.35	3468967.9	2	38.00	20.84	1	17.16
GARNER_635	39114	2/2/2012	602665.35	3468967.9	2	39.20	20.87	1	18.33
GARNER_635	39185	4/13/2012	602665.35	3468967.9	2	33.50	20.88	1	12.62
GARNER_635	39274	7/11/2012	602665.35	3468967.9	2	37.70	20.90	1	16.80
GARNER_635	39360	10/5/2012	602665.35	3468967.9	2	39.10	20.92	1	18.18
GGOOSE_547	37762	5/21/2008	606256.66	3469820.26	4	199.00	8.00	1	191.00
GGOOSE_547	37848	8/15/2008	606256.66	3469820.26	4	178.00	8.00	1	170.00
GGOOSE_547	37923	10/29/2008	606256.66	3469820.26	4	216.00	8.00	1	208.00
GGOOSE_547	38041	2/24/2009	606256.66	3469820.26	4	186.00	8.00	1	178.00
GGOOSE_547	38120	5/14/2009	606256.66	3469820.26	4	174.00	8.00	1	166.00
GGOOSE_547	38217	8/19/2009	606256.66	3469820.26	4	175.00	8.00	1	167.00
GGOOSE_547	38301	11/11/2009	606256.66	3469820.26	4	188.00	8.00	1	180.00
GOAR_G4	29592	1/7/1986	601596.4	3468580	1	850.00	364.34	1	485.66
HOBAN	37678	2/27/2008	601705.85	3468880.33	1	510.00	829.01	1	-319.01
HOBAN	37748	5/7/2008	601705.85	3468880.33	1	670.00	830.17	1	-160.17
HOBAN	37816	7/14/2008	601705.85	3468880.33	1	690.00	831.26	1	-141.26
HOBAN	37910	10/16/2008	601705.85	3468880.33	1	692.00	832.83	1	-140.83
HOBAN	38014	1/28/2009	601705.85	3468880.33	1	580.00	834.53	1	-254.53
HOBAN	38091	4/15/2009	601705.85	3468880.33	1	700.00	835.77	1	-135.77
HOBAN	38181	7/14/2009	601705.85	3468880.33	1	670.00	837.19	1	-167.19
HOBAN	38274	10/15/2009	601705.85	3468880.33	1	670.00	838.63	1	-168.63
HOBAN	38412	3/2/2010	601705.85	3468880.33	1	580.00	840.73	1	-260.73
HOBAN	38959	8/31/2011	601705.85	3468880.33	1	893.00	848.45	1	44.55
HOBAN	39064	12/14/2011	601705.85	3468880.33	1	944.00	849.89	1	94.11
HOBAN	39113	2/1/2012	601705.85	3468880.33	1	993.00	850.57	1	142.43
HOBAN	39191	4/19/2012	601705.85	3468880.33	1	868.00	851.65	1	16.35
HOBAN	39274	7/11/2012	601705.85	3468880.33	1	1110.00	852.76	1	257.24
HOBAN	39372	10/17/2012	601705.85	3468880.33	1	1040.00	854.13	1	185.87
HOWARD	37684	3/4/2008	601281.22	3468770.19	1	571.00	592.25	1	-21.25
HOWARD	37749	5/8/2008	601281.22	3468770.19	1	673.00	593.84	1	79.16
HOWARD	37755	5/14/2008	601281.22	3468770.19	1	23.70	593.98	1	-570.28
HOWARD	37816	7/14/2008	601281.22	3468770.19	1	610.00	595.46	1	14.54
HOWARD	37826	7/24/2008	601281.22	3468770.19	1	18.00	595.71	1	-577.71
HOWARD	37909	10/15/2008	601281.22	3468770.19	1	683.00	597.74	1	85.26
HOWARD	37910	10/16/2008	601281.22	3468770.19	1	19.00	597.77	1	-578.77
HOWARD	38006	1/20/2009	601281.22	3468770.19	1	19.80	600.10	1	-580.30
HOWARD	38014	1/28/2009	601281.22	3468770.19	1	640.00	600.29	1	39.71
HOWARD	38091	4/15/2009	601281.22	3468770.19	1	620.00	602.14	1	17.86
HOWARD	38182	7/15/2009	601281.22	3468770.19	1	640.00	604.29	1	35.71
HOWARD	38271	10/12/2009	601281.22	3468770.19	1	600.00	606.37	1	-6.37
HOWARD	38378	1/27/2010	601281.22	3468770.19	1	440.00	608.84	1	-168.84
HOWARD	38462	4/21/2010	601281.22	3468770.19	1	710.00	610.74	1	99.26
HOWARD	38551	7/19/2010	601281.22	3468770.19	1	548.00	612.70	1	-64.70
HOWARD	38642	10/18/2010	601281.22	3468770.19	1	568.00	614.69	1	-46.69
HOWARD	38733	1/17/2011	601281.22	3468770.19	1	520.00	616.65	1	-96.65
HOWARD	38817	4/11/2011	601281.22	3468770.19	1	616.00	618.48	1	-2.48
HOWARD	38954	8/26/2011	601281.22	3468770.19	1	498.00	621.49	1	-123.49
HOWARD	39000	10/11/2011	601281.22	3468770.19	1	545.00	622.50	1	-77.50
HOWARD	39113	2/1/2012	601281.22	3468770.19	1	630.00	625.00	1	5.00
HOWARD	39185	4/13/2012	601281.22	3468770.19	1	632.00	626.60	1	5.40
HOWARD	39338	9/13/2012	601281.22	3468770.19	1	699.00	630.03	1	68.97
HOWARD	39371	10/16/2012	601281.22	3468770.19	1	576.00	630.78	1	-54.78
HOWARD_312	39308	8/14/2012	601308.92	3468772.63	2	69.20	24.87	1	44.33
HOWARD_312	39371	10/16/2012	601308.92	3468772.63	2	68.10	24.96	1	43.14
KEEFER	37657	2/6/2008	599879.18	3468119.02	1	6.80	44.40	1	-37.60
KEEFER	37747	5/6/2008	599879.18	3468119.02	1	9.00	44.65	1	-35.65
KEEFER	37818	7/16/2008	599879.18	3468119.02	1	8.00	44.84	1	-36.84
KEEFER	37922	10/28/2008	599879.18	3468119.02	1	21.20	45.12	1	-23.92
KEEFER	38014	1/28/2009	599879.18	3468119.02	1	6.10	45.36	1	-39.26

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
KEEFER	38092	4/16/2009	599879.18	3468119.02	1	7.70	45.56	1	-37.86
KEEFER	38181	7/14/2009	599879.18	3468119.02	1	7.00	45.78	1	-38.78
KEEFER	38272	10/13/2009	599879.18	3468119.02	1	8.70	46.00	1	-37.30
KEEFER	38377	1/26/2010	599879.18	3468119.02	1	7.30	46.25	1	-38.95
KEEFER	38461	4/20/2010	599879.18	3468119.02	1	8.77	46.44	1	-37.67
KEEFER	38547	7/15/2010	599879.18	3468119.02	1	8.84	46.64	1	-37.80
KEEFER	38643	10/19/2010	599879.18	3468119.02	1	7.89	46.86	1	-38.97
KEEFER	38734	1/18/2011	599879.18	3468119.02	1	7.24	47.05	1	-39.81
KEEFER	38812	4/6/2011	599879.18	3468119.02	1	8.04	47.21	1	-39.17
KEEFER	38915	7/18/2011	599879.18	3468119.02	1	7.79	47.40	1	-39.61
KEEFER	39000	10/11/2011	599879.18	3468119.02	1	7.98	47.55	1	-39.57
KEEFER	39118	2/6/2012	599879.18	3468119.02	1	6.84	47.73	1	-40.89
KEEFER	39195	4/23/2012	599879.18	3468119.02	1	7.14	47.83	1	-40.69
KEEFER	39280	7/17/2012	599879.18	3468119.02	1	7.29	47.93	1	-40.64
KEEFER	39364	10/9/2012	599879.18	3468119.02	1	8.47	48.02	1	-39.55
MARCELL_OLD	38954	8/26/2011	601162.25	3468600.97	1	669.00	488.04	1	180.96
MARCELL_OLD	38985	9/26/2011	601162.25	3468600.97	1	638.00	488.68	1	149.32
MARCELL_OLD	39042	11/22/2011	601162.25	3468600.97	1	687.00	489.86	1	197.14
MARCELL_OLD	39113	2/1/2012	601162.25	3468600.97	1	705.00	491.36	1	213.64
MARCELL_OLD	39185	4/13/2012	601162.25	3468600.97	1	668.00	492.90	1	175.10
MARCELL_OLD	39276	7/13/2012	601162.25	3468600.97	1	650.00	494.84	1	155.16
MARCELL_OLD	39372	10/17/2012	601162.25	3468600.97	1	660.00	496.93	1	163.07
MCCONNELL_265	37671	2/20/2008	601463.09	3468840.14	1	720.00	707.07	1	12.93
MCCONNELL_265	37747	5/6/2008	601463.09	3468840.14	1	737.00	708.74	1	28.26
MCCONNELL_265	37817	7/15/2008	601463.09	3468840.14	1	700.00	710.24	1	-10.24
MCCONNELL_265	37845	8/12/2008	601463.09	3468840.14	1	725.00	710.86	1	14.14
MCCONNELL_265	37909	10/15/2008	601463.09	3468840.14	1	703.00	712.28	1	-9.28
MCCONNELL_265	38014	1/28/2009	601463.09	3468840.14	1	660.00	714.58	1	-54.58
MCCONNELL_265	38091	4/15/2009	601463.09	3468840.14	1	657.00	716.24	1	-59.24
MCCONNELL_265	38182	7/15/2009	601463.09	3468840.14	1	662.00	718.18	1	-56.18
MCCONNELL_265	38271	10/12/2009	601463.09	3468840.14	1	666.00	720.04	1	-54.04
MCCONNELL_265	38377	1/26/2010	601463.09	3468840.14	1	685.00	722.23	1	-37.23
MCCONNELL_265	38463	4/22/2010	601463.09	3468840.14	1	811.00	723.98	1	87.02
MCCONNELL_265	38553	7/21/2010	601463.09	3468840.14	1	805.00	725.76	1	79.24
MCCONNELL_265	38642	10/18/2010	601463.09	3468840.14	1	775.00	727.50	1	47.50
MCCONNELL_265	38735	1/19/2011	601463.09	3468840.14	1	711.00	729.29	1	-18.29
MCCONNELL_265	38814	4/8/2011	601463.09	3468840.14	1	810.00	730.80	1	79.20
MCCONNELL_265	38909	7/12/2011	601463.09	3468840.14	1	790.00	732.65	1	57.35
MCCONNELL_265	39000	10/11/2011	601463.09	3468840.14	1	845.00	734.42	1	110.58
MCCONNELL_265	39119	2/7/2012	601463.09	3468840.14	1	847.00	736.73	1	110.27
MCCONNELL_265	39183	4/11/2012	601463.09	3468840.14	1	833.00	737.99	1	95.01
MCCONNELL_265	39269	7/6/2012	601463.09	3468840.14	1	851.00	739.64	1	111.36
MCCONNELL_265	39363	10/8/2012	601463.09	3468840.14	1	934.00	741.50	1	192.50
MCCONNELL_459	39290	7/27/2012	601471.71	3468840.68	2	41.00	25.27	1	15.73
MCCONNELL_459	39363	10/8/2012	601471.71	3468840.68	2	43.40	25.36	1	18.04
METZLER	37685	3/5/2008	602123.88	3471229.25	1	317.00	58.54	1	258.46
METZLER	37756	5/15/2008	602123.88	3471229.25	1	329.00	57.47	1	271.53
METZLER	37833	7/31/2008	602123.88	3471229.25	1	317.00	56.33	1	260.67
METZLER	37914	10/20/2008	602123.88	3471229.25	1	305.00	55.16	1	249.84
METZLER	38028	2/11/2009	602123.88	3471229.25	1	321.00	53.54	1	267.46
METZLER	38096	4/20/2009	602123.88	3471229.25	1	313.00	52.61	1	260.39
METZLER	38182	7/15/2009	602123.88	3471229.25	1	293.00	51.46	1	241.54
METZLER	38273	10/14/2009	602123.88	3471229.25	1	315.00	50.28	1	264.72
METZLER	38383	2/1/2010	602123.88	3471229.25	1	286.00	48.87	1	237.13
METZLER	38489	5/18/2010	602123.88	3471229.25	1	330.00	47.56	1	282.44
METZLER	38548	7/16/2010	602123.88	3471229.25	1	330.00	46.86	1	283.14
METZLER	38643	10/19/2010	602123.88	3471229.25	1	319.00	45.77	1	273.23
METZLER	38735	1/19/2011	602123.88	3471229.25	1	298.00	44.72	1	253.28
METZLER	38810	4/4/2011	602123.88	3471229.25	1	323.00	43.88	1	279.12
METZLER	38909	7/12/2011	602123.88	3471229.25	1	312.00	42.83	1	269.17
METZLER	39001	10/12/2011	602123.88	3471229.25	1	301.00	41.89	1	259.11
METZLER	39119	2/7/2012	602123.88	3471229.25	1	326.00	40.72	1	285.28
METZLER	39184	4/12/2012	602123.88	3471229.25	1	320.00	40.09	1	279.91
MILLER_341	29564	12/10/1985	601876.67	3467710.96	1	60.00	35.18	1	24.82
MILLER_342	29565	12/11/1985	604439.27	3467569.37	1	13.00	-1.00	1	14.00
MOORE	37671	2/20/2008	599494.9	3468060	1	7.10	20.62	1	-13.52
MOORE	37749	5/8/2008	599494.9	3468060	1	7.50	20.75	1	-13.25
MOORE	37818	7/16/2008	599494.9	3468060	1	9.80	20.86	1	-11.06
MOORE	37923	10/29/2008	599494.9	3468060	1	19.20	21.04	1	-1.84
MOORE	38015	1/29/2009	599494.9	3468060	1	6.60	21.19	1	-14.59
MOORE	38092	4/16/2009	599494.9	3468060	1	6.40	21.32	1	-14.92
MOORE	38182	7/15/2009	599494.9	3468060	1	5.80	21.46	1	-15.66
MOORE	38272	10/13/2009	599494.9	3468060	1	7.10	21.61	1	-14.51
MOORE	38377	1/26/2010	599494.9	3468060	1	6.30	21.78	1	-15.48
MOORE	38463	4/22/2010	599494.9	3468060	1	7.40	21.92	1	-14.52
MOORE	38547	7/15/2010	599494.9	3468060	1	7.54	22.05	1	-14.51
MOORE	38643	10/19/2010	599494.9	3468060	1	7.14	22.21	1	-15.07
MOORE	38734	1/18/2011	599494.9	3468060	1	6.42	22.35	1	-15.93
MOORE	38812	4/6/2011	599494.9	3468060	1	6.70	22.46	1	-15.76
MOORE	38910	7/13/2011	599494.9	3468060	1	7.62	22.59	1	-14.97
MOORE	39000	10/11/2011	599494.9	3468060	1	7.31	22.71	1	-15.40
MOORE	39112	1/31/2012	599494.9	3468060	1	7.21	22.85	1	-15.64
MOORE	39195	4/23/2012	599494.9	3468060	1	6.99	22.93	1	-15.94
MOORE	39280	7/17/2012	599494.9	3468060	1	7.01	23.01	1	-16.00

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
MOORE	39363	10/8/2012	599494.9	3468060	1	7.51	23.09	1	-15.58
NSD-01	33897	10/21/1997	598080.4	3468647	1	14.00	7.95	1	6.05
NSD-01	35823	1/29/2003	598080.4	3468647	1	11.60	7.94	1	3.66
NSD-01	36256	4/6/2004	598080.4	3468647	1	26.00	7.94	1	18.06
NSD-01	36564	2/8/2005	598080.4	3468647	1	14.00	7.94	1	6.06
NSD-01	36713	7/7/2005	598080.4	3468647	1	15.00	7.94	1	7.06
NSD-01	36839	11/10/2005	598080.4	3468647	1	14.00	7.94	1	6.06
NSD-01	36935	2/14/2006	598080.4	3468647	1	9.00	7.94	1	1.06
NSD-01	37305	2/19/2007	598080.4	3468647	1	17.10	7.94	1	9.16
NSD-01	37480	8/13/2007	598080.4	3468647	1	18.40	7.94	1	10.46
NSD-02	33897	10/21/1997	598884.42	3468847.3	1	25.00	11.93	1	13.07
NSD-02	35341	10/4/2001	598884.42	3468847.3	1	18.20	12.93	1	5.27
NSD-02	35823	1/29/2003	598884.42	3468847.3	1	34.20	13.18	1	21.02
NSD-02	36256	4/6/2004	598884.42	3468847.3	1	16.00	13.42	1	2.58
NSD-02	36564	2/8/2005	598884.42	3468847.3	1	43.00	13.56	1	29.44
NSD-02	36713	7/7/2005	598884.42	3468847.3	1	44.00	13.64	1	30.36
NSD-02	36839	11/10/2005	598884.42	3468847.3	1	48.00	13.72	1	34.28
NSD-02	36935	2/14/2006	598884.42	3468847.3	1	73.00	13.87	1	59.13
NSD-02	37305	2/19/2007	598884.42	3468847.3	1	54.00	15.12	1	38.88
NSD-02	37480	8/13/2007	598884.42	3468847.3	1	67.30	16.51	1	50.79
NSD-02	37656	2/5/2008	598884.42	3468847.3	1	43.00	17.79	1	25.21
NSD-02	37809	7/7/2008	598884.42	3468847.3	1	44.00	18.79	1	25.21
NSD-03	33897	10/21/1997	598076.92	3468637.5	1	122.00	7.95	1	114.05
NSD-03	35159	4/5/2001	598076.92	3468637.5	1	109.00	7.95	1	101.06
NSD-03	36256	4/6/2004	598076.92	3468637.5	1	94.00	7.94	1	86.06
NSD-03	36564	2/8/2005	598076.92	3468637.5	1	85.00	7.94	1	77.06
NSD-03	36713	7/7/2005	598076.92	3468637.5	1	58.90	7.94	1	50.96
NSD-03	36839	11/10/2005	598076.92	3468637.5	1	80.00	7.94	1	72.06
NSD-03	36935	2/14/2006	598076.92	3468637.5	1	39.00	7.94	1	31.06
NSD-03	37305	2/19/2007	598076.92	3468637.5	1	76.00	7.94	1	68.06
NSD-03	37480	8/13/2007	598076.92	3468637.5	1	0.14	7.94	1	-7.80
NSD-03	37656	2/5/2008	598076.92	3468637.5	1	70.70	7.94	1	62.76
NSD-03	37809	7/7/2008	598076.92	3468637.5	1	58.90	7.94	1	50.96
NWC-01	33464	8/14/1996	599987.68	3467340.93	1	7.30	8.46	1	-1.16
NWC-02	33464	8/14/1996	600182.65	3467464.6	1	7.80	9.66	1	-1.86
NWC-02	37921	10/27/2008	600182.65	3467464.6	1	5.10	10.46	1	-5.36
NWC-02	38029	2/12/2009	600182.65	3467464.6	1	6.60	10.48	1	-3.88
NWC-02	38099	4/23/2009	600182.65	3467464.6	1	6.40	10.49	1	-4.09
NWC-02	38188	7/21/2009	600182.65	3467464.6	1	5.00	10.50	1	-5.50
NWC-02	38280	10/21/2009	600182.65	3467464.6	1	6.80	10.52	1	-3.72
NWC-02	38385	2/3/2010	600182.65	3467464.6	1	8.50	10.53	1	-2.03
NWC-02	38462	4/21/2010	600182.65	3467464.6	1	7.26	10.54	1	-3.28
NWC-02R	37921	10/27/2008	600177.44	3467474.67	1	5.10	10.65	1	-5.55
NWC-02R	38029	2/12/2009	600177.44	3467474.67	1	6.60	10.67	1	-4.07
NWC-02R	38099	4/23/2009	600177.44	3467474.67	1	6.40	10.69	1	-4.29
NWC-02R	38188	7/21/2009	600177.44	3467474.67	1	5.00	10.70	1	-5.70
NWC-02R	38280	10/21/2009	600177.44	3467474.67	1	6.80	10.72	1	-3.92
NWC-02R	38385	2/3/2010	600177.44	3467474.67	1	8.50	10.74	1	-2.24
NWC-02R	38462	4/21/2010	600177.44	3467474.67	1	7.26	10.75	1	-3.49
NWC-02R	38552	7/20/2010	600177.44	3467474.67	1	6.87	10.76	1	-3.89
NWC-02R	38643	10/19/2010	600177.44	3467474.67	1	7.39	10.78	1	-3.39
NWC-02R	38734	1/18/2011	600177.44	3467474.67	1	6.43	10.79	1	-4.36
NWC-02R	38812	4/6/2011	600177.44	3467474.67	1	6.40	10.80	1	-4.40
NWC-02R	38912	7/15/2011	600177.44	3467474.67	1	7.24	10.82	1	-3.58
NWC-02R	39002	10/13/2011	600177.44	3467474.67	1	7.31	10.83	1	-3.52
NWC-02R	39111	1/30/2012	600177.44	3467474.67	1	7.78	10.84	1	-3.06
NWC-02R	39197	4/25/2012	600177.44	3467474.67	1	8.42	10.85	1	-2.43
NWC-02R	39281	7/18/2012	600177.44	3467474.67	1	6.99	10.85	1	-3.86
NWC-02R	39365	10/10/2012	600177.44	3467474.67	1	7.46	10.86	1	-3.40
NWC-03	29593	1/8/1986	601153.23	3468344.53	1	21.00	125.62	1	-104.62
NWC-03	33457	8/7/1996	601153.23	3468344.53	1	129.00	213.64	1	-84.64
NWC-03	33912	11/5/1997	601153.23	3468344.53	1	148.00	223.93	1	-75.93
NWC-03	35766	12/3/2002	601153.23	3468344.53	1	215.00	254.48	1	-39.48
NWC-03	36808	10/10/2005	601153.23	3468344.53	1	460.00	274.53	1	185.47
NWC-03	37921	10/27/2008	601153.23	3468344.53	1	489.00	291.25	1	197.75
NWC-03	38029	2/12/2009	601153.23	3468344.53	1	412.00	292.54	1	119.46
NWC-03	38099	4/23/2009	601153.23	3468344.53	1	466.00	293.36	1	172.64
NWC-03	38188	7/21/2009	601153.23	3468344.53	1	458.00	294.36	1	163.64
NWC-03	38280	10/21/2009	601153.23	3468344.53	1	444.00	295.36	1	148.64
NWC-03	38385	2/3/2010	601153.23	3468344.53	1	444.00	296.44	1	147.56
NWC-03	38462	4/21/2010	601153.23	3468344.53	1	433.00	297.18	1	135.82
NWC-03R	36812	10/14/2005	601153.86	3468350.84	1	460.00	279.36	1	180.64
NWC-03R	36838	11/9/2005	601153.86	3468350.84	1	390.00	279.86	1	110.14
NWC-03R	37223	11/29/2006	601153.86	3468350.84	1	360.00	286.93	1	73.07
NWC-03R	37684	3/4/2008	601153.86	3468350.84	1	560.00	293.24	1	266.76
NWC-03R	37781	6/9/2008	601153.86	3468350.84	1	524.00	294.52	1	229.48
NWC-03R	37921	10/27/2008	601153.86	3468350.84	1	489.00	296.32	1	192.68
NWC-03R	38029	2/12/2009	601153.86	3468350.84	1	412.00	297.65	1	114.35
NWC-03R	38099	4/23/2009	601153.86	3468350.84	1	466.00	298.50	1	167.50
NWC-03R	38188	7/21/2009	601153.86	3468350.84	1	458.00	299.54	1	158.46
NWC-03R	38280	10/21/2009	601153.86	3468350.84	1	444.00	300.57	1	143.43
NWC-03R	38385	2/3/2010	601153.86	3468350.84	1	444.00	301.69	1	142.31
NWC-03R	38462	4/21/2010	601153.86	3468350.84	1	433.00	302.46	1	130.54
NWC-03R	38552	7/20/2010	601153.86	3468350.84	1	477.00	303.32	1	173.68

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
NWC-03R	38643	10/19/2010	601153.86	3468350.84	1	432.00	304.17	1	127.83
NWC-03R	38734	1/18/2011	601153.86	3468350.84	1	386.00	305.04	1	80.96
NWC-03R	38812	4/6/2011	601153.86	3468350.84	1	361.00	305.95	1	55.05
NWC-03R	38912	7/15/2011	601153.86	3468350.84	1	386.00	307.13	1	78.87
NWC-03R	39002	10/13/2011	601153.86	3468350.84	1	353.00	308.18	1	44.82
NWC-03R	39111	1/30/2012	601153.86	3468350.84	1	379.00	309.50	1	69.50
NWC-03R	39197	4/25/2012	601153.86	3468350.84	1	346.00	310.65	1	35.35
NWC-03R	39281	7/18/2012	601153.86	3468350.84	1	354.00	311.80	1	42.20
NWC-03R	39365	10/10/2012	601153.86	3468350.84	1	354.00	312.94	1	41.06
NWC-04	33178	11/2/1995	605829.81	3469071.96	3	219.00	23.42	1	195.58
NWC-04	33913	11/6/1997	605829.81	3469071.96	3	314.00	23.77	1	290.23
NWC-04	35766	12/3/2002	605829.81	3469071.96	3	255.00	24.57	1	230.43
NWC-04	36812	10/14/2005	605829.81	3469071.96	3	220.00	24.37	1	195.63
NWC-04	36816	10/18/2005	605829.81	3469071.96	3	220.00	24.37	1	195.63
NWC-04	36838	11/9/2005	605829.81	3469071.96	3	200.00	24.36	1	175.64
NWC-04	37224	11/30/2006	605829.81	3469071.96	3	210.00	24.30	1	185.70
NWC-04	37684	3/4/2008	605829.81	3469071.96	3	240.00	24.22	1	215.78
NWC-04	37781	6/9/2008	605829.81	3469071.96	3	231.00	24.17	1	206.83
NWC-04	37921	10/27/2008	605829.81	3469071.96	3	162.00	24.11	1	137.89
NWC-04	38008	1/22/2009	605829.81	3469071.96	3	184.00	24.09	1	159.91
NWC-04	38029	2/12/2009	605829.81	3469071.96	3	181.00	24.08	1	156.92
NWC-04	38056	3/11/2009	605829.81	3469071.96	3	197.00	24.07	1	172.93
NWC-04	38099	4/23/2009	605829.81	3469071.96	3	188.00	24.06	1	163.94
NWC-04	38134	5/28/2009	605829.81	3469071.96	3	210.00	24.05	1	185.95
NWC-04	38161	6/24/2009	605829.81	3469071.96	3	169.00	24.04	1	144.96
NWC-04	38188	7/21/2009	605829.81	3469071.96	3	193.00	24.03	1	168.97
NWC-04	38217	8/19/2009	605829.81	3469071.96	3	183.00	24.02	1	158.98
NWC-04	38252	9/23/2009	605829.81	3469071.96	3	202.00	24.01	1	177.99
NWC-04	38280	10/21/2009	605829.81	3469071.96	3	191.00	24.00	1	167.00
NWC-04	38308	11/18/2009	605829.81	3469071.96	3	191.00	23.99	1	167.01
NWC-04	38336	12/16/2009	605829.81	3469071.96	3	193.00	23.99	1	169.01
NWC-04	38385	2/3/2010	605829.81	3469071.96	3	167.00	24.05	1	142.95
NWC-04	38418	3/8/2010	605829.81	3469071.96	3	182.00	24.11	1	157.89
NWC-04	38462	4/21/2010	605829.81	3469071.96	3	218.00	24.11	1	193.89
NWC-04	38489	5/18/2010	605829.81	3469071.96	3	210.00	24.07	1	185.93
NWC-04	38517	6/15/2010	605829.81	3469071.96	3	212.00	24.04	1	187.96
NWC-04	38552	7/20/2010	605829.81	3469071.96	3	188.00	24.02	1	163.98
NWC-04	38588	8/25/2010	605829.81	3469071.96	3	196.00	24.02	1	171.98
NWC-04	38623	9/29/2010	605829.81	3469071.96	3	205.00	24.02	1	180.98
NWC-04	38643	10/19/2010	605829.81	3469071.96	3	195.00	24.02	1	170.98
NWC-04	38659	11/4/2010	605829.81	3469071.96	3	197.00	24.02	1	172.98
NWC-04	38699	12/14/2010	605829.81	3469071.96	3	182.00	24.02	1	157.98
NWC-04	38734	1/18/2011	605829.81	3469071.96	3	194.00	24.02	1	169.98
NWC-04	38764	2/17/2011	605829.81	3469071.96	3	169.00	24.01	1	144.99
NWC-04	38792	3/17/2011	605829.81	3469071.96	3	182.00	24.01	1	158.00
NWC-04	38811	4/5/2011	605829.81	3469071.96	3	196.00	24.00	1	172.00
NWC-04	38847	5/11/2011	605829.81	3469071.96	3	175.00	23.98	1	151.02
NWC-04	38884	6/17/2011	605829.81	3469071.96	3	204.00	23.97	1	180.03
NWC-04	38912	7/15/2011	605829.81	3469071.96	3	202.00	23.95	1	178.05
NWC-04	38953	8/25/2011	605829.81	3469071.96	3	195.00	23.94	1	171.06
NWC-04	38985	9/26/2011	605829.81	3469071.96	3	198.00	23.92	1	174.08
NWC-04	39002	10/13/2011	605829.81	3469071.96	3	198.00	23.92	1	174.08
NWC-04	39042	11/22/2011	605829.81	3469071.96	3	201.00	23.90	1	177.10
NWC-04	39058	12/8/2011	605829.81	3469071.96	3	207.00	23.90	1	183.10
NWC-04	39111	1/30/2012	605829.81	3469071.96	3	217.00	23.88	1	193.12
NWC-04	39129	2/17/2012	605829.81	3469071.96	3	203.00	23.87	1	179.13
NWC-04	39156	3/15/2012	605829.81	3469071.96	3	207.00	23.86	1	183.14
NWC-04	39197	4/25/2012	605829.81	3469071.96	3	204.00	23.85	1	180.15
NWC-04	39224	5/22/2012	605829.81	3469071.96	3	178.00	23.84	1	154.16
NWC-04	39239	6/6/2012	605829.81	3469071.96	3	195.00	23.84	1	171.16
NWC-04	39281	7/18/2012	605829.81	3469071.96	3	205.00	23.83	1	181.17
NWC-04	39322	8/28/2012	605829.81	3469071.96	3	208.00	23.81	1	184.19
NWC-04	39338	9/13/2012	605829.81	3469071.96	3	205.00	23.81	1	181.19
NWC-04	39365	10/10/2012	605829.81	3469071.96	3	207.00	23.80	1	183.20
NWC-04_CAPPED	33457	8/7/1996	605825.49	3469074.24	2	248.00	68.79	1	179.21
NWC-04_CAPPED	33913	11/6/1997	605825.49	3469074.24	2	314.00	71.49	1	242.51
NWC-04_CAPPED	35766	12/3/2002	605825.49	3469074.24	2	255.00	76.11	1	178.89
NWC-04_CAPPED	36808	10/10/2005	605825.49	3469074.24	2	220.00	70.75	1	149.25
NWC-05	33457	8/7/1996	606980.11	3469445.64	2	78.90	8.00	1	70.90
NWC-06	34669	12/2/1999	599825.8	3467741.72	1	8.10	12.28	1	-4.18
NWC-06	37684	3/4/2008	599825.8	3467741.72	1	7.90	13.91	1	-6.01
NWC-06	37781	6/9/2008	599825.8	3467741.72	1	7.20	13.98	1	-6.78
NWC-06	37921	10/27/2008	599825.8	3467741.72	1	6.40	14.08	1	-7.68
NWC-06	38029	2/12/2009	599825.8	3467741.72	1	8.00	14.16	1	-6.16
NWC-06	38099	4/23/2009	599825.8	3467741.72	1	7.30	14.20	1	-6.90
NWC-06	38188	7/21/2009	599825.8	3467741.72	1	6.40	14.26	1	-7.86
NWC-06	38280	10/21/2009	599825.8	3467741.72	1	8.00	14.31	1	-6.31
NWC-06	38385	2/3/2010	599825.8	3467741.72	1	7.50	14.37	1	-6.87
NWC-06	38462	4/21/2010	599825.8	3467741.72	1	8.49	14.40	1	-5.91
NWC-06	38552	7/20/2010	599825.8	3467741.72	1	8.59	14.45	1	-5.86
NWC-06	38643	10/19/2010	599825.8	3467741.72	1	8.32	14.50	1	-6.18
NWC-06	38734	1/18/2011	599825.8	3467741.72	1	8.24	14.55	1	-6.31
NWC-06	38812	4/6/2011	599825.8	3467741.72	1	7.76	14.60	1	-6.84
NWC-06	38912	7/15/2011	599825.8	3467741.72	1	8.36	14.65	1	-6.29

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
NWC-06	39002	10/13/2011	599825.8	3467741.72	1	8.48	14.69	1	-6.21
NWC-06	39111	1/30/2012	599825.8	3467741.72	1	8.44	14.74	1	-6.30
NWC-06	39197	4/25/2012	599825.8	3467741.72	1	7.11	14.76	1	-7.65
NWC-06	39281	7/18/2012	599825.8	3467741.72	1	8.60	14.77	1	-6.17
NWC-06	39365	10/10/2012	599825.8	3467741.72	1	9.33	14.78	1	-5.45
Old_House_Well	29565	12/11/1985	597619.17	3468714.01	1	20.00	7.96	1	12.04
OSBORN	37676	2/25/2008	607031.82	3470270.55	4	16.40	8.00	1	8.40
OSBORN	37754	5/13/2008	607031.82	3470270.55	4	17.20	8.00	1	9.20
OSBORN	37824	7/22/2008	607031.82	3470270.55	4	17.70	8.00	1	9.70
OSBORN	37910	10/16/2008	607031.82	3470270.55	4	15.90	8.00	1	7.90
OSBORN	38006	1/20/2009	607031.82	3470270.55	4	16.00	8.00	1	8.00
OSBORN	38083	4/7/2009	607031.82	3470270.55	4	17.00	8.00	1	9.00
OSBORN	38216	8/18/2009	607031.82	3470270.55	4	17.40	8.00	1	9.40
OSBORN	38264	10/5/2009	607031.82	3470270.55	4	17.90	8.00	1	9.90
OSBORN	38372	1/21/2010	607031.82	3470270.55	4	15.60	8.00	1	7.60
OSBORN	38460	4/19/2010	607031.82	3470270.55	4	19.30	8.00	1	11.30
OSBORN	38544	7/12/2010	607031.82	3470270.55	4	18.40	8.00	1	10.40
OSBORN	38909	7/12/2011	607031.82	3470270.55	4	19.50	8.00	1	11.50
OSBORN	39115	2/3/2012	607031.82	3470270.55	4	19.20	8.00	1	11.20
PALMER_819	37665	2/14/2008	607724.4	3469545	4	15.90	8.00	1	7.90
PALMER_819	37754	5/13/2008	607724.4	3469545	4	16.60	8.00	1	8.60
PALMER_819	37824	7/22/2008	607724.4	3469545	4	16.20	8.00	1	8.20
PALMER_819	37910	10/16/2008	607724.4	3469545	4	15.90	8.00	1	7.90
PALMER_819	38006	1/20/2009	607724.4	3469545	4	14.30	8.00	1	6.30
PALMER_819	38084	4/8/2009	607724.4	3469545	4	15.40	8.00	1	7.40
PALMER_819	38175	7/8/2009	607724.4	3469545	4	14.30	8.00	1	6.30
PALMER_819	38264	10/5/2009	607724.4	3469545	4	16.20	8.00	1	8.20
PALMER_819	38371	1/20/2010	607724.4	3469545	4	13.80	8.00	1	5.80
PALMER_819	38463	4/22/2010	607724.4	3469545	4	16.70	8.00	1	8.70
PALMER_819	38544	7/12/2010	607724.4	3469545	4	15.70	8.00	1	7.70
PALMER_819	38642	10/18/2010	607724.4	3469545	4	16.50	8.00	1	8.50
PALMER_819	38734	1/18/2011	607724.4	3469545	4	15.70	8.00	1	7.70
PALMER_819	38811	4/5/2011	607724.4	3469545	4	15.80	8.00	1	7.80
PALMER_819	38909	7/12/2011	607724.4	3469545	4	16.40	8.00	1	8.40
PALMER_819	39000	10/11/2011	607724.4	3469545	4	17.00	8.00	1	9.00
PALMER_819	39115	2/3/2012	607724.4	3469545	4	17.10	8.00	1	9.10
PALMER_819	39183	4/11/2012	607724.4	3469545	4	17.30	8.00	1	9.30
PALMER_819	39273	7/10/2012	607724.4	3469545	4	16.60	8.00	1	8.60
PALMER_819	39358	10/3/2012	607724.4	3469545	4	17.60	8.00	1	9.60
PANAGAKOS	37732	4/21/2008	605311.68	3469320.99	2	410.00	72.00	1	338.00
PANAGAKOS	37823	7/21/2008	605311.68	3469320.99	2	444.00	71.36	1	372.64
PANAGAKOS	37907	10/13/2008	605311.68	3469320.99	2	480.00	70.80	1	409.20
PANAGAKOS	38008	1/22/2009	605311.68	3469320.99	2	397.00	70.14	1	326.86
PANAGAKOS	38085	4/9/2009	605311.68	3469320.99	2	431.00	69.66	1	361.34
PANAGAKOS	38176	7/9/2009	605311.68	3469320.99	2	490.00	69.12	1	420.88
PANAGAKOS	38265	10/6/2009	605311.68	3469320.99	2	472.00	68.62	1	403.38
PANAGAKOS	38372	1/21/2010	605311.68	3469320.99	2	318.00	68.04	1	249.96
PANAGAKOS	38461	4/20/2010	605311.68	3469320.99	2	608.00	67.60	1	540.40
PANAGAKOS	38552	7/20/2010	605311.68	3469320.99	2	706.00	67.18	1	638.82
PANAGAKOS	38642	10/18/2010	605311.68	3469320.99	2	568.00	66.77	1	501.23
PANAGAKOS	38911	7/14/2011	605311.68	3469320.99	2	223.00	65.59	1	157.41
PANAGAKOS	38953	8/25/2011	605311.68	3469320.99	2	222.00	65.42	1	156.58
PANAGAKOS	39118	2/6/2012	605311.68	3469320.99	2	166.00	64.78	1	101.22
PANAGAKOS	39141	2/29/2012	605311.68	3469320.99	2	362.00	64.70	1	297.30
PANAGAKOS	39156	3/15/2012	605311.68	3469320.99	2	282.00	64.64	1	217.36
PANAGAKOS	39184	4/12/2012	605311.68	3469320.99	2	346.00	64.54	1	281.46
PANAGAKOS	39272	7/9/2012	605311.68	3469320.99	2	292.00	64.22	1	227.78
PARRA	37662	2/11/2008	602170.72	3471263.55	1	360.00	47.41	1	312.59
PARRA	37756	5/15/2008	602170.72	3471263.55	1	405.00	46.18	1	358.82
PARRA	37833	7/31/2008	602170.72	3471263.55	1	404.00	45.19	1	358.81
PARRA	37914	10/20/2008	602170.72	3471263.55	1	387.00	44.18	1	342.82
PARRA	38030	2/13/2009	602170.72	3471263.55	1	405.00	42.75	1	362.25
PARRA	38096	4/20/2009	602170.72	3471263.55	1	372.00	41.97	1	330.03
PARRA	38187	7/20/2009	602170.72	3471263.55	1	375.00	40.91	1	334.09
PARRA	38279	10/20/2009	602170.72	3471263.55	1	388.00	39.88	1	348.12
PARRA	38383	2/1/2010	602170.72	3471263.55	1	353.00	38.73	1	314.27
PARRA	38463	4/22/2010	602170.72	3471263.55	1	417.00	37.88	1	379.12
PARRA	38546	7/14/2010	602170.72	3471263.55	1	403.00	37.02	1	365.98
PARRA	38644	10/20/2010	602170.72	3471263.55	1	411.00	36.05	1	374.95
PARRA	38735	1/19/2011	602170.72	3471263.55	1	391.00	35.16	1	355.84
PARRA	38810	4/4/2011	602170.72	3471263.55	1	382.00	34.44	1	347.56
PARRA	38909	7/12/2011	602170.72	3471263.55	1	404.00	33.54	1	370.46
PARRA	39001	10/12/2011	602170.72	3471263.55	1	406.00	32.73	1	373.27
PARRA	39119	2/7/2012	602170.72	3471263.55	1	428.00	31.74	1	396.26
PARRA	39185	4/13/2012	602170.72	3471263.55	1	402.00	31.20	1	370.80
PARRA	39281	7/18/2012	602170.72	3471263.55	1	418.00	30.45	1	387.55
PARRA	39364	10/9/2012	602170.72	3471263.55	1	428.00	29.83	1	398.17
PIONKE	37657	2/6/2008	600936.29	3468836.65	1	394.00	469.40	1	-75.40
PIONKE	37748	5/7/2008	600936.29	3468836.65	1	391.00	471.94	1	-80.94
PIONKE	37819	7/17/2008	600936.29	3468836.65	1	420.00	473.96	1	-53.96
PIONKE	37845	8/12/2008	600936.29	3468836.65	1	423.00	474.68	1	-51.68
PIONKE	37921	10/27/2008	600936.29	3468836.65	1	460.00	476.78	1	-16.78
PIONKE	38015	1/29/2009	600936.29	3468836.65	1	385.00	479.35	1	-94.35
PIONKE	38090	4/14/2009	600936.29	3468836.65	1	411.00	481.38	1	-70.38

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
PIONKE	38180	7/13/2009	600936.29	3468836.65	1	472.00	483.79	1	-11.79
PIONKE	38266	10/7/2009	600936.29	3468836.65	1	403.00	486.08	1	-83.08
PIONKE	38418	3/8/2010	600936.29	3468836.65	1	406.00	490.01	1	-84.01
PIONKE	38467	4/26/2010	600936.29	3468836.65	1	438.00	491.25	1	-53.25
PIONKE	38547	7/15/2010	600936.29	3468836.65	1	474.00	493.25	1	-19.25
PIONKE	38642	10/18/2010	600936.29	3468836.65	1	487.00	495.62	1	-8.62
PIONKE	38735	1/19/2011	600936.29	3468836.65	1	471.00	497.91	1	-26.91
PIONKE	38814	4/8/2011	600936.29	3468836.65	1	467.00	499.88	1	-32.88
PIONKE	38909	7/12/2011	600936.29	3468836.65	1	500.00	502.29	1	-2.29
PIONKE	39000	10/11/2011	600936.29	3468836.65	1	502.00	504.60	1	-2.60
PIONKE	39113	2/1/2012	600936.29	3468836.65	1	481.00	507.48	1	-26.48
PIONKE	39184	4/12/2012	600936.29	3468836.65	1	508.00	509.32	1	-1.32
PIONKE	39274	7/11/2012	600936.29	3468836.65	1	439.00	511.70	1	-72.70
PIONKE	39372	10/17/2012	600936.29	3468836.65	1	419.00	514.28	1	-95.28
PIONKE_517	39343	9/18/2012	600909.97	3468866.65	2	14.00	146.07	1	-132.07
PIONKE_517	39366	10/11/2012	600909.97	3468866.65	2	14.90	146.33	1	-131.43
POOL	37671	2/20/2008	599683.6	3470013.82	1	134.00	22.60	1	111.40
POOL	37760	5/19/2008	599683.6	3470013.82	1	122.00	22.78	1	99.22
POOL	37833	7/31/2008	599683.6	3470013.82	1	117.00	22.93	1	94.07
POOL	37915	10/21/2008	599683.6	3470013.82	1	120.00	23.11	1	96.89
POOL	38030	2/13/2009	599683.6	3470013.82	1	141.00	23.35	1	117.65
POOL	38097	4/21/2009	599683.6	3470013.82	1	124.00	23.49	1	100.51
POOL	38187	7/20/2009	599683.6	3470013.82	1	122.00	23.69	1	98.31
POOL	38279	10/20/2009	599683.6	3470013.82	1	122.00	23.89	1	98.11
POOL	38406	2/24/2010	599683.6	3470013.82	1	110.00	24.17	1	85.83
POOL	38463	4/22/2010	599683.6	3470013.82	1	130.00	24.29	1	105.71
POOL	38546	7/14/2010	599683.6	3470013.82	1	117.00	24.48	1	92.52
POOL	38644	10/20/2010	599683.6	3470013.82	1	115.00	24.70	1	90.30
POOL	38736	1/20/2011	599683.6	3470013.82	1	112.00	24.91	1	87.09
POOL	38812	4/6/2011	599683.6	3470013.82	1	114.00	25.08	1	88.92
RAMIREZ	37655	2/4/2008	599730.65	3467584.36	1	7.60	9.87	1	-2.27
RAMIREZ	37747	5/6/2008	599730.65	3467584.36	1	8.30	9.88	1	-1.58
RAMIREZ	37819	7/17/2008	599730.65	3467584.36	1	8.80	9.90	1	-1.10
RAMIREZ	37921	10/27/2008	599730.65	3467584.36	1	7.30	9.92	1	-2.62
RAMIREZ	38015	1/29/2009	599730.65	3467584.36	1	8.30	9.93	1	-1.63
RAMIREZ	38092	4/16/2009	599730.65	3467584.36	1	7.60	9.95	1	-2.35
RAMIREZ	38177	7/10/2009	599730.65	3467584.36	1	6.40	9.96	1	-3.56
RAMIREZ	38265	10/6/2009	599730.65	3467584.36	1	8.40	9.98	1	-1.58
RAMIREZ	38376	1/25/2010	599730.65	3467584.36	1	7.80	10.00	1	-2.20
RAMIREZ	38462	4/21/2010	599730.65	3467584.36	1	9.04	10.02	1	-0.98
RAMIREZ	38553	7/21/2010	599730.65	3467584.36	1	8.98	10.04	1	-1.06
RAMIREZ	38643	10/19/2010	599730.65	3467584.36	1	10.80	10.06	1	0.74
RAMIREZ	38734	1/18/2011	599730.65	3467584.36	1	8.18	10.07	1	-1.89
RAMIREZ	38817	4/11/2011	599730.65	3467584.36	1	8.65	10.08	1	-1.43
RAMIREZ	38915	7/18/2011	599730.65	3467584.36	1	8.44	10.10	1	-1.66
RAMIREZ	39001	10/12/2011	599730.65	3467584.36	1	8.55	10.11	1	-1.56
RAMIREZ	39111	1/30/2012	599730.65	3467584.36	1	8.80	10.12	1	-1.32
RAMIREZ	39182	4/10/2012	599730.65	3467584.36	1	8.70	10.13	1	-1.43
RAMIREZ	39269	7/6/2012	599730.65	3467584.36	1	8.97	10.14	1	-1.17
RAMIREZ	39363	10/8/2012	599730.65	3467584.36	1	9.14	10.15	1	-1.01
RAY	37666	2/15/2008	607194.14	3468878.19	2	159.00	8.84	1	150.16
RAY	37732	4/21/2008	607194.14	3468878.19	2	125.00	8.83	1	116.17
RAY	37754	5/13/2008	607194.14	3468878.19	2	123.00	8.83	1	114.17
RAY	37795	6/23/2008	607194.14	3468878.19	2	130.00	8.83	1	121.17
RAY	37831	7/29/2008	607194.14	3468878.19	2	120.00	8.83	1	111.17
RAY	37861	8/28/2008	607194.14	3468878.19	2	129.00	8.83	1	120.17
RAY	37887	9/23/2008	607194.14	3468878.19	2	125.00	8.83	1	116.17
RAY	37916	10/22/2008	607194.14	3468878.19	2	145.00	8.83	1	136.17
RAY	38006	1/20/2009	607194.14	3468878.19	2	88.00	8.82	1	79.18
RAY	38084	4/8/2009	607194.14	3468878.19	2	178.00	8.82	1	169.18
RAY	38176	7/9/2009	607194.14	3468878.19	2	126.00	8.82	1	117.18
RAY	38266	10/7/2009	607194.14	3468878.19	2	127.00	8.81	1	118.19
RAY	38377	1/26/2010	607194.14	3468878.19	2	125.00	8.81	1	116.19
RAY	38461	4/20/2010	607194.14	3468878.19	2	134.00	8.81	1	125.19
RAY	38546	7/14/2010	607194.14	3468878.19	2	137.00	8.80	1	128.20
RAY	38644	10/20/2010	607194.14	3468878.19	2	127.00	8.80	1	118.20
RAY	38733	1/17/2011	607194.14	3468878.19	2	132.00	8.80	1	123.20
RAY	38811	4/5/2011	607194.14	3468878.19	2	132.00	8.79	1	123.21
RAY	38908	7/11/2011	607194.14	3468878.19	2	126.00	8.79	1	117.21
RAY	39001	10/12/2011	607194.14	3468878.19	2	130.00	8.79	1	121.21
RAY	39112	1/31/2012	607194.14	3468878.19	2	131.00	8.78	1	122.22
RAY	39183	4/11/2012	607194.14	3468878.19	2	131.00	8.78	1	122.22
RAY	39269	7/6/2012	607194.14	3468878.19	2	129.00	8.78	1	120.22
RAY	39358	10/3/2012	607194.14	3468878.19	2	130.00	8.77	1	121.23
ROGERS_596	38278	10/19/2009	600894.1	3468271	1	590.00	190.89	1	399.11
ROGERS_596	38295	11/5/2009	600894.1	3468271	1	540.00	190.98	1	349.02
ROGERS_596	38407	2/25/2010	600894.1	3468271	1	520.00	191.58	1	328.42
ROGERS_596	38463	4/22/2010	600894.1	3468271	1	710.00	191.87	1	518.13
ROGERS_803	37658	2/7/2008	601003.22	3468480.03	1	138.00	347.94	1	-209.94
ROGERS_803	37700	3/20/2008	601003.22	3468480.03	1	125.00	348.87	1	-223.87
ROGERS_803	37732	4/21/2008	601003.22	3468480.03	1	128.00	349.55	1	-221.55
ROGERS_803	37749	5/8/2008	601003.22	3468480.03	1	141.00	349.92	1	-208.92
ROGERS_803	37795	6/23/2008	601003.22	3468480.03	1	129.00	350.89	1	-221.89
ROGERS_803	37831	7/29/2008	601003.22	3468480.03	1	134.00	351.66	1	-217.66

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
ROGERS_803	37861	8/28/2008	601003.22	3468480.03	1	128.00	352.29	1	-224.29
ROGERS_803	37887	9/23/2008	601003.22	3468480.03	1	133.00	352.85	1	-219.85
ROGERS_803	37916	10/22/2008	601003.22	3468480.03	1	144.00	353.45	1	-209.45
ROGERS_803	38027	2/10/2009	601003.22	3468480.03	1	141.00	355.75	1	-214.75
ROGERS_803	38105	4/29/2009	601003.22	3468480.03	1	211.00	357.34	1	-146.34
ROGERS_803	38201	8/3/2009	601003.22	3468480.03	1	150.00	359.27	1	-209.27
ROGERS_803	38278	10/19/2009	601003.22	3468480.03	1	590.00	360.80	1	229.20
ROGERS_803	38295	11/5/2009	601003.22	3468480.03	1	540.00	361.13	1	178.87
ROGERS_803	38548	7/16/2010	601003.22	3468480.03	1	169.00	365.83	1	-196.83
ROGERS_803	38643	10/19/2010	601003.22	3468480.03	1	154.00	367.54	1	-213.54
ROGERS_803	38736	1/20/2011	601003.22	3468480.03	1	143.00	369.22	1	-226.22
ROGERS_803	38814	4/8/2011	601003.22	3468480.03	1	160.00	370.70	1	-210.70
ROGERS_803	38911	7/14/2011	601003.22	3468480.03	1	166.00	372.58	1	-206.58
ROGERS_803	39001	10/12/2011	601003.22	3468480.03	1	175.00	374.31	1	-199.31
ROGERS_803	39111	1/30/2012	601003.22	3468480.03	1	171.00	376.47	1	-205.47
ROGERS_803	39195	4/23/2012	601003.22	3468480.03	1	166.00	378.22	1	-212.22
ROGERS_803	39276	7/13/2012	601003.22	3468480.03	1	171.00	379.92	1	-208.92
ROGERS_803	39365	10/10/2012	601003.22	3468480.03	1	177.00	381.79	1	-204.79
ROGERS_E	37655	2/4/2008	599895.4	3468264	1	4.60	53.97	1	-49.37
ROGERS_E	37748	5/7/2008	599895.4	3468264	1	5.90	54.10	1	-48.20
ROGERS_E	37819	7/17/2008	599895.4	3468264	1	7.10	54.20	1	-47.10
ROGERS_E	37921	10/27/2008	599895.4	3468264	1	15.70	54.32	1	-38.62
ROGERS_E	38027	2/10/2009	599895.4	3468264	1	5.40	54.43	1	-49.03
ROGERS_E	38092	4/16/2009	599895.4	3468264	1	4.90	54.49	1	-49.59
ROGERS_E	38180	7/13/2009	599895.4	3468264	1	3.80	54.57	1	-50.77
ROGERS_E	38265	10/6/2009	599895.4	3468264	1	5.80	54.64	1	-48.84
ROGERS_E	38376	1/25/2010	599895.4	3468264	1	5.10	54.72	1	-49.62
ROGERS_E	38462	4/21/2010	599895.4	3468264	1	6.04	54.78	1	-48.74
ROGERS_E	38553	7/21/2010	599895.4	3468264	1	6.47	54.84	1	-48.37
ROGERS_E	38643	10/19/2010	599895.4	3468264	1	5.92	54.89	1	-48.97
ROGERS_E	38734	1/18/2011	599895.4	3468264	1	5.50	54.95	1	-49.45
ROGERS_E	38817	4/11/2011	599895.4	3468264	1	6.13	55.01	1	-48.88
ROGERS_E	38915	7/18/2011	599895.4	3468264	1	6.00	55.10	1	-49.10
ROGERS_E	39002	10/13/2011	599895.4	3468264	1	5.99	55.18	1	-49.19
ROGERS_E	39111	1/30/2012	599895.4	3468264	1	6.22	55.28	1	-49.06
ROGERS_E	39182	4/10/2012	599895.4	3468264	1	6.31	55.38	1	-49.07
ROGERS_E	39280	7/17/2012	599895.4	3468264	1	5.85	55.52	1	-49.67
ROGERS_E	39372	10/17/2012	599895.4	3468264	1	6.04	55.63	1	-49.59
RUIZ	37656	2/5/2008	602857.36	3471424.22	1	263.00	88.13	1	174.87
RUIZ	37756	5/15/2008	602857.36	3471424.22	1	265.00	87.22	1	177.78
RUIZ	37832	7/30/2008	602857.36	3471424.22	1	243.00	86.62	1	156.38
RUIZ	37914	10/20/2008	602857.36	3471424.22	1	238.00	85.85	1	152.15
RUIZ	38029	2/12/2009	602857.36	3471424.22	1	254.00	85.05	1	168.95
RUIZ	38097	4/21/2009	602857.36	3471424.22	1	227.00	84.51	1	142.49
RUIZ	38201	8/3/2009	602857.36	3471424.22	1	221.00	83.96	1	137.04
RUIZ	38287	10/28/2009	602857.36	3471424.22	1	220.00	83.38	1	136.62
RUIZ	38383	2/1/2010	602857.36	3471424.22	1	236.00	83.08	1	152.92
RUIZ	38467	4/26/2010	602857.36	3471424.22	1	240.00	82.72	1	157.28
RUIZ	38552	7/20/2010	602857.36	3471424.22	1	240.00	82.25	1	157.75
RUIZ	38644	10/20/2010	602857.36	3471424.22	1	231.00	81.60	1	149.40
RUIZ	38734	1/18/2011	602857.36	3471424.22	1	213.00	81.29	1	131.71
RUIZ	38814	4/8/2011	602857.36	3471424.22	1	236.00	80.79	1	155.21
RUIZ	38954	8/26/2011	602857.36	3471424.22	1	220.00	80.12	1	139.88
RUIZ	39002	10/13/2011	602857.36	3471424.22	1	230.00	79.93	1	150.07
RUIZ	39119	2/7/2012	602857.36	3471424.22	1	230.00	79.54	1	150.46
RUIZ	39185	4/13/2012	602857.36	3471424.22	1	203.00	79.40	1	123.60
RUIZ	39281	7/18/2012	602857.36	3471424.22	1	214.00	79.38	1	134.62
RUIZ	39364	10/9/2012	602857.36	3471424.22	1	229.00	79.06	1	149.94
SCHWARTZ	37659	2/8/2008	600810.96	3468269.68	1	158.00	170.80	1	-12.80
SCHWARTZ	37732	4/21/2008	600810.96	3468269.68	1	122.00	171.34	1	-49.34
SCHWARTZ	37754	5/13/2008	600810.96	3468269.68	1	130.00	171.52	1	-41.52
SCHWARTZ	37760	5/19/2008	600810.96	3468269.68	1	130.00	171.57	1	-41.57
SCHWARTZ	37795	6/23/2008	600810.96	3468269.68	1	129.00	171.85	1	-42.85
SCHWARTZ	37831	7/29/2008	600810.96	3468269.68	1	245.00	172.10	1	72.90
SCHWARTZ	37861	8/28/2008	600810.96	3468269.68	1	131.00	172.31	1	-41.31
SCHWARTZ	37887	9/23/2008	600810.96	3468269.68	1	124.00	172.49	1	-48.49
SCHWARTZ	37916	10/22/2008	600810.96	3468269.68	1	135.00	172.68	1	-37.68
SCHWARTZ	37944	11/19/2008	600810.96	3468269.68	1	140.00	172.85	1	-32.85
SCHWARTZ	37972	12/17/2008	600810.96	3468269.68	1	144.00	173.03	1	-29.03
SCHWARTZ	38015	1/29/2009	600810.96	3468269.68	1	124.00	173.30	1	-49.30
SCHWARTZ	38040	2/23/2009	600810.96	3468269.68	1	123.00	173.46	1	-50.46
SCHWARTZ	38093	4/17/2009	600810.96	3468269.68	1	120.00	173.78	1	-53.78
SCHWARTZ	38177	7/10/2009	600810.96	3468269.68	1	116.00	174.27	1	-58.27
SCHWARTZ	38265	10/6/2009	600810.96	3468269.68	1	120.00	174.76	1	-54.76
SCHWARTZ	38373	1/22/2010	600810.96	3468269.68	1	133.00	175.32	1	-42.32
SCHWARTZ	38462	4/21/2010	600810.96	3468269.68	1	129.00	175.74	1	-46.74
SCHWARTZ	38553	7/21/2010	600810.96	3468269.68	1	134.00	176.16	1	-42.16
SCHWARTZ	38643	10/19/2010	600810.96	3468269.68	1	147.00	176.55	1	-29.55
SCHWARTZ	38733	1/17/2011	600810.96	3468269.68	1	116.00	176.94	1	-60.94
SCHWARTZ	38817	4/11/2011	600810.96	3468269.68	1	128.00	177.44	1	-49.44
SCHWARTZ	38915	7/18/2011	600810.96	3468269.68	1	116.00	178.05	1	-62.05
SCHWARTZ	39001	10/12/2011	600810.96	3468269.68	1	124.00	178.58	1	-54.58
SCHWARTZ	39118	2/6/2012	600810.96	3468269.68	1	116.00	179.37	1	-63.37
SCHWARTZ	39182	4/10/2012	600810.96	3468269.68	1	120.00	179.91	1	-59.91

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
SCHWARTZ	39279	7/16/2012	600810.96	3468269.68	1	117.00	180.78	1	-63.78
SCHWARTZ	39372	10/17/2012	600810.96	3468269.68	1	121.00	181.56	1	-60.56
SRC	37734	4/23/2008	599722.47	3472503.26	3	19.00	8.01	1	10.99
SRC	37838	8/5/2008	599722.47	3472503.26	3	15.40	8.01	1	7.39
SUNBELT	37657	2/6/2008	605998.25	3471735.15	4	18.70	26.39	1	-7.69
SWAN	37664	2/13/2008	607378.55	3470648.3	4	24.10	8.00	1	16.10
SWAN	37755	5/14/2008	607378.55	3470648.3	4	23.70	8.00	1	15.70
SWAN	37826	7/24/2008	607378.55	3470648.3	4	220.00	8.00	1	212.00
SWAN	37910	10/16/2008	607378.55	3470648.3	4	19.00	8.00	1	11.00
SWAN	38006	1/20/2009	607378.55	3470648.3	4	19.80	8.00	1	11.80
SWAN	38083	4/7/2009	607378.55	3470648.3	4	19.90	8.00	1	11.90
SWAN	38083	4/7/2009	607378.55	3470648.3	4	19.90	8.00	1	11.90
SWAN	38175	7/8/2009	607378.55	3470648.3	4	18.50	8.00	1	10.50
SWAN	38264	10/5/2009	607378.55	3470648.3	4	19.70	8.00	1	11.70
SWAN	38372	1/21/2010	607378.55	3470648.3	4	18.40	8.00	1	10.40
SWAN	38462	4/21/2010	607378.55	3470648.3	4	20.90	8.00	1	12.90
SWAN	38551	7/19/2010	607378.55	3470648.3	4	22.20	8.00	1	14.20
SWAN	38734	1/18/2011	607378.55	3470648.3	4	18.70	8.00	1	10.70
SWAN	38909	7/12/2011	607378.55	3470648.3	4	19.10	8.00	1	11.10
SWAN	39115	2/3/2012	607378.55	3470648.3	4	20.10	8.00	1	12.10
SWAN	39273	7/10/2012	607378.55	3470648.3	4	19.40	8.00	1	11.40
TM-01	30713	2/1/1989	604096.2	3470517	1	1650.00	1180.38	1	469.62
TM-01	30742	3/2/1989	604096.2	3470517	1	1630.00	1184.47	1	445.53
TM-01	30788	4/17/1989	604096.2	3470517	1	1660.00	1188.97	1	471.03
TM-01	30818	5/17/1989	604096.2	3470517	1	1450.00	1190.49	1	259.51
TM-01	30855	6/23/1989	604096.2	3470517	1	146.00	1193.33	1	-1047.33
TM-01	30863	7/1/1989	604096.2	3470517	1	1600.00	1194.04	1	405.96
TM-01	30894	8/1/1989	604096.2	3470517	1	1620.00	1196.38	1	423.62
TM-01	30925	9/1/1989	604096.2	3470517	1	1520.00	1199.27	1	320.73
TM-01	30955	10/1/1989	604096.2	3470517	1	1600.00	1202.31	1	397.69
TM-01	31016	12/1/1989	604096.2	3470517	1	1500.00	1206.00	1	294.00
TM-01	31047	1/1/1990	604096.2	3470517	1	1480.00	1208.62	1	271.38
TM-02	30708	1/27/1989	604077.6	3471921	1	2600.00	2499.21	1	100.80
TM-02	30739	2/27/1989	604077.6	3471921	1	2500.00	2499.22	1	0.78
TM-02	30777	4/6/1989	604077.6	3471921	1	2700.00	2499.25	1	200.75
TM-02	30802	5/1/1989	604077.6	3471921	1	2890.00	2499.28	1	390.72
TM-02	30840	6/8/1989	604077.6	3471921	1	2900.00	2499.33	1	400.67
TM-02	30875	7/13/1989	604077.6	3471921	1	2640.00	2499.39	1	140.61
TM-02	30895	8/2/1989	604077.6	3471921	1	2950.00	2499.43	1	450.57
TM-02	30936	9/12/1989	604077.6	3471921	1	2700.00	2499.51	1	200.49
TM-02	30970	10/16/1989	604077.6	3471921	1	2800.00	2499.58	1	300.43
TM-02	30998	11/13/1989	604077.6	3471921	1	2840.00	2499.63	1	340.37
TM-02	31026	12/11/1989	604077.6	3471921	1	2700.00	2499.68	1	200.32
TM-02	31050	1/4/1990	604077.6	3471921	1	2800.00	2499.72	1	300.28
TM-02	32469	11/23/1993	604077.6	3471921	1	2200.00	2490.04	1	-290.04
TM-02	33409	6/20/1996	604077.6	3471921	1	1200.00	2473.14	1	-1273.14
TM-02	33437	7/18/1996	604077.6	3471921	1	1156.00	2472.68	1	-1316.68
TM-02	33456	8/6/1996	604077.6	3471921	1	1300.00	2472.38	1	-1172.38
TM-02	33814	7/30/1997	604077.6	3471921	1	1290.00	2466.19	1	-1176.19
TM-02	33913	11/6/1997	604077.6	3471921	1	1210.00	2464.11	1	-1254.11
TM-02	35753	11/20/2002	604077.6	3471921	1	1320.00	2409.63	1	-1089.63
TM-02A	30736	2/24/1989	604152.06	3472008.79	4	640.00	26.91	1	613.09
TM-02A	30743	3/3/1989	604152.06	3472008.79	4	26.00	26.93	1	-0.93
TM-02A	30777	4/6/1989	604152.06	3472008.79	4	27.00	27.04	1	-0.04
TM-02A	30802	5/1/1989	604152.06	3472008.79	4	29.00	27.11	1	1.89
TM-02A	30840	6/8/1989	604152.06	3472008.79	4	27.00	27.23	1	-0.23
TM-02A	30875	7/13/1989	604152.06	3472008.79	4	24.00	27.34	1	-3.34
TM-02A	30900	8/7/1989	604152.06	3472008.79	4	27.00	27.41	1	-0.41
TM-02A	30936	9/12/1989	604152.06	3472008.79	4	26.00	27.52	1	-1.52
TM-02A	30970	10/16/1989	604152.06	3472008.79	4	26.00	27.63	1	-1.63
TM-02A	30998	11/13/1989	604152.06	3472008.79	4	27.00	27.71	1	-0.71
TM-02A	31026	12/11/1989	604152.06	3472008.79	4	26.00	27.80	1	-1.80
TM-02A	31050	1/4/1990	604152.06	3472008.79	4	27.00	27.87	1	-0.87
TM-02A	32469	11/23/1993	604152.06	3472008.79	4	20.00	31.66	1	-11.66
TM-02A	33413	6/24/1996	604152.06	3472008.79	4	15.00	33.69	1	-18.69
TM-02A	37684	3/4/2008	604152.06	3472008.79	4	12.30	44.14	1	-31.84
TM-02A	37764	5/23/2008	604152.06	3472008.79	4	14.70	44.36	1	-29.66
TM-02A	37848	8/15/2008	604152.06	3472008.79	4	14.40	44.59	1	-30.19
TM-02A	37924	10/30/2008	604152.06	3472008.79	4	21.90	44.79	1	-22.89
TM-02A	38041	2/24/2009	604152.06	3472008.79	4	20.30	45.11	1	-24.81
TM-02A	38112	5/6/2009	604152.06	3472008.79	4	18.70	45.31	1	-26.61
TM-02A	38210	8/12/2009	604152.06	3472008.79	4	20.00	45.57	1	-25.57
TM-02A	38294	11/4/2009	604152.06	3472008.79	4	21.80	45.81	1	-24.01
TM-02A	38420	3/10/2010	604152.06	3472008.79	4	21.40	46.15	1	-24.75
TM-02A	38447	4/6/2010	604152.06	3472008.79	4	25.60	46.23	1	-20.63
TM-02A	38448	4/7/2010	604152.06	3472008.79	4	25.60	46.23	1	-20.63
TM-02A	38538	7/6/2010	604152.06	3472008.79	4	22.10	46.48	1	-24.38
TM-02A	38757	2/10/2011	604152.06	3472008.79	4	22.90	47.10	1	-24.20
TM-02A	38910	7/13/2011	604152.06	3472008.79	4	22.50	47.53	1	-25.03
TM-02A	39114	2/2/2012	604152.06	3472008.79	4	23.00	48.11	1	-25.11
TM-02A	39308	8/14/2012	604152.06	3472008.79	4	23.40	48.67	1	-25.27
TM-05_MILLER	33415	6/26/1996	603896.91	3467185.24	1	10.00	7.98	1	2.02
TM-06_MILLER	33415	6/26/1996	606124.4	3468324	2	29.00	8.01	1	20.99
TM-06_MILLER	37678	2/27/2008	606124.4	3468324	2	13.90	8.01	1	5.89

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
TM-06_MILLER	37761	5/20/2008	606124.4	3468324	2	32.70	8.01	1	24.69
TM-06_MILLER	37837	8/4/2008	606124.4	3468324	2	31.30	8.01	1	23.29
TM-06_MILLER	37923	10/29/2008	606124.4	3468324	2	34.50	8.01	1	26.49
TM-06_MILLER	38043	2/26/2009	606124.4	3468324	2	32.70	8.01	1	24.69
TM-06_MILLER	38119	5/13/2009	606124.4	3468324	2	30.60	8.01	1	22.59
TM-06_MILLER	38216	8/18/2009	606124.4	3468324	2	30.90	8.01	1	22.89
TM-06_MILLER	38302	11/12/2009	606124.4	3468324	2	31.10	8.01	1	23.09
TM-06_MILLER	38455	4/14/2010	606124.4	3468324	2	29.00	8.01	1	20.99
TM-06_MILLER	38534	7/2/2010	606124.4	3468324	2	29.80	8.01	1	21.79
TM-06_MILLER	38918	7/21/2011	606124.4	3468324	2	31.70	8.01	1	23.69
TM-06_MILLER	39272	7/9/2012	606124.4	3468324	2	33.50	8.01	1	25.49
TM-08_SWAN	37664	2/13/2008	607769.66	3470649.12	4	12.60	8.00	1	4.60
TM-08_SWAN	37755	5/14/2008	607769.66	3470649.12	4	12.60	8.00	1	4.60
TM-08_SWAN	37825	7/23/2008	607769.66	3470649.12	4	12.60	8.00	1	4.60
TM-10_USBP	30711	1/30/1989	601666.4	3471898	2	16.00	8.00	1	8.00
TM-10_USBP	30742	3/2/1989	601666.4	3471898	2	16.00	8.00	1	8.00
TM-10_USBP	30778	4/7/1989	601666.4	3471898	2	16.00	8.00	1	8.00
TM-10_USBP	30803	5/2/1989	601666.4	3471898	2	12.00	8.00	1	4.00
TM-10_USBP	30839	6/7/1989	601666.4	3471898	2	17.00	8.00	1	9.00
TM-10_USBP	30876	7/14/1989	601666.4	3471898	2	18.00	8.00	1	10.00
TM-10_USBP	30903	8/10/1989	601666.4	3471898	2	14.00	8.00	1	6.00
TM-10_USBP	30931	9/7/1989	601666.4	3471898	2	15.00	8.00	1	7.00
TM-10_USBP	30964	10/10/1989	601666.4	3471898	2	15.00	8.00	1	7.00
TM-10_USBP	30999	11/14/1989	601666.4	3471898	2	15.00	8.00	1	7.00
TM-10_USBP	31019	12/4/1989	601666.4	3471898	2	15.00	8.00	1	7.00
TM-10_USBP	31049	1/3/1990	601666.4	3471898	2	17.00	8.00	1	9.00
TM-10_USBP	39058	12/8/2011	601666.4	3471898	2	16.80	8.00	1	8.80
TM-10_USBP	39156	3/15/2012	601666.4	3471898	2	15.10	8.00	1	7.10
TM-10_USBP	39196	4/24/2012	601666.4	3471898	2	13.40	8.00	1	5.40
TM-10_USBP	39338	9/13/2012	601666.4	3471898	2	13.30	8.00	1	5.30
TM-10_USBP	39374	10/19/2012	601666.4	3471898	2	12.80	8.00	1	4.80
TM-11_PIONKE	30705	1/24/1989	600892.3	3468876	1	9.00	237.17	1	-228.17
TM-11_PIONKE	30739	2/27/1989	600892.3	3468876	1	10.00	238.23	1	-228.23
TM-11_PIONKE	30775	4/4/1989	600892.3	3468876	1	9.00	239.36	1	-230.36
TM-11_PIONKE	30802	5/1/1989	600892.3	3468876	1	10.00	240.21	1	-230.21
TM-11_PIONKE	30838	6/6/1989	600892.3	3468876	1	11.00	241.34	1	-230.34
TM-11_PIONKE	30874	7/12/1989	600892.3	3468876	1	8.00	242.48	1	-234.48
TM-11_PIONKE	30900	8/7/1989	600892.3	3468876	1	7.00	243.30	1	-236.30
TM-11_PIONKE	30931	9/7/1989	600892.3	3468876	1	16.00	244.27	1	-228.27
TM-11_PIONKE	30964	10/10/1989	600892.3	3468876	1	9.00	245.32	1	-236.32
TM-11_PIONKE	30993	11/8/1989	600892.3	3468876	1	9.00	246.24	1	-237.24
TM-11_PIONKE	31019	12/4/1989	600892.3	3468876	1	9.00	247.06	1	-238.06
TM-11_PIONKE	31049	1/3/1990	600892.3	3468876	1	9.00	248.01	1	-239.01
TM-12_MILLER	33415	6/26/1996	601576.82	3467164.29	1	7.00	8.13	1	-1.13
TM-14_NELSON	37659	2/8/2008	599687.6	3470076	1	32.90	17.72	1	15.18
TM-14_NELSON	37660	2/9/2008	599687.6	3470076	1	32.90	17.73	1	15.17
TM-15_MILLER	33416	6/27/1996	599617.33	3471427.5	2	14.00	8.02	1	5.98
TM-15_MILLER	37678	2/27/2008	599617.33	3471427.5	2	14.00	8.01	1	5.99
TM-15_MILLER	37764	5/23/2008	599617.33	3471427.5	2	14.40	8.01	1	6.39
TM-15_MILLER	37838	8/5/2008	599617.33	3471427.5	2	13.70	8.01	1	5.69
TM-15_MILLER	37922	10/28/2008	599617.33	3471427.5	2	18.60	8.01	1	10.59
TM-15_MILLER	38043	2/26/2009	599617.33	3471427.5	2	14.60	8.01	1	6.59
TM-15_MILLER	38119	5/13/2009	599617.33	3471427.5	2	13.70	8.01	1	5.69
TM-15_MILLER	38215	8/17/2009	599617.33	3471427.5	2	14.20	8.01	1	6.19
TM-15_MILLER	38293	11/3/2009	599617.33	3471427.5	2	14.80	8.01	1	6.79
TM-15_MILLER	38406	2/24/2010	599617.33	3471427.5	2	14.40	8.01	1	6.39
TM-15_MILLER	38468	4/27/2010	599617.33	3471427.5	2	14.90	8.01	1	6.89
TM-15_MILLER	38552	7/20/2010	599617.33	3471427.5	2	14.30	8.01	1	6.29
TM-15_MILLER	38909	7/12/2011	599617.33	3471427.5	2	14.20	8.01	1	6.19
TM-15_MILLER	39273	7/10/2012	599617.33	3471427.5	2	14.90	8.01	1	6.89
TM-16	30708	1/27/1989	605588.32	3469842.06	2	510.00	248.33	1	261.67
TM-16	30741	3/1/1989	605588.32	3469842.06	2	560.00	248.29	1	311.71
TM-16	30777	4/6/1989	605588.32	3469842.06	2	555.00	248.25	1	306.75
TM-16	30804	5/3/1989	605588.32	3469842.06	2	535.00	248.22	1	286.78
TM-16	30833	6/1/1989	605588.32	3469842.06	2	560.00	248.18	1	311.82
TM-16	30875	7/13/1989	605588.32	3469842.06	2	540.00	248.12	1	291.88
TM-16	30901	8/8/1989	605588.32	3469842.06	2	508.00	248.09	1	259.91
TM-16	30932	9/8/1989	605588.32	3469842.06	2	510.00	248.04	1	261.96
TM-16	30965	10/11/1989	605588.32	3469842.06	2	500.00	248.00	1	252.00
TM-16	30998	11/13/1989	605588.32	3469842.06	2	500.00	247.95	1	252.05
TM-16	31022	12/7/1989	605588.32	3469842.06	2	520.00	247.92	1	272.08
TM-16	31050	1/4/1990	605588.32	3469842.06	2	520.00	247.88	1	272.12
TM-16	33416	6/27/1996	605588.32	3469842.06	2	500.00	231.86	1	268.14
TM-16	33456	8/6/1996	605588.32	3469842.06	2	470.00	231.20	1	238.80
TM-16	33626	1/23/1997	605588.32	3469842.06	2	484.00	228.27	1	255.73
TM-16	33813	7/29/1997	605588.32	3469842.06	2	500.00	224.82	1	275.18
TM-16	33913	11/6/1997	605588.32	3469842.06	2	506.00	222.90	1	283.10
TM-16	37685	3/5/2008	605588.32	3469842.06	2	497.00	160.77	1	336.23
TM-16	37763	5/22/2008	605588.32	3469842.06	2	522.00	160.04	1	361.96
TM-16	37839	8/6/2008	605588.32	3469842.06	2	466.00	159.35	1	306.65
TM-16	37930	11/5/2008	605588.32	3469842.06	2	547.00	158.56	1	388.44
TM-16	38037	2/20/2009	605588.32	3469842.06	2	492.00	157.65	1	334.35
TM-16	38119	5/13/2009	605588.32	3469842.06	2	484.00	156.97	1	327.03
TM-16	38217	8/19/2009	605588.32	3469842.06	2	468.00	156.19	1	311.81

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
TM-16	38300	11/10/2009	605588.32	3469842.06	2	505.00	155.55	1	349.45
TM-16	38412	3/2/2010	605588.32	3469842.06	2	451.00	154.70	1	296.30
TM-16	38455	4/14/2010	605588.32	3469842.06	2	484.00	154.39	1	329.61
TM-16	38534	7/2/2010	605588.32	3469842.06	2	474.00	153.81	1	320.19
TM-16	38911	7/14/2011	605588.32	3469842.06	2	511.00	151.27	1	359.73
TM-16	38913	7/16/2011	605588.32	3469842.06	2	513.00	151.26	1	361.74
TM-16	39272	7/9/2012	605588.32	3469842.06	2	544.00	149.08	1	394.92
TM-19	30711	1/30/1989	602523.69	3469075.71	1	50.00	1016.48	1	-966.48
TM-19	30741	3/1/1989	602523.69	3469075.71	1	54.00	1016.97	1	-962.97
TM-19	30778	4/7/1989	602523.69	3469075.71	1	55.00	1017.57	1	-962.57
TM-19	30803	5/2/1989	602523.69	3469075.71	1	50.00	1017.97	1	-967.97
TM-19	30841	6/9/1989	602523.69	3469075.71	1	55.00	1018.58	1	-963.58
TM-19	30875	7/13/1989	602523.69	3469075.71	1	55.00	1019.13	1	-964.13
TM-19	30901	8/8/1989	602523.69	3469075.71	1	53.00	1019.54	1	-966.54
TM-19	30935	9/11/1989	602523.69	3469075.71	1	58.00	1020.08	1	-962.08
TM-19	30967	10/13/1989	602523.69	3469075.71	1	58.00	1020.58	1	-962.58
TM-19	30999	11/14/1989	602523.69	3469075.71	1	58.00	1021.08	1	-963.08
TM-19	31022	12/7/1989	602523.69	3469075.71	1	58.00	1021.44	1	-963.44
TM-19	31050	1/4/1990	602523.69	3469075.71	1	62.00	1021.88	1	-959.88
TM-19	32469	11/23/1993	602523.69	3469075.71	1	63.00	1041.80	1	-978.80
TM-19	33414	6/25/1996	602523.69	3469075.71	1	56.00	1050.41	1	-994.41
TM-19	37686	3/6/2008	602523.69	3469075.71	1	56.10	1066.77	1	-1010.67
TM-19	37763	5/22/2008	602523.69	3469075.71	1	64.50	1066.84	1	-1002.34
TM-19	37839	8/6/2008	602523.69	3469075.71	1	55.30	1066.90	1	-1011.60
TM-19A	30711	1/30/1989	602458.71	3469189.79	2	1100.00	12.08	1	1087.92
TM-19A	30741	3/1/1989	602458.71	3469189.79	2	1100.00	12.09	1	1087.91
TM-19A	30778	4/7/1989	602458.71	3469189.79	2	1180.00	12.10	1	1167.90
TM-19A	30803	5/2/1989	602458.71	3469189.79	2	1125.00	12.10	1	1112.90
TM-19A	30841	6/9/1989	602458.71	3469189.79	2	1070.00	12.11	1	1057.89
TM-19A	30875	7/13/1989	602458.71	3469189.79	2	1120.00	12.12	1	1107.88
TM-19A	30901	8/8/1989	602458.71	3469189.79	2	1110.00	12.13	1	1097.87
TM-19A	30932	9/8/1989	602458.71	3469189.79	2	1080.00	12.13	1	1067.87
TM-19A	30967	10/13/1989	602458.71	3469189.79	2	1200.00	12.14	1	1187.86
TM-19A	30999	11/14/1989	602458.71	3469189.79	2	1100.00	12.15	1	1087.85
TM-19A	31022	12/7/1989	602458.71	3469189.79	2	1120.00	12.16	1	1107.84
TM-19A	31050	1/4/1990	602458.71	3469189.79	2	1120.00	12.16	1	1107.84
TM-19A	32469	11/23/1993	602458.71	3469189.79	2	1100.00	12.49	1	1087.51
TM-19A	33409	6/20/1996	602458.71	3469189.79	2	1100.00	12.68	1	1087.32
TM-19A	33456	8/6/1996	602458.71	3469189.79	2	1200.00	12.69	1	1187.31
TM-19A	33626	1/23/1997	602458.71	3469189.79	2	1140.00	12.72	1	1127.28
TM-19A	37686	3/6/2008	602458.71	3469189.79	2	56.10	13.76	1	42.34
TM-19A	37763	5/22/2008	602458.71	3469189.79	2	64.50	13.77	1	50.73
TM-19A	37839	8/6/2008	602458.71	3469189.79	2	55.30	13.78	1	41.52
TM-19A	37943	11/18/2008	602458.71	3469189.79	2	66.30	13.80	1	52.50
TM-19A	38048	3/3/2009	602458.71	3469189.79	2	66.20	13.82	1	52.38
TM-19A	38098	4/22/2009	602458.71	3469189.79	2	62.50	13.82	1	48.68
TM-19A	38210	8/12/2009	602458.71	3469189.79	2	61.30	13.84	1	47.46
TM-19A	38294	11/4/2009	602458.71	3469189.79	2	63.00	13.85	1	49.15
TM-19A	38420	3/10/2010	602458.71	3469189.79	2	60.60	13.87	1	46.73
TM-19A	38450	4/9/2010	602458.71	3469189.79	2	66.50	13.88	1	52.62
TM-19A	38539	7/7/2010	602458.71	3469189.79	2	63.20	13.89	1	49.31
TM-19A	38761	2/14/2011	602458.71	3469189.79	2	61.90	13.92	1	47.98
TM-19A	38912	7/15/2011	602458.71	3469189.79	2	62.10	13.95	1	48.15
TM-19A	39114	2/2/2012	602458.71	3469189.79	2	62.20	13.98	1	48.22
TM-19A	39273	7/10/2012	602458.71	3469189.79	2	63.70	14.00	1	49.70
TM-41	33814	7/30/1997	604839.63	3471299.39	2	1940.00	1724.95	1	215.05
TM-41	33913	11/6/1997	604839.63	3471299.39	2	1900.00	1698.58	1	201.42
TM-42	33814	7/30/1997	603698.27	3469104.9	2	985.00	205.85	1	779.15
TM-42	33913	11/6/1997	603698.27	3469104.9	2	958.00	205.80	1	752.20
TM-42	37685	3/5/2008	603698.27	3469104.9	2	482.00	204.30	1	277.70
TM-42	37763	5/22/2008	603698.27	3469104.9	2	483.00	204.28	1	278.72
TM-42	37839	8/6/2008	603698.27	3469104.9	2	467.00	204.25	1	262.75
TM-42	37931	11/6/2008	603698.27	3469104.9	2	477.00	204.22	1	272.78
TM-42	38035	2/18/2009	603698.27	3469104.9	2	429.00	204.18	1	224.82
TM-42	38113	5/7/2009	603698.27	3469104.9	2	430.00	204.16	1	225.84
TM-42	38216	8/18/2009	603698.27	3469104.9	2	428.00	204.12	1	223.88
TM-42	38293	11/3/2009	603698.27	3469104.9	2	430.00	204.10	1	225.90
TM-42	38406	2/24/2010	603698.27	3469104.9	2	390.00	204.06	1	185.94
TM-42	38460	4/19/2010	603698.27	3469104.9	2	444.00	204.04	1	239.96
TM-42	38534	7/2/2010	603698.27	3469104.9	2	407.00	204.01	1	202.99
TM-42	38909	7/12/2011	603698.27	3469104.9	2	441.00	203.86	1	237.14
TM-42	39121	2/9/2012	603698.27	3469104.9	2	444.00	203.78	1	240.22
TM-42	39274	7/11/2012	603698.27	3469104.9	2	449.00	203.71	1	245.29
TVI_236	37672	2/21/2008	600552.21	3467978.43	1	41.90	68.80	1	-26.90
TVI_236	37700	3/20/2008	600552.21	3467978.43	1	31.30	68.89	1	-37.59
TVI_236	37748	5/7/2008	600552.21	3467978.43	1	32.60	69.06	1	-36.46
TVI_236	37817	7/15/2008	600552.21	3467978.43	1	37.60	69.30	1	-31.70
TVI_236	37909	10/15/2008	600552.21	3467978.43	1	36.60	69.56	1	-32.96
TVI_236	38028	2/11/2009	600552.21	3467978.43	1	27.60	69.87	1	-42.27
TVI_236	38093	4/17/2009	600552.21	3467978.43	1	28.10	70.03	1	-41.93
TVI_236	38188	7/21/2009	600552.21	3467978.43	1	31.30	70.24	1	-38.94
TVI_236	38278	10/19/2009	600552.21	3467978.43	1	33.20	70.43	1	-37.23
TVI_236	38384	2/2/2010	600552.21	3467978.43	1	26.00	70.61	1	-44.61
TVI_236	38464	4/23/2010	600552.21	3467978.43	1	30.90	70.74	1	-39.84

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
TVI_236	38547	7/15/2010	600552.21	3467978.43	1	39.30	70.93	1	-31.63
TVI_236	38912	7/15/2011	600552.21	3467978.43	1	42.90	71.38	1	-28.48
TVI_236	39279	7/16/2012	600552.21	3467978.43	1	36.30	71.51	1	-35.21
TVI_236	39364	10/9/2012	600552.21	3467978.43	1	40.90	71.53	1	-30.63
TVI_875	37672	2/21/2008	600715.14	3468419.27	1	244.00	232.93	1	11.07
TVI_875	37748	5/7/2008	600715.14	3468419.27	1	250.00	233.62	1	16.38
TVI_875	37817	7/15/2008	600715.14	3468419.27	1	274.00	234.33	1	39.67
TVI_875	37909	10/15/2008	600715.14	3468419.27	1	245.00	235.14	1	9.86
TVI_875	38028	2/11/2009	600715.14	3468419.27	1	312.00	236.14	1	75.86
TVI_875	38093	4/17/2009	600715.14	3468419.27	1	251.00	236.71	1	14.29
TVI_875	38188	7/21/2009	600715.14	3468419.27	1	236.00	237.51	1	-1.51
TVI_875	38278	10/19/2009	600715.14	3468419.27	1	247.00	238.26	1	8.74
TVI_875	38384	2/2/2010	600715.14	3468419.27	1	250.00	239.04	1	10.96
TVI_875	38464	4/23/2010	600715.14	3468419.27	1	294.00	239.60	1	54.40
TVI_875	38547	7/15/2010	600715.14	3468419.27	1	262.00	240.38	1	21.62
TVI_875	38644	10/20/2010	600715.14	3468419.27	1	242.00	241.18	1	0.82
TVI_875	38736	1/20/2011	600715.14	3468419.27	1	226.00	241.93	1	-15.93
TVI_875	38817	4/11/2011	600715.14	3468419.27	1	235.00	242.77	1	-7.77
TVI_875	38912	7/15/2011	600715.14	3468419.27	1	239.00	243.83	1	-4.83
TVI_875	39001	10/12/2011	600715.14	3468419.27	1	262.00	244.81	1	17.19
TVI_875	39115	2/3/2012	600715.14	3468419.27	1	299.00	246.15	1	52.85
TVI_875	39197	4/25/2012	600715.14	3468419.27	1	267.00	247.30	1	19.70
TVI_875	39279	7/16/2012	600715.14	3468419.27	1	261.00	248.49	1	12.51
TVI_875	39364	10/9/2012	600715.14	3468419.27	1	281.00	249.68	1	31.32
TVI_SS2	29564	12/10/1985	600555	3467965.7	1	13.00	41.34	1	-28.34
UN-3	29599	1/14/1986	599949.17	3465796.57	1	6.50	7.96	1	-1.46
WALKER	37664	2/13/2008	607564.69	3468577.47	2	20.00	8.00	1	12.00
WALKER	37825	7/23/2008	607564.69	3468577.47	2	45.40	8.00	1	37.40
WEED	37665	2/14/2008	601434.4	3470924.54	2	11.10	11.98	1	-0.88
WEED	37756	5/15/2008	601434.4	3470924.54	2	12.60	12.01	1	0.59
WEED	37832	7/30/2008	601434.4	3470924.54	2	11.50	12.03	1	-0.53
WEED	37914	10/20/2008	601434.4	3470924.54	2	10.20	12.05	1	-1.85
WEED	38030	2/13/2009	601434.4	3470924.54	2	12.60	12.08	1	0.52
WEED	38098	4/22/2009	601434.4	3470924.54	2	11.60	12.10	1	-0.50
WEED	38183	7/16/2009	601434.4	3470924.54	2	10.80	12.12	1	-1.32
WEED	38279	10/20/2009	601434.4	3470924.54	2	12.70	12.14	1	0.56
WEED	38383	2/1/2010	601434.4	3470924.54	2	12.20	12.17	1	0.03
WEED	38467	4/26/2010	601434.4	3470924.54	2	13.40	12.19	1	1.21
WEED	38553	7/21/2010	601434.4	3470924.54	2	13.60	12.21	1	1.39
WEED	38643	10/19/2010	601434.4	3470924.54	2	11.70	12.23	1	-0.53
WEED	38735	1/19/2011	601434.4	3470924.54	2	12.20	12.25	1	-0.05
WEED	38817	4/11/2011	601434.4	3470924.54	2	13.00	12.27	1	0.73
WEED	38915	7/18/2011	601434.4	3470924.54	2	12.70	12.30	1	0.40
WEED	39001	10/12/2011	601434.4	3470924.54	2	13.30	12.32	1	0.98
WEED	39118	2/6/2012	601434.4	3470924.54	2	13.50	12.35	1	1.15
WEED	39197	4/25/2012	601434.4	3470924.54	2	12.70	12.37	1	0.33
WEED	39268	7/5/2012	601434.4	3470924.54	2	12.90	12.38	1	0.52
WEED	39364	10/9/2012	601434.4	3470924.54	2	14.00	12.41	1	1.59
WEISKOPF	37666	2/15/2008	601154.95	3468658.85	1	500.00	485.19	1	14.81
WEISKOPF	37748	5/7/2008	601154.95	3468658.85	1	483.00	487.21	1	-4.21
WEISKOPF	37818	7/16/2008	601154.95	3468658.85	1	560.00	488.95	1	71.05
WEISKOPF	37922	10/28/2008	601154.95	3468658.85	1	602.00	491.49	1	110.51
WEISKOPF	38015	1/29/2009	601154.95	3468658.85	1	503.00	493.73	1	9.27
WEISKOPF	38091	4/15/2009	601154.95	3468658.85	1	503.00	495.54	1	7.46
WEISKOPF	38182	7/15/2009	601154.95	3468658.85	1	486.00	497.69	1	-11.69
WEISKOPF	38274	10/15/2009	601154.95	3468658.85	1	484.00	499.83	1	-15.83
WEISKOPF	38384	2/2/2010	601154.95	3468658.85	1	451.00	502.35	1	-51.35
WEISKOPF	38463	4/22/2010	601154.95	3468658.85	1	572.00	504.12	1	67.88
WEISKOPF	38551	7/19/2010	601154.95	3468658.85	1	573.00	506.06	1	66.94
WEISKOPF	38644	10/20/2010	601154.95	3468658.85	1	529.00	508.07	1	20.93
WEISKOPF	38733	1/17/2011	601154.95	3468658.85	1	481.00	509.99	1	-28.99
WEISKOPF	38817	4/11/2011	601154.95	3468658.85	1	557.00	511.82	1	45.18
WEISKOPF	38954	8/26/2011	601154.95	3468658.85	1	549.00	514.85	1	34.15
WEISKOPF	39002	10/13/2011	601154.95	3468658.85	1	539.00	515.91	1	23.09
WEISKOPF	39115	2/3/2012	601154.95	3468658.85	1	583.00	518.42	1	64.58
WEISKOPF	39197	4/25/2012	601154.95	3468658.85	1	575.00	520.28	1	54.72
WEISKOPF	39276	7/13/2012	601154.95	3468658.85	1	552.00	522.07	1	29.93
WEISKOPF	39366	10/11/2012	601154.95	3468658.85	1	572.00	524.14	1	47.86
WESTERN_LANDSCAPE	29565	12/11/1985	598685.9	3468855	1	12.00	7.99	1	4.01
WMD2011-3M	39114	2/2/2012	605366.91	3470677.38	2	391.00	113.57	1	277.43
ZANDER	37655	2/4/2008	599678.88	3467998.49	1	5.70	24.36	1	-18.66
ZANDER	37747	5/6/2008	599678.88	3467998.49	1	6.30	24.55	1	-18.25
ZANDER	37818	7/16/2008	599678.88	3467998.49	1	6.90	24.69	1	-17.79
ZANDER	37922	10/28/2008	599678.88	3467998.49	1	15.00	24.89	1	-9.89
ZANDER	38027	2/10/2009	599678.88	3467998.49	1	6.00	25.09	1	-19.09
ZANDER	38092	4/16/2009	599678.88	3467998.49	1	5.50	25.22	1	-19.72
ZANDER	38181	7/14/2009	599678.88	3467998.49	1	4.50	25.39	1	-20.89
ZANDER	38272	10/13/2009	599678.88	3467998.49	1	6.30	25.56	1	-19.26
ZANDER	38377	1/26/2010	599678.88	3467998.49	1	5.70	25.75	1	-20.05
ZANDER	38443	4/2/2010	599678.88	3467998.49	1	6.70	25.88	1	-19.18
ZANDER	38463	4/22/2010	599678.88	3467998.49	1	6.70	25.91	1	-19.21
ZANDER	38553	7/21/2010	599678.88	3467998.49	1	6.78	26.08	1	-19.30
ZANDER	38643	10/19/2010	599678.88	3467998.49	1	6.56	26.24	1	-19.68
ZANDER	38734	1/18/2011	599678.88	3467998.49	1	6.14	26.40	1	-20.26

Table G.5.2
Transport Model Target Statistics

Well Name	Time	Date	Easting (UTM meters)	Northing (UTM meters)	Model Layer	Observed (mg/l)	Computed (mg/l)	Weight	Residual
ZANDER	38812	4/6/2011	599678.88	3467998.49	1	6.12	26.53	1	-20.41
ZANDER	38910	7/13/2011	599678.88	3467998.49	1	6.43	26.68	1	-20.25
ZANDER	39001	10/12/2011	599678.88	3467998.49	1	6.38	26.82	1	-20.44
ZANDER	39112	1/31/2012	599678.88	3467998.49	1	6.59	26.98	1	-20.39
ZANDER	39182	4/10/2012	599678.88	3467998.49	1	6.90	27.07	1	-20.17
ZANDER	39280	7/17/2012	599678.88	3467998.49	1	6.38	27.17	1	-20.79
ZANDER	39363	10/8/2012	599678.88	3467998.49	1	7.03	27.26	1	-20.23

Notes:
UTM = Universal Transverse Mercator Zone 12, North American Datum 1983 (NAD83)
mg/l = milligrams per liter

APPENDIX H

EXHIBITS FOR PREDICTIVE SIMULATIONS

APPENDIX H

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H.1 Alternative 1 Particle Tracking Results; and Predicted Groundwater Elevations and Sulfate Concentration at Public Supply Wells

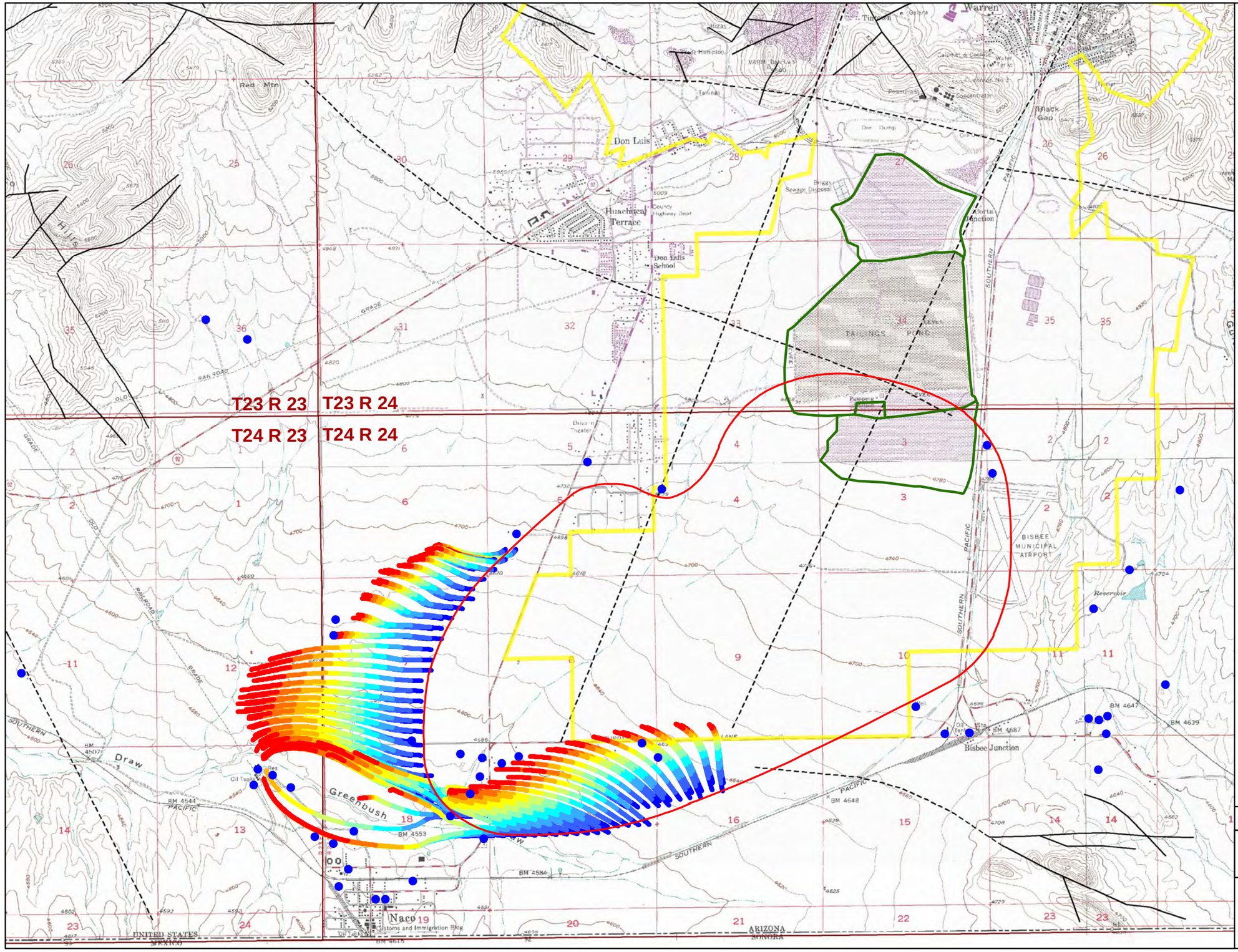
H.2 Alternative 2 Particle Tracking Results; and Predicted Groundwater Elevations and Sulfate Concentration at Public Supply Wells

H.3 Alternative 3 Particle Tracking Results; and Predicted Groundwater Elevations and Sulfate Concentration at Public Supply Wells

H.4 Alternative 4 Particle Tracking Results; and Predicted Groundwater Elevations and Sulfate Concentration at Public Supply Wells

APPENDIX H.1

ALTERNATIVE 1 PARTICLE TRACKING RESULTS; AND PREDICTED GROUNDWATER ELEVATIONS AND SULFATE CONCENTRATION AT PUBLIC SUPPLY WELLS



Legend

Particle Tracks Alternative 1

Year

- 2014 - 2020
- 2021 - 2030
- 2031 - 2040
- 2041 - 2050
- 2051 - 2060
- 2061 - 2070
- 2071 - 2080
- 2081 - 2090
- 2091 - 2100
- 2101 - 2115

Estimated 250 mg/L Sulfate Concentration Contour Q1 2013

Drinking Water Supply Well

CQB Property Boundary

CTSA Facility

Fault (Dashed Where Inferred)

Township and Range

Scale (Feet)

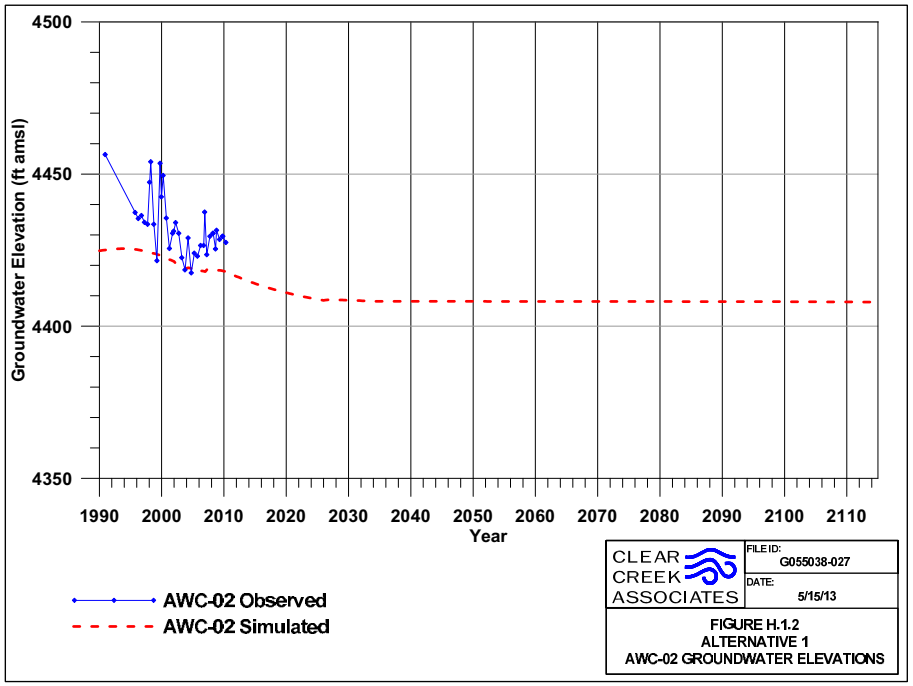
0 3,000 6,000

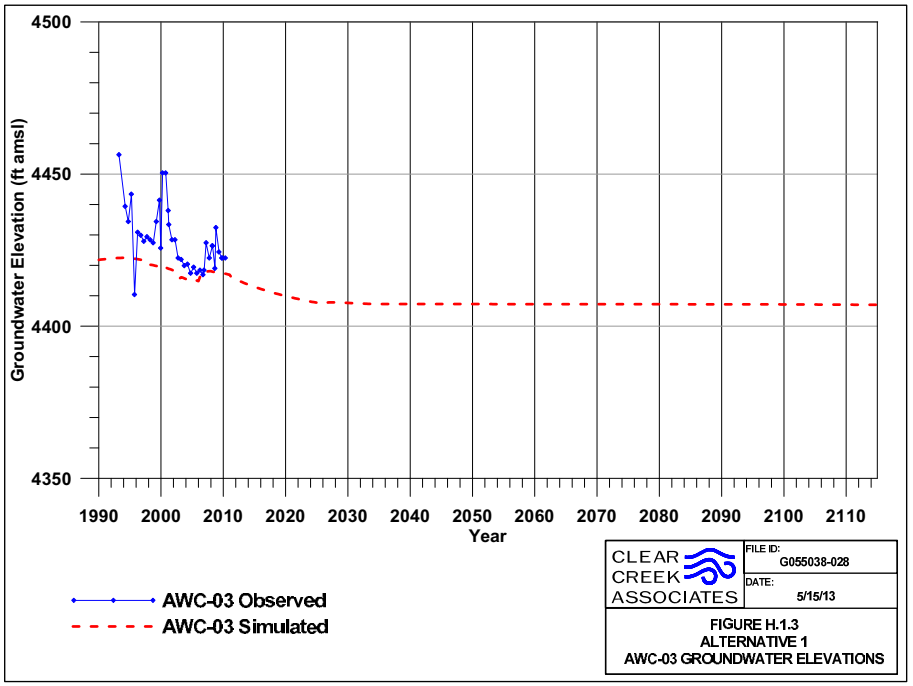
NOTES:
Particles are released in Layer 1 in 2013.
Projection is UTM Zone 12 NAD 83.

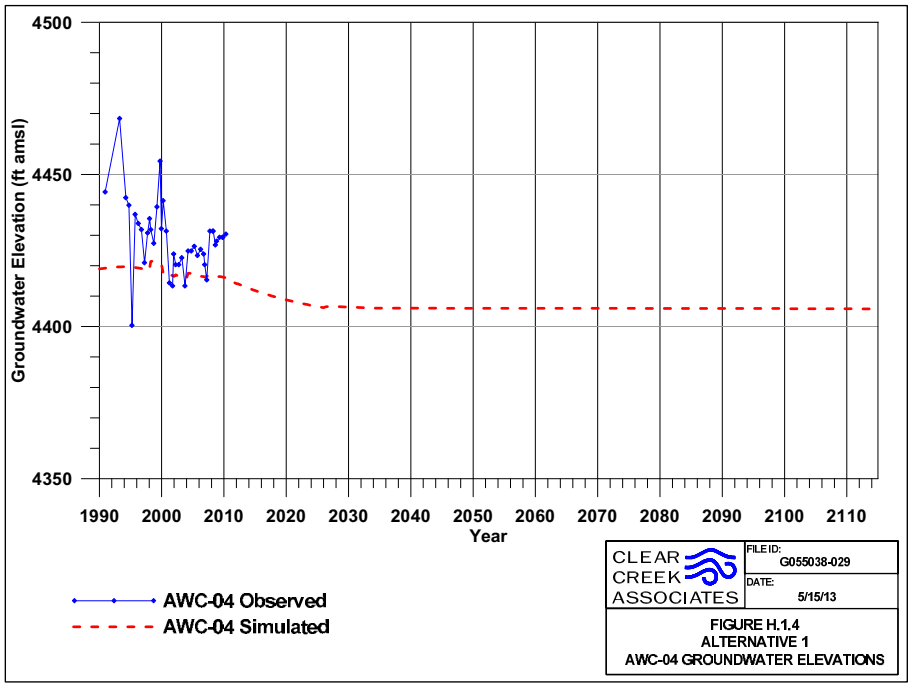
Date	File ID
5/15/13	055038-275

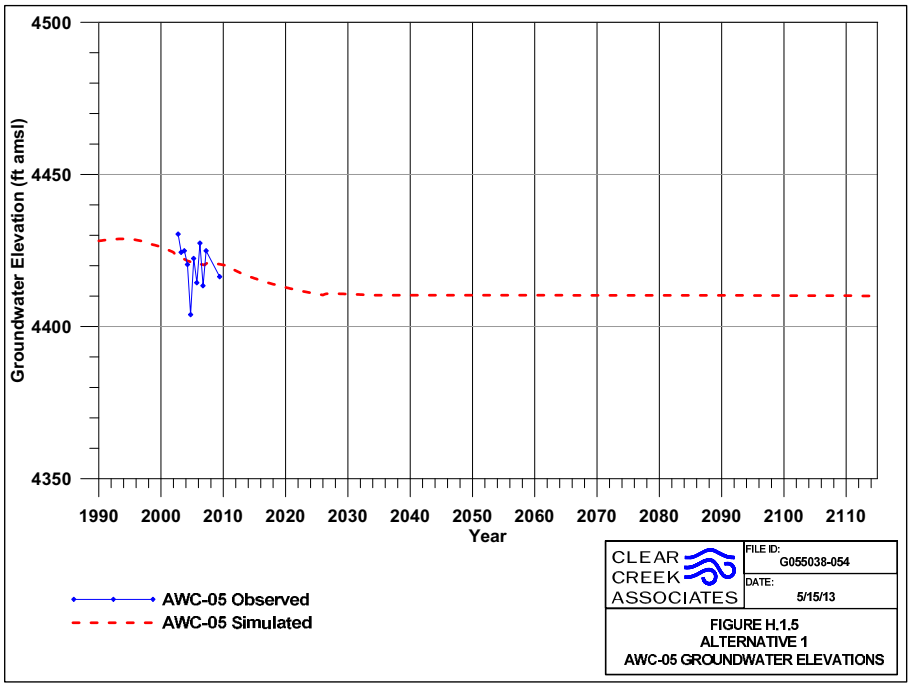
CLEAR CREEK ASSOCIATES

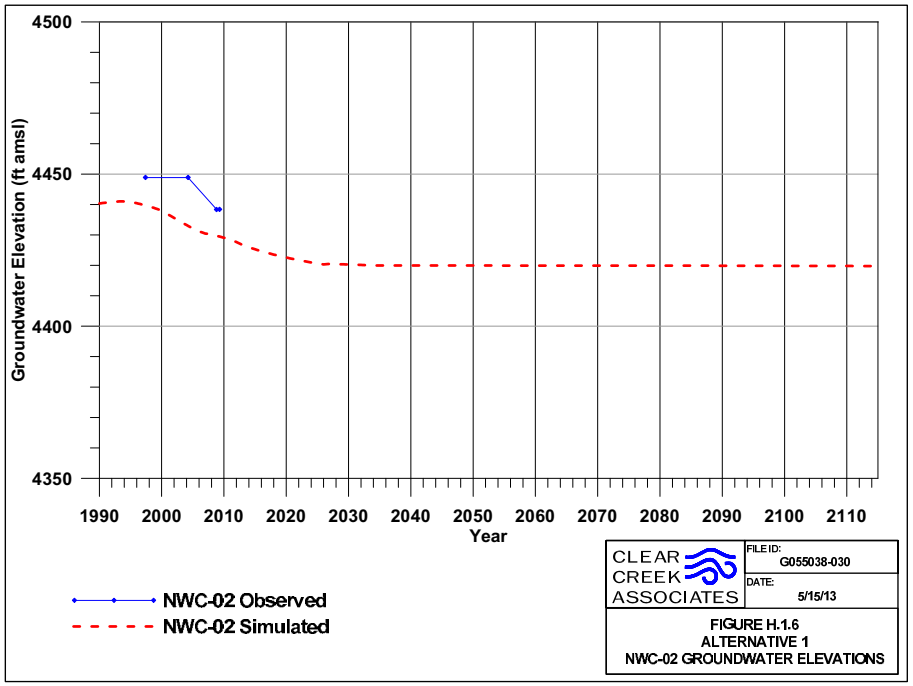
FIGURE H.1.1
ALTERNATIVE 1
SIMULATED PARTICLE TRACKS FOR 100 YEARS

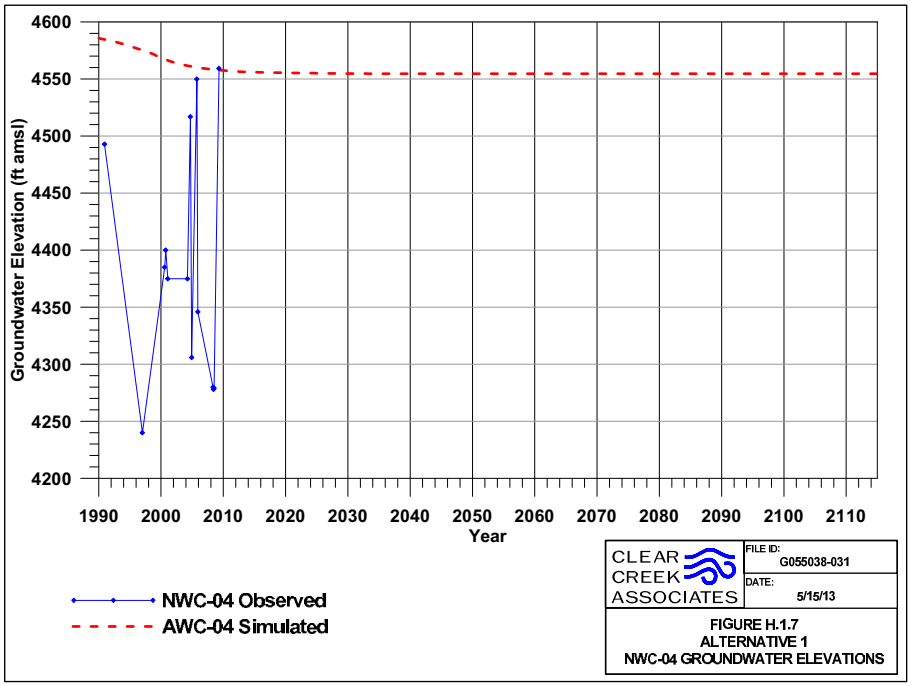

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-02 Observed
AWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-027
DATE: 5/15/13
FIGURE H.1.2
ALTERNATIVE 1
AWC-02 GROUNDWATER ELEVATIONS

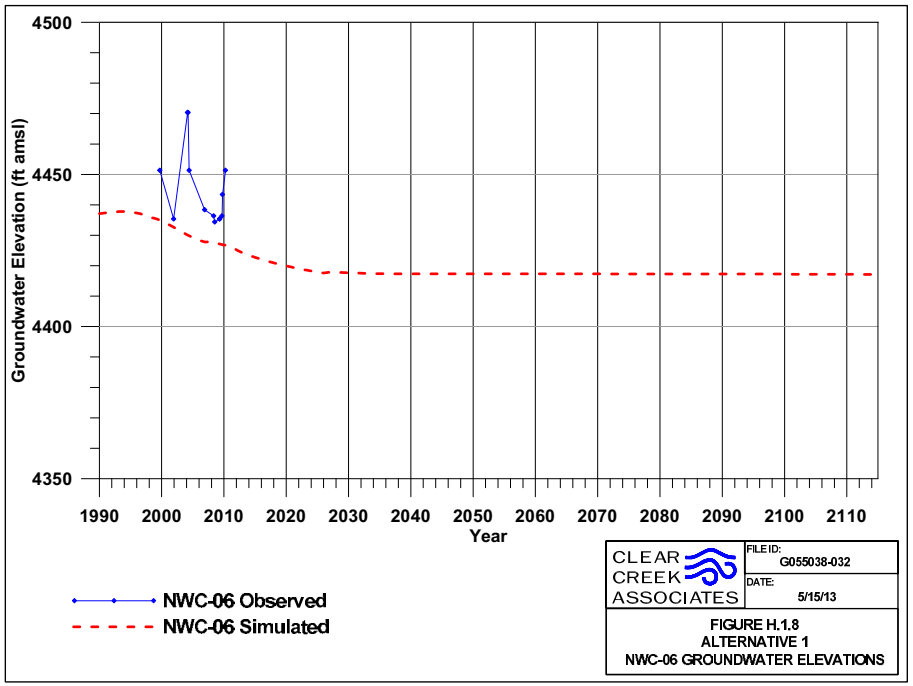

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-03 Observed
AWC-03 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-028
DATE: 5/15/13
FIGURE H.1.3
ALTERNATIVE 1
AWC-03 GROUNDWATER ELEVATIONS

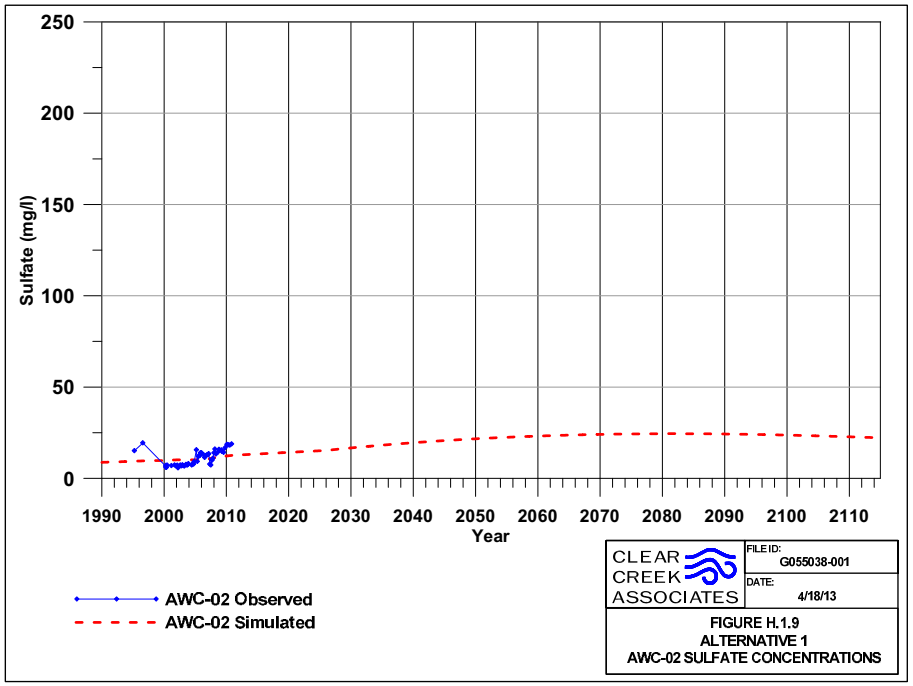

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-029
DATE: 5/15/13
FIGURE H.1.4
ALTERNATIVE 1
AWC-04 GROUNDWATER ELEVATIONS

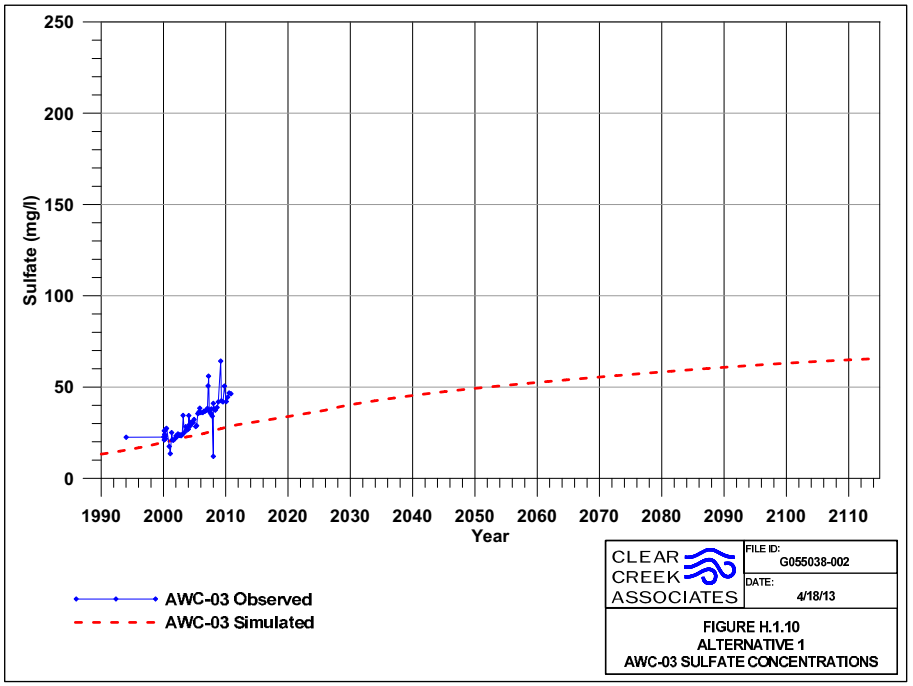

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-05 Observed
AWC-05 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-054
DATE: 5/15/13
FIGURE H.1.5
ALTERNATIVE 1
AWC-05 GROUNDWATER ELEVATIONS

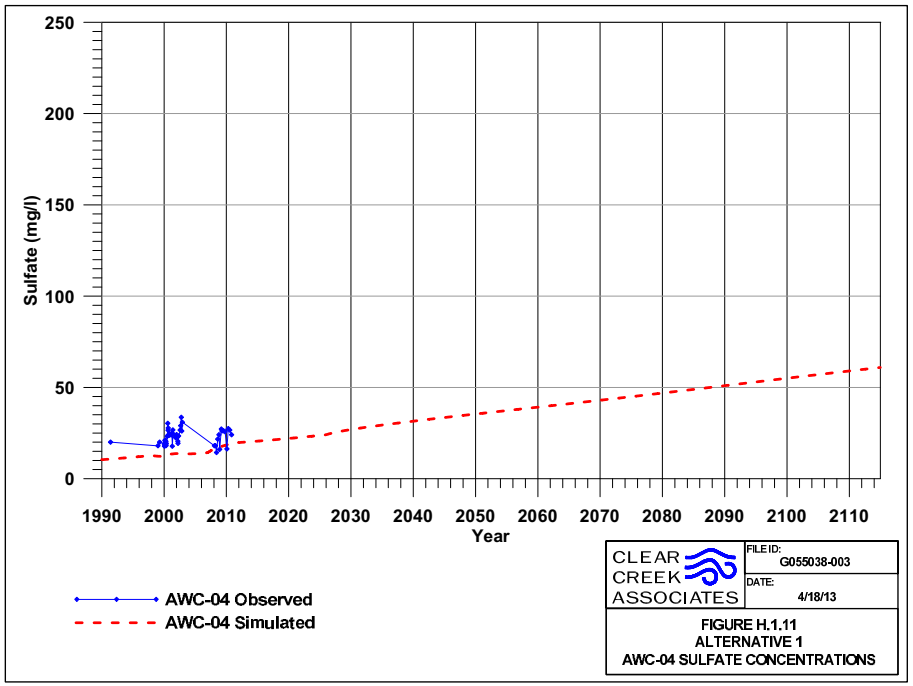

Groundwater Elevation (ft amsl)
4500
4450
4400
4350
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-02 Observed
NWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-030
DATE: 5/15/13
FIGURE H.1.6
ALTERNATIVE 1
NWC-02 GROUNDWATER ELEVATIONS

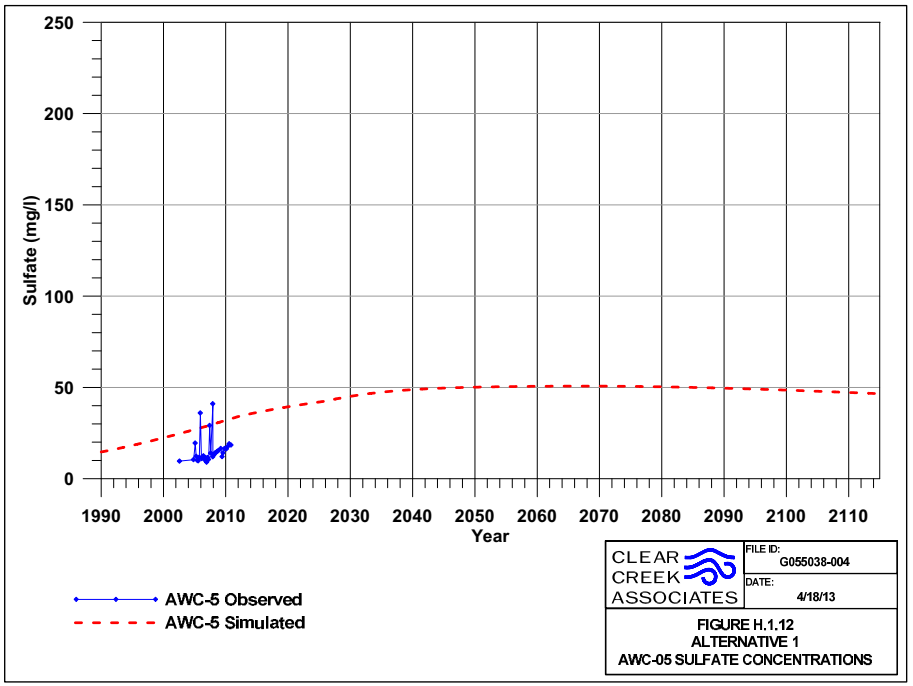

Groundwater Elevation (ft amsl)
4600
4550
4500
4450
4400
4350
4300
4250
4200
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-031
DATE: 5/15/13
FIGURE H.1.7
ALTERNATIVE 1
NWC-04 GROUNDWATER ELEVATIONS

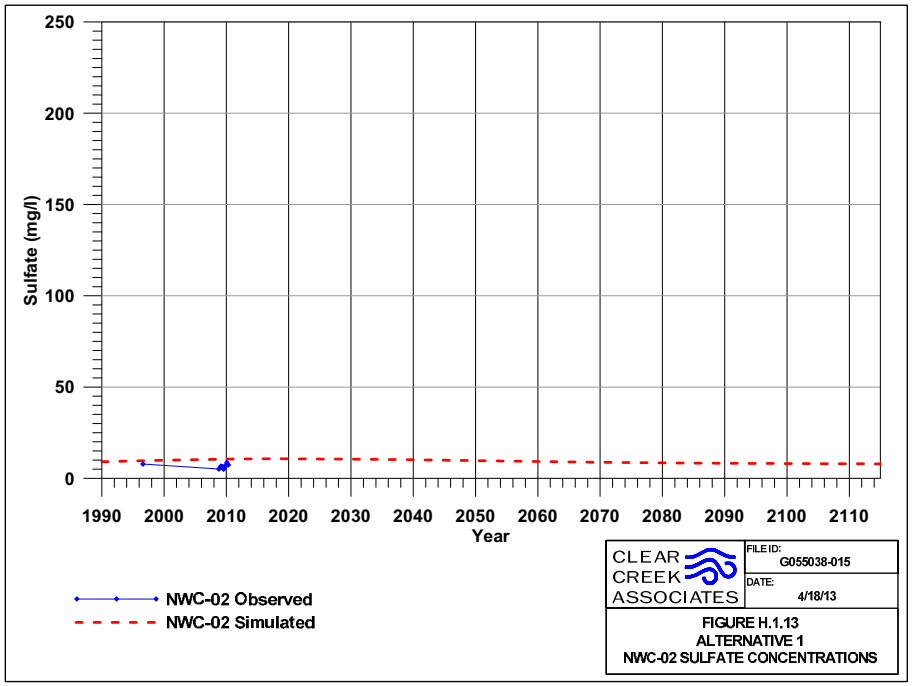

Groundwater Elevation (ft amsl)
4500
4450
4400
4350
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-06 Observed
NWC-06 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-032
DATE: 5/15/13
FIGURE H.1.8
ALTERNATIVE 1
NWC-06 GROUNDWATER ELEVATIONS

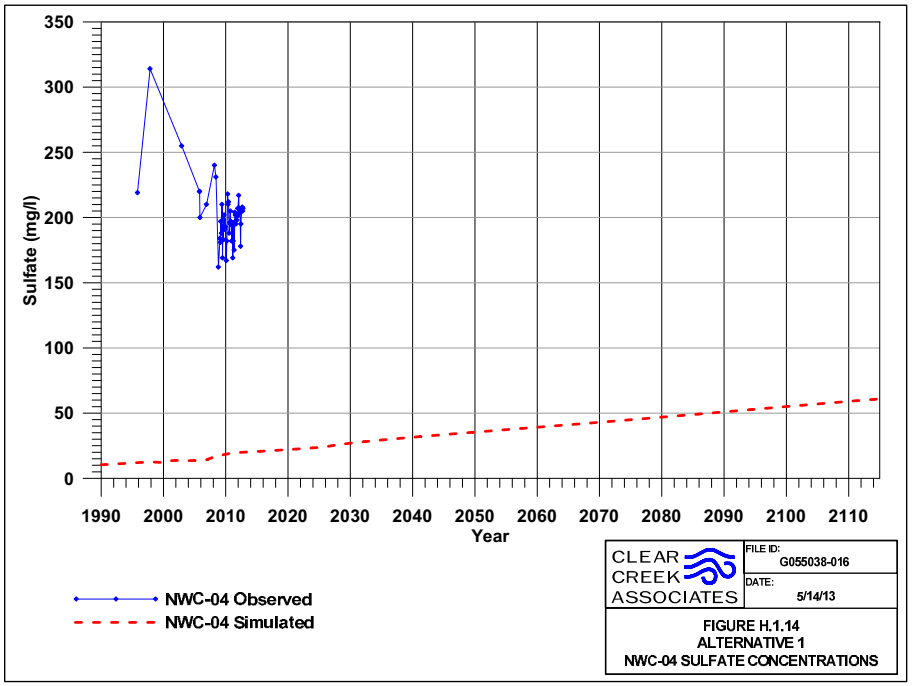

Sulfate (mg/l)
Year
AWC-02 Observed
AWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-001
DATE: 4/18/13
FIGURE H.1.9
ALTERNATIVE 1
AWC-02 SULFATE CONCENTRATIONS

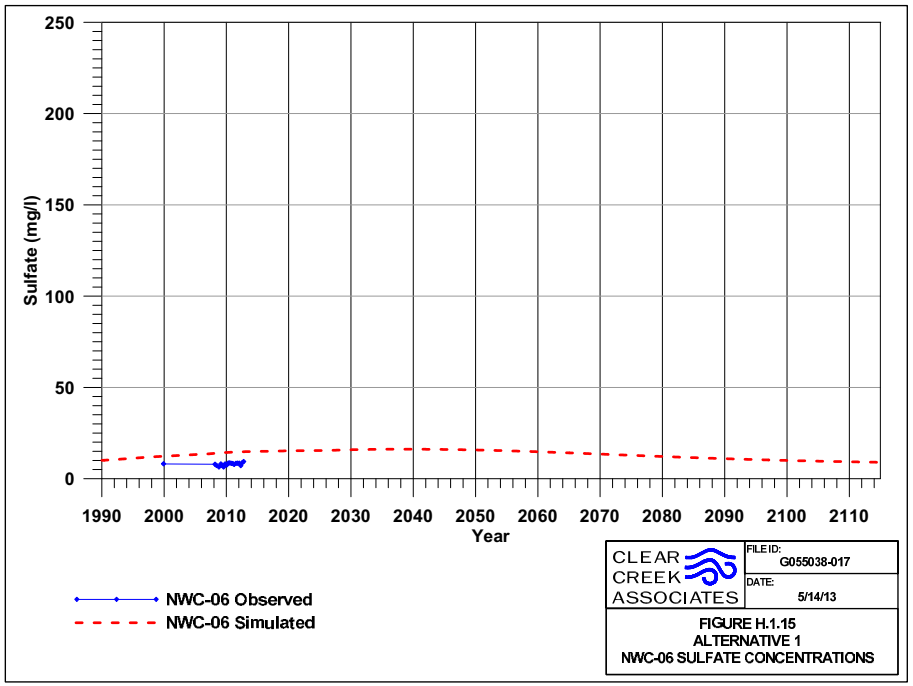

Sulfate (mg/l)
Year
AWC-03 Observed
AWC-03 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-002
DATE: 4/18/13
FIGURE H.1.10
ALTERNATIVE 1
AWC-03 SULFATE CONCENTRATIONS


Sulfate (mg/l)
Year
AWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-003
DATE: 4/18/13
FIGURE H.1.11
ALTERNATIVE 1
AWC-04 SULFATE CONCENTRATIONS


Sulfate (mg/l)
Year
AWC-5 Observed
AWC-5 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-004
DATE: 4/18/13
FIGURE H.1.12
ALTERNATIVE 1
AWC-05 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-02 Observed
NWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-015
DATE: 4/18/13
FIGURE H.1.13
ALTERNATIVE 1
NWC-02 SULFATE CONCENTRATIONS


Sulfate (mg/l)
350
300
250
200
150
100
50
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-04 Observed
NWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-016
DATE: 5/14/13
FIGURE H.1.14
ALTERNATIVE 1
NWC-04 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-06 Observed
NWC-06 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-017
DATE: 5/14/13
FIGURE H.1.15
ALTERNATIVE 1
NWC-06 SULFATE CONCENTRATIONS

APPENDIX H.2

ALTERNATIVE 2 PARTICLE TRACKING RESULTS; AND PREDICTED GROUNDWATER ELEVATIONS AND SULFATE CONCENTRATION AT PUBLIC SUPPLY WELLS

Well Name	Pumping Rate 2015-2065 (gpm)	Pumping Rate 2066-2115 (gpm)
FS-1	240	240
FS-2	400	400
FS-3	100	0
FS-4	100	100
TOTAL	840	740

T23 R 23 T23 R 24

T24 R 23 T24 R 24

FS-1

FS-2

FS-4

FS-3

Legend

Particle Tracks Alternative 2

Year

- 2014 - 2020
- 2021 - 2030
- 2031 - 2040
- 2041 - 2050
- 2051 - 2060
- 2061 - 2070
- 2071 - 2080
- 2081 - 2090
- 2091 - 2100
- 2101 - 2115

Alternative 2 Extraction Well

Estimated 250 mg/L Sulfate Concentration Contour Q1 2013

Drinking Water Supply Well

CQB Property Boundary

CTSA Facility

Township and Range

Fault (Dashed Where Inferred)

Scale (Feet)

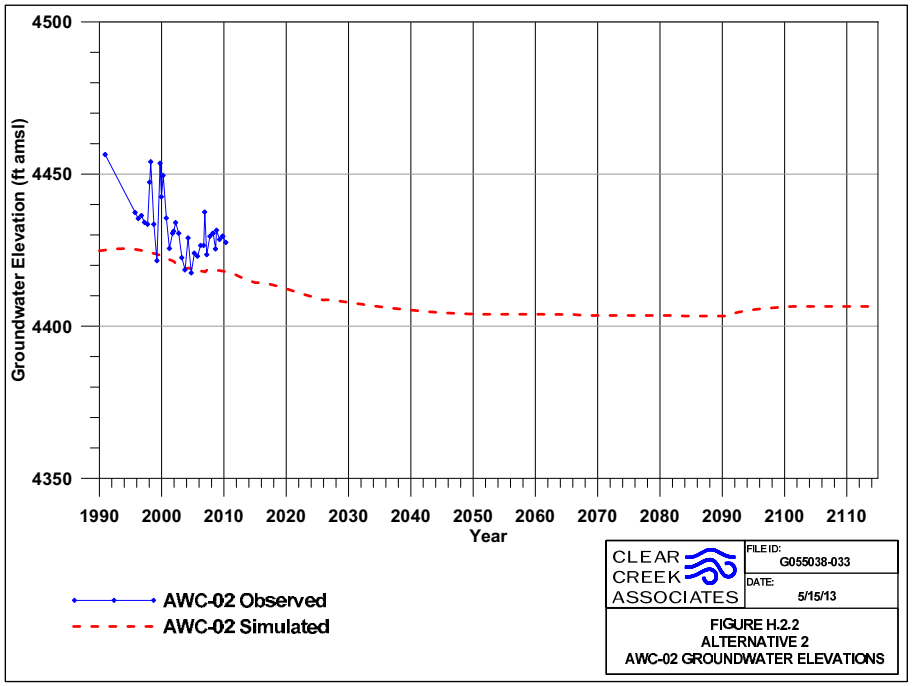
0 3,000 6,000

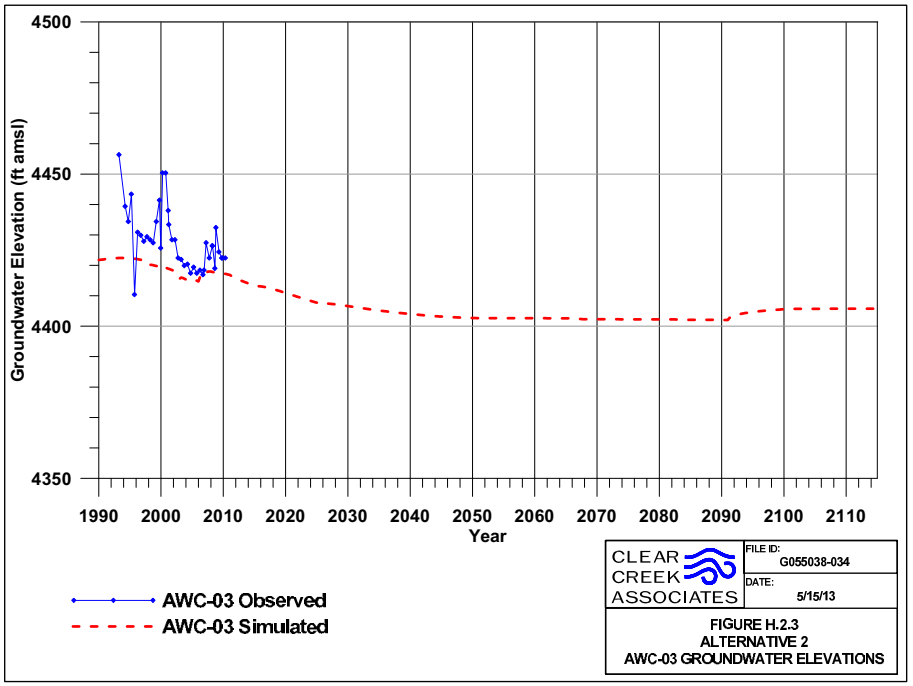
NOTES:
Particles are released in Layer 1 in 2013.
Projection is UTM Zone 12 NAD 83.

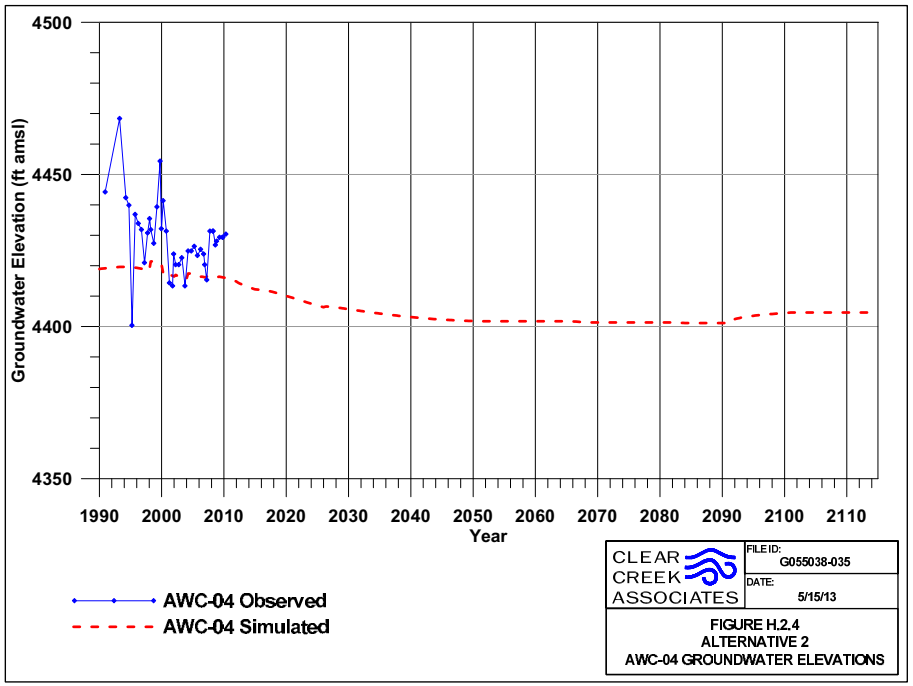
Date	File ID
4/17/13	055038-283

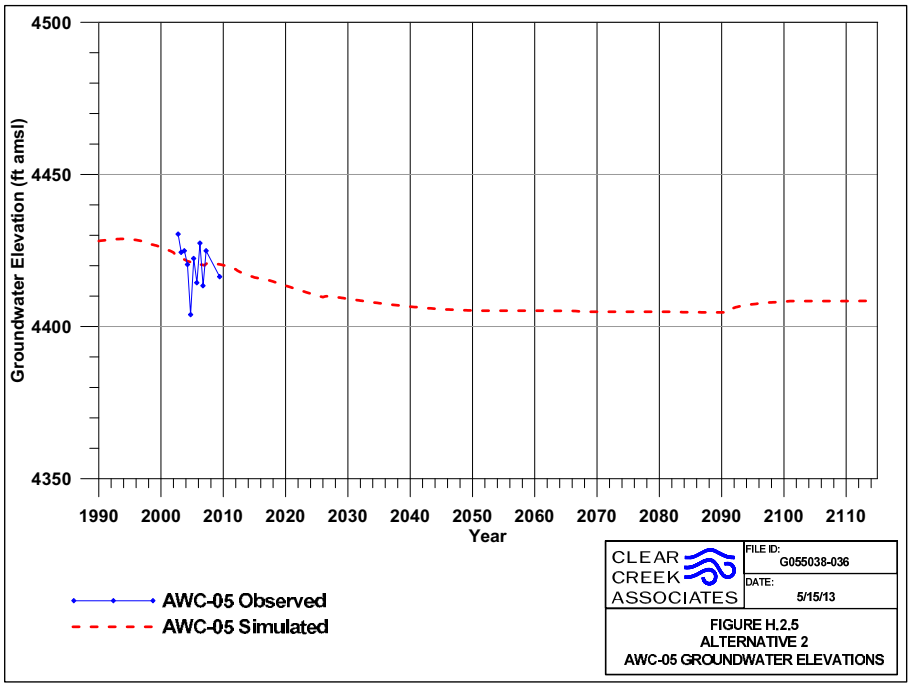
CLEAR CREEK ASSOCIATES

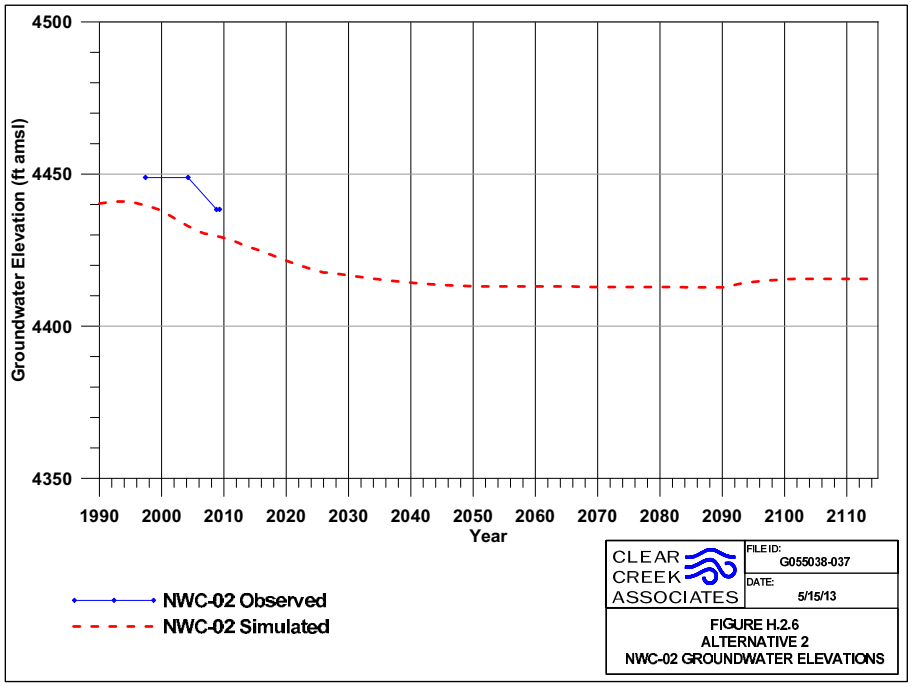
FIGURE H.2.1
ALTERNATIVE 2
SIMULATED PARTICLE TRACK
FOR 100 YEARS

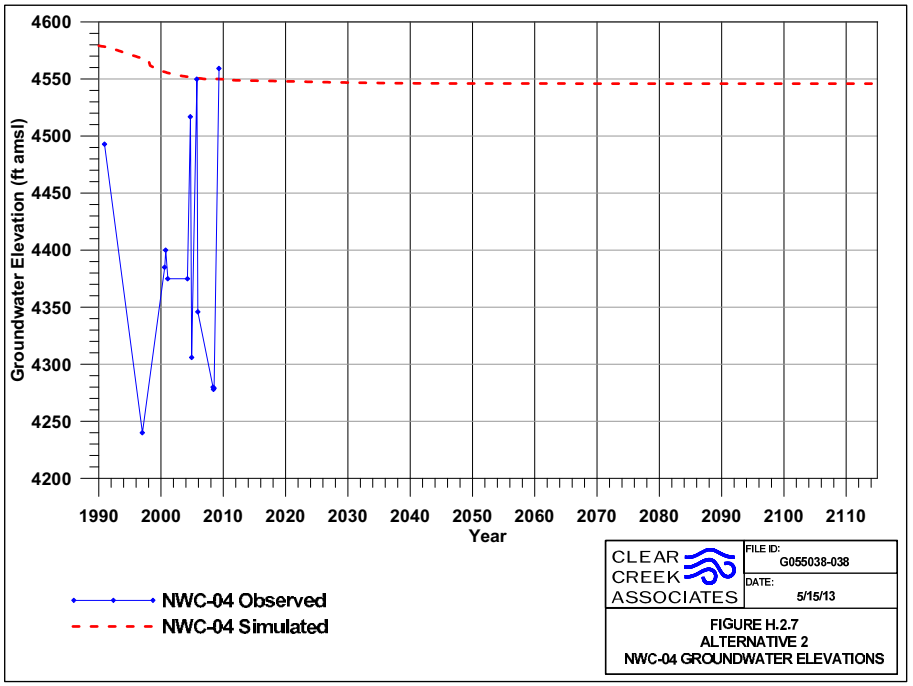

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-02 Observed
AWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-033
DATE: 5/15/13
FIGURE H.2.2
ALTERNATIVE 2
AWC-02 GROUNDWATER ELEVATIONS

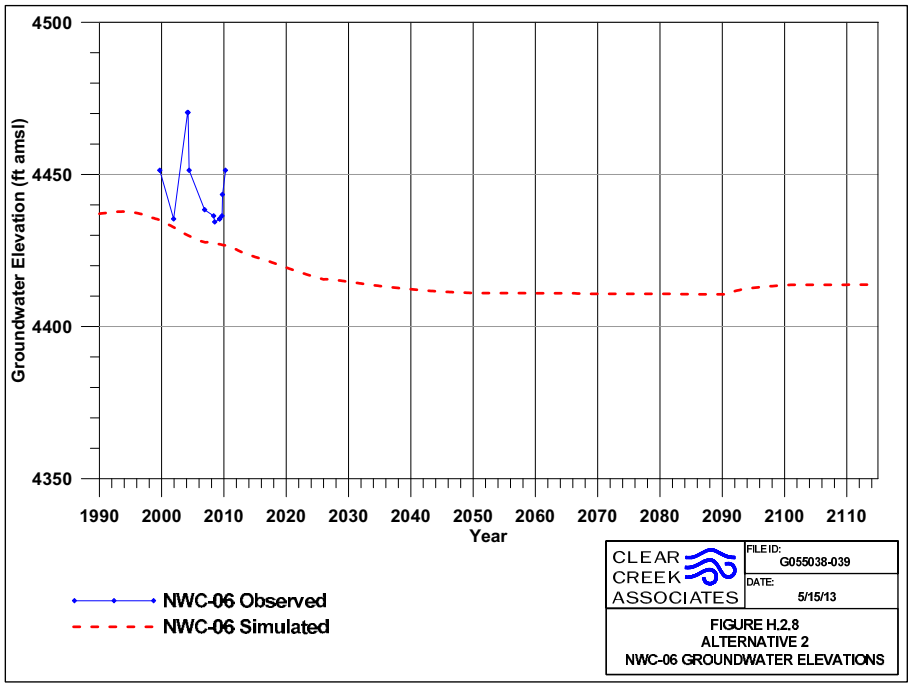

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-03 Observed
AWC-03 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-034
DATE: 5/15/13
FIGURE H.2.3
ALTERNATIVE 2
AWC-03 GROUNDWATER ELEVATIONS

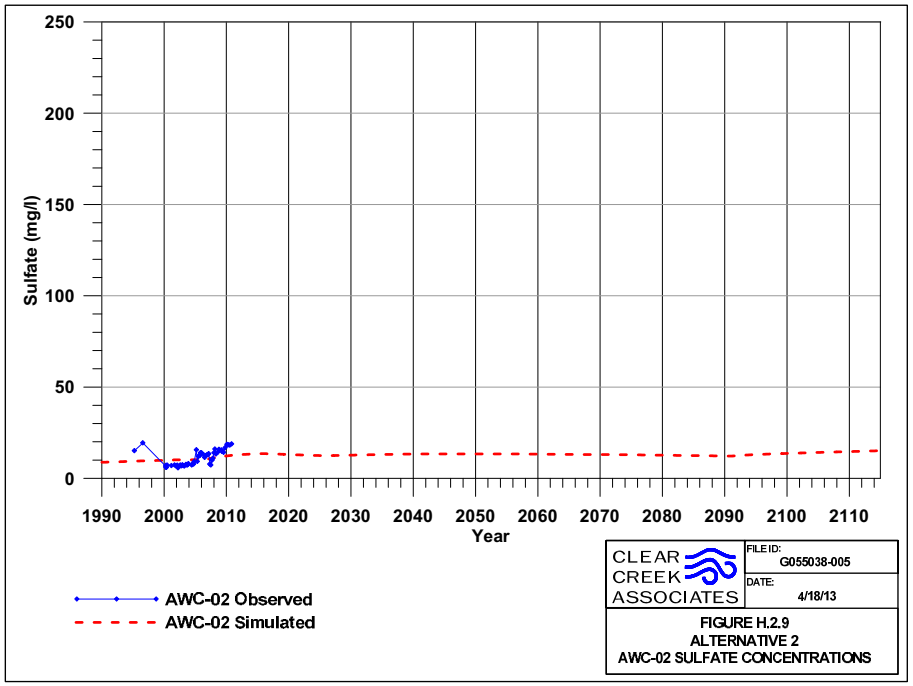

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-035
DATE: 5/15/13
FIGURE H.2.4
ALTERNATIVE 2
AWC-04 GROUNDWATER ELEVATIONS

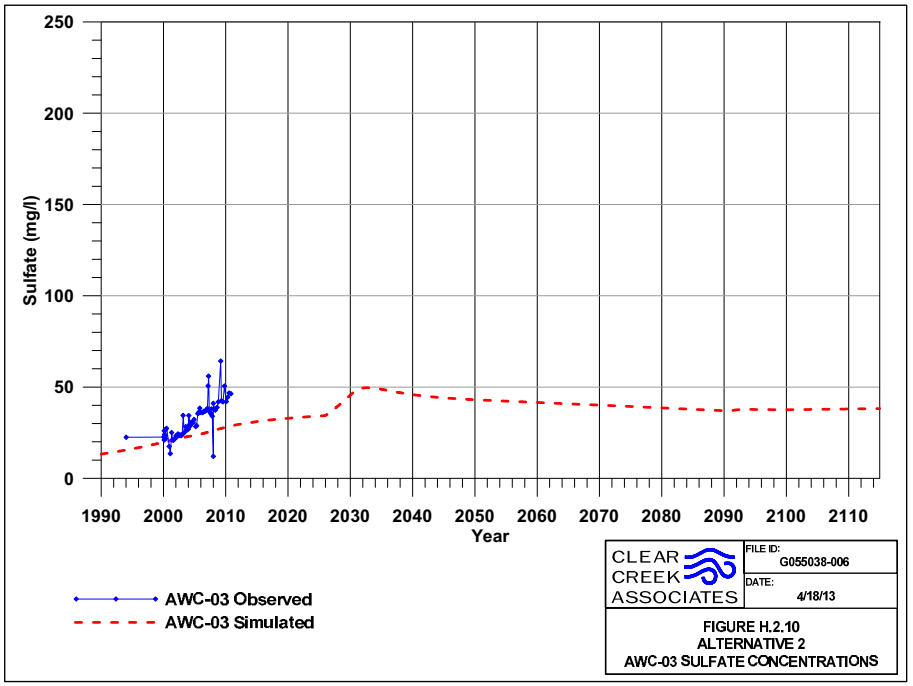

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-05 Observed
AWC-05 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-036
DATE: 5/15/13
FIGURE H.2.5
ALTERNATIVE 2
AWC-05 GROUNDWATER ELEVATIONS

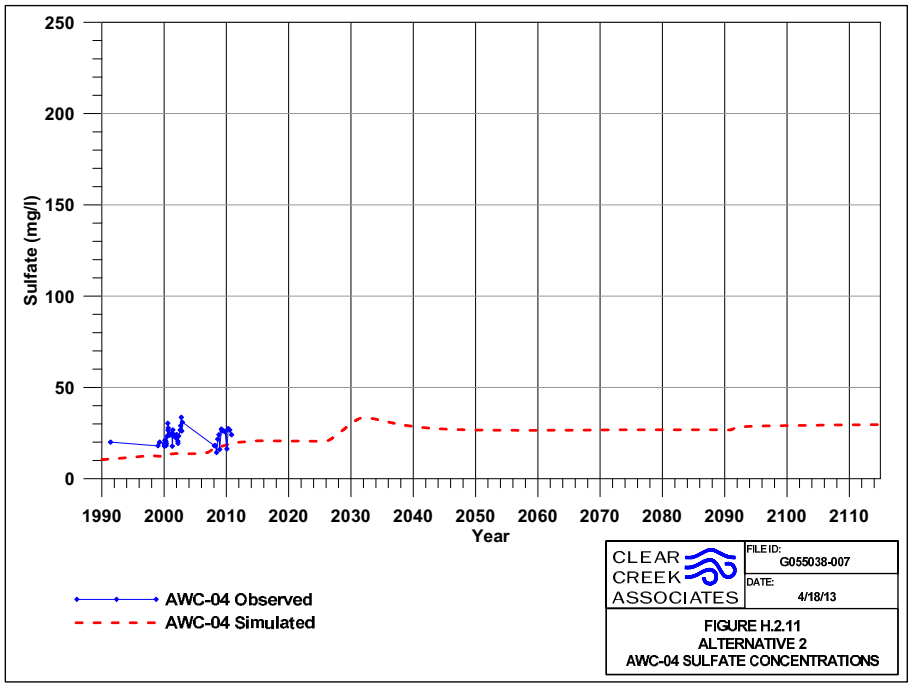

Groundwater Elevation (ft amsl)
4500
4450
4400
4350
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-02 Observed
NWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-037
DATE: 5/15/13
FIGURE H.2.6
ALTERNATIVE 2
NWC-02 GROUNDWATER ELEVATIONS

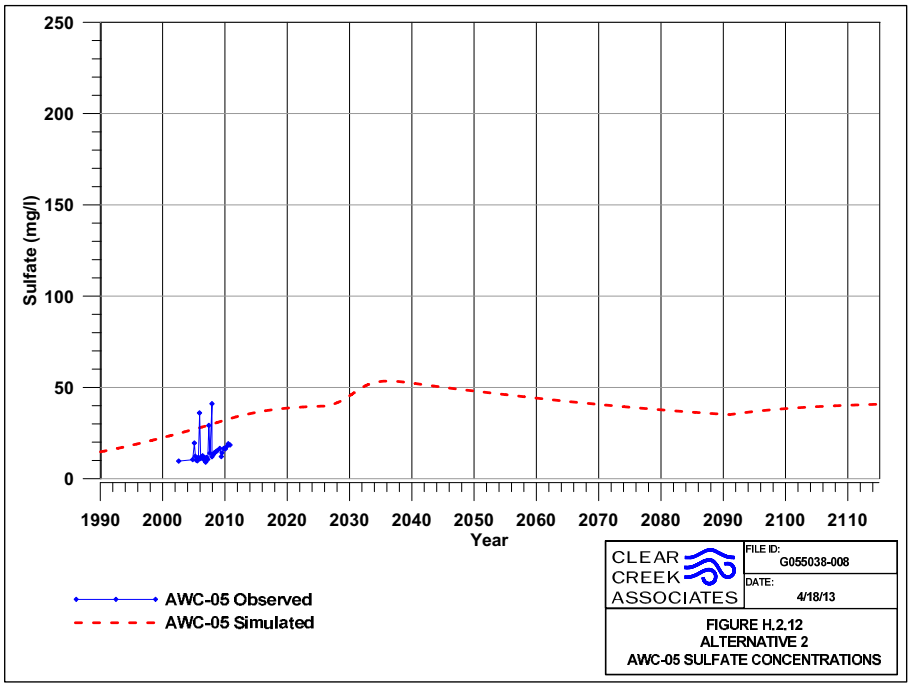

Groundwater Elevation (ft amsl)
4600
4550
4500
4450
4400
4350
4300
4250
4200
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-04 Observed
NWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-038
DATE: 5/15/13
FIGURE H.2.7
ALTERNATIVE 2
NWC-04 GROUNDWATER ELEVATIONS

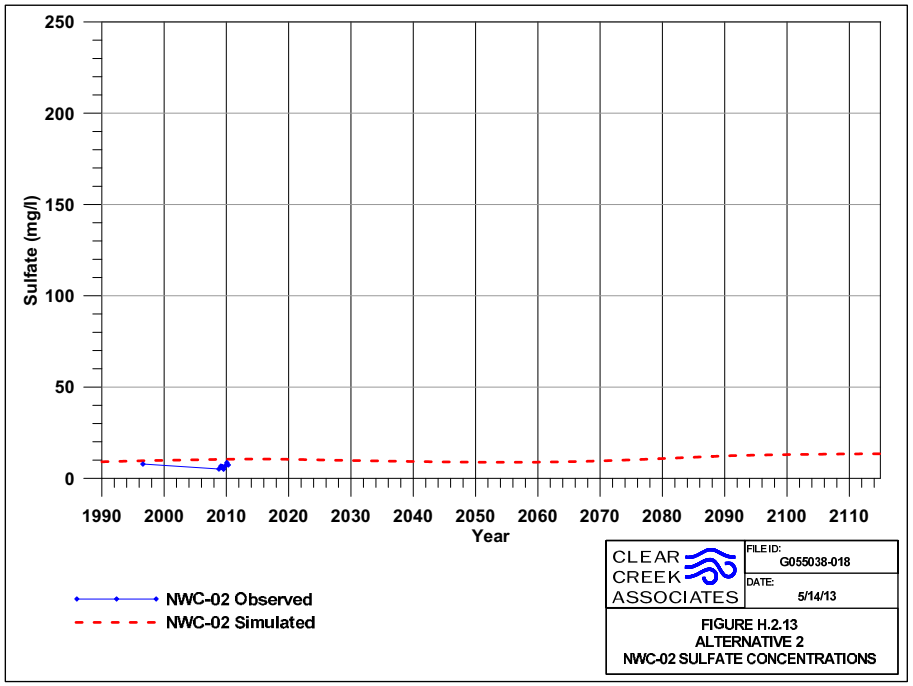

Groundwater Elevation (ft amsl)
4500
4450
4400
4350
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-06 Observed
NWC-06 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-039
DATE: 5/15/13
FIGURE H.2.8
ALTERNATIVE 2
NWC-06 GROUNDWATER ELEVATIONS

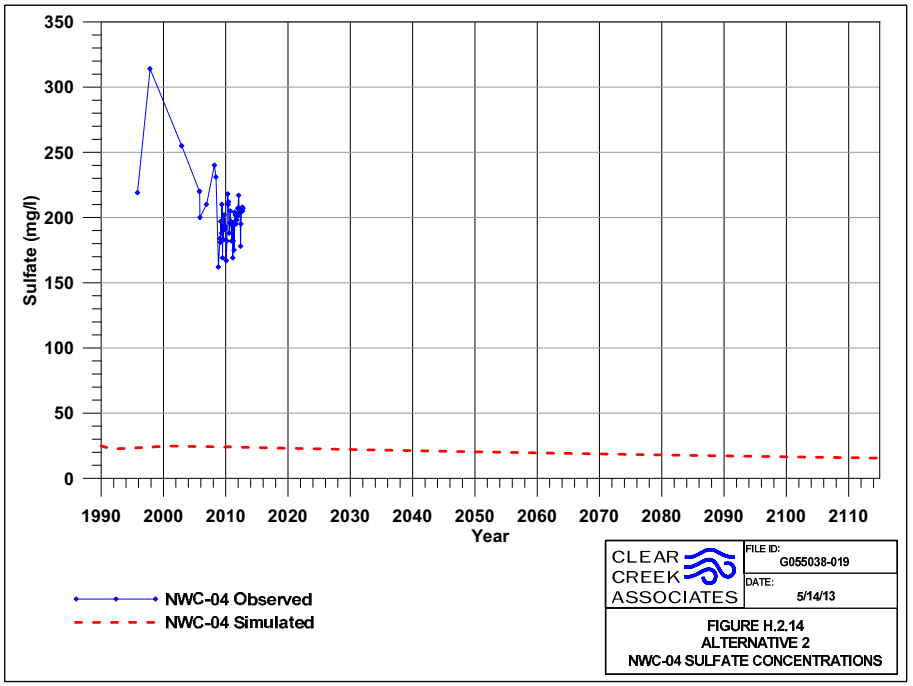

Sulfate (mg/l)
Year
AWC-02 Observed
AWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-005
DATE: 4/18/13
FIGURE H.2.9
ALTERNATIVE 2
AWC-02 SULFATE CONCENTRATIONS

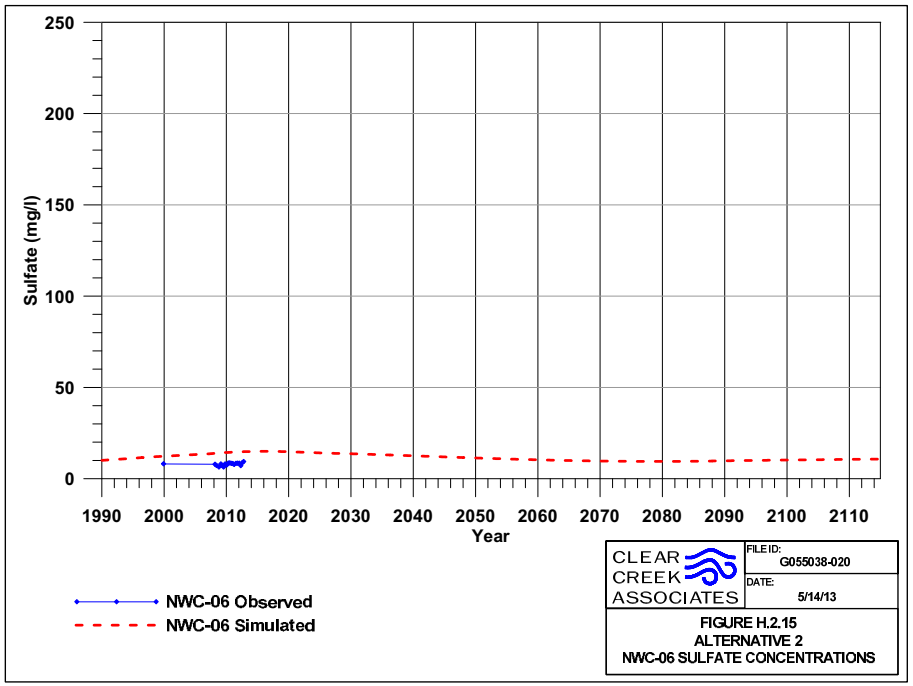

Sulfate (mg/l)
Year
AWC-03 Observed
AWC-03 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-006
DATE: 4/18/13
FIGURE H.2.10
ALTERNATIVE 2
AWC-03 SULFATE CONCENTRATIONS


Sulfate (mg/l)
Year
AWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-007
DATE: 4/18/13
FIGURE H.2.11
ALTERNATIVE 2
AWC-04 SULFATE CONCENTRATIONS


Sulfate (mg/l)
Year
AWC-05 Observed
AWC-05 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-008
DATE: 4/18/13
FIGURE H.2.12
ALTERNATIVE 2
AWC-05 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
NWC-02 Observed
NWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-018
DATE: 5/14/13
FIGURE H.2.13
ALTERNATIVE 2
NWC-02 SULFATE CONCENTRATIONS


Sulfate (mg/l)
350
300
250
200
150
100
50
0
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
NWC-04 Observed
NWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-019
DATE: 5/14/13
FIGURE H.2.14
ALTERNATIVE 2
NWC-04 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
NWC-06 Observed
NWC-06 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-020
DATE: 5/14/13
FIGURE H.2.15
ALTERNATIVE 2
NWC-06 SULFATE CONCENTRATIONS

APPENDIX H.3

ALTERNATIVE 3 PARTICLE TRACKING RESULTS; AND PREDICTED GROUNDWATER ELEVATIONS AND SULFATE CONCENTRATION AT PUBLIC SUPPLY WELLS

Well Name	Pumping Rate 2015-2065 (gpm)	Pumping Rate 2066-2115 (gpm)
FS-1	300	300
FS-2	400	400
FS-3	100	50
FS-4	100	100
TOTAL	900	850

T23 R 23 T23 R 24

T24 R 23 T24 R 24

FS-1

FS-2

FS-3

FS-4

Legend

Particle Tracks Alternative 3

Year

- 2014 - 2020
- 2021 - 2030
- 2031 - 2040
- 2041 - 2050
- 2051 - 2060
- 2061 - 2070
- 2071 - 2080
- 2081 - 2090
- 2091 - 2100
- 2101 - 2115

Alternative 3 Extraction Well

Estimated 250 mg/L Sulfate Concentration Contour Q1 2013

Drinking Water Supply Well

CQB Property Boundary

CTSA Facility

Fault (Dashed Where Inferred)

Township and Range

Scale (Feet)

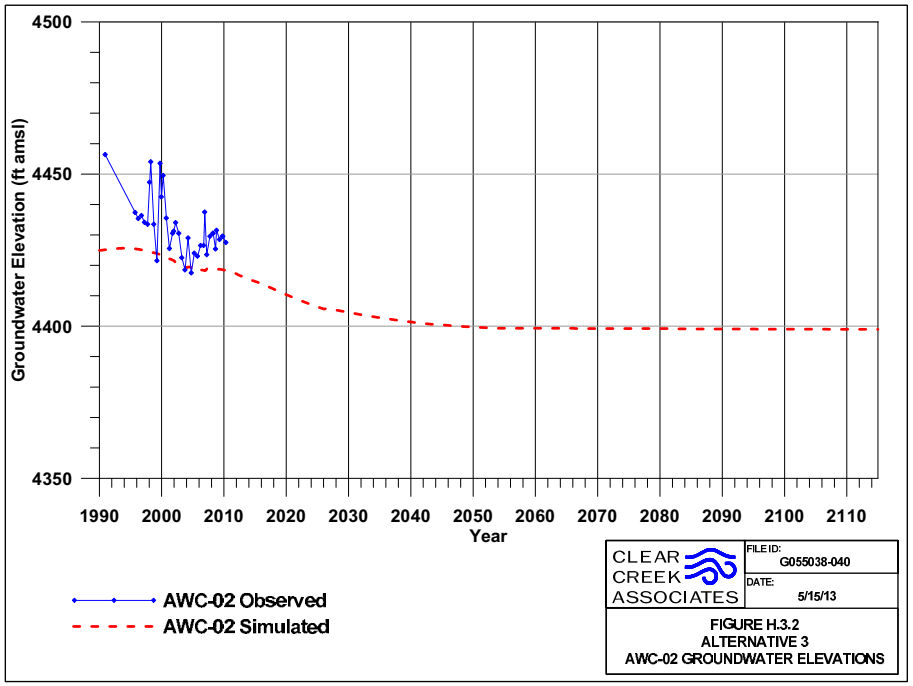
0 3,000 6,000

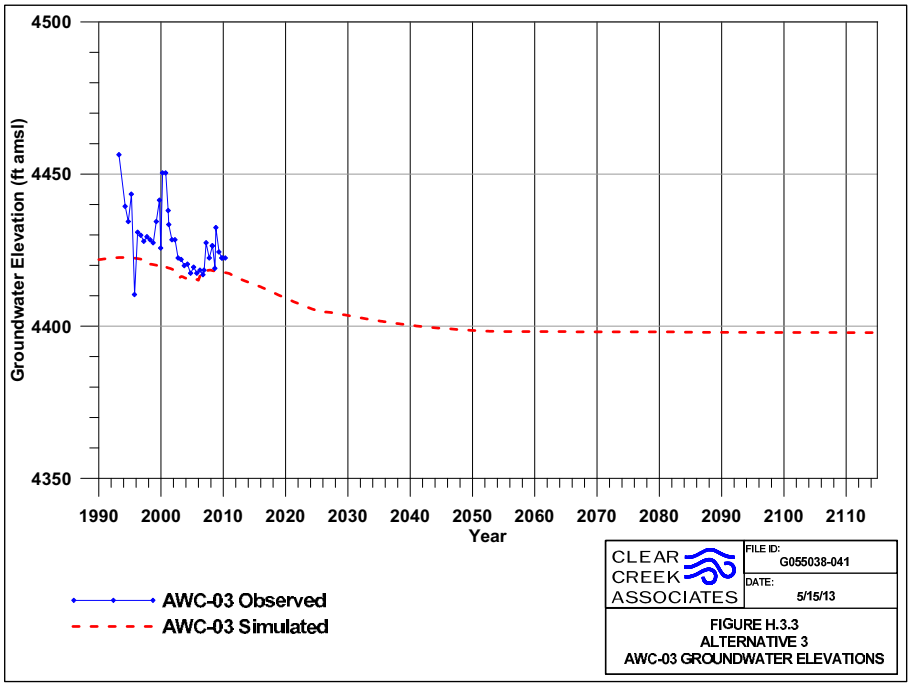
NOTES:
Particles are released in Layer 1 in 2013.
Projection is UTM Zone 12 NAD 83.

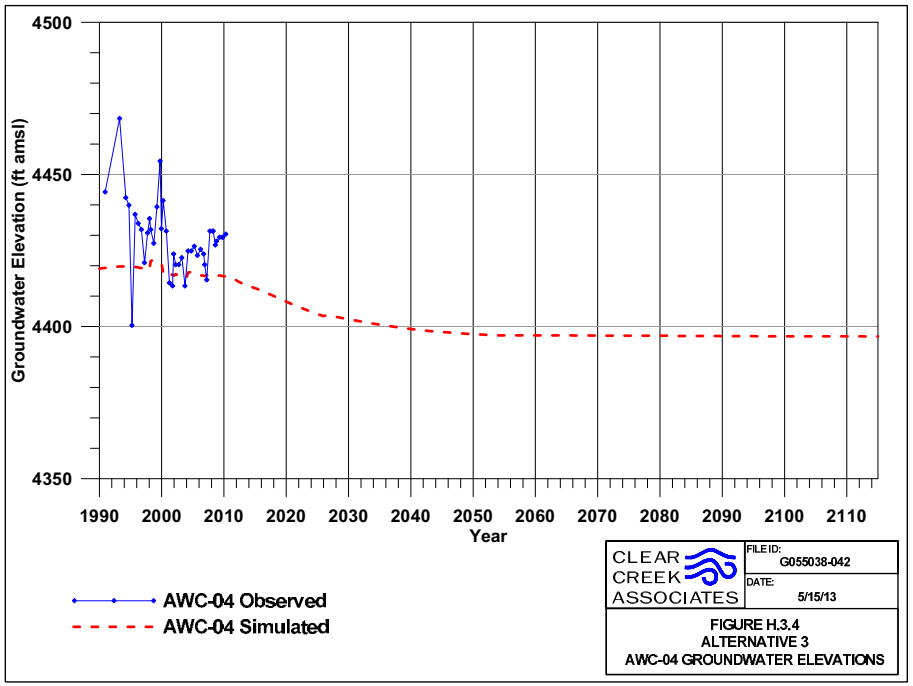
Date	File ID
2/13/13	055038-286

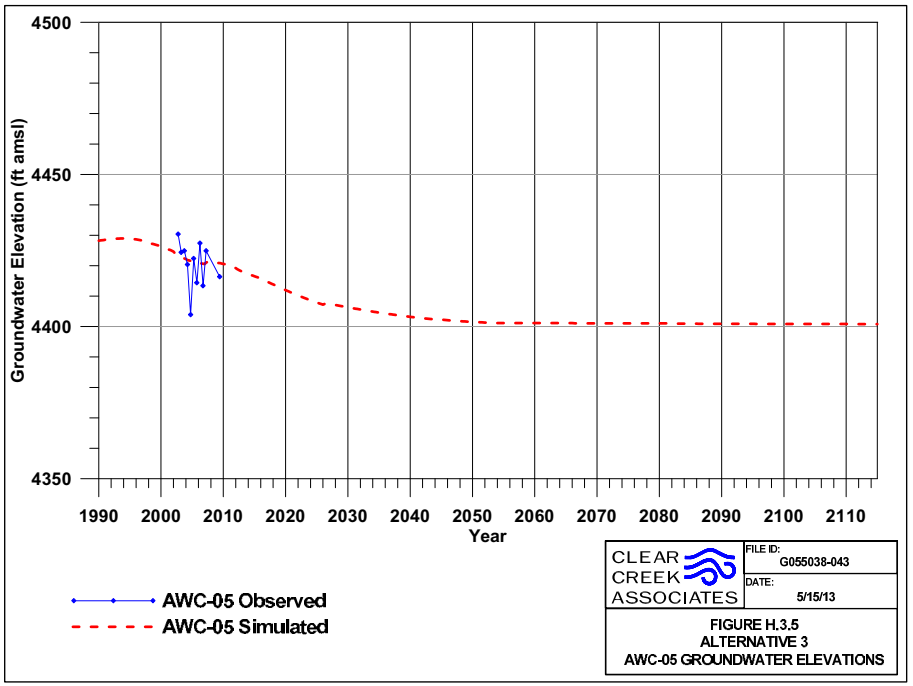
CLEAR CREEK ASSOCIATES

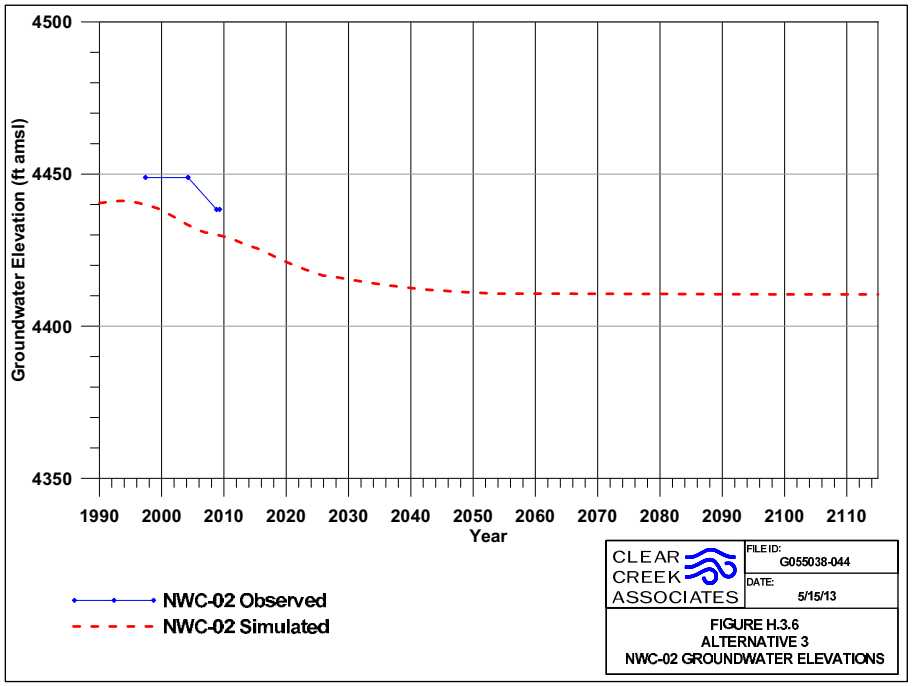
FIGURE H.3.1
ALTERNATIVE 3
SIMULATED PARTICLE TRACKS FOR 100 YEARS

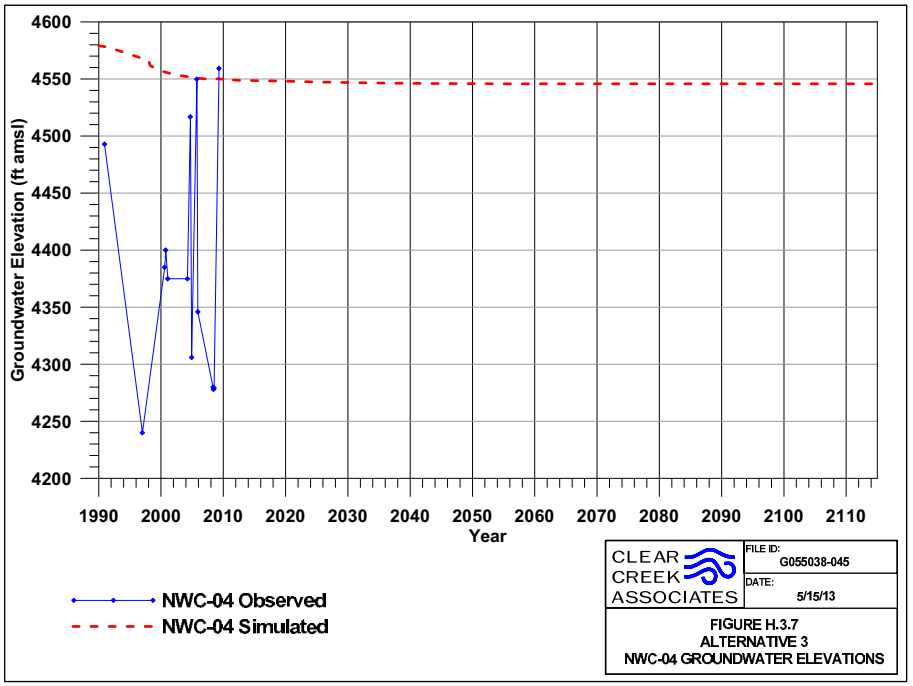

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-02 Observed
AWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-040
DATE: 5/15/13
FIGURE H.3.2
ALTERNATIVE 3
AWC-02 GROUNDWATER ELEVATIONS

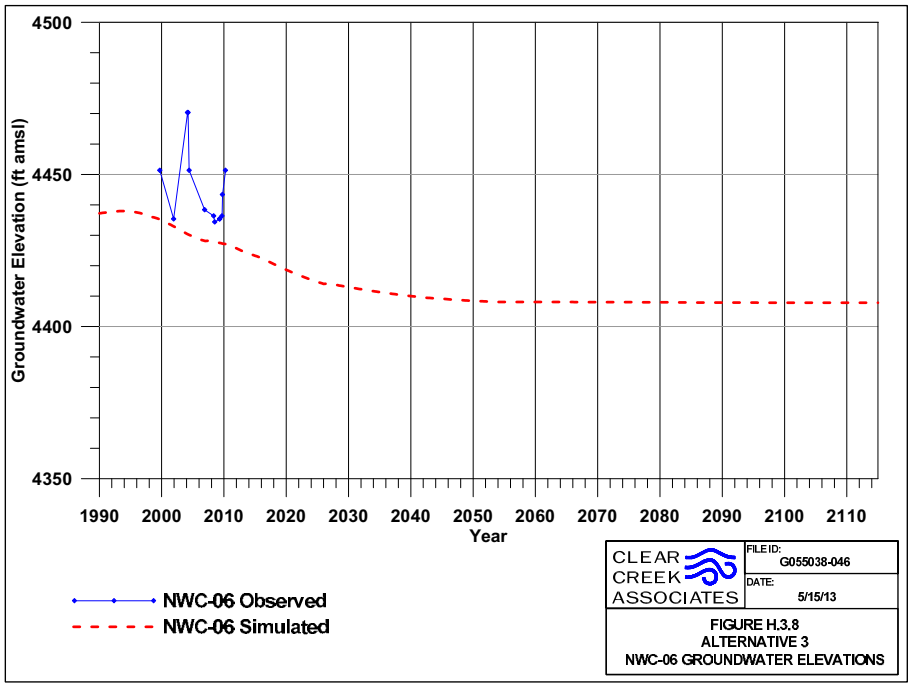

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-03 Observed
AWC-03 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-041
DATE: 5/15/13
FIGURE H.3.3
ALTERNATIVE 3
AWC-03 GROUNDWATER ELEVATIONS

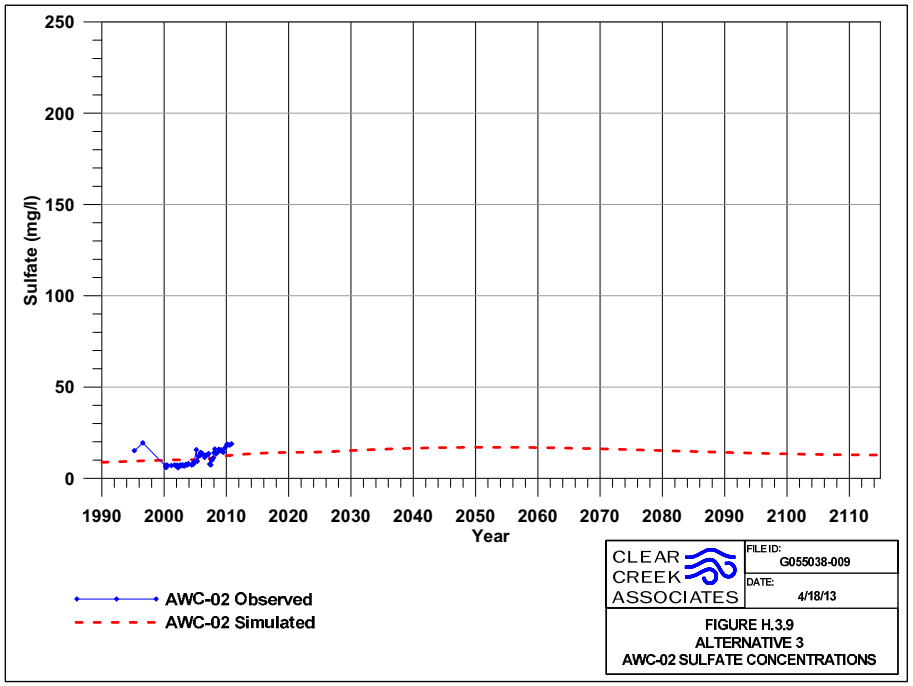

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-042
DATE: 5/15/13
FIGURE H.3.4
ALTERNATIVE 3
AWC-04 GROUNDWATER ELEVATIONS

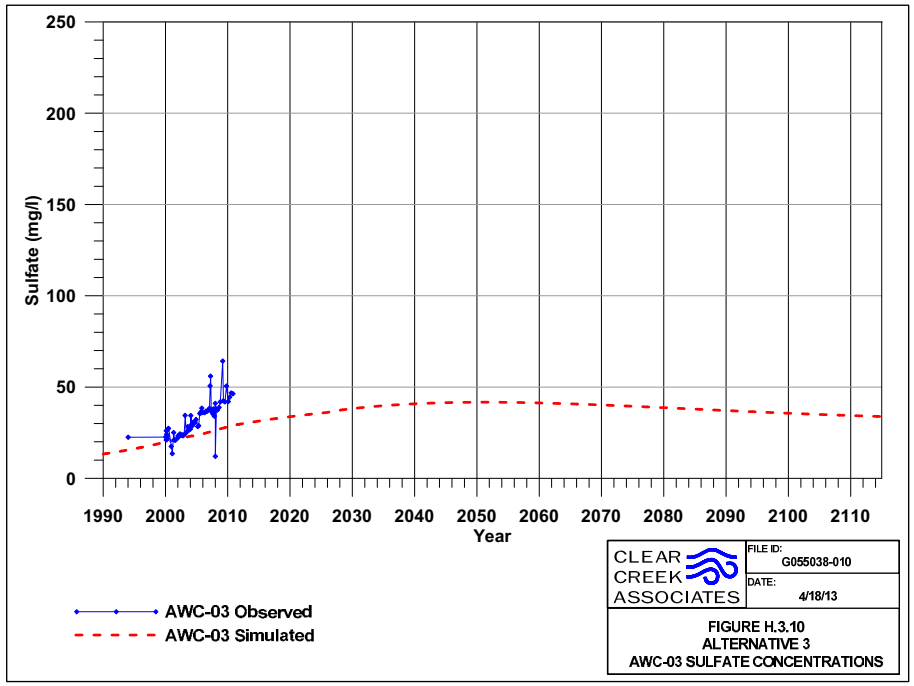

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-05 Observed
AWC-05 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-043
DATE: 5/15/13
FIGURE H.3.5
ALTERNATIVE 3
AWC-05 GROUNDWATER ELEVATIONS

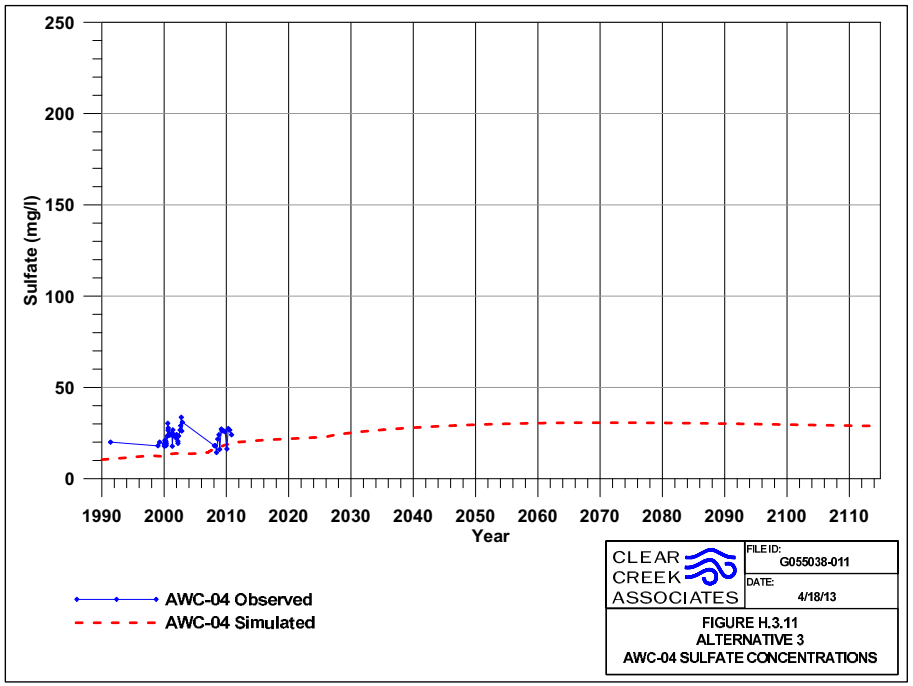

Groundwater Elevation (ft amsl)
4500
4450
4400
4350
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-02 Observed
NWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-044
DATE: 5/15/13
FIGURE H.3.6
ALTERNATIVE 3
NWC-02 GROUNDWATER ELEVATIONS

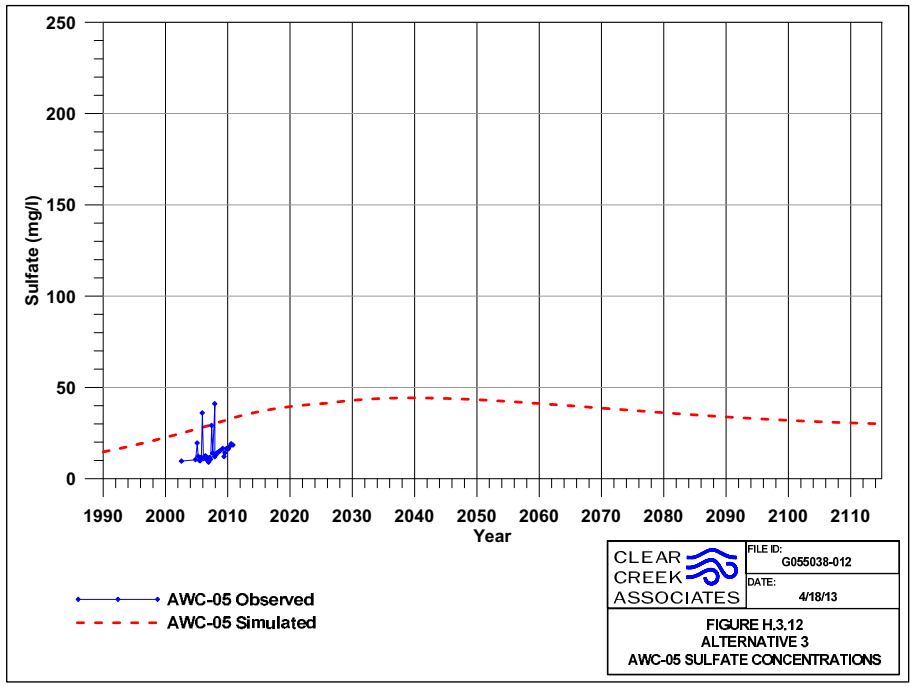

Groundwater Elevation (ft amsl)
4600
4550
4500
4450
4400
4350
4300
4250
4200
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-04 Observed
NWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-045
DATE: 5/15/13
FIGURE H.3.7
ALTERNATIVE 3
NWC-04 GROUNDWATER ELEVATIONS

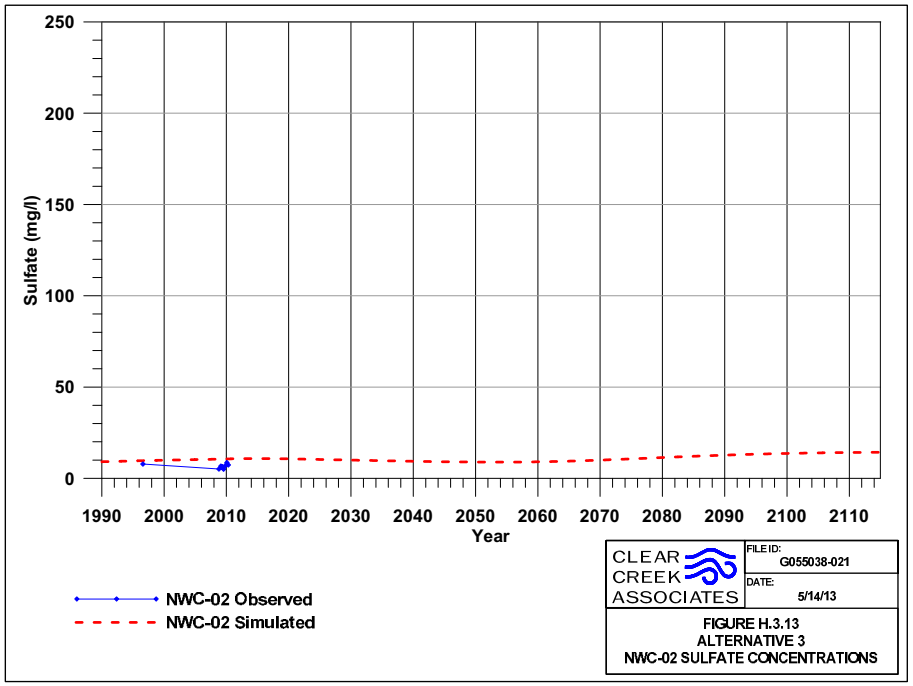

Groundwater Elevation (ft amsl)
4500
4450
4400
4350
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-06 Observed
NWC-06 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-046
DATE: 5/15/13
FIGURE H.3.8
ALTERNATIVE 3
NWC-06 GROUNDWATER ELEVATIONS

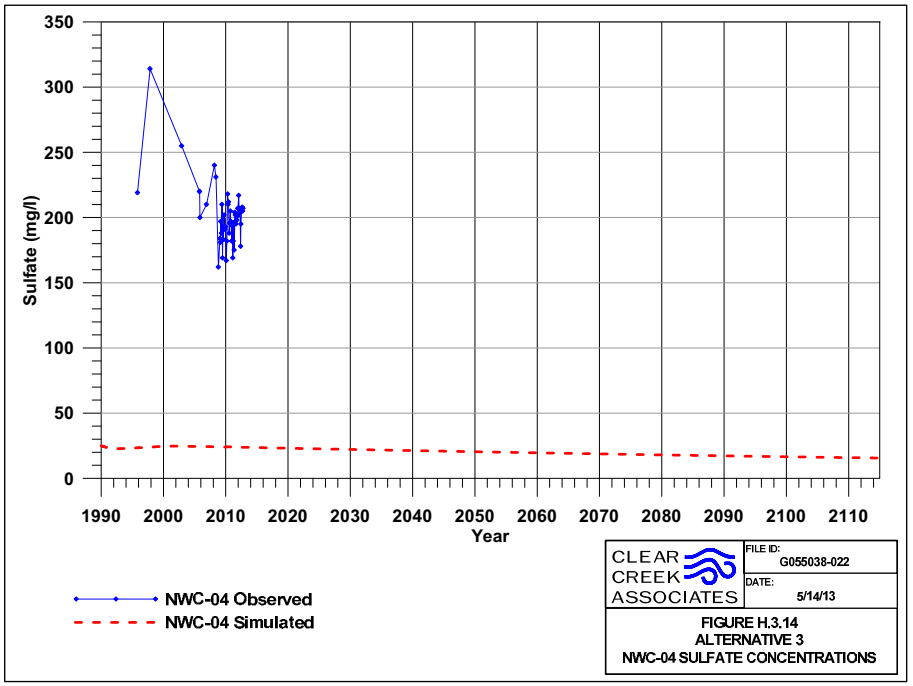

Sulfate (mg/l)
250
200
150
100
50
0
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-02 Observed
AWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-009
DATE: 4/18/13
FIGURE H.3.9
ALTERNATIVE 3
AWC-02 SULFATE CONCENTRATIONS

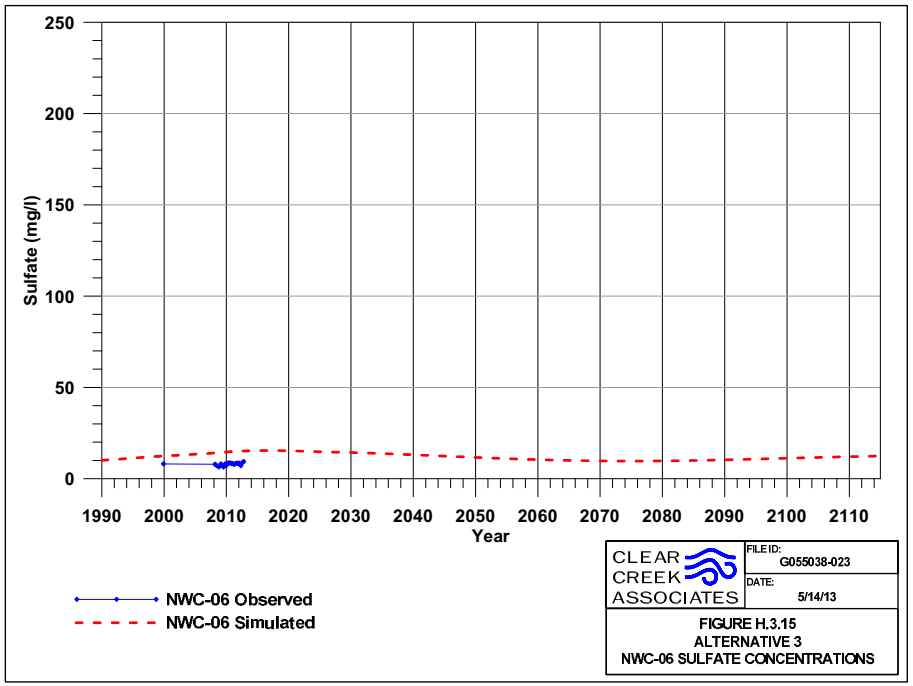

Sulfate (mg/l)
250
200
150
100
50
0
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-03 Observed
AWC-03 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-010
DATE: 4/18/13
FIGURE H.3.10
ALTERNATIVE 3
AWC-03 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-011
DATE: 4/18/13
FIGURE H.3.11
ALTERNATIVE 3
AWC-04 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-05 Observed
AWC-05 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-012
DATE: 4/18/13
FIGURE H.3.12
ALTERNATIVE 3
AWC-05 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-02 Observed
NWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-021
DATE: 5/14/13
FIGURE H.3.13
ALTERNATIVE 3
NWC-02 SULFATE CONCENTRATIONS

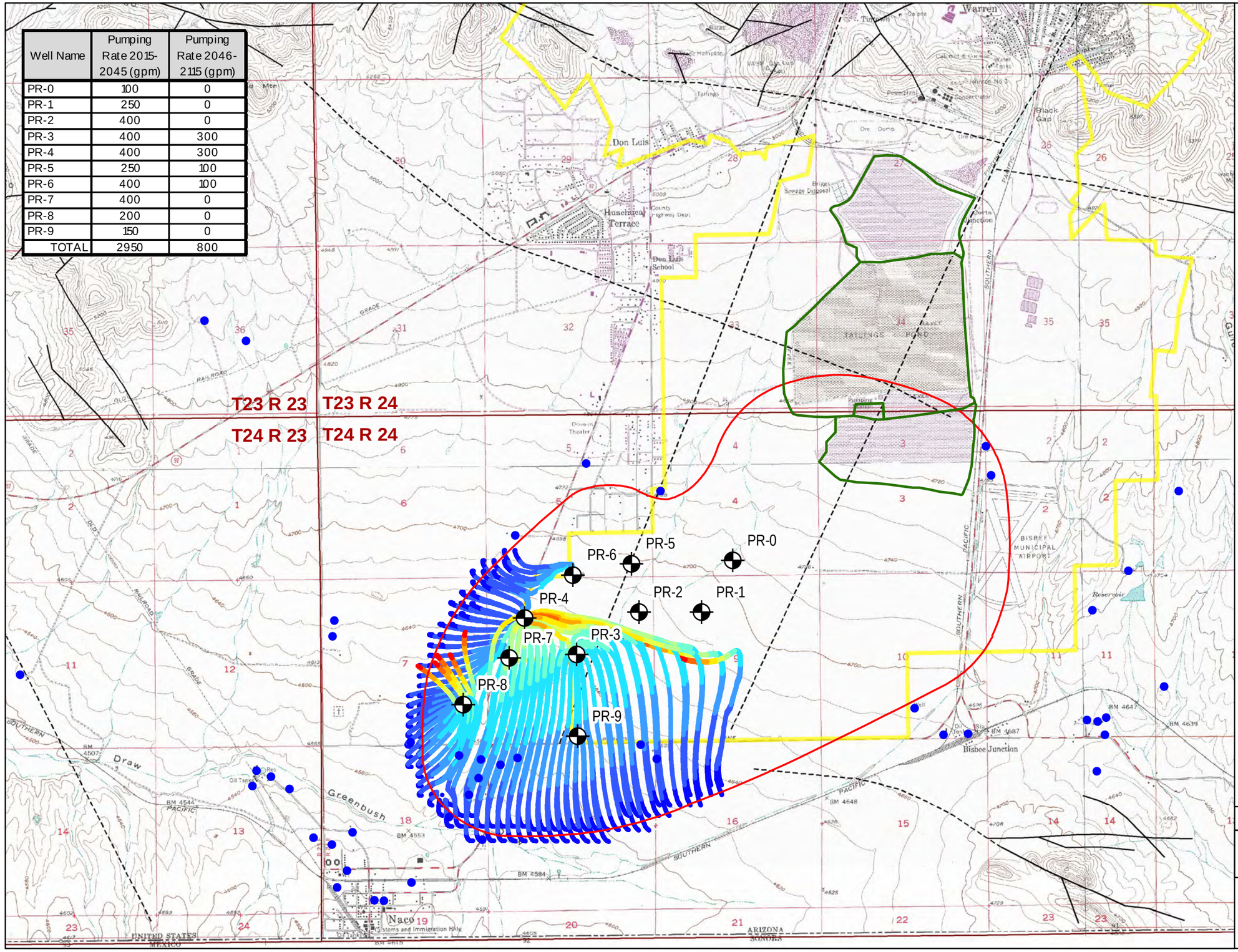

Sulfate (mg/l)
350
300
250
200
150
100
50
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-04 Observed
NWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-022
DATE: 5/14/13
FIGURE H.3.14
ALTERNATIVE 3
NWC-04 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-06 Observed
NWC-06 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-023
DATE: 5/14/13
FIGURE H.3.15
ALTERNATIVE 3
NWC-06 SULFATE CONCENTRATIONS

APPENDIX H.4

ALTERNATIVE 4 PARTICLE TRACKING RESULTS; AND PREDICTED GROUNDWATER ELEVATIONS AND SULFATE CONCENTRATION AT PUBLIC SUPPLY WELLS

Well Name	Pumping Rate 2015-2045 (gpm)	Pumping Rate 2046-2115 (gpm)
PR-0	100	0
PR-1	250	0
PR-2	400	0
PR-3	400	300
PR-4	400	300
PR-5	250	100
PR-6	400	100
PR-7	400	0
PR-8	200	0
PR-9	150	0
TOTAL	2950	800



Legend

Particle Tracks Alternative 4

Year

- 2014 - 2020
- 2021 - 2030
- 2031 - 2040
- 2041 - 2050
- 2051 - 2060
- 2061 - 2070
- 2071 - 2080
- 2081 - 2090
- 2091 - 2100
- 2101 - 2115

- Alternative 4 Extraction Well
- Estimated 250 mg/L Sulfate Concentration Contour Q1 2013
- Drinking Water Supply Well
- CQB Property Boundary
- CTSA Facility
- Fault (Dashed Where Inferred)
- Township and Range

Scale (Feet)

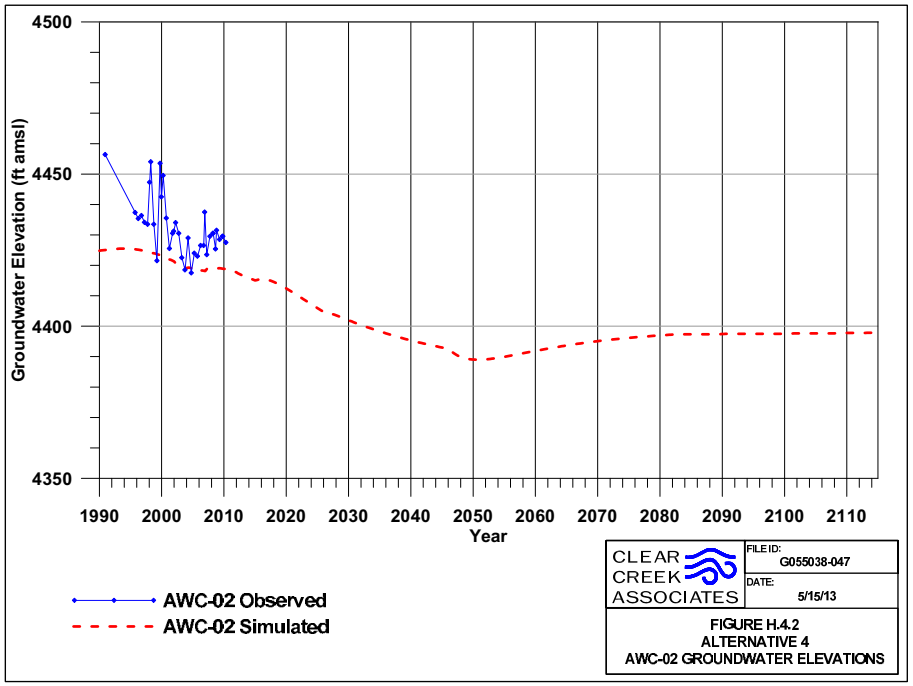
0 3,000 6,000

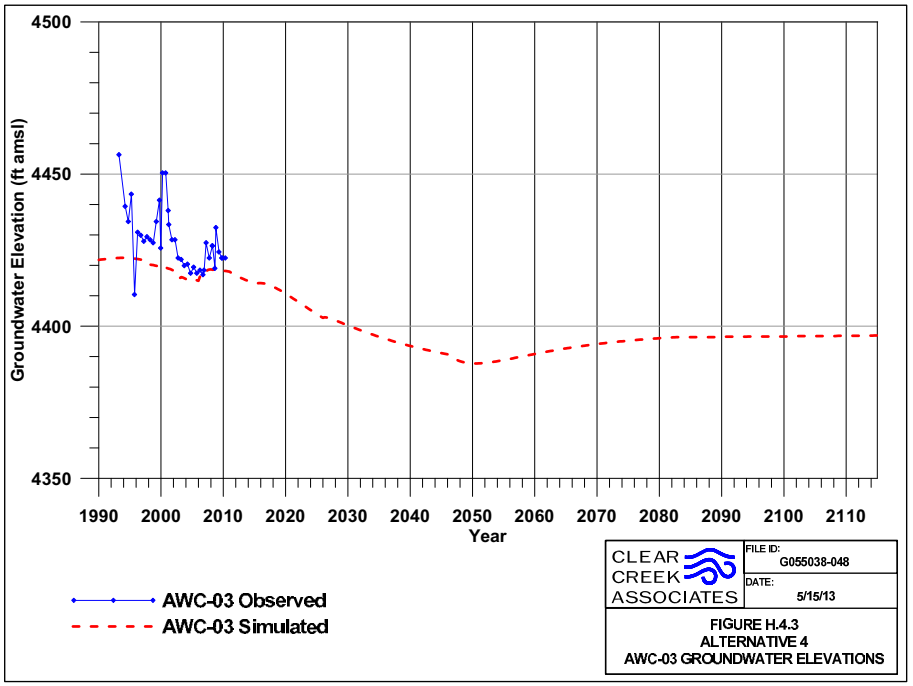
NOTES:
Particles are released in Layer 1 in 2013.
Projection is UTM Zone 12 NAD 83.

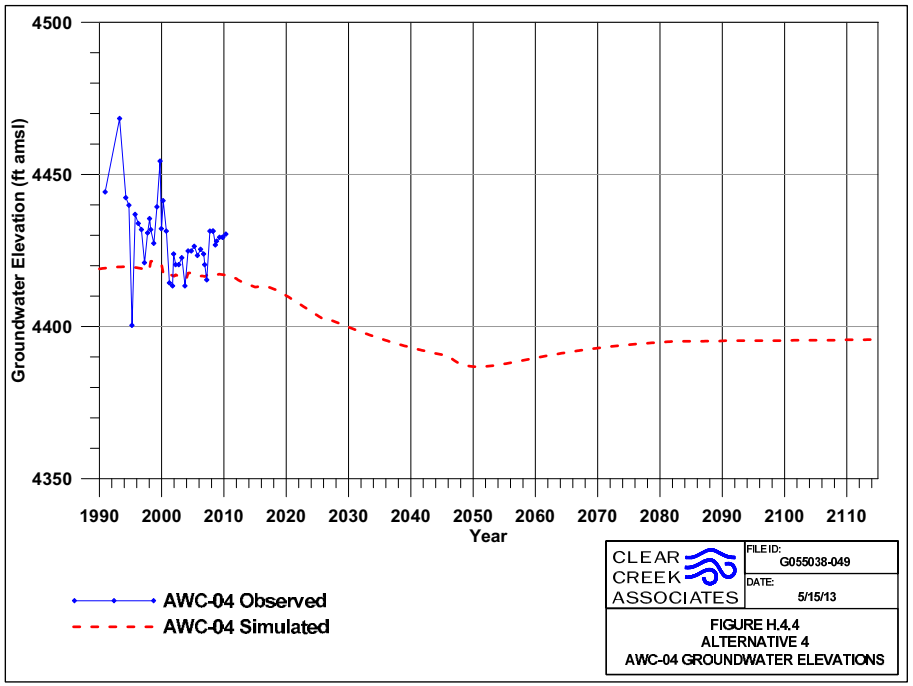
Date	File ID
5/15/13	055038-295

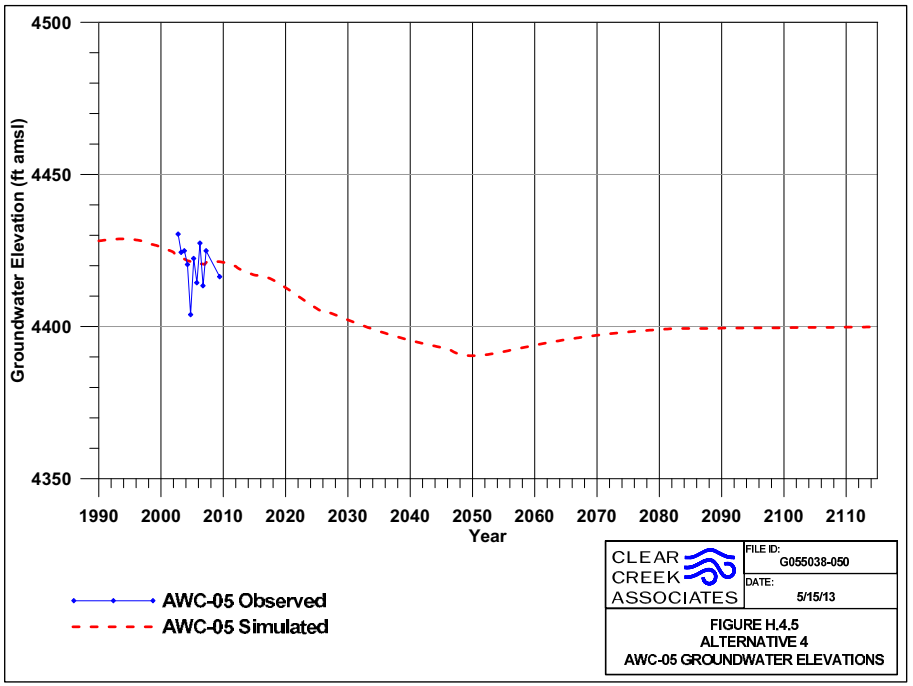
CLEAR CREEK ASSOCIATES

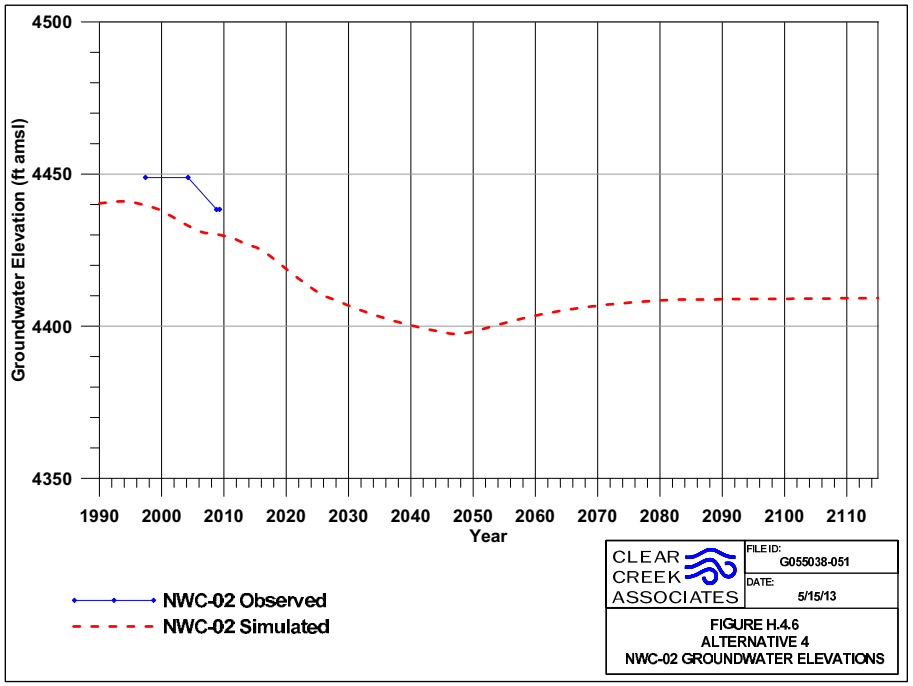
FIGURE H.4.1
ALTERNATIVE 4
SIMULATED PARTICLE TRACKS FOR 100 YEARS

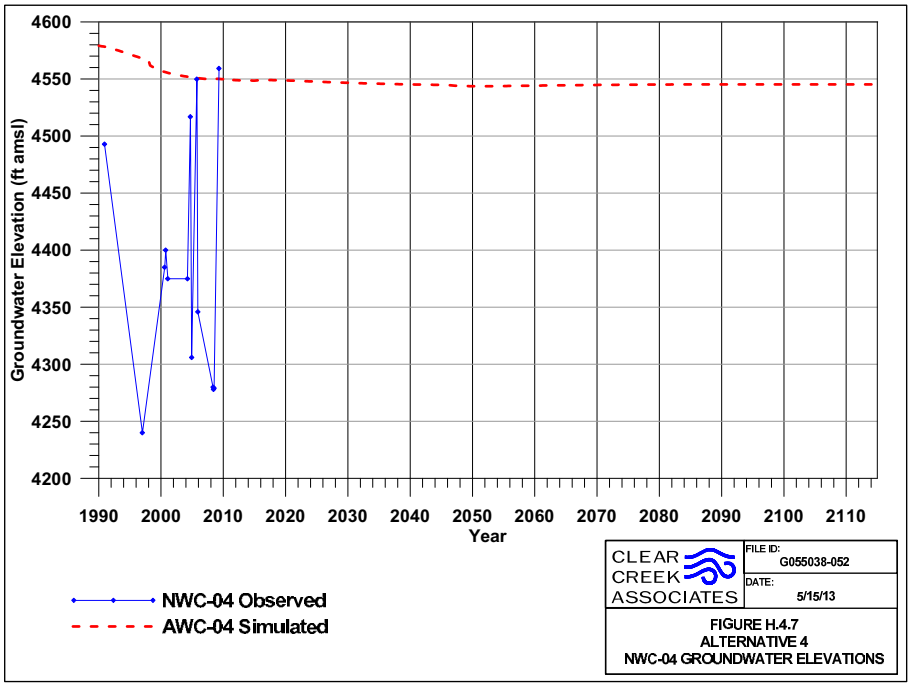

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-02 Observed
AWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-047
DATE: 5/15/13
FIGURE H.4.2
ALTERNATIVE 4
AWC-02 GROUNDWATER ELEVATIONS

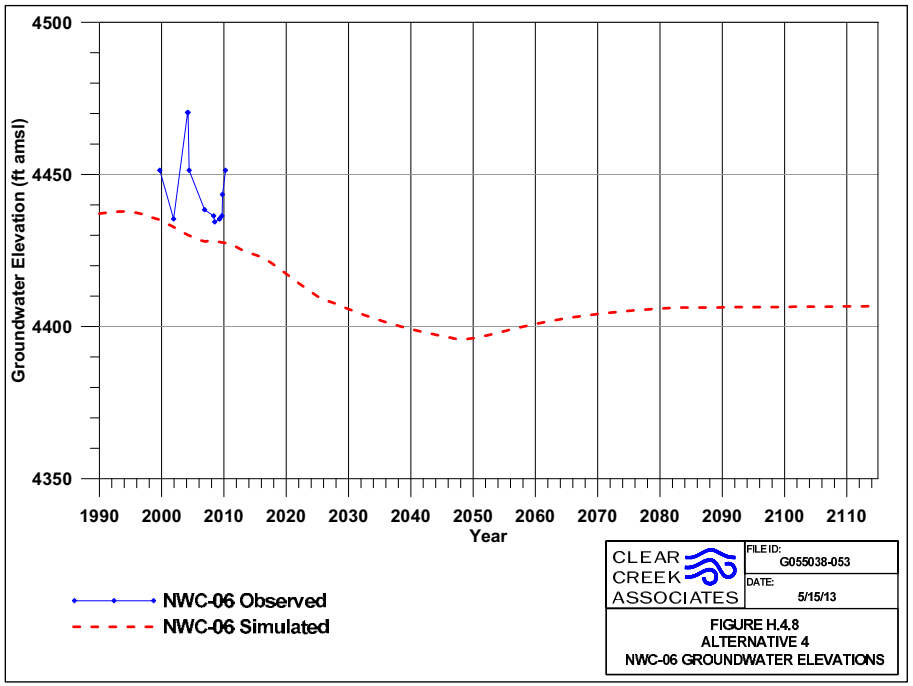

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-03 Observed
AWC-03 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-048
DATE: 5/15/13
FIGURE H.4.3
ALTERNATIVE 4
AWC-03 GROUNDWATER ELEVATIONS

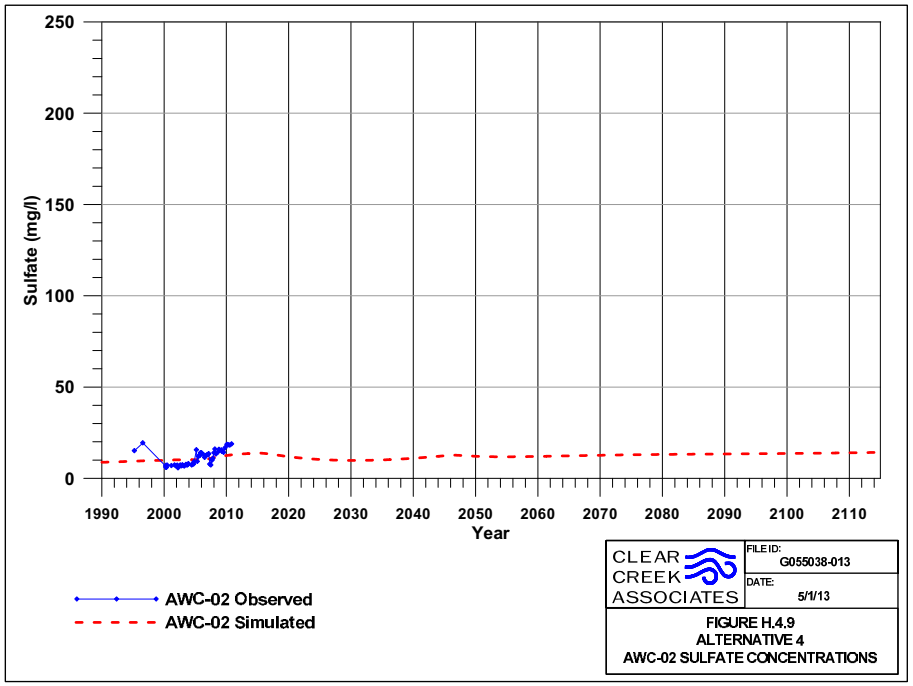

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-049
DATE: 5/15/13
FIGURE H.4.4
ALTERNATIVE 4
AWC-04 GROUNDWATER ELEVATIONS

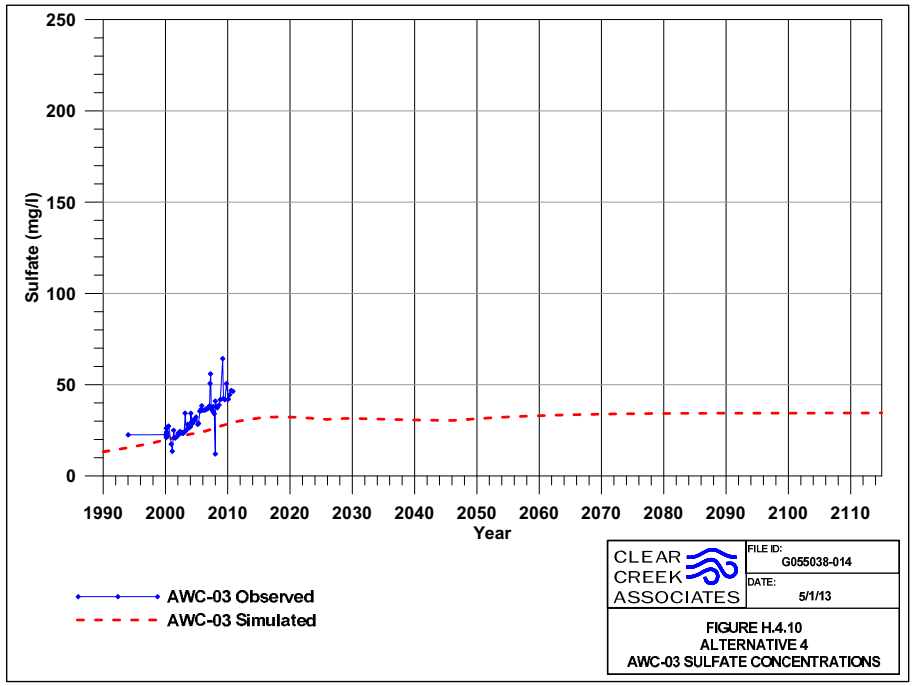

4500
4450
4400
4350
Groundwater Elevation (ft amsl)
1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Year
AWC-05 Observed
AWC-05 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-050
DATE: 5/15/13
FIGURE H.4.5
ALTERNATIVE 4
AWC-05 GROUNDWATER ELEVATIONS

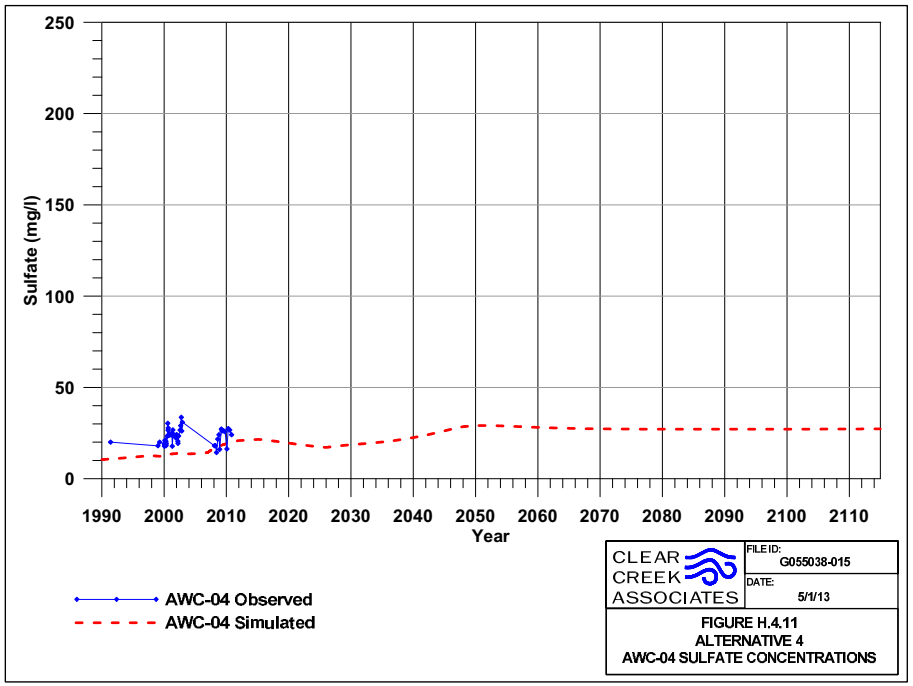

Groundwater Elevation (ft amsl)
4500
4450
4400
4350
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-02 Observed
NWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-051
DATE: 5/15/13
FIGURE H.4.6
ALTERNATIVE 4
NWC-02 GROUNDWATER ELEVATIONS

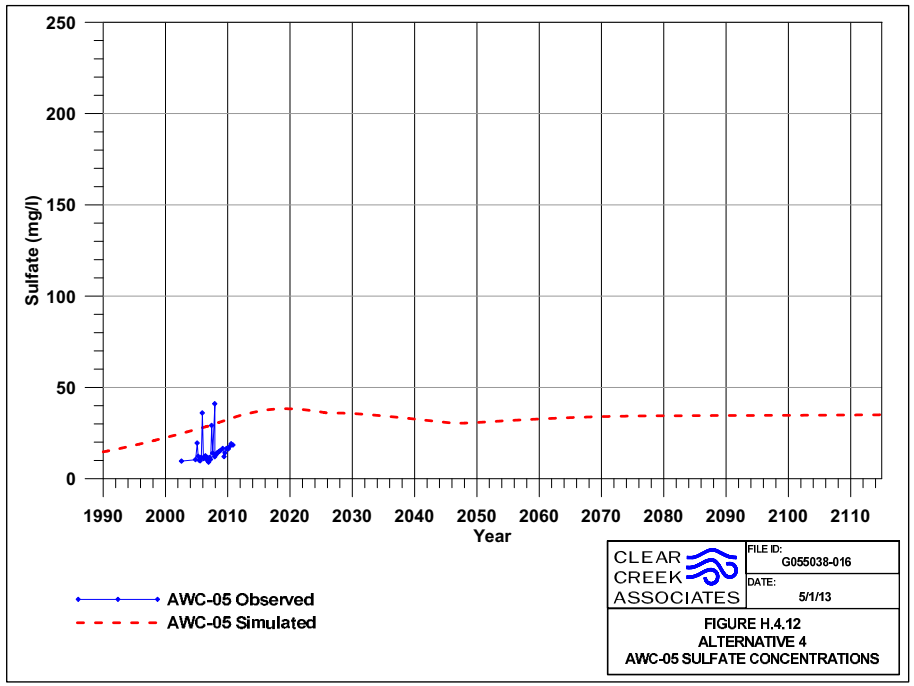

Groundwater Elevation (ft amsl)
4600
4550
4500
4450
4400
4350
4300
4250
4200
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-052
DATE: 5/15/13
FIGURE H.4.7
ALTERNATIVE 4
NWC-04 GROUNDWATER ELEVATIONS

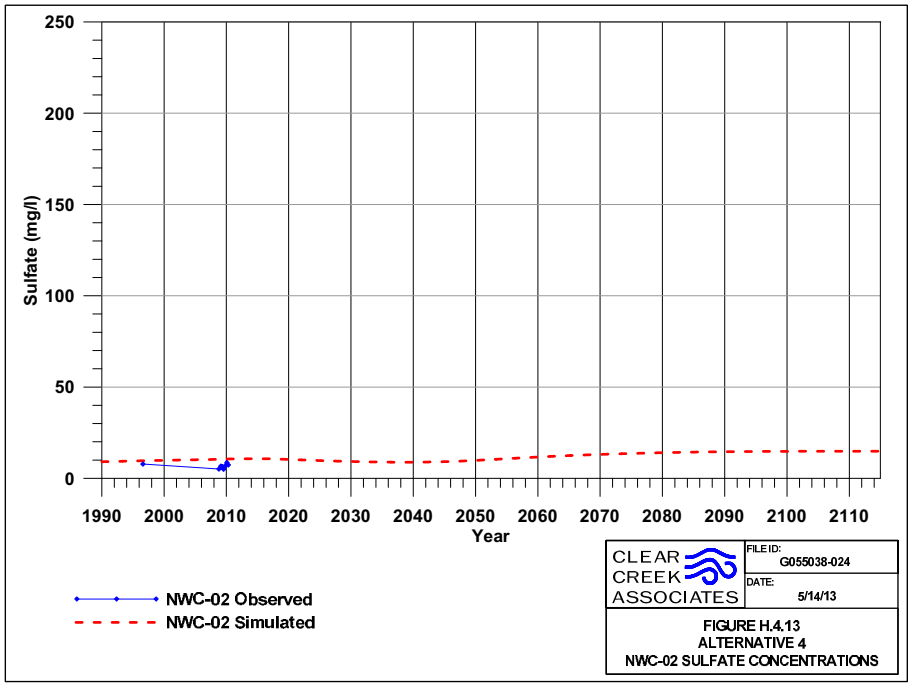

Groundwater Elevation (ft amsl)
4500
4450
4400
4350
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-06 Observed
NWC-06 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-053
DATE: 5/15/13
FIGURE H.4.8
ALTERNATIVE 4
NWC-06 GROUNDWATER ELEVATIONS

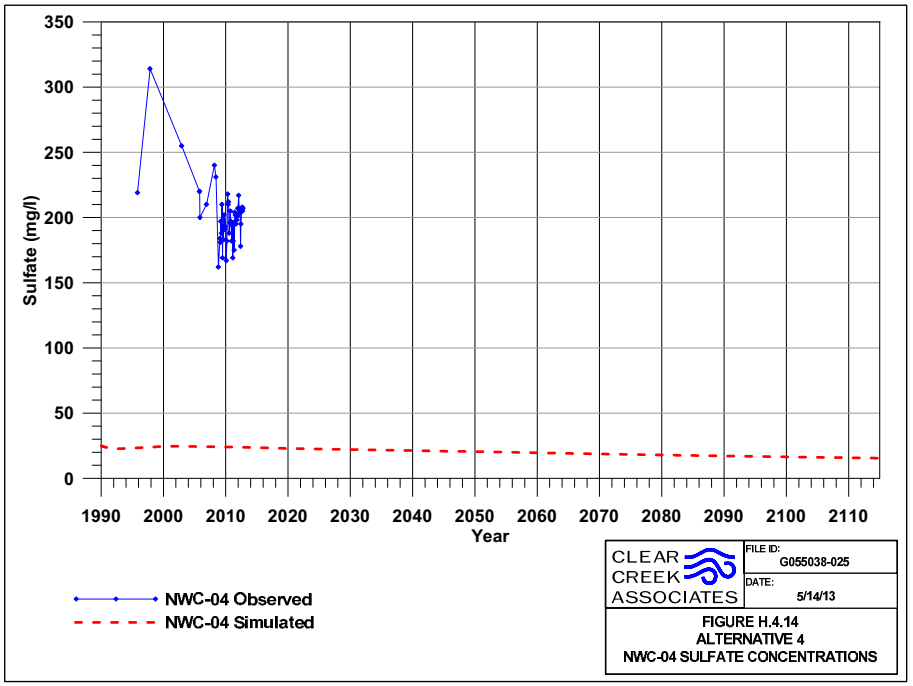

Sulfate (mg/l)
Year
AWC-02 Observed
AWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-013
DATE: 5/1/13
FIGURE H.4.9
ALTERNATIVE 4
AWC-02 SULFATE CONCENTRATIONS

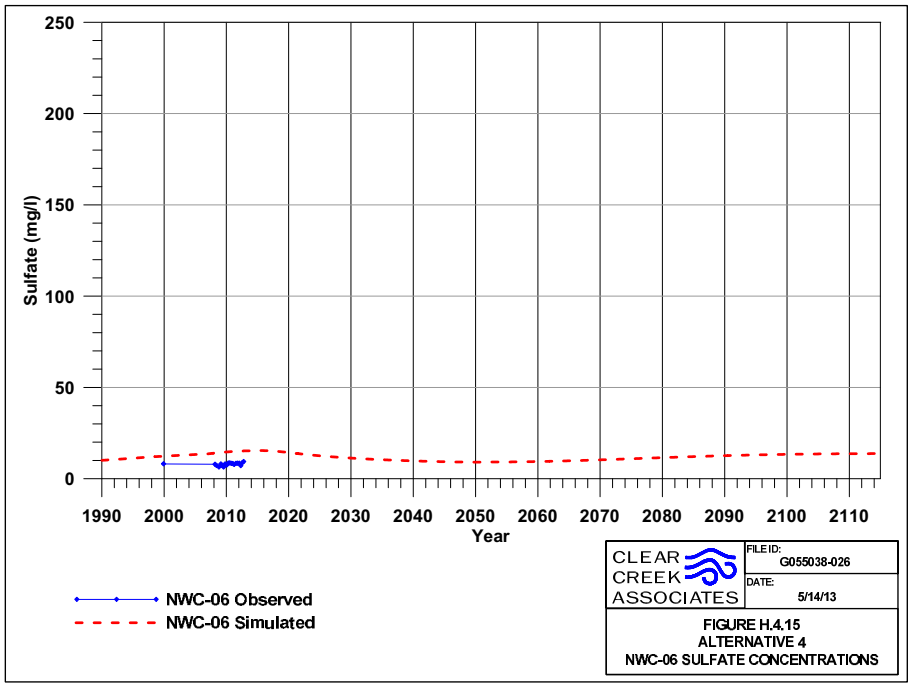

Sulfate (mg/l)
Year
AWC-03 Observed
AWC-03 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-014
DATE: 5/1/13
FIGURE H.4.10
ALTERNATIVE 4
AWC-03 SULFATE CONCENTRATIONS


Sulfate (mg/l)
Year
AWC-04 Observed
AWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-015
DATE: 5/1/13
FIGURE H.4.11
ALTERNATIVE 4
AWC-04 SULFATE CONCENTRATIONS


Sulfate (mg/l)
Year
AWC-05 Observed
AWC-05 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-016
DATE: 5/1/13
FIGURE H.4.12
ALTERNATIVE 4
AWC-05 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-02 Observed
NWC-02 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-024
DATE: 5/14/13
FIGURE H.4.13
ALTERNATIVE 4
NWC-02 SULFATE CONCENTRATIONS


Sulfate (mg/l)
350
300
250
200
150
100
50
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-04 Observed
NWC-04 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-025
DATE: 5/14/13
FIGURE H.4.14
ALTERNATIVE 4
NWC-04 SULFATE CONCENTRATIONS


Sulfate (mg/l)
250
200
150
100
50
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
Year
NWC-06 Observed
NWC-06 Simulated
CLEAR CREEK ASSOCIATES
FILE ID: G055038-026
DATE: 5/14/13
FIGURE H.4.15
ALTERNATIVE 4
NWC-06 SULFATE CONCENTRATIONS

APPENDIX I

MITIGATION ALTERNATIVE COST TABLES

APPENDIX I

MITIGATION ALTERNATIVE COST TABLES

I.1A Alternative 1A Cost Estimate
I.1B Alternative 1B Cost Estimate
I.1C Alternative 1C Cost Estimate
I.2 Alternative 2 Cost Estimate
I.3 Alternative 3 Cost Estimate
I.4 Alternative 4 Cost Estimate

TABLE I.1A
Alternative 1A Cost Estimate

ALTERNATIVE IMPLEMENTATION YEAR	CALENDAR YEAR	CAPITAL						OPERATION AND MAINTENANCE								Capital and O&M TOTAL
		Civil, Mechanical, and Electrical	Treatment	Land Application	Monitoring Wells	DWS Mitigation	Total Cap	Civil, Mechanical, and Electrical	Periodic Mechanical	Periodic Electrical	Treatment	Periodic Treatment	Land Application	Groundwater Monitoring	Total Annual O&M	
1	2014	$0	$0	$0	$1,300,000	$0	$1,300,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$1,645,000
2	2015	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
3	2016	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
4	2017	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
5	2018	$0	$0	$0	$0	$180,000	$180,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$525,000
6	2019	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
7	2020	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
8	2021	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
9	2022	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
10	2023	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
11	2024	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
12	2025	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
13	2026	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
14	2027	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
15	2028	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
16	2029	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
17	2030	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
18	2031	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
19	2032	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
20	2033	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
21	2034	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
22	2035	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
23	2036	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
24	2037	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
25	2038	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
26	2039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
27	2040	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
28	2041	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
29	2042	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
30	2043	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
31	2044	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
32	2045	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
33	2046	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
34	2047	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
35	2048	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
36	2049	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
37	2050	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
38	2051	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
39	2052	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
40	2053	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
41	2054	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
42	2055	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
43	2056	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
44	2057	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
45	2058	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
46	2059	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
47	2060	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
48	2061	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
49	2062	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
50	2063	$0	$0	$0	$0	$360,000	$360,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$705,000
50 Year Non-Discounted Cost		**$0**	**$0**	**$0**	**$1,300,000**	**$540,000**	**$1,840,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$17,250,000**	**$17,250,000**	**$19,090,000**
50 Year Net Present Value		**$0**	**$0**	**$0**	**$1,233,397**	**$164,337**	**$1,397,733**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$5,928,214**	**$5,928,214**	**$7,325,947**

Notes:
1. Monitor well costs based on installation of 10 basin fill wells at $130,000 per well
2. DWS Mitigation cost based on one private well at $180,000
3. Groundwater monitoring costs based on current expenditures.

DWS = Drinking Water Supply
O&M = Operating and Maintenance

CLEAR CREEK ASSOCIATES

TABLE I.1B
Alternative 1B Cost Estimate

ALTERNATIVE IMPLEMENTATION YEAR	CALENDAR YEAR	CAPITAL						OPERATION AND MAINTENANCE								Capital and O&M TOTAL
		Civil, Mechanical, and Electrical	Treatment	Land Application	Monitoring Wells	DWS Mitigation	Total Cap	Civil, Mechanical, and Electrical	Periodic Mechanical	Periodic Electrical	Treatment	Periodic Treatment	Land Application	Groundwater Monitoring	Total Annual O&M	
1	2014	$0	$0	$0	$1,300,000	$0	$1,300,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$1,645,000
2	2015	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
3	2016	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
4	2017	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
5	2018	$0	$0	$0	$0	$180,000	$180,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$525,000
6	2019	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
7	2020	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
8	2021	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
9	2022	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
10	2023	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
11	2024	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
12	2025	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
13	2026	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
14	2027	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
15	2028	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
16	2029	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
17	2030	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
18	2031	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
19	2032	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
20	2033	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
21	2034	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
22	2035	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
23	2036	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
24	2037	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
25	2038	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
26	2039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
27	2040	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
28	2041	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
29	2042	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
30	2043	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
31	2044	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
32	2045	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
33	2046	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
34	2047	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
35	2048	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
36	2049	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
37	2050	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
38	2051	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
39	2052	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
40	2053	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
41	2054	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
42	2055	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
43	2056	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
44	2057	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
45	2058	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
46	2059	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
47	2060	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
48	2061	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
49	2062	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
50	2063	$0	$0	$0	$0	$360,000	$360,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$705,000
50 Year Non-Discounted Cost		**$0**	**$0**	**$0**	**$1,300,000**	**$540,000**	**$1,840,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$17,250,000**	**$17,250,000**	**$19,090,000**
50 Year Net Present Value		**$0**	**$0**	**$0**	**$1,233,397**	**$164,337**	**$1,397,733**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$5,928,214**	**$5,928,214**	**$7,325,947**

Notes:
1. Monitor well costs based on installation of 10 basin fill wells at $130,000 per well
2. DWS Mitigation cost based on one private well at $180,000
3. Groundwater monitoring costs based on current expenditures.

DWS = Drinking Water Supply
O&M = Operating and Maintenance

CLEAR CREEK ASSOCIATES

TABLE I.1C
Alternative 1C Cost Estimate

ALTERNATIVE IMPLEMENTATION YEAR	CALENDAR YEAR	CAPITAL						OPERATION AND MAINTENANCE								Capital and O&M TOTAL
		Civil, Mechanical, and Electrical	Treatment	Land Application	Monitoring Wells	DWS Mitigation	Total Cap	Civil, Mechanical, and Electrical	Periodic Mechanical	Periodic Electrical	Treatment	Periodic Treatment	Land Application	Groundwater Monitoring	Total Annual O&M	
1	2014	$0	$0	$0	$1,300,000	$900,000	$2,200,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$2,545,000
2	2015	$0	$0	$0	$0	$900,000	$900,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$1,245,000
3	2016	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
4	2017	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
5	2018	$0	$0	$0	$0	$180,000	$180,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$525,000
6	2019	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
7	2020	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
8	2021	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
9	2022	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
10	2023	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
11	2024	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
12	2025	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
13	2026	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
14	2027	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
15	2028	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
16	2029	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
17	2030	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
18	2031	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
19	2032	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
20	2033	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
21	2034	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
22	2035	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
23	2036	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
24	2037	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
25	2038	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
26	2039	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
27	2040	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
28	2041	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
29	2042	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
30	2043	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
31	2044	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
32	2045	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
33	2046	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
34	2047	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
35	2048	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
36	2049	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
37	2050	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
38	2051	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
39	2052	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
40	2053	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
41	2054	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
42	2055	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
43	2056	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
44	2057	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
45	2058	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
46	2059	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
47	2060	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
48	2061	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
49	2062	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$345,000
50	2063	$0	$0	$0	$0	$360,000	$360,000	$0	$0	$0	$0	$0	$0	$345,000	$345,000	$705,000
50 Year Non-Discounted Cost		**$0**	**$0**	**$0**	**$1,300,000**	**$2,340,000**	**$3,640,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$17,250,000**	**$17,250,000**	**$20,890,000**
50 Year Net Present Value		**$0**	**$0**	**$0**	**$1,233,397**	**$1,828,369**	**$3,061,766**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$5,928,214**	**$5,928,214**	**$8,989,979**

Notes:
1. Monitor well costs based on installation of 10 basin fill wells at $130,000 per well
2. DWS Mitigation cost based on one private well at $180,000
3. Groundwater monitoring costs based on current expenditures.

DWS = Drinking Water Supply
O&M = Operating and Maintenance

TABLE I.2
Alternative 2 Cost Estimate

ALTERNATIVE IMPLEMENTATION YEAR	CALENDAR YEAR	CAPITAL						OPERATION AND MAINTENANCE								CAP and O&M TOTAL
		Civil, Mechanical, and Electrical	Treatment	Land Application	Monitoring Wells	DWS Mitigation	Total Cap	Civil, Mechanical, and Electrical	Periodic Mechanical	Periodic Electrical	Treatment	Periodic Treatment	Land Application	Groundwater Monitoring	Total Annual O&M	
1	2014	$4,681,994	$16,479,363	$0	$0	$0	$21,161,357	$0	$0	$0	$0	$0	$0	$250,000	$250,000	$21,411,357
2	2015	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
3	2016	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
4	2017	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
5	2018	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
6	2019	$0	$0	$0	$0	$0	$0	$214,388	$237,600	$0	$1,598,005	$294,196	$0	$250,000	$2,594,189	$2,594,189
7	2020	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
8	2021	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
9	2022	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
10	2023	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
11	2024	$0	$0	$0	$0	$0	$0	$214,388	$237,600	$0	$1,598,005	$712,800	$0	$250,000	$3,012,793	$3,012,793
12	2025	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
13	2026	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
14	2027	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
15	2028	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
16	2029	$0	$0	$0	$0	$0	$0	$214,388	$237,600	$0	$1,598,005	$2,286,780	$0	$250,000	$4,586,773	$4,586,773
17	2030	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
18	2031	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
19	2032	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
20	2033	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
21	2034	$0	$8,289,560	$0	$0	$0	$8,289,560	$214,388	$310,400	$116,000	$1,598,005	$2,029,476	$0	$250,000	$4,518,269	$12,807,829
22	2035	$0	$2,881,200	$0	$0	$0	$2,881,200	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$4,943,593
23	2036	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
24	2037	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
25	2038	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
26	2039	$0	$0	$0	$0	$0	$0	$214,388	$237,600	$41,500	$1,598,005	$294,196	$0	$250,000	$2,635,689	$2,635,689
27	2040	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
28	2041	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
29	2042	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
30	2043	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
31	2044	$0	$8,189,803	$0	$0	$0	$8,189,803	$214,388	$237,600	$0	$1,598,005	$3,521,588	$0	$250,000	$5,821,580	$14,011,383
32	2045	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
33	2046	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
34	2047	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
35	2048	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
36	2049	$0	$0	$0	$0	$0	$0	$214,388	$237,600	$0	$1,598,005	$294,196	$0	$250,000	$2,594,189	$2,594,189
37	2050	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
38	2051	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
39	2052	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
40	2053	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
41	2054	$0	$8,289,560	$0	$0	$0	$8,289,560	$214,388	$310,400	$116,000	$1,598,005	$2,029,476	$0	$250,000	$4,518,269	$12,807,829
42	2055	$0	$2,881,200	$0	$0	$0	$2,881,200	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$4,943,593
43	2056	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
44	2057	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
45	2058	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
46	2059	$0	$0	$0	$0	$0	$0	$214,388	$237,600	$0	$1,598,005	$2,286,780	$0	$250,000	$4,586,773	$4,586,773
47	2060	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
48	2061	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
49	2062	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
50	2063	$0	$0	$0	$0	$0	$0	$214,388	$0	$0	$1,598,005	$0	$0	$250,000	$2,062,393	$2,062,393
50 Year Non-Discounted Cost		**$4,681,994**	**$47,010,685**	**$0**	**$0**	**$0**	**$51,692,679**	**$10,505,012**	**$2,284,000**	**$273,500**	**$78,302,235**	**$13,749,490**	**$0**	**$12,500,000**	**$117,614,238**	**$169,306,917**
50 Year Net Present Value		**$4,442,120**	**$22,168,102**	**$0**	**$0**	**$0**	**$26,610,222**	**$3,480,474**	**$711,737**	**$62,442**	**$25,942,748**	**$3,519,993**	**$0**	**$4,295,807**	**$38,013,201**	**$64,623,423**

Notes:
1. Civil, Mechanical, and Electrical costs from Appendix F.1
2. Treatment costs from Appendix D scaled to Alternative 2 flow rate
3. Groundwater monitoring costs based on current expenditures

DWS = Drinking Water Supply
O&M = Operating and Maintenance

CLEAR CREEK ASSOCIATES

TABLE I.3
Alternative 3 Cost Estimate

ALTERNATIVE IMPLEMENTATION YEAR	CALENDAR YEAR	CAPITAL						OPERATION AND MAINTENANCE								CAP and O&M TOTAL
		Civil, Mechanical, and Electrical	Treatment	Land Application	Monitoring Wells	DWS Mitigation	Total Cap	Civil, Mechanical, and Electrical	Periodic Mechanical	Periodic Electrical	Treatment	Periodic Treatment	Land Application	Groundwater Monitoring	Total Annual O&M	
1	2014	$3,794,679	$0	$2,621,800	$0	$0	$6,416,479	$0	$0	$0	$0	$0	$0	$250,000	$250,000	$6,666,479
2	2015	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
3	2016	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
4	2017	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
5	2018	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
6	2019	$0	$0	$0	$0	$0	$0	$257,080	$237,600	$0	$0	$0	$89,900	$250,000	$834,580	$834,580
7	2020	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
8	2021	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
9	2022	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
10	2023	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
11	2024	$0	$0	$0	$0	$0	$0	$257,080	$237,600	$0	$0	$0	$89,900	$250,000	$834,580	$834,580
12	2025	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
13	2026	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
14	2027	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
15	2028	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
16	2029	$0	$0	$0	$0	$0	$0	$257,080	$237,600	$0	$0	$0	$89,900	$250,000	$834,580	$834,580
17	2030	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
18	2031	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
19	2032	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
20	2033	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
21	2034	$0	$0	$0	$0	$0	$0	$257,080	$310,400	$116,000	$0	$0	$89,900	$250,000	$1,023,380	$1,023,380
22	2035	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
23	2036	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
24	2037	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
25	2038	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
26	2039	$0	$0	$0	$0	$0	$0	$257,080	$237,600	$41,500	$0	$0	$89,900	$250,000	$876,080	$876,080
27	2040	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
28	2041	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
29	2042	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
30	2043	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
31	2044	$0	$0	$0	$0	$0	$0	$257,080	$237,600	$0	$0	$0	$89,900	$250,000	$834,580	$834,580
32	2045	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
33	2046	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
34	2047	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
35	2048	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
36	2049	$0	$0	$0	$0	$0	$0	$257,080	$237,600	$0	$0	$0	$89,900	$250,000	$834,580	$834,580
37	2050	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
38	2051	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
39	2052	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
40	2053	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
41	2054	$0	$0	$0	$0	$0	$0	$257,080	$310,400	$116,000	$0	$0	$89,900	$250,000	$1,023,380	$1,023,380
42	2055	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
43	2056	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
44	2057	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
45	2058	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
46	2059	$0	$0	$0	$0	$0	$0	$257,080	$237,600	$0	$0	$0	$89,900	$250,000	$834,580	$834,580
47	2060	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
48	2061	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
49	2062	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
50	2063	$0	$0	$0	$0	$0	$0	$257,080	$0	$0	$0	$0	$89,900	$250,000	$596,980	$596,980
50 Year Non-Discounted Cost		**$3,794,679**	**$0**	**$2,621,800**	**$0**	**$0**	**$6,416,479**	**$12,596,920**	**$2,284,000**	**$273,500**	**$0**	**$0**	**$4,405,100**	**$12,500,000**	**$32,059,520**	**$38,475,999**
50 Year Net Present Value		**$3,600,265**	**$0**	**$2,487,476**	**$0**	**$0**	**$6,087,741**	**$4,173,555**	**$711,737**	**$62,442**	**$0**	**$0**	**$1,459,478**	**$4,295,807**	**$10,703,019**	**$16,790,760**

Notes:
1. Civil, Mechanical, and Electrical costs from Appendix F.2
2. Land Application costs from Appendix E.1
3. Groundwater monitoring costs based on current expenditures

DWS = Drinking Water Supply
O&M = Operating and Maintenance

CLEAR CREEK ASSOCIATES

TABLE I.4
Alternative 4 Cost Estimate

ALTERNATIVE IMPLEMENTATION YEAR	CALENDAR YEAR	CAPITAL						OPERATION AND MAINTENANCE								CAP and O&M TOTAL
		Civil, Mechanical, and Electrical	Treatment	Land Application	Monitoring Wells	DWS Mitigation	Total Cap	Civil, Mechanical, and Electrical	Periodic Mechanical	Periodic Electrical	Treatment	Periodic Treatment	Land Application	Groundwater Monitoring	Total Annual O&M	
1	2014	$12,088,793	$26,234,972	$4,270,500	$0	$0	$42,594,265	$0	$0	$0	$0	$0	$0	$250,000	$250,000	$42,844,265
2	2015	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
3	2016	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
4	2017	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
5	2018	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
6	2019	$0	$0	$0	$0	$0	$0	$392,214	$683,600	$0	$1,948,152	$515,136	$14,600	$250,000	$3,803,702	$3,803,702
7	2020	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
8	2021	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
9	2022	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
10	2023	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
11	2024	$0	$0	$0	$0	$0	$0	$392,214	$683,600	$0	$1,948,152	$1,032,000	$14,600	$250,000	$4,320,566	$4,320,566
12	2025	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
13	2026	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
14	2027	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
15	2028	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
16	2029	$0	$0	$0	$0	$0	$0	$392,214	$683,600	$0	$1,948,152	$3,657,296	$14,600	$250,000	$6,945,862	$6,945,862
17	2030	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
18	2031	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
19	2032	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
20	2033	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
21	2034	$0	$15,791,900	$0	$0	$0	$15,791,900	$392,214	$1,011,200	$116,000	$1,948,152	$2,728,836	$14,600	$250,000	$6,461,002	$22,252,902
22	2035	$0	$5,488,000	$0	$0	$0	$5,488,000	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$8,092,966
23	2036	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
24	2037	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
25	2038	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
26	2039	$0	$0	$0	$0	$0	$0	$392,214	$683,600	$41,500	$1,948,152	$515,136	$14,600	$250,000	$3,845,202	$3,845,202
27	2040	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
28	2041	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
29	2042	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
30	2043	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$14,600	$250,000	$2,604,966	$2,604,966
31	2044	$0	$0	$0	$0	$0	$0	$392,214	$237,600	$0	$1,948,152	$1,032,000	$14,600	$250,000	$3,874,566	$3,874,566
32	2045	$0	$0	$0	$0	$0	$0	$392,214	$0	$0	$1,948,152	$0	$89,900	$250,000	$2,680,266	$2,680,266
33	2046	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$453,976	$0	$89,900	$250,000	$990,084	$990,084
34	2047	$0	$5,488,000	$0	$0	$0	$5,488,000	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$6,024,108
35	2048	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
36	2049	$0	$0	$0	$0	$0	$0	$196,208	$237,600	$0	$0	$0	$89,900	$250,000	$773,708	$773,708
37	2050	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
38	2051	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
39	2052	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
40	2053	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
41	2054	$0	$0	$0	$0	$0	$0	$196,208	$310,400	$116,000	$0	$0	$89,900	$250,000	$962,508	$962,508
42	2055	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
43	2056	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
44	2057	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
45	2058	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
46	2059	$0	$0	$0	$0	$0	$0	$196,208	$237,600	$0	$0	$0	$89,900	$250,000	$773,708	$773,708
47	2060	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
48	2061	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
49	2062	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
50	2063	$0	$0	$0	$0	$0	$0	$196,208	$0	$0	$0	$0	$89,900	$250,000	$536,108	$536,108
50 Year Non-Discounted Cost		**$12,088,793**	**$53,002,872**	**$4,270,500**	**$0**	**$0**	**$69,362,165**	**$15,690,378**	**$4,768,800**	**$273,500**	**$60,846,688**	**$9,480,404**	**$2,146,100**	**$12,500,000**	**$105,705,870**	**$175,068,035**
50 Year Net Present Value		**$11,469,443**	**$32,767,740**	**$4,051,708**	**$0**	**$0**	**$48,288,890**	**$5,954,617**	**$1,825,254**	**$62,442**	**$27,604,654**	**$3,768,655**	**$409,589**	**$4,295,807**	**$43,921,018**	**$92,209,908**

Notes:
1. Civil, Mechanical, and Electrical costs from Appendix F.3
2. Water treatment costs from Appendix D scaled to Alternative 4 flow rates
2. Land Application costs from Appendix E.2
3. Groundwater monitoring costs based on current expenditures
DWS = Drinking Water Supply
O&M = Operating and Maintenance

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