EXPLORATION DRILLING AND HYDRAULIC TESTING FOR WATER SUPPLY STUDY

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

Prepared for:

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February 5, 2016

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1.0 INTRODUCTION

This report describes the results of field work conducted to identify and test potential drinking water sources for the Water Supply Study. The Water Supply Study is a requirement of the Mitigation Plan submitted to Arizona Department of Environmental Quality (ADEQ) in March 2015 (Clear Creek Associates, 2015) pursuant to Mitigation Order on Consent Docket No. P-121-07 between Freeport Minerals Corporation, Copper Queen Branch (CQB) and ADEQ.

The Mitigation Order requires mitigation of existing drinking water supplies exceeding 250 milligrams per liter (mg/L) sulfate at the point of use, if the sulfate originates from the Concentrator Tailing Storage Area (Figure 1). Drinking water supplies do not currently contain sulfate in excess of 250 mg/L, based on groundwater monitoring conducted under the Mitigation Plan. However, the Mitigation Plan includes contingency planning actions for existing public drinking water supplies in the path of the sulfate plume near Naco, Arizona. The water supply study is a contingency planning action conducted to identify and evaluate potential new sources of drinking water to blend with or replace a public drinking water supply should a supply be affected in the future by sulfate in excess of 250 mg/L.

1.1 Purpose and Scope of the Water Supply Study

The purpose of this water supply study is to evaluate different aquifers in the vicinity of the sulfate plume to assess their suitability to provide the quantity and quality of groundwater needed for an alternate public water supply. If a feasible supply is identified, CQB will prepare a preliminary design and implementation schedule for development of the water supply as a contingent mitigation action in the event a public drinking water supply is affected.

Two areas were evaluated for their water supply: basin fill, south of the existing Arizona Water Company (AWC) wellfield (Figure 2), and bedrock, on CQB property north of Don Luis (Figure 3). The basin fill contains an aquifer known to have the potential production and water quality suitable for a public water supply. An exploration well was installed and tested in an area of the basin fill outside the predicted path of the plume. The basin fill well is named LADD 635 in agreement with the well naming nomenclature used in other projects at CQB (i.e., well inventory and groundwater monitoring). Field investigations at LADD 635 included lithologic logging during pilot hole drilling, temporary well construction to collect depth-specific reconnaissance water samples to evaluate water quality as a function of depth, well installation, hydraulic testing and new source approval water quality sampling.

The bedrock site was chosen based on the anticipated geology and because the area is known to contain water bearing zones based on piezometers and wells installed and tested for previous environmental investigations. However, the productivity of the bedrock is uncertain given the fracture controlled nature of its permeability. Work conducted in the bedrock consisted of drilling, lithologic logging, collection of depth-specific reconnaissance water samples to evaluate potential vertical variations in water quality, and installation of nested piezometers (shallow and deep) at site WMD-2015-01; and completion of a long term aquifer test at bedrock well WMD2010-05B to determine the hydraulic response of the bedrock for the purpose of reservoir evaluation.

1.2 Permitting

Drilling authorization was received from the Arizona Department of Water Resources (ADWR) for both drilling locations prior to mobilization of the drilling rig. The registration numbers and cadastral locations for the well and piezometers are:

- LADD 635 55-224635 D-24-23-13ccd
- WMD-2015-01 55-918242 D-23-24-20aaa

Clear Creek Associates (Clear Creek) obtained authorization for discharges from borehole-drilling and testing activities at all work sites from the ADEQ. Authorization issued by ADEQ under the Arizona Pollutant Discharge Elimination System General Permit for De Minimis Discharges, allowed groundwater produced during development and testing to be discharged into ephemeral drainages near the work sites. At the completion of field activities a Notice of Termination was submitted for each permit. Authorization numbers for each site were:

- WMD2010-05B AZDGP-85656
- LADD 635 AZDGP-86082
- WMD-2015-01 AZDGP-86487

Copies of the ADWR and ADEQ authorizations are provided in Appendix A.

2.0 WELL AND NESTED PIEZOMETER INSTALLATION

Yellow Jacket Drilling (YJD), of Phoenix, Arizona, installed the basin fill and bedrock borings using a STAR 50K-CH drilling rig. Hydrogeologists from Clear Creek oversaw the drilling, construction, development and testing of the well and nested piezometer. The procedures used for borehole drilling and well construction were in general accordance with the technical specifications (Clear Creek Associates, 2014). Geophysical borehole logging was not conducted at either site. The nested piezometer, WMD-2015-01, was not in the technical specifications. CQB subsequently decided to build piezometers in the bedrock in lieu of the large diameter well specified because low flow volumes attained during depth-specific sampling and drilling indicated low permeability conditions in the borehole. Tables 1 and 2 summarize the well and nested piezometer installation and development.

2.1 Borehole Drilling

2.1.1 Basin Fill Site

The basin fill boring was drilled using the Mud Rotary method. Drilling commenced on April 3, 2015 using a 24-inch hammer bit to install 16-inch diameter steel surface casing to 20 feet below land surface (ft bls). A 9 ⅞-inch tri-cone bit was used to advance the borehole from below the surface casing to a total depth of 515 feet. The pilot hole was completed on April 27, 2015. The borehole was later reamed to a 14 ¾-inch diameter.

The basin fill boring was drilled in unconsolidated to lightly cemented basin fill consisting mostly of sand and gravel, with lesser amounts of clay and silt (0 to 490 ft bls), and sandstone bedrock (490 to 515 ft bls). Samples of drill cuttings were collected at 10-foot intervals from the land surface to the total depth of the boring and logged using ASTM Standard D 2488-00, *Standard Practice for Description and Identification of Soils (Visual Manual Procedure)*. Information collected and recorded during drilling included lithology, drill rate, reaction with a 10% solution of hydrochloric acid (HCl), grain-size distribution, clast composition, and depth to bedrock. The lithologic log for the basin fill boring is in Appendix B.

2.1.2 Bedrock Site

The bedrock boring was drilled using the reverse air-rotary drilling method from 0 to 860 feet, and direct air from 860 to the total depth of 1,100 feet. Drilling commenced on June 24, 2015 using a 24-inch hammer bit to install 16-inch diameter steel surface casing to 22 ft bls. A

9 ⅞-inch hammer bit was used to advance the borehole from below the surface casing to a total depth of 1,100 feet. The borehole drilling was completed on August 24, 2015.

The bedrock boring was drilled in unconsolidated alluvium (0 to 24 ft bls), the Escabrosa Limestone (24 to 605 ft bls), the Martin Limestone (605 to 835 ft bls), and the Abrigo Limestone (835 to 1100 ft bls) (Figure 4). Samples of drill cuttings were collected at 10-foot intervals from 25 ft bls to the total depth of the boring. Information collected and recorded during drilling included lithology, drill rate, and reaction with HCl. The lithologic log of the bedrock boring is presented in Appendix B.

2.2 Reconnaissance Depth-Specific Water Quality Sampling

Reconnaissance depth-specific water quality samples were collected from both the basin fill and the bedrock boreholes to evaluate the water quality as a function of depth in the saturated zone. Temporary wells were constructed to collect groundwater from specific depth intervals. A 4-inch diameter steel pipe with a 20-foot perforated section at the bottom was lowered to the targeted depth. Gravel pack (3/8 by 3/16-inch pea gravel) was emplaced to 10 feet above and below the perforated zone. Bentonite seals were placed above and below (the bottom seal was only emplaced if the bottom of the targeted zone was not the bottom of the borehole) the gravel pack to isolate a 40-foot zone for sampling. After the temporary well was constructed, the interval was airlifted until groundwater was clear of mud and solids, and three borehole volumes had been purged prior to sample collection.

Depth-specific samples were collected for field and laboratory analyses of radiochemistry, dissolved metals and major ions. The pH, electrical conductivity and temperature of the water samples were measured in the field with a Myron Ultrameter II multi-parameter probe. The sample suite consisted of three laboratory prepared bottles. Samples that required filtration (dissolved metals) were field-filtered with a 0.45 micrometer filter. An additional sample of water was filtered for sulfate analysis in the field with a factory-calibrated DR/820 HACH colorimeter. The laboratory samples were packed on ice and delivered to Turner Laboratories in Tucson, Arizona. Laboratory reports for reconnaissance depth-specific samples are in Appendix C.

2.2.1 Basin Fill Site

The temporary wells in the basin fill were constructed after the pilot hole had been completed, starting with the lowermost zone. Two zones were selected for analysis in the basin fill (250 to

290 ft bls and 370 to 410 ft bls) based on lithology (small percentage of fine grained material). Zone 1 (370 to 410 feet) was airlifted for 5.2 hours at a low end estimate of 4 gallons per minute (gpm) for an approximate total purge of 1,248 gallons. Zone 2 (250 to 290 feet) was airlifted for 1.4 hours at approximately 11 gpm for an approximate total purge of 935 gallons. Field and laboratory analytical results for depth-specific samples from the basin fill borehole are in Table 3.

2.2.2 Bedrock Site

The temporary wells in the bedrock were constructed as the borehole was drilled, starting with the uppermost zone. Zone 1 (445 to 485 feet) was airlifted for 3.2 hours at 1 gpm for an approximate purge of 192 gallons. Zone 2 (645 to 685 feet) was airlifted for 4.1 hours at 0.6 gpm for an approximate purge of 182 gallons. Zone 3 (960 to 1,000 feet) was airlifted for 8.7 hours at 1 gpm for an approximate purge of 530 gallons. Due to low flow conditions in each zone only approximately one borehole volume was purged prior to sampling. Field and laboratory analytical results for depth-specific samples from the bedrock borehole are in Table 4.

2.3 Basin Fill Well Construction, Development, and Completion

The basin fill well, LADD 635, was constructed in accordance with the technical specifications (Clear Creek Associates, 2014a). The one exception was the use of well screen with only 16 slots per foot instead of the specified 32 slots per foot (approved by CQB prior to installation). The 16 slot screen was selected because it was immediately available, whereas the 32 slot screen would have required a four week delay for delivery. Prior to installation, Clear Creek inspected casing and screen to ensure that each section was new, clean and undamaged, and to verify that materials complied with the project technical specifications. Figure 5 presents the as-built diagram for LADD 635. Table 1 summarizes construction.

2.3.1 Casing and Screen

The 16-inch, low carbon steel surface casing (manufactured in accordance with ASTM Specification A53 Grade B) extended from 1 foot above grade to 20.25 ft bls. The blank well casing consisted of 8-inch, low carbon steel pipe. The screen was 8-inch, low carbon steel pipe with factory cut 0.1875-inch mill slots at 16 slots per foot.

The screen and well casing were installed by welding each section together and lowering the pipe string into the borehole incrementally. The ends of the casing and screen sections were

beveled by the factory and butt-welded in the field. The lowermost section of screen arrived onsite fitted with a low carbon steel end cap. The pipe string was suspended in the borehole during annular material installation.

2.3.2 Annular Materials

Annular materials were installed following placement of the well casing. The estimated volume of each material type was calculated in the field before it was installed. The depth to the top of each annular material type was verified by measuring the top of the material with a weighted tape measure, and the volume installed was monitored to verify consistency with calculated volumes. The annular materials were emplaced in the annulus with a 1 ½-inch tremie pipe. Water was pumped down with the annular materials to prevent bridging in the tremie pipe. The bottom of the tremie pipe was submerged into the cement during cement installation.

Annular materials included in LADD 635 were: natural fill; filter pack consisting of 3/8- by 3/16-inch pea gravel; an annual seal consisting of 8 by 12 silica sand, number 60 fine sand and bentonite chips; sand cement and cement grout. Figure 5 shows the construction details for LADD 635.

The pea gravel was pumped into the well annulus with a sodium hypochlorite solution (32-ounces of NSF-approved sodium hypochlorite dissolved into 1,000 gallons of water for an 83 parts per million mixture) added to each super sack (approximately 3,000-pounds) installment of pea gravel. The sodium hypochlorite was added to the filter pack in accordance with American Water Work Association Standard for C654 for disinfection of wells.

2.3.3 LADD 635 Development

LADD 635 was initially developed by incrementally swabbing and airlifting with a 20-foot long perforated double flanged swabbing tool. Further development was accomplished with a submersible pump. All development water was discharged to the surface, north of the well location, and did not reach any wash. Clear Creek recorded flow rates, water clarity, pH, temperature, specific conductance, and sand content of the discharge to monitor development progress. Well development information is summarized on Table 1.

Swab and airlift development was performed for approximately 1,440 minutes from June 12 through June 16, 2015. Each twenty foot section of the well screen from 480 ft bls to 240 ft bls was swabbed and airlifted for 25 to 115 minutes depending on clarity of the discharge. Sand content was measured with an Imhoff cone throughout development. At the start of development

for each interval the discharge was brown and cloudy with sand and silt. Water was airlifted until clarity improved and there was zero or trace amount of sand content. After the discreet intervals were completed, the bottom cap on the swab tool was removed to allow greater volume of water through the tool. The bottom of the tool was placed near the bottom of the well and airlifted to remove sediment settled in the bottom of the well and then incrementally pulled up at 100-foot intervals for further development.

Pumping development was performed on July 17, 2015 for 84 minutes with rates ranging from 200 to 243 gpm. The discharge was light brown and slightly turbid at the start of pumping development and cleared within 20 minutes. The discharge remained clear as the flowrate was increased during development. Hydraulic testing conducted following development is discussed in Section 3.

2.3.4 Surface Completion

After airlifting development was completed, YJD poured a 3 foot by 5 foot by 6 inch cement pad around the casing at the surface. A 36- by 24- by 20-inch tall, lockable, steel-hinged well cover was set in the pad in accordance with the technical specifications.

2.3.5 Dedicated Pump and Sounding Tube Installation

After the surface completion, the well was equipped with an electric submersible stainless steel Grundfos pump with a 2-horsepower, single-phase motor, a 1.25-inch schedule 120 PVC drop pipe, and an electric cable wired with a three-prong, 20-amp plug. The pump assembly was tested for 19 minutes and produced 27 gpm.

A 1-inch, Schedule 40 flush-threaded PVC sounding tube was installed from the wellhead to within 2 feet of the pump intake. The bottom 20 feet of the sounding tube consists of Schedule 40 PVC with horizontal slots and a bottom cap.

2.4 Bedrock Site Nested Piezometer Construction, Development, and Completion

The nested piezometer, WMD-2015-01, constructed in the bedrock was originally specified to be an exploration test well; however, low flow conditions encountered during drilling and reconnaissance depth-specific sampling indicated the bedrock permeability was insufficient for water supply purposes and that a test well was unwarranted. CQB decided to use the borehole to install nested piezometers (shallow and deep) so that water level monitoring could be conducted. Prior to installation, Clear Creek inspected casing and screen to ensure that each section was

clean and undamaged. Figure 6 presents the as-built diagram for WMD-2015-01. Table 2 summarizes construction information.

2.4.1 Casing and Screen

The 16-inch, low carbon steel surface casing (manufactured in accordance with ASTM Specification A53 Grade B) extended from 1 foot above grade to 22 ft bls. The blank casing consisted of 2-inch, schedule 40, low carbon steel pipe (ASTM A53A). The screen was 2-inch, low carbon steel with field cut vertical slots at 2 slots per foot. YJD used a grinder to cut slots into a 20-foot section of the 2-inch blank casing for both the shallow and deep piezometers.

The screen and casing were connected by threaded steel couplings between each section of pipe while lowering the pipe string into the borehole incrementally. The bottommost section of screen was fitted with a threaded, low carbon steel end cap. The piezometer casing was suspended in the borehole during annular material installation.

2.4.2 Annular Materials

Prior to casing installation, the lower 160 feet of the borehole was backfilled with pea gravel and the lower seal for the deep piezometer was set. Similarly, the casing for the shallow piezometer was not installed until the lower seal for the shallow piezometer was set. This was to minimize the crowding of the borehole from the two piezometers and the tremie pipe being used.

The estimated volume of each material type was calculated in the field before it was installed. The depth to the top of each annular material type was verified by measuring the top of the material with a weighted tape measure, and the volume installed was monitored to verify consistency with calculated volumes. The annular materials were emplaced in the annulus with a 1 ½-inch tremie pipe. Water was pumped down with the annular materials to prevent bridging in the tremie pipe. The bottom of the tremie pipe was submerged into the cement during cement installation.

Annular materials included in WMD-2015-01 were: 3/8 by 3/16-inch pea gravel; bentonite chips; sand cement and cement grout. Specific construction details for WMD-2015-01 are shown on the as-built diagram (Figure 6).

2.4.3 WMD-2015-01 Development

The piezometers were developed by airlifting with 1-inch PVC and the shallow piezometer was further developed by flushing. All development water was discharged to the surface, west of the piezometer location. Clear Creek recorded flow rates, water clarity, pH, temperature, specific conductance, and sand content of the discharge to monitor development progress. Static water levels measured in the deep and shallow piezometers prior to development were 354.62 ft bls and 362.19 ft bls, respectively. Well development information is summarized on Table 2.

The 1-inch PVC airline was incrementally stepped down the water column in the deep piezometer as the pressure head was too great to start at the bottom. The airline was partially submerged into the water column such that the water above the bottom of the airline was blown out. The airline was then submerged again before the water column was able to recharge and the process repeated until reaching the bottom of the piezometer. Once at the bottom, the deep piezometer was airlifted for total of 74 minutes. The piezometer was allowed to recharge and airlifting continued from 100 ft above the bottom for 49 minutes (previously this interval was not able to sustain flow). Initially, the development water was turbid, dark orangey-brown, and contained a little foam from drilling operations. The last development water sample contained no foam, was clear with a yellow tint and stabilized field water quality parameters.

The shallow piezometer was airlifted from the bottom (no stepping required). Initial development water was turbid and dark orangey-brown, and contained foam. The shallow piezometer was dewatered within 20 minutes of airlifting. The piezometer was allowed to recover overnight but only a mist was produced by subsequent airlifting attempts. Water level measurements after the failed attempts to resume airlifting determined that the piezometer was recharging at a rate of 0.6 feet per hour (ft/hr). Airlift development at such a low recovery rate is not practical. Therefore, the shallow piezometer and filter pack were flushed with 150 gallons of water for development.

On November 19, 2015 the post development static water levels in the deep and shallow piezometers were 352.12 and 370.63 ft bls, respectively. The difference between the two piezometers increased from 7.57 feet to 18.51 feet after development.

2.4.4 Surface Completion

After piezometer construction and development was completed, YJD installed the surface completion with a 12-inch diameter steel monument with steel locking cap. The surface completion also included a 3 foot by 5 foot by 6 inch concrete pad installed around the casing at

the surface. At completion the shallow and deep nested piezometers were named WMD-2015-01S and WMD-2015-01D.

3.0 HYDRAULIC TESTING

3.1 LADD 635

Step and constant-rate tests were conducted in LADD 635. YJD provided and operated a Grundfos submersible pump for the tests. Clear Creek measured water levels in the well using a pressure transducer with a vented cable. Manual depth to water measurements were also collected using an electric sounder for verification of transducer data. Clear Creek personnel were onsite for the entirety of the 6-hr step-rate test and for the initial day of the 5-day constant-rate test. Clear Creek was onsite periodically during the constant-rate test to collect manual water level measurements, download the data from the transducer, and monitor the extent of the discharge. YJD was onsite daily for 12 hours to operate the tests, collect water level measurements, and monitor equipment. The hydraulic testing data are provided in Appendix D.1.

The purpose for the step-rate test was to evaluate efficiency and determine the rate for the constant-rate test, based on the drawdown recorded at different pumping rates. The 6-hour step-rate test was conducted on July 17, 2015 and consisted of four 90-minute steps with flowrates averaging about 95, 145, 198 and 232 gpm. These average rates were calculated from the total gallons pumped during each of the 90-minute steps, as recorded from totalizer readings at the end of each step. The static water level was measured at 168.25 ft bls prior to the start of pumping. The final drawdown at the end of each step was 6.26, 10.35, 14.86 and 17.87 feet, respectively.

The constant-rate test was started on July 18, 2015 at 232 gpm. However, a 65 minute shut-down of pumping occurred at 1,365 minutes into the test due to a generator malfunction. The water level recovered within 97% of the static water level during the shutdown. The test was restarted on July 19, 2015 and no further issues were encountered with the test.

LADD 635 was pumped at 232 gpm (based on totalizer readings) for 5,760 minutes (4 days) from July 19 to 23, 2015. On July 19, 2015 the static water level was 168.98 ft bls. The drawdown after 5,760 minutes of pumping was 17.69 feet, corresponding to a specific capacity of 13.1 gallons per minute per foot. The water level recovered to within 95% of the static water level in 30 minutes after pumping ceased. The discharge from the constant-rate test reached and followed an unnamed wash approximately 3,600 feet northwest of well location but did not reach Greenbush Draw.

3.1.1 Step-Rate Test Analysis

The drawdown data for the step-rate test are shown on Figure 7. The specific capacity for the 95, 145, 198, and 232 gpm steps was 15.18, 14.01, 13.32, and 12.98 gpm/ft, respectively. Once the flowrate was established the drawdown stabilized quickly during each step. Based on the step-rate test results, it was decided that the target flowrate for the constant-rate would be 232 gpm (the maximum the pump was capable of generating).

3.1.2 Constant-Rate Test Analysis

The drawdown data for the constant-rate test are shown on Figure 8. A check valve was not installed above the pump, therefore the recovery data were not used for aquifer parameter estimation.

Drawdown in LADD 635 occurs rapidly for the first five minutes of the test (15.70 feet). After the first five minutes of the test, drawdown increases very gradually, only an additional 1.99 feet over the remaining 5,755 minutes. The graphical Cooper-Jacob (1946) straight line method was used to estimate a transmissivity value of approximately 8,190 feet squared per day (ft^2/day). The estimated hydraulic conductivity for the basin fill unit is 25.4 feet per day (ft/day) based on the transmissivity and an aquifer thickness of 322 feet.

3.2 WMD2010-05B

A 20-day constant-rate test was conducted at WMD2010-05B from April 30 to May 20, 2015. YJD provided and operated a Grundfos submersible pump for the test. Clear Creek measured water levels in the pumping well using a pressure transducer with a vented cable. Manual depth to water measurements were also collected using an electric sounder for verification of transducer data. Clear Creek personnel were onsite for the initial 2 days of the test. Subsequently, Clear Creek was onsite periodically to collect manual water level measurements and download the data from the transducer. The hydraulic testing data are provided in Appendix D.1.

The pump intake was set at 510 ft bls. A 1-inch PVC pipe was attached to the column pipe to allow access for a transducer. Water pumped from the well was routed through a 4-inch lay-flat hose and discharged to the surface approximately 250 feet to the east of the well location. The discharge wetted an area approximately 50 feet wide by 1,000 feet long to the south of the discharge point before infiltrating to the subsurface.

The pumping well, WMD2010-05B, is screened across the Abrigo Limestone and the Bolsa Quartzite formations. Three wells in the vicinity of the pumping well were identified as observation wells (Figure 3). WMD2010-02B (2,300 feet east, in the Pinal Schist) and WMD2010-03B (3,700 feet north, in the Bolsa Quartzite) are equipped with permanent vibrating wire transducers that did not record a response to pumping from WMD2010-05B. Well WMD2010-04B is located approximately 575 feet to the west and north of the pumping well and is screened across the Bolsa Quartzite. WMD2010-04B did respond to pumping (as expected from previous testing) and was monitored for the duration of the test with both transducer and manual readings. Well construction details for WMD2010-04B and WMD2010-05B are provided in Appendix E.

Based on totalizer readings at the beginning and end of the test, the average discharge rate during the test was approximately 38.9 gpm. The static water level in the pumping well was 385.05 ft bls (4773.23 feet above mean sea level (ft amsl)) prior to the start of the test (125 feet above the pump intake). The drawdown after 482 hours of pumping was 7.60 feet. The static water level in the observation well, WMD2010-04B, was 411.90 ft bls (4773.21 ft amsl) and the final drawdown was 5.60 feet. The observation well and pumping well, recovered to 38% and 53% of the static water level, respectively, 29-days after pumping ceased.

3.2.1 Constant-Rate Test Analysis

Both manual and automated water level data were plotted for graphical analysis. A semi-log plot of drawdown in the pumping well versus time (Figure 9) shows a departure from the theoretical straight-line, expected from homogenous and isotropic aquifers of infinite areal extent. An initial change was encountered at about 600 minutes when the drawdown curve becomes curvilinear with a slope that increased through the end of pumping. The curvilinear semi-log drawdown curve negates the use of analytical solutions for a homogenous and isotropic aquifer, such as Theis (1935) or Cooper-Jacob (1946) methods, unless boundary conditions are taken into account.

The drawdown curve for the observation well (WMD2010-04B) mirrors the behavior in the pumping well but to a lesser magnitude of drawdown (Figure 9). The water level in WMD2010-04B responds rapidly to the start of pumping in WMD2010-05B. The recovery data in the observation well also mirrors the behavior of the recovery data in the pumping well. Neither well recovered to the static water level and a hydraulic gradient towards WMD2010-05B was maintained 28 days after the cessation of pumping. The lack of recovery from the pumping test indicates that the aquifer was dewatered as a result of pumping.

Both the Theis solution for an unconfined aquifer and the Gringarten-Ramey (1974) solution for a fractured bedrock (with horizontal fracturing) aquifer were evaluated in Aqtesolv Pro (HydroSOLVE Inc., 2007). The solutions compared the fit of the two curves against the data to estimate aquifer parameters. Of the two, the Gringarten-Ramey (1974) solution, constrained by two parallel impermeable boundaries, produced the best statistical fit to the actual data estimating a transmissivity of 508 ft^2/day and a hydraulic conductivity of 0.83 ft/day. The analysis and interpretation results of the pumping test data are discussed in Appendix D.2 and summarized in Table D.5.

A linear plot of drawdown versus time for both the pumping and observation wells shows a linear relationship between drawdown and duration of pumping (Figure 10). The slope of the line indicates a 0.288 ft/day decrease in the water level for both the pumping and observation wells. Assuming the rate of water level decline remains constant, with a flowrate of 40 gpm, it would take two years to dewater the aquifer to 50% of the saturated thickness above the Pinal Schist at WMD2010-05B. However, this estimate does not consider recharge from precipitation events or the possibility of encountering another boundary condition.

3.3 WMD-2015-01

Although pump testing was not conducted at WMD-2015-01, airlifting during development did impose a stressor on the aquifer. As discussed in Section 2.4.3, the recharge rate in the shallow piezometer was 0.6 ft/hr. The slow recharge rate indicates an area of low permeability and therefore a minimal ability of the bedrock to transmit water at this depth and location.

4.0 NEW SOURCE APPROVAL SAMPLING

Clear Creek collected water quality samples from LADD 635 and WMD2010-05B near the end of the constant-rate pumping tests. Sampling near the end of the pumping test provided water representative of the potential potable supply. The samples were submitted for the suite of chemical analyses required by the ADEQ Drinking Water Source Approval Form for public water drinking water systems. All results were compared to the primary Maximum Contaminant Levels (MCL) issued by the Environmental Protection Agency (2012) under the Safe Drinking Water Act and the Arizona Aquifer Water Quality Standards (AWQS) (Arizona Administrative Code R18-11-406). Analytical method detection levels were below MCL and AWQS levels to allow relevant comparison to standards.

4.1 LADD 635

The New Source Approval sample was collected 78 hours into the constant-rate pumping test after 1,085,760 gallons had been pumped from the well. The sample met MCLs and AWQSs for the constituents analyzed. No synthetic or volatile organic compounds, or polychlorinated biphenols were detected.

The analysis indicated that the water is a calcium-sodium bicarbonate type. The total dissolved solids concentration was 210 mg/L. Sulfate was detected at 6.2 mg/L and sodium at 16 mg/L. The hardness was 120 mg/L. Nitrate was detected at 1.2 mg/L. A list of the major constituents detected in the New Source Approval sample is provided in Table 6 along with their respective MCL, if applicable. The laboratory report is provided in Appendix C.

4.2 WMD2010-05B

The New Source Approval sample was collected 481 hours into the constant-rate pumping test after 449,062 gallons had been pumped from the well. The sample met MCLs and AWQSs for the constituents analyzed. No synthetic or volatile organic compounds, or polychlorinated biphenols were detected.

The analysis indicated that the water is a calcium bicarbonate type. The total dissolved solids concentration was 310 mg/L. Sulfate was detected at 39 mg/L and sodium at 6.9 mg/L. The hardness was 75 mg/L. Nitrate was detected at 2.6 mg/L. A list of the major constituents detected in the New Source Approval sample is provided in Table 6 along with their respective MCL, if applicable. The laboratory report is provided in Appendix C.

5.0 DISCUSSION

5.1 Basin Fill Exploration Target

Hydraulic testing of LADD 635 produced shallow drawdown (17.69 feet), after pumping for 4 days at a high discharge rate of 232 gpm, which was the maximum capacity of the pump. LADD 635 recovered 96% of the static water level within 30 minutes after shutdown. The shallow drawdown and quick recovery indicate that the aquifer is capable of producing at higher pumping rates than the test rate.

Water quality samples collected during drilling and near the end of the hydraulic test indicate that concentrations of inorganic, organic and radiological constituents are less than the limits ADEQ applies to new drinking water sources. The new source approval well sample sulfate concentration was measured at 6.2 mg/L, well below the Mitigation Order maximum of 250 mg/L. Based on these results, this portion of the basin fill aquifer has suitable water quality as a public drinking water supply.

Groundwater modeling shows that the portion of the basin fill aquifer (south of Greenbush Draw) will not be affected by the sulfate plume. Based on the testing and data collected from LADD 635, the water quality sampling confirms that the groundwater is suitable as a drinking water supply and hydraulic testing shows that the basin fill aquifer in this area can likely produce water at rates similar to the AWC wellfield. The basin fill aquifer exploration target has good potential as an alternate water supply.

5.2 Bedrock Exploration Target

The new source approval sample collected near the end of the constant-rate test at WMD2010-05B complied with the drinking water standards applied by ADEQ for new drinking water sources. The analytes measured during reconnaissance depth-specific sampling in the WMD-2015-01 borehole were all within the AWQSs and MCLs. Sulfate concentrations in bedrock at WMD-2010-05B and WMD-2015-01 ranged from 15 to 53 mg/L. Although the groundwater in the aquifer has suitable water quality as a potable supply, the quantity of groundwater is questionable.

Hydraulic testing at the WMD-2015-01 boring and WMD2010-05B indicate that faulting in the area has likely developed a series of isolated aquifers with varying hydraulic conductivities. Furthermore, the lack of complete recovery to the pumping and observation wells after the

WMD2010-05B hydraulic test is evidence of the aquifer dewatering as a result of pumping. The low permeability and bounded character of the bedrock aquifer limits potential water production. Therefore, although the groundwater in the aquifer in the bedrock target area has suitable water quality as a potable supply, the long-term supply of groundwater in the bedrock is questionable. Based on testing to date, the bedrock exploration target north of Don Luis does not provide a viable source of water for an alternate water supply.

6.0 REFERENCES

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TABLES

TABLE 1
Basin Fill Exploration
LADD 635 Construction and Development Summary

Project Name:	Water Supply Study			Boring:	Basin Fill
Drilling Co.:	Yellow Jacket Drilling			Project No.:	287052
ADWR Well No.:	55-224635	Driller(s):	J. Chavez	Geologist:	MML + RDT
UTM Location:	3467541.096 N 598724.834 E		Surface Elevation:	4598.04 ft	NAD83

DRILLING SUMMARY

Total Drilled Depth (Pilot/Final):	515/510 ft	Hole Diameter:	24.00" to 20 ft, 14.75" to 510 ft, 9.875" to 514 ft
Drill Rig:	STAR 50K-CH	Drill Bit/Type:	Tri-Cone/Mud Rotary

WELL CONSTRUCTION DATA

Type of Material	Depth Interval (ft bls)		Description
	From	To	
Surface Casing	0	20	16" Low Carbon Steel
Casing	0	158	8" Low Carbon Steel
Well Screen	158	490	8" Low Carbon Steel, Mill Slot (0.125")
End Cap	490	490	8" Low Carbon Steel, welded
Centralizer Locations	*20*	*420*	*8 @ ~50' ft intervals along casing*
Cement Grout	0	20	Type II Portland Cement
Sand Cement	20	118	Sand Cement
Bentonite Pellets	118	133	Bentonite Chips
FineTransition Sand	133	138	No. 60 Sand
CoarseTransition Sand	138	143	8x12 Sand
Filter Pack	143	510	3/8" x 3/16" Pea Gravel
Natural Fill	510	515	Natural Fill

CONSTRUCTION TIME LOG

TASK	Start		Finish	
	Date	Time	Date	Time
Pilot Hole Drilling	23-Apr-15	9:08	27-Apr-15	11:44
Reaming	7-May-15	13:08	16-May-15	9:55
Casing	16-May-15	11:50	16-May-15	17:37
Filter Pack	17-May-15	11:35	17-May-15	17:43
Bentonite Pellets	18-May-15	8:37	18-May-15	9:01
Sand Cement	18-May-15	10:00	18-May-15	10:35
Cement	18-May-15	11:16	18-May-15	11:30

WELL DEVELOPMENT

SWL Date & Time:	12-Jun-15 10:25		
Airlift Date & Time Started:	16-Jun-15 16:28	Static water level in feet bls:	167.70
Duration in minutes:	1,440	Gallons Airlifted:	22,589
Pump Date & Time Started:	16-Jul-15 15:45	Static water level in feet bls:	168.06
Duration in minutes:	84	Gallons Pumped:	17,430
Date & Time Completed:	16-Jul-15 17:10	Total Gallons Purged:	40,019

Remarks: Discharge rate during airlifting was estimated, total gallons purged is based on gpm estimation.

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TABLE 2
Bedrock Exploration
WMD-2015-01 Construction and Development Summary

Project Name:	Water Supply Study			Boring:	Bedrock
Drilling Co.:	Yellow Jacket Drilling			Project No.:	287052
ADWR Well No.:	55-918242	Driller:	J. Chavez	Geologist:	MML + RDT
UTM Location:	3475757.740 N 601496.337 E		Surface Elevation:	5278.84 ft	NAD83

DRILLING SUMMARY

Total Drilled Depth:	1100	Hole Diameter:	9.875
Drill Rig:	STAR 50K-CH	Drill bit/Type:	Hammer / Air Rotary

WELL CONSTRUCTION DATA

Type of Material	Depth Interval (ft bls)		Description
	Shallow Pizometer	Deep Piezometer	
Surface Casing	0 - 22	0 - 22	16" Low Carbon Steel
Casing	0 - 539	0 - 899	2" Low Carbon Steel
Well Screen	539 - 560	899 - 920	2" Low Carbon Steel, cut slots
End Cap	560	920	2" Low Carbon Steel
	From	To	
Cement Grout	0	21	Type II Portland Cement
Bentonite Chips	21	75	Bentonite Chips
Gravel Pack	75	235	3/8" x 3/16" Pea Gravel
Sand Cement	235	477	Sand Cement
Bentonite Chips	477	528	Bentonite Chips
Filter Pack	528	570	3/8" x 3/16" Pea Gravel
Bentonite Chips	570	583	Bentonite Chips
Gravel Pack	583	872	3/8" x 3/16" Pea Gravel
Bentonite Chips	872	889	Bentonite Chips
Filter Pack	889	930	3/8" x 3/16" Pea Gravel
Bentonite Chips	930	940	Bentonite Chips
Gravel Pack	940	1100	3/8" x 3/16" Pea Gravel

CONSTRUCTION TIME LOG

TASK	Start		Finish	
	Date	Time	Date	Time
Drilling	24-Jun-15	12:15	24-Aug-15	16:00
Casing	28-Aug-15	11:00	29-Aug-15	16:36
Annular Materials	27-Aug-15	15:05	11-Sep-15	11:16
Surface Completion	13-Sep-15	9:57	13-Sep-15	13:38

SHALLOW PIEZOMETER DEVELOPMENT

SWL Date & Time:	11-Sep-15 9:06	Date & Time Completed:	12-Sep-15 11:27
Airlift Date & Time Started:	11-Sep-15 15:05	Static water level in feet bls:	362.19
Duration in minutes:	56	Gallons Airlifted:	35

DEEP PIEZOMETER DEVELOPMENT

SWL Date & Time:	11-Sep-15 9:14	Date & Time Completed:	13-Sep-15 8:31
Airlift Date & Time Started:	12-Sep-15 12:32	Static water level in feet bls:	354.62
Duration in minutes:	249	Gallons Airlifted:	360

Remarks: Discharge rate during airlifting was estimated, total gallons purged is based on gpm estimation. Due to slow recharge in the shallow piezometer, approximately 150 gallons were added to the piezometer to further deveolpment.

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TABLE 3
LADD 635 Reconnaissance Depth-Specific Sample Results

Analysis	Units	Zone 1: 370-409	Zone 2: 250-290
Turner Report Number	--	15D0779	15E0323
Field Parameters			
pH	SU	8.42	8.24
Electrical Conductivity	µS/cm	384.4	377.7
Temperature	°C	15.8	20.0
Sulfate	mg/L	5	3
ICP Dissolved Metals-E 200.7			
Barium	mg/L	0.24	0.21
Beryllium	mg/L	<0.0020	<0.0020
Cadmium	mg/L	<0.0020	<0.0020
Calcium	mg/L	41	47
Chromium	mg/L	<0.030	<0.030
Copper	mg/L	<0.020	<0.020
Magnesium	mg/L	7.0	7.5
Nickel	mg/L	<0.050	<0.050
Potassium	mg/L	<5.0	<5.0
Sodium	mg/L	31	23
ICP/MS Dissolved Metals-E 200.8			
Antimony	mg/L	<0.00050	<0.00050
Arsenic	mg/L	0.00096	0.0013
Lead	mg/L	<0.00050	<0.00050
Selenium	mg/L	<0.0025	<0.0025
Thallium	mg/L	<0.00050	<0.00050
Uranium	mg/L	0.0020	0.00075
CVAA Dissolved Mercury-E 245.1			
Mercury	mg/L	<0.0010	<0.0010
Anions by Ion Chromatography-E300			
Chloride	mg/L	7.7	9.4
Fluoride	mg/L	<0.50	<0.50
Nitrogen, Nitrate (As N)	mg/L	0.78	0.71
Nitrogen, Nitrite (As N)	mg/L	<0.10	<0.10
Sulfate	mg/L	10	7.4
Alkalinity-SM2320B			
Alkalinity, Bicarbonate (As $CaCO_3$)	mg/L	200	170
Alkalinity, Carbonate (As $CaCO_3$)	mg/L	<2.0	<2.0
Alkalinity, Hydroxide (As $CaCO_3$)	mg/L	<2.0	<2.0
Alkalinity, Total (As $CaCO_3$)	mg/L	200	170
Total Dissolved Solids (Residue, Filterable)-SM2540 C			
Total Dissolved Solids (Residue, Filterable)	mg/L	240	230
Silica-SM4500-Si D			
Silica	mg/L	35	34
Calculation-TDS Balance			
TDS Balance	TDS Ratio	1.00	1.00
Radiochemical Analysis			
Gross Alpha	pCi/L	4.6 ± 0.4	2.3 ± 0.3
Radium 226	pCi/L	<0.5	<0.4
Radium 228	pCi/L	<0.7	<0.7
Combined Radium (226, 228)	pCi/L	<0.7	<0.7
Gross Beta	mrem	<4	<4

Notes:
SU = standard units
µS/cm = micro Siemens per centimeter
°C = degrees Celsius
mg/L = milligrams per liter
pCi/L = picocuries per liter
mrem = millirem

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TABLE 4
WMD-2015-01 Reconnaissance Depth-Specific Sampling Results

Analysis	Units	Zone 1: 445-485	Zone 2: 643-685	Zone 3*: 960-1000
Turner Report Number	--	15G0488	15G0880	15H0744
Field Parameters				
pH	SU	8.41	8.60	8.39
Electrical Conductivity	µS/cm	513.5	449.8	767.4
Temperature	°C	21.9	28.5	22.1
Sulfate	mg/L	53	15	46
ICP Dissolved Metals-E 200.7				
Barium	mg/L	0.072	0.055	0.054
Beryllium	mg/L	<0.0020	<0.0020	<0.0020
Cadmium	mg/L	<0.0020	<0.0020	<0.0020
Calcium	mg/L	55	31	53
Chromium	mg/L	<0.030	<0.030	<0.030
Copper	mg/L	<0.020	<0.020	<0.020
Magnesium	mg/L	12	20	11
Nickel	mg/L	<0.050	<0.050	<0.050
Potassium	mg/L	<5.0	<5.0	<5.0
Sodium	mg/L	31	30	73
ICP/MS Dissolved Metals-E 200.8				
Antimony	mg/L	<0.00050	<0.00050	<0.00050
Arsenic	mg/L	0.00057	0.00061	0.00079
Lead	mg/L	<0.00050	0.00066	0.00095
Selenium	mg/L	0.0027	<0.0025	0.0029
Thallium	mg/L	<0.00050	<0.00050	<0.00050
Uranium	mg/L	0.0031	0.0061	0.015
CVAA Dissolved Mercury-E 245.1				
Mercury	mg/L	<0.0010	<0.0010	<0.0010
Anions by Ion Chromatography-E300				
Chloride	mg/L	18	14	100
Fluoride	mg/L	<0.50	<0.50	<0.50
Nitrogen, Nitrate (As N)	mg/L	3.5	1.4	1.8
Nitrogen, Nitrite (As N)	mg/L	0.11	<0.10	0.11
Sulfate	mg/L	49	24	45
Alkalinity-SM2320B				
Alkalinity, Bicarbonate (As $CaCO_3$)	mg/L	180	190	180
Alkalinity, Carbonate (As $CaCO_3$)	mg/L	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (As $CaCO_3$)	mg/L	<2.0	<2.0	<2.0
Alkalinity, Total (As $CaCO_3$)	mg/L	180	190	180
Total Dissolved Solids (Residue, Filterable)-SM2540 C				
Total Dissolved Solids (Residue, Filterable)	mg/L	290	280	440
Silica-SM4500-Si D				
Silica	mg/L	14	14	16
Calculation-TDS Balance				
TDS Balance	TDS Ratio	1.00	1.10	1.10
Radiochemical Analysis				
Gross Alpha	pCi/L	6.8 ± 1.2	13.6 ± 1.1	0.5 ± 0.4
Radium 226	pCi/L	0.7 ± 0.2	<0.5	<0.4
Radium 228	pCi/L	<0.7	<0.7	<0.7
Combined Radium (226, 228)	pCi/L	0.7 ± 0.2	<0.7	<0.7
Gross Beta	mrem	<4	<4	<4

Notes:
SU = standard units
µS/cm = micro Siemens per centimeter
°C = degrees Celsius
mg/L = milligrams per liter
pCi/L = picocuries per liter
mrem = millirem
*Zone 3 was sampled with drilling foam still in the discharge

TABLE 5
New Source Approval Results

Analyte[A]	Units	LADD 635 Concentration	WMD2010-05B Concentration	EPA MCL[B]
Alkalinity, bicarbonate (As $CaCO_3$)	mg/L	180	230	--
Arsenic	mg/L	0.0019	0.0005	0.01
Barium	mg/L	0.30	<0.050	2
Calcium	mg/L	46	75	--
Chloride	mg/L	7.5	8.0	--
Lead	mg/L	<0.00050	0.00089	0.015
Magnesium	mg/L	7.3	12	--
Nitrate	mg/L	1.2	2.6	10
Sodium	mg/L	16	6.9	--
Sulfate	mg/L	6.2	39	--
TDS	mg/L	210	310	--
Hardness/Calcium	mg/L	120	190	--
Langlier Index	LI	0.20	0.10	--
Adjusted Gross Alpha	pCi/L	1.7 ± 0.5	<1.0	15
Gross Alpha Activity	pCi/L	2.9 ± 0.3	7.4 ± 0.5	--
Radium 226	pCi/L	<0.5	0.5 ± 0.2	--
Radium 228	pCi/L	<0.7	1.7 ± 0.4	--
Combined Radium	pCi/L	<0.7	2.2 ± 0.4	5
Uranium Activity	pCi/L	1.2 ± 0.4	10.0 ± 1.0	--
Uranium 238 Activity	pCi/L	0.4 ± 0.2	2.3 ± 0.4	--
Uranium 238	µg/L	1.1 ± 0.5	6.7 ± 1.1	--
Uranium 235 Activity	pCi/L	0.017 ± 0.001	0.105 ± 0.003	--
Uranium 235	µg/L	0.008 ± 0.001	0.049 ± 0.001	--
Uranium 234 Activity	pCi/L	0.8 ± 0.2	7.6 ± 0.7	--
Uranium 234	µg/L	0.00013 ± 0.00004	0.00122 ± 0.00011	--
Uranium Total Activity	pCi/L	1.2 ± 0.4	10.0 ± 1.0	--
Uranium, Total	µg/L	1.1 ± 0.5	6.8 ± 1.1	30

Notes:
[A]Analytes below detection limits are not included
[B]Source: U.S. Environmental Protection Agency. 2012 Edition of the Drinking Water Standards and Health Advisories. Spring 2012.
-- No standard
mg/L = milligrams per liter
pCi/L = picocuries per liter
µg/L = micrograms/Liter

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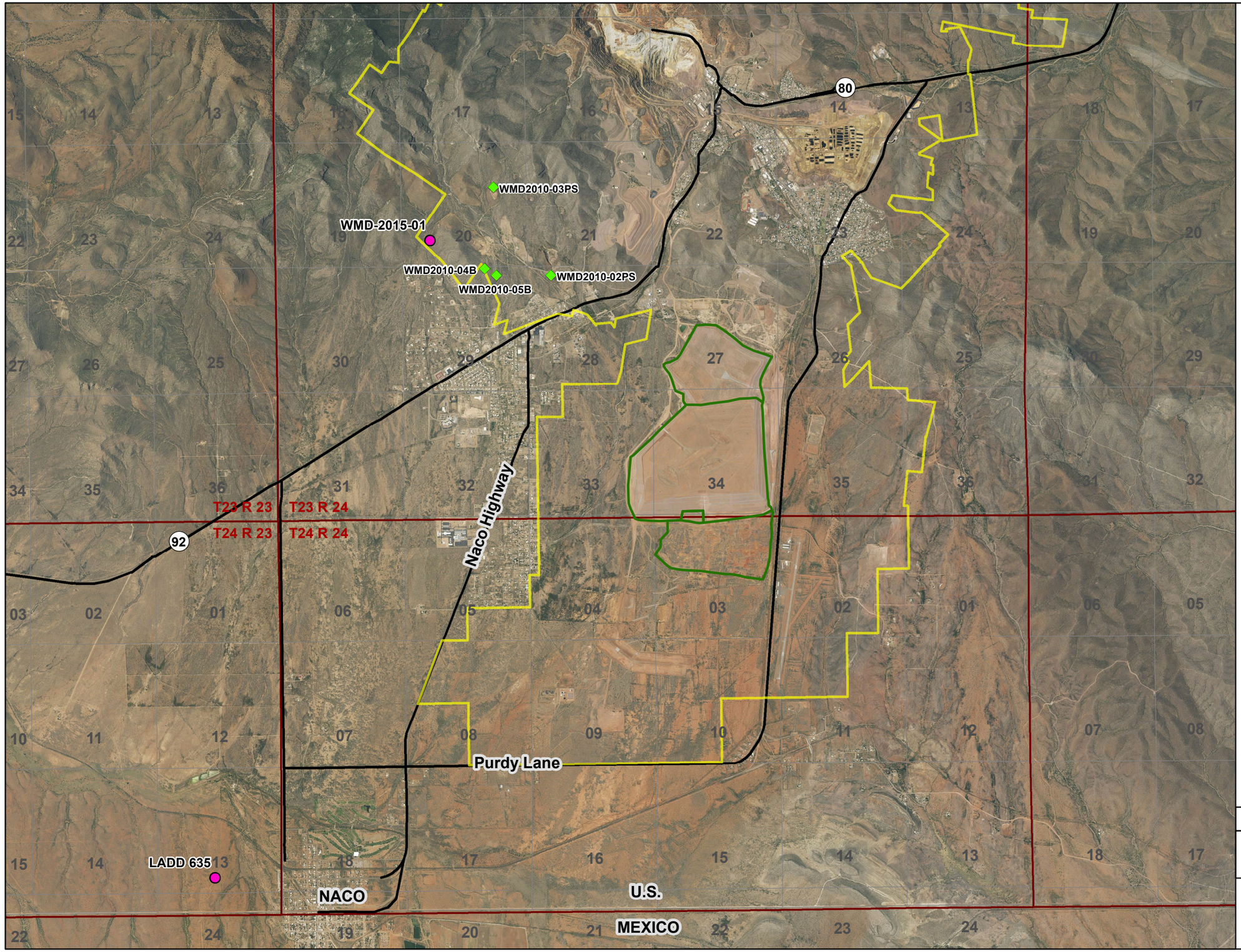
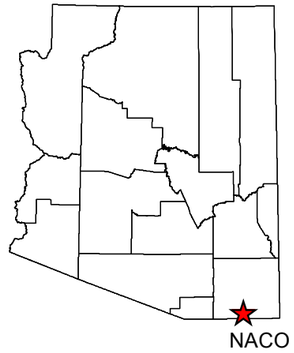
FIGURES





Legend

- Township and Range
- CQB Property Boundary
- Road
- CTSA Facility
- Exploration Wells
- Pumping Test Wells

Miles

0 0.375 0.75 1.5

Notes:

Projection: UTM Zone 12N NAD83

Date	File ID
11/19/15	055038-451

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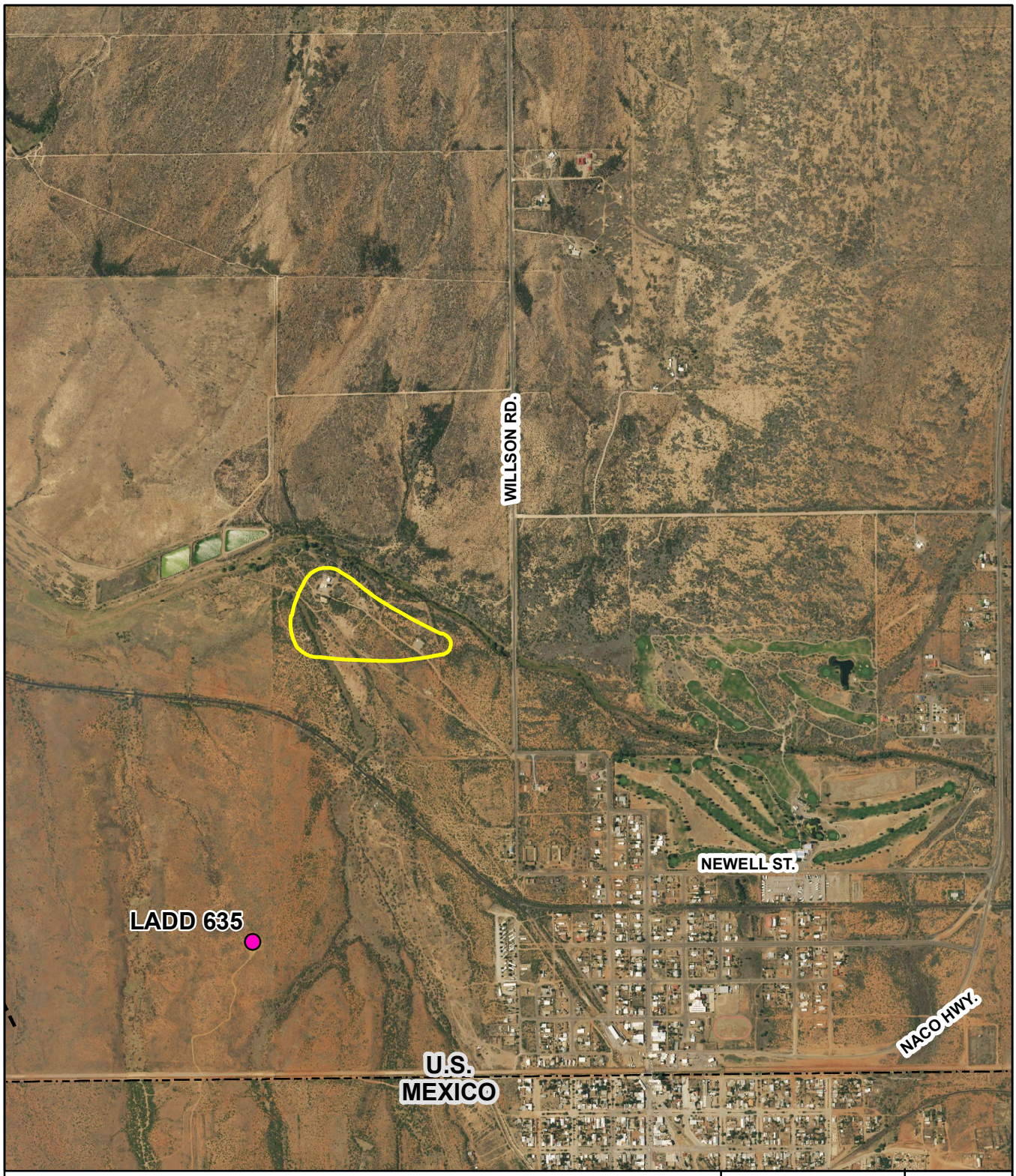
FIGURE 1
Project Location Map



Legend

- LADD 635
- AWC Wellfield

Scale (Feet)

0 1,500 3,000

NOTE: Projection is UTM Zone 12 NAD 83.

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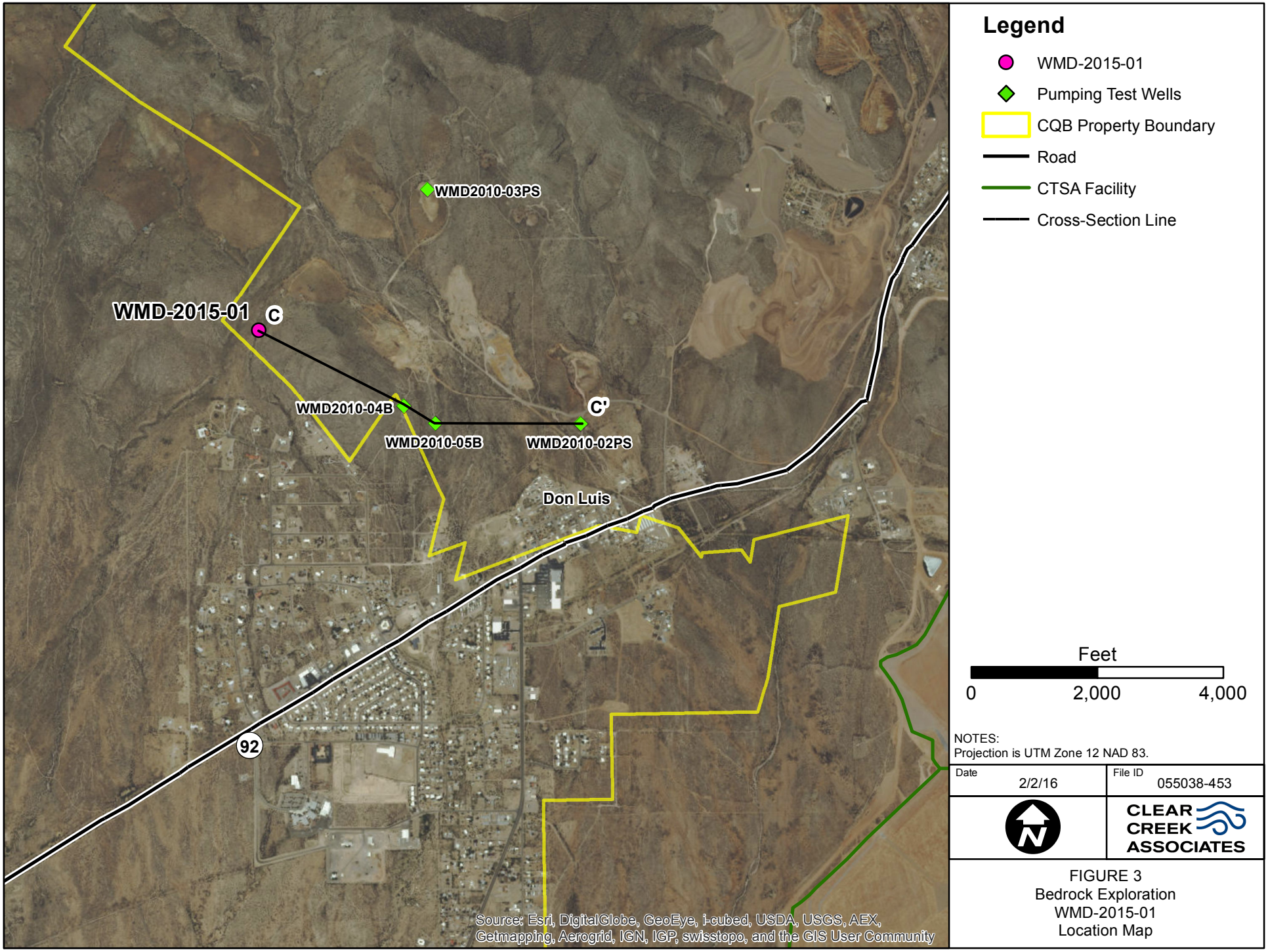
File ID 055038-452

Date 2/2/16

FIGURE 2
Basin Fill Exploration
LADD 635
Location Map



Legend

- WMD-2015-01
- Pumping Test Wells
- CQB Property Boundary
- Road
- CTSA Facility
- Cross-Section Line

Feet

0 2,000 4,000

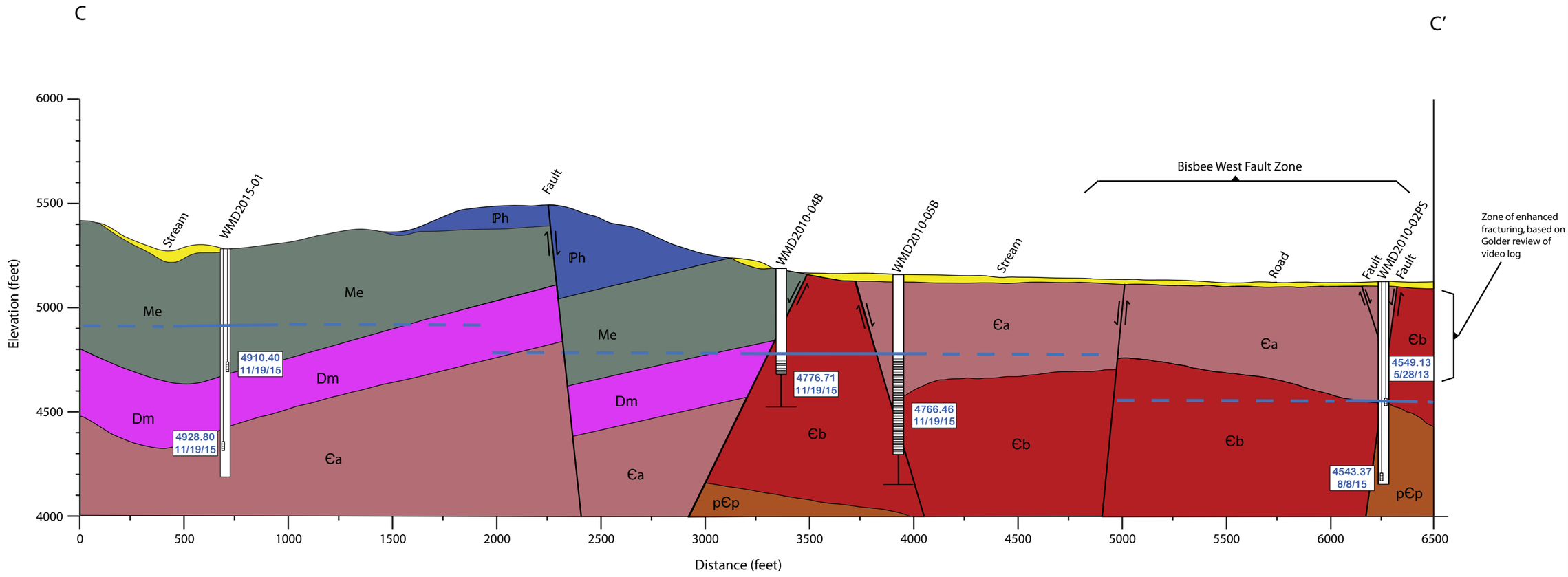
NOTES:
Projection is UTM Zone 12 NAD 83.

Date	File ID
2/2/16	055038-453

CLEAR CREEK ASSOCIATES

FIGURE 3
Bedrock Exploration
WMD-2015-01
Location Map

Facing North



Geologic Units

Legend

- Contact
- Well (shown with screen interval, wire piezometer, & borehole depth)
- Fault
- Block Movement Direction
- Potentiometric Surface (Based on hydrographs)

Qal	Alluvium
Jj	Juniper Flats Granite
Ph	Horquilla Limestone
Me	Escabrosa Limestone
Dm	Martin Limestone
Ca	Abrigo Limestone
Cb	Bolsa Quartzite
pCp	Pinal Schist

0ft 500ft 750ft 1000ft

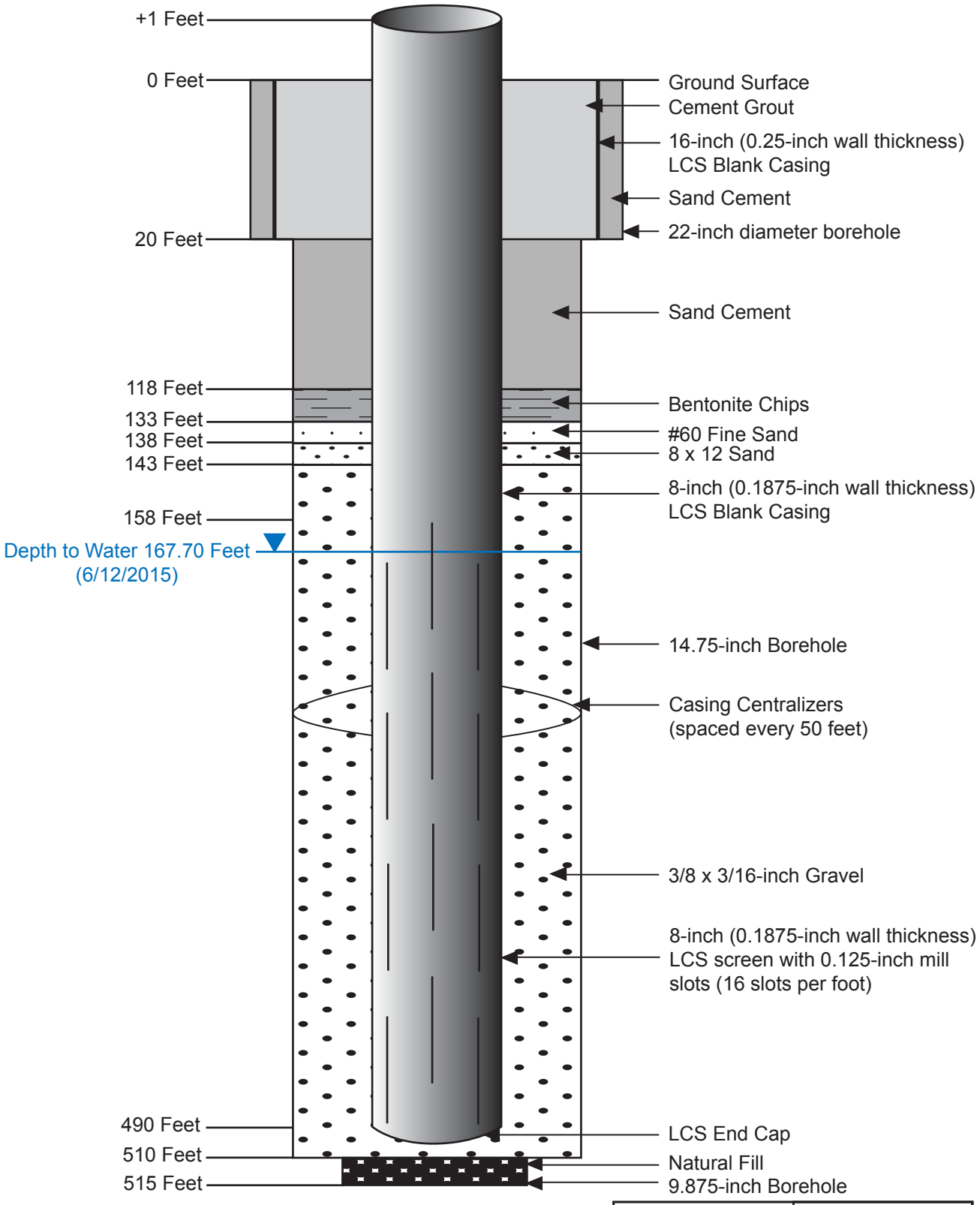
Geology and faults based on Hayes and Landis (1964) and Golder (2014)

CLEAR CREEK ASSOCIATES

Date 12/03/15

File ID A055038-010D

FIGURE 4
Bedrock Cross Section
C-C'



File ID	Date
	11/19/2015

FIGURE 5
LADD 635
55-224635
As-Built Diagram

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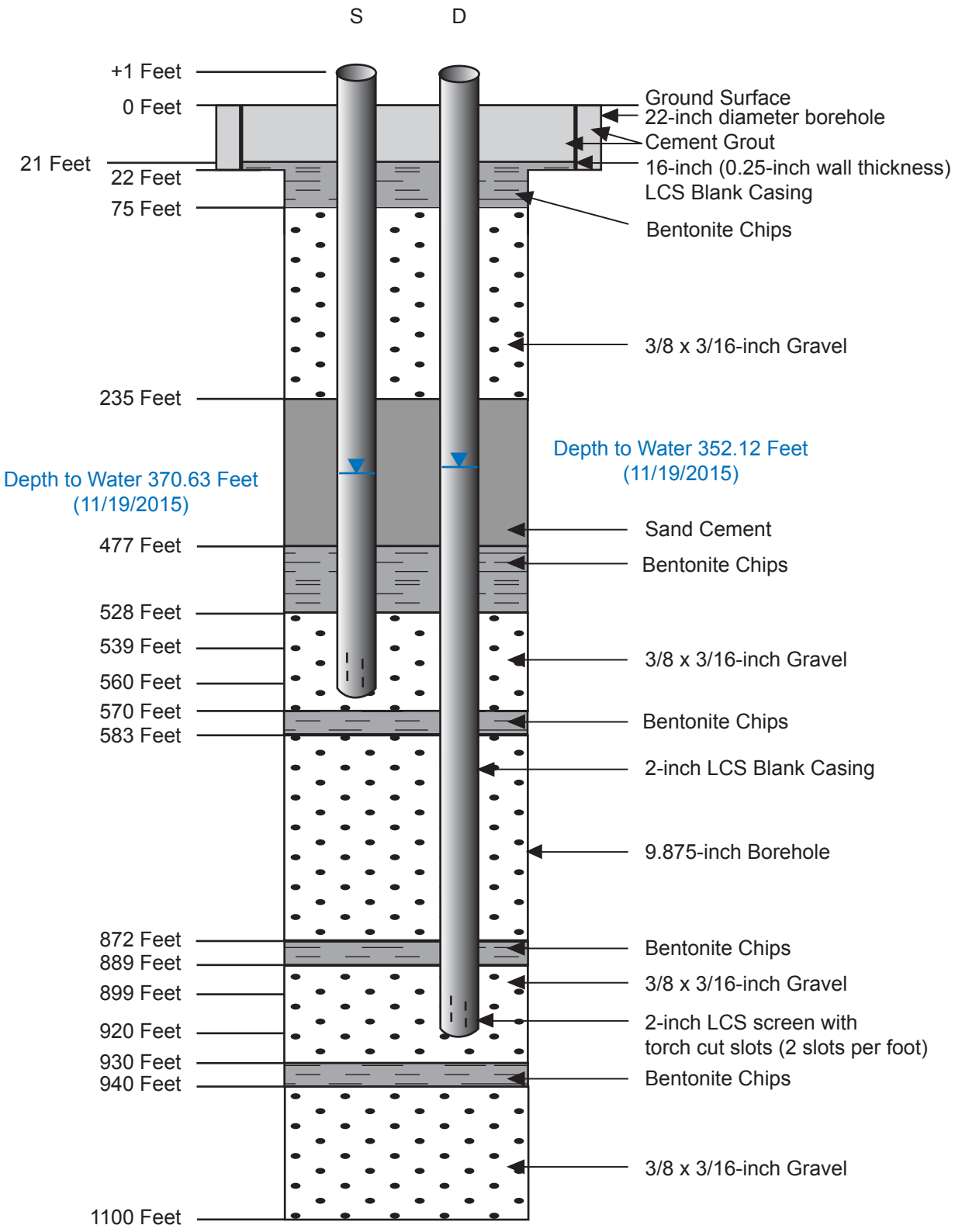
Notes:
NOT TO SCALE
LCS: Low Carbon Steel
All casing diameters are nominal



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Notes:

NOT TO SCALE

LCS: Low Carbon Steel

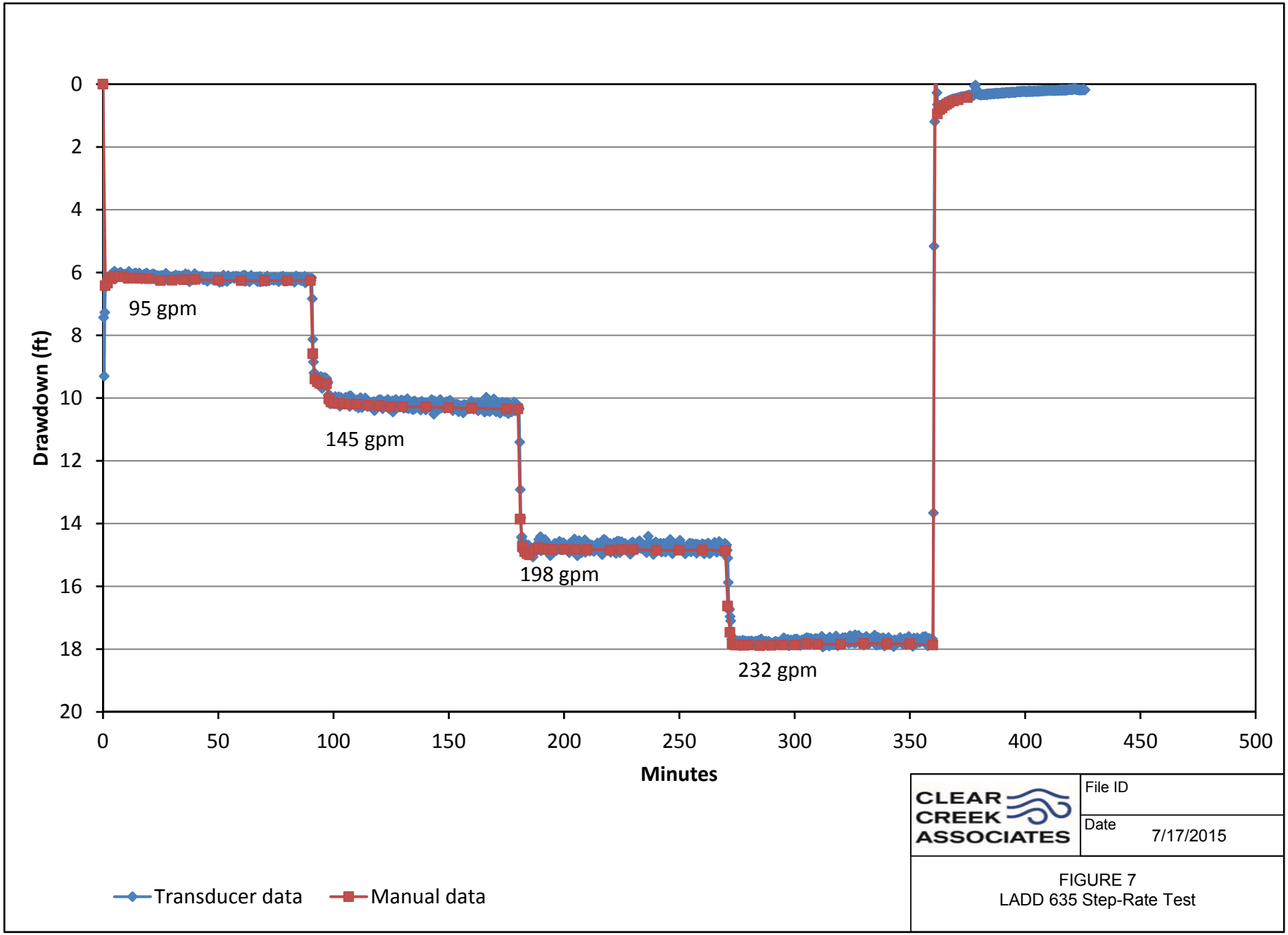
All casing diameters are nominal

Shallow piezometer on northern side

Deep piezometer on southern side

File ID	Date
	11/19/2015

FIGURE 6
WMD-2015-01
55-918242
As-Built Diagram

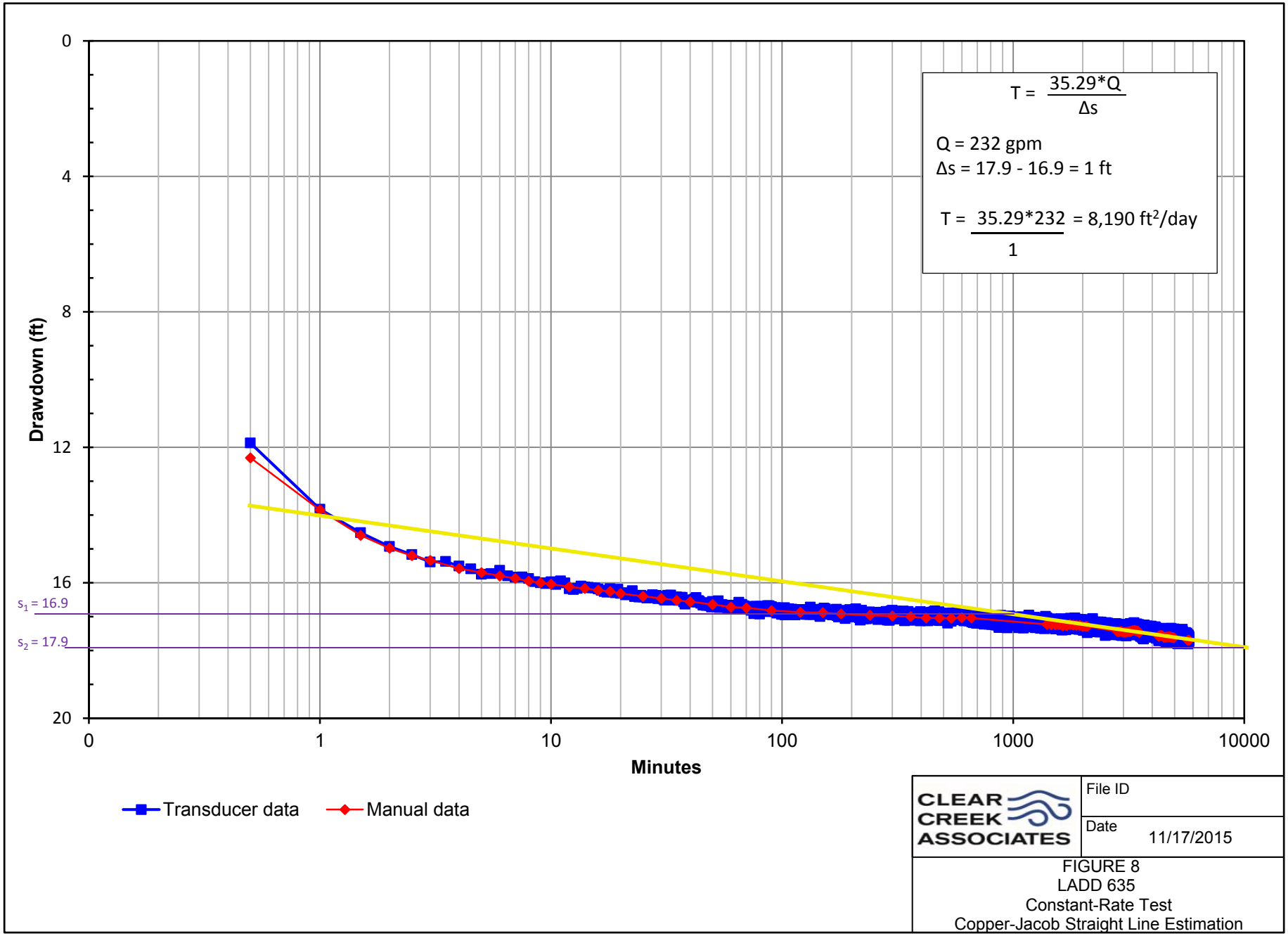


CLEAR CREEK ASSOCIATES

File ID

Date 7/17/2015

FIGURE 7
LADD 635 Step-Rate Test

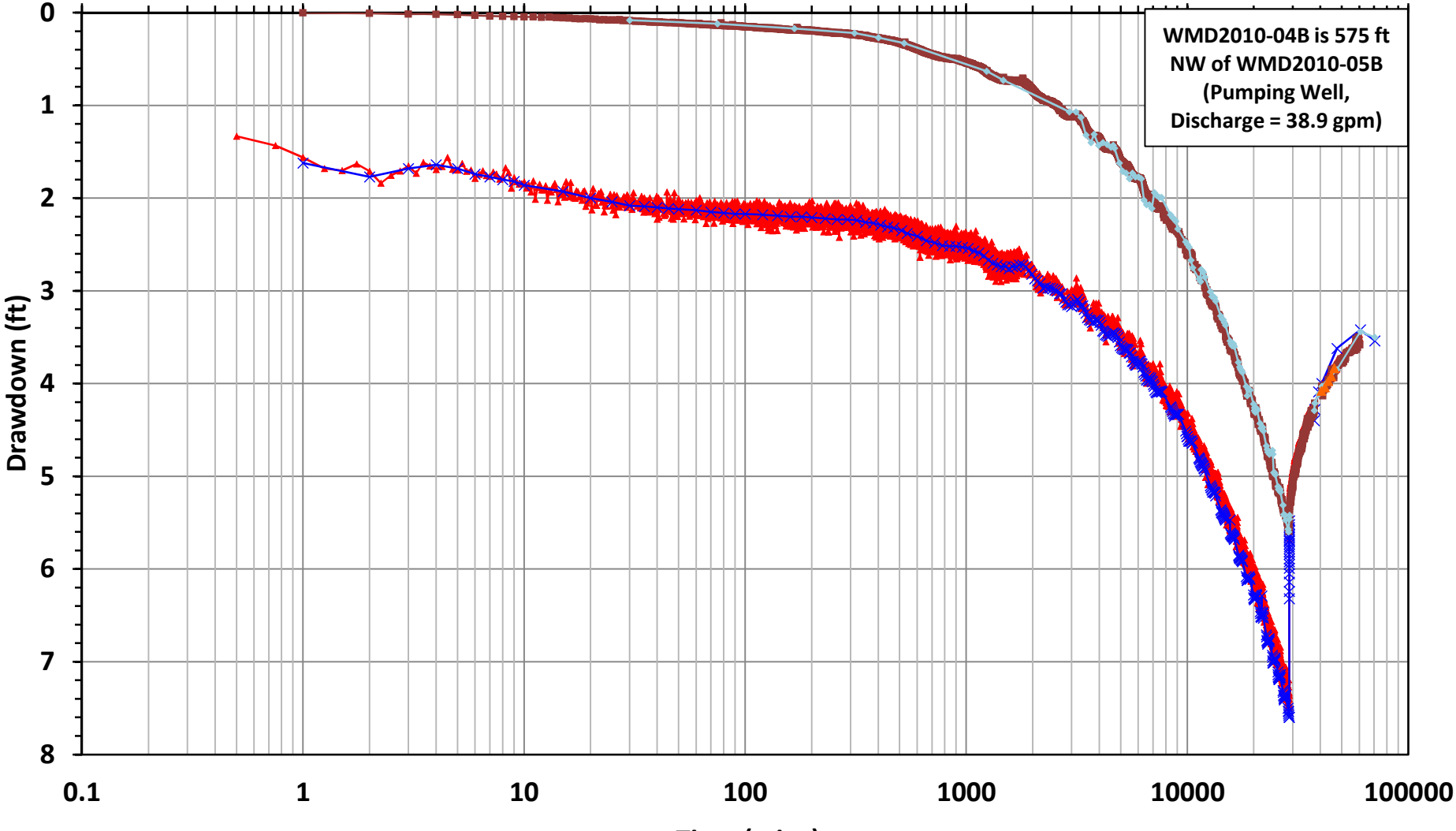


CLEAR CREEK ASSOCIATES

File ID

Date 11/17/2015

FIGURE 8
LADD 635
Constant-Rate Test
Copper-Jacob Straight Line Estimation

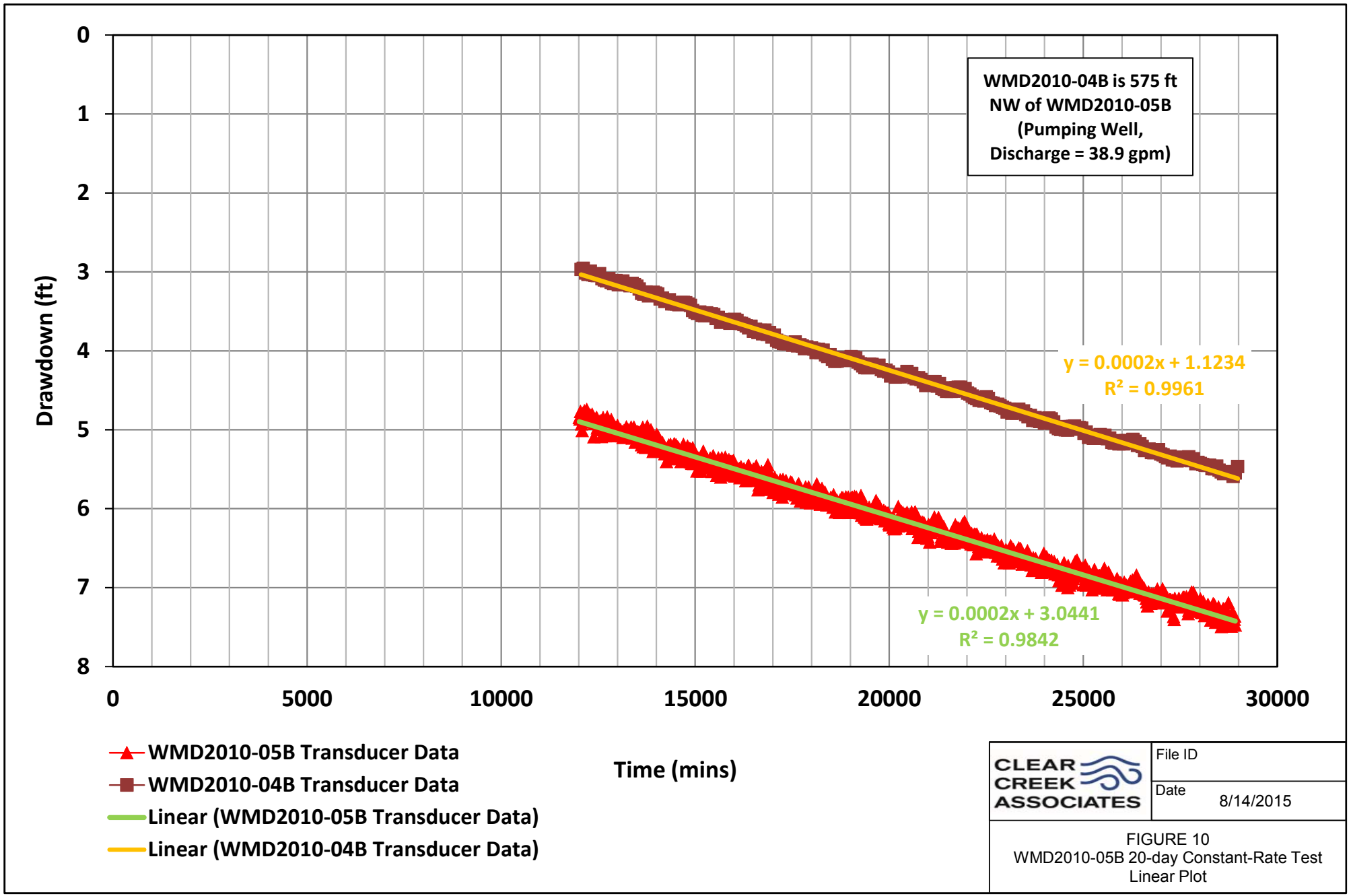


CLEAR CREEK ASSOCIATES

File ID

Date 10/27/2015

FIGURE 9
WMD2010-05B 20-day Constant-Rate Test
Semi-log Plot



CLEAR CREEK ASSOCIATES

File ID

Date 8/14/2015

FIGURE 10
WMD2010-05B 20-day Constant-Rate Test
Linear Plot

APPENDIX A

ADWR AND ADEQ AUTHORIZATION PERMITS

ARIZONA DEPARTMENT OF WATER RESOURCES
3550 North Central Avenue, Second Floor
Phoenix, Arizona 85012

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILLING OPERATIONS

WELL REGISTRATION NO: **55-224635**

AUTHORIZED DRILLER: **YELLOW JACKET DRILLING SERVICES, LLC** LICENSE NO: **78**

NOTICE OF INTENTION TO DRILL EXEMPT WELL(S) HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: **FREEPORT MACMORAN COPPER QUEEN BRANCH 36 W. HIGHWAY 92 BISBEE, AZ, 85603**

THE WELL(S) IS/ARE TO BE LOCATED IN THE:

NE 1/4 of the **SE** 1/4 of the **SW** 1/4 Section **13** Township **24.0 SOUTH** Range **23.0 EAST**

NO. OF WELLS IN THIS PROJECT: **1** ASSESSOR'S PARCEL NO: **102-34-006C**

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE DAY OF **April 15, 2016**

Steve Mrulla

GROUNDWATER PERMITTING AND WELLS

THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING.

NOTICE! The Authorization to drill this well **DOES NOT constitute or guarantee an approval to use the well** for the purpose of withdrawing groundwater **for transportation to an Active Management Area (AMA)** pursuant to A.R.S. § 45-552, 45-553, 45-554 or 45-555(A) **without official prior approval from the Department.**

ARIZONA DEPARTMENT OF WATER RESOURCES

Phoenix, Arizona 85012

DRILLING CARD
VARIANCE GRANTED

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILLING OPERATIONS

WELL REGISTRATION NO: **55-918242**

AUTHORIZED DRILLER: **YELLOW JACKET DRILLING SERVICES, LLC** LICENSE NO: **78**

NOTICE OF INTENT TO **DRILL A ENV - MONITOR WELL** HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: **FREEPORT MCMORAN - COPPER QUEEN BRANCH**

ADDRESS: **36 HIGHWAY 92, BISBEE, AZ, 85603**

THE WELL(S) IS/ARE TO BE LOCATED IN THE:

NE 1/4 of the **NE** 1/4 of the **NE** 1/4 Section **20** Township **23 S** Range **24 E**

NO. OF WELLS IN THIS PROJECT: **1**

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE DAY OF **5/29/2016**

THE DRILLER MUST FILE A WELL DRILLER REPORT AND WELL LOG WITHIN 30 DAYS OF COMPLETION OF DRILLING

This drilling or abandonment authority was granted based upon the certifications made by the above-named Driller in the notice of intent to drill or abandon. Those certifications, along with any variances granted, are listed below. By drilling or abandoning the well pursuant to this authorization, the above-named driller acknowledges the accuracy of the driller certifications. If the certifications are in error, this authorization is invalid and driller must contact the Department of Water Resource's NOI Section in writing at the addres above to correct.

Variance(s) Granted To Driller:

- Well Screen > 10' Variance – Monitor well's screen may be screened greater than 10 feet above the highest seasonal static water level.

Certification(s) Made By Driller:

☑ By checking this box, I certify that I have all necessary Registrar of Contractor (ROC) licenses in all necessary license categories for this drilling or abandonment project and that those licenses are current.

☑ By checking this box, I certify that I have been authorized by the above-named well owner to submit this Notice of Intent on the well owner's behalf.

☑ By checking this box, I certify that I have read the applicable substantive policy statement regarding each variance that I am requesting, and that I shall comply with all of the requirements set forth therein.

☑ By checking this box, I certify that the information above is complete and correct, and that the well shall be drilled or abandoned in compliance with all pertinent statutes and rules, including any special standards that may be required to protect the aquifer or other water sources.

☑ By checking this box, I certify that this NOI application is not an application to replace, deepen, or modify an existing well.

By checking this box, I understand that the Authorization to drill this well DOES NOT constitute or guarantee an

Douglas A. Ducey
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov

Misael Cabrera
Director

August 18, 2015

Applicant:
WILLIAM HART, SR. ENVIR. SCIENTIST
FREEPORT MINERALS CORP., COPPER QUEEN BR.
36 WEST HIGHWAY 92
BISBEE AZ 85603

Discharging Facility:
WATER SUPPLY STUDY - BEDROCK WELL
(SEE ACCESS DIRECTIONS)
BISBEE AZ - COCHISE COUNTY
LAT: 312443.909 LONG: 1095556.233

SUBJECT: Authorization to Discharge under AZPDES De Minimis General Permit;
Authorization Number: AZDGP-86487

Dear Applicant:

The Arizona Department of Environmental Quality (ADEQ) has received and processed your Notice of Intent (NOI) for the above-referenced discharges. The discharges described in the NOI have been authorized under the terms and conditions of the AZPDES De Minimis General Permit (DMGP) effective 07/01/2015 (five business days after ADEQ received the NOI). The enclosed NOI Certificate reflects the information on record with ADEQ for this discharge.

Please be aware that this document is not your permit but confirms your authorization to discharge within the requirements of the DMGP. Discharge monitoring (per DMGP Appendix A) and full implementation of your Best Management Practices Plan (BMPP) (per DMGP Part IV. D.) are among those requirements. You must be prepared to demonstrate compliance with all elements of the BMPP and those of the DMGP to maintain coverage and avoid possible penalties. The permit and associated forms are available on ADEQ's web site at:

http://www.azdeq.gov/environ/water/permits/gen.html#demi

Please keep this document for your records, and use this Authorization Number for any inquiries or correspondence. Use this number also on the Notice of Termination (NOT), which must be submitted within 30 days after 1) the discharge has permanently ceased; 2) coverage has been obtained under another AZPDES permit; or 3) responsibility for the discharge activity has been transferred. If the discharge lasts continuously for more than four consecutive days or exceeds 0.5 million gallons in any one day, monitoring results must be submitted with the NOT, using a De Minimis Discharge Monitoring Report Form for numerical data.

Thank you for your attention to AZPDES compliance. If you have any questions regarding this letter or the enclosure, please contact Lavinia Wright, DMGP Project Manager, ADEQ Stormwater and General Permits Unit, at (602) 771-4585 or by e-mail at wright.lavinia@azdeq.gov.

Enclosure: NOI Certificate

Form# apprdemincert.rdf

ADEQ

Authorization Certificate for De Minimis Discharges under the AZPDES De Minimis General Permit

Arizona Department of Environmental Quality
1110 West Washington Street, 5415A-1 ▪ Phoenix, Arizona 85007
(Office) (602) 771-4585 ▪ (Fax) 602-771-4528

De Minimis General Permit Authorization Certificate

Authorization Number: AZDGP-86487

Effective Date: 07/01/2015

Application Information:

ID Number:	86487	**Project:**	WATER SUPPLY STUDY - BEDROCK WELL	**Received:**	06/24/2015
Inventory #:	106173	**Type:**	SINGLE		
Prior Permit:					

Owner Information:

First:	WILLIAM	**Last**	HART	**Phone:**	(520) 432-6206
Business:	FREEPORT MINERALS CORP., COPPER QUEEN BR.			**Fax:**	(520) 432-1395
Address:	36 WEST HIGHWAY 92				
City:	BISBEE	**State:**	AZ	**Zip:**	85603

Project/Site Information:

Project:	WATER SUPPLY STUDY - BEDROCK WELL	**Phone:**		**Estimated dates:**	
Address:	(SEE ACCESS DIRECTIONS)	**County:**	COCHISE	**Start:**	07/01/2015
City:	BISBEE AZ - COCHISE COUNTY			**End:**	09/30/2015
Access:	FROM HWY 92 APPX 0.5 MI. E. FROM XS OF NACO HWY & HWY 92 IN BISBEE. DISCHG LOC IS APPX 1.3 MI. MW OF SITE ACCESS FROM HWY 92.				

DWR Well Reg No: 55-

Other IDs:

Source(s) of Discharge:
- Well installation / development
- Well testing, purging

Discharge To:
- Ephemeral

Latitude:	312443.909
Longitude:	1095556.233
Watershed:	SAN PEDRO
Closest Water:	Un-Named Stream
Perennial/Int. Water:	San Pedro River
Distance from perennial/int.	12 miles

Discharge into MS4 or conveyance? No

MS4/Conveyance:

Best Management Practices Plan (BMPP):

First:	WILLIAM	**Last:**	HART	**Phone:**	(520) 432-6206
Business:	FREEPORT MINERALS CORP., COPPER QUEEN BR.			**BMPP Confirmation**	Y
Address:	36 WEST HIGHWAY 92				
City:	BISBEE	**State:**	AZ	**Zip:**	85603
				BMPP Submitted:	N

Certification (Owner-Operator or Operator):

First:	WILLIAM	**Last:**	HART	**Phone:**	(520) 432-6206
Business:	FREEPORT MINERALS CORP., COPPER QUEEN BR.				
Address:	36 WEST HIGHWAY 92			**Certification Signed:**	Y
City:	BISBEE	**State:**	AZ	**Zip:**	85603

Douglas A. Ducey
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Henry R. Darwin
Director

May 21, 2015

Applicant:
WILLIAM HART, SENIOR ENVIR. SCIENTIST
FREEPORT-MCMORAN CORP., COPPER QUEEN BR.
36 WEST HIGHWAY 92
BISBEE AZ 85603

Discharging Facility:
WATER SUPPLY STUDY
(SEE ACCESS DIRECTIONS)
BISBEE AZ - COCHISE COUNTY
LAT: 312425.38 LONG: 1095517.08

SUBJECT: Authorization to Discharge under AZPDES De Minimis General Permit;
Authorization Number: AZDGP-85656

Dear Applicant:

The Arizona Department of Environmental Quality (ADEQ) has received and processed your Notice of Intent (NOI) for the above-referenced discharges. The discharges described in the NOI have been authorized under the terms and conditions of the AZPDES De Minimis General Permit (DMGP) effective 04/28/2015 (five business days after ADEQ received the NOI). The enclosed NOI Certificate reflects the information on record with ADEQ for this discharge.

Please be aware that this document is not your permit but confirms your authorization to discharge within the requirements of the DMGP. Discharge monitoring (per DMGP Appendix A) and full implementation of your Best Management Practices Plan (BMPP) (per DMGP Part IV. D.) are among those requirements. You must be prepared to demonstrate compliance with all elements of the BMPP and those of the DMGP to maintain coverage and avoid possible penalties. The permit and associated forms are available on ADEQ's web site at:

http://www.azdeq.gov/environ/water/permits/gen.html#demi

Please keep this document for your records, and use this Authorization Number for any inquiries or correspondence. Use this number also on the Notice of Termination (NOT), which must be submitted within 30 days after 1) the discharge has permanently ceased; 2) coverage has been obtained under another AZPDES permit; or 3) responsibility for the discharge activity has been transferred. If the discharge lasts continuously for more than four consecutive days or exceeds 0.5 million gallons in any one day, monitoring results must be submitted with the NOT, using a De Minimis Discharge Monitoring Report Form for numerical data.

Thank you for your attention to AZPDES compliance. If you have any questions regarding this letter or the enclosure, please contact Lavinia Wright, DMGP Project Manager, ADEQ Stormwater and General Permits Unit, at (602) 771-4585 or by e-mail at wright.lavinia@azdeq.gov.

Enclosure: NOI Certificate

Form# apprdemincert.rdf

ADEQ

Authorization Certificate for De Minimis Discharges under the AZPDES De Minimis General Permit

Arizona Department of Environmental Quality
1110 West Washington Street, 5415A-1 • Phoenix, Arizona 85007
(Office) (602) 771-4585• (Fax) 602-771-4528

De Minimis General Permit Authorization Certificate

Authorization Number: AZDGP-85656

Effective Date: 04/28/2015

Application Information:

ID Number:	85656	**Project:**	WATER SUPPLY STUDY	**Received:**	04/21/2015
Inventory #:	106173	**Type:**	SINGLE		
Prior Permit:					

Owner Information:

First:	WILLIAM	**Last**	HART	**Phone:**	(520) 432-6206
Business:	FREEPORT-MCMORAN CORP., COPPER QUEEN BR.			**Fax:**	(520) 432-6206
Address:	36 WEST HIGHWAY 92				
City:	BISBEE	**State:**	AZ	**Zip:**	85603

Project/Site Information:

Estimated dates:

Project:	WATER SUPPLY STUDY	**Phone:**		**Start:**	04/27/2015
Address:	(SEE ACCESS DIRECTIONS)	**County:**	COCHISE	**End:**	05/27/2015
City:	BISBEE AZ - COCHISE COUNTY				
Access:	SITE ACCESS IS APPX. 300' W. OF 608 STATE HIGHWAY 92 IN BISBEE. DISCHG. LOC. IS APPX. 3,000' NW OF SITE ACCESS.				

DWR Well Reg No: 55- 912722

Other IDs:

Source(s) of Discharge: Well testing, purging

Discharge To: Ephemeral

Latitude:	312425.38
Longitude:	1095517.08
Watershed:	SAN PEDRO
Closest Water:	UNNAMED WASH
Perennial/Int. Water:	San Pedro River
Distance from perennial/int.	10.67 miles

Discharge into MS4 or conveyance? No

MS4/Conveyance:

Best Management Practices Plan (BMPP):

First:	WILLIAM	**Last:**	HART	**Phone:**	(520) 432-6206
Business:	FREEPORT-MCMORAN CORP., COPPER QUEEN BRANCH			**BMPP Confirmation**	Y
Address:	36 WEST HIGHWAY 92				
City:	BISBEE	**State:**	AZ	**Zip:**	85603
				BMPP Submitted:	N

Certification (Owner-Operator or Operator):

First:	WILLIAM	**Last:**	HART	**Phone:**	(520) 432-6206
Business:	FREEPORT-MCMORAN CORP., COPPER QUEEN BR.				
Address:	36 WEST HIGHWAY 92			**Certification Signed:**	Y
City:	BISBEE	**State:**	AZ	**Zip:**	85603

Douglas A. Ducey
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
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Henry R. Darwin
Director

May 21, 2015

Applicant:
WILLIAM HART, SENIOR ENVIR. SCIENTIST
FREEPORT-MCMORAN CORP., COPPER QUEEN BR.
36 WEST HIGHWAY 92
BISBEE AZ 85603

Discharging Facility:
WATER SUPPLY STUDY
(SEE ACCESS DIRECTIONS0
NACO AZ - COCHISE COUNTY
LAT: 312017.376 LONG: 1095743.812

SUBJECT: Authorization to Discharge under AZPDES De Minimis General Permit;
Authorization Number: AZDGP-86082

Dear Applicant:

The Arizona Department of Environmental Quality (ADEQ) has received and processed your Notice of Intent (NOI) for the above-referenced discharges. The discharges described in the NOI are now authorized under the terms and conditions of the AZPDES De Minimis General Permit (DMGP). The enclosed NOI Certificate reflects the information on record with ADEQ for this discharge.

Please be aware that this document is not your permit but confirms your authorization to discharge within the requirements of the DMGP. Discharge monitoring (per DMGP Appendix A) and full implementation of your Best Management Practices Plan (BMPP) (per DMGP Part IV. D.) are among those requirements. You must be prepared to demonstrate compliance with all elements of the BMPP and those of the DMGP to maintain coverage and avoid possible penalties. The permit and associated forms are available on ADEQ's web site at:

http://www.azdeq.gov/environ/water/permits/gen.html#demi

Please keep this document for your records, and use this Authorization Number for any inquiries or correspondence. Use this number also on the Notice of Termination (NOT), which must be submitted within 30 days after 1) the discharge has permanently ceased; 2) coverage has been obtained under another AZPDES permit; or 3) responsibility for the discharge activity has been transferred. If the discharge lasts continuously for more than four consecutive days or exceeds 0.5 million gallons in any one day, monitoring results must be submitted with the NOT, using a De Minimis Discharge Monitoring Report Form for numerical data.

Thank you for your attention to AZPDES compliance. If you have any questions regarding this letter or the enclosure, please contact Lavinia Wright, DMGP Project Manager, ADEQ Stormwater and General Permits Unit, at (602) 771-4585 or by e-mail at wright.lavinia@azdeq.gov.

Enclosure: NOI Certificate

apprdemincert

ADEQ

Authorization Certificate for De Minimis Discharges
under the AZPDES De Minimis General Permit

Arizona Department of Environmental Quality
1110 West Washington Street, 5415A-1 • Phoenix, Arizona 85007
(Office) (602) 771-4585• (Fax) 602-771-4528

De Minimis General Permit Authorization Certificate

Authorization Number: AZDGP-86082

Effective Date: 05/21/2015

Application Information:

ID Number:	86082	**Project:**	WATER SUPPLY STUDY	**Received:**	05/21/2015
Inventory #:	106173	**Type:**	SINGLE		
Prior Permit:					

Owner Information:

First:	WILLIAM	**Last:**	HART	**Phone:**	(520) 432-6206
Business:	FREEPORT-MCMORAN CORP., COPPER QUEEN BRANCH			**Fax:**	(520) 432-1395
Address:	36 WEST HIGHWAY 92				
City:	BISBEE	**State:**	AZ	**Zip:**	85603

Project/Site Information:

Project:	WATER SUPPLY STUDY	**Phone:**		**Estimated Dates:**	
Address:	(SEE ACCESS DIRECTIONS0	**County:**	COCHISE	**Start:**	05/12/2015
City:	NACO AZ - COCHISE COUNTY			**End:**	08/15/2015
Access:	SITE ACCESS IS FROM W. INTERNATIONAL RD., APPX I MI. W. FROM XS OF WILSON RD. AND W. INTERNATIONAL RD, NACO, AZ. DISCHG. LOC. IS APPX. 1,500' NW OF SITE ACCESS RD. FROM W. INTERNATIONAL RD.				

DWR Well Reg No: 55- 224635

Other IDs:

Source(s) of Discharge:
Well installation / development
Well testing, purging

Discharge To:
Ephemeral

Latitude:	312017.376	**Discharge into MS4 or conveyance?**	No
Longitude:	1095743.812		
Watershed:	SAN PEDRO	**MS4/Conveyance:**	
Closest Water:	UNNAMED WASH		
Perennial/Int.Water:	San Pedro River		
Distance from perennial/int. :	9.06 miles		

Best Management Practices Plan (BMPP):

First:	WILLIAM	**Last:**	HART	**Phone:**	(520) 432-6206
Business:	FREEPORT-MCMORAN CORP., COPPER QUEEN BRANCH			**BMPP Confirmation:**	Y
Address:	36 WEST HIGHWAY 92			**BMPP Submitted:**	N
City:	BISBEE	**State:**	AZ	**Zip:**	85603

Certification (Owner-Operator or Operator):

First:	WILLIAM	**Last:**	HART	**Phone:**	(520) 432-6206
Business:	FREEPORT-MCMORAN CORP., COPPER QUEEN BR.			**Certification Signed:**	Y
Address:	36 WEST HIGHWAY 92				
City:	BISBEE	**State:**	AZ	**Zip:**	85603

APPENDIX B

LITHOLOGIC LOGS

Project No.: 287052	Boring Name: 55-224635 (Pilot Hole)	* Percentages of fines, sand, & gravel based on visual estimates of volume
Project Name: Water Supply Study	Date Started: 4/23/2015	
ADWR Number: 55-224635	Date Completed: 4/27/2015 (Pilot)	■ Relative % fines (F < 0.08 mm)
Location Cadastral: *S13 T245 R24E CDD*	Drilling Equipment: STAR 50K-CH	
Location NAD 83: 31.33816° N, 109.96217° W	Drilling Method: Mud Rotary	□ Relative % sand (S >0.08 < 4.8 mm)
Drill Company: Yellow Jacket Drilling	Bit Size/Type: *22-in hammer bit 0-20ft; 9 7/8-in tricone bit 20-515ft (pilot boring)*	
Driller(s): J Chaves	Conductor Casing (type; diameter; depth): *steel; 16-in; 20.25 feet bls)*	▨ Relative % gravel (G > 4.8 mm)
Logged By: M Lindsey and R Toomey	Total Borehole Depth: 515 feet bls	

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/hr)	HCl Rxn	Munsell Color	USCS	Sample Description	Remarks
	F	S	G	F	S	G						
10	40	60	T				10	M	5YR 4/6	SC	Clayey Sand. Yellowish red. Soft, sticky, highly plastic clay. Sand is fine to coarse but fine dominant. Trace gravel present. Only 20% of sample is greater than 2 mm. Coarser material is felsic, mostly, and subround, exhibits 10% yellow oxide staining, no cementation.	Start drilling. 22-inch Hammer bit, 4/23/15, 09:08. Munsell color is from moist sample unless noted otherwise.
20	40	60	T				20	W	5YR 4/4	SC	Clayey sand. Reddish brown. Soft, fat clay (sticky and plastic). Fine sand with some medium to coarse sand, no cementation. Trace gravels present (fine).	Air rotary during surface casing borehole. Water added for dust control.
30	20	70	10				20	W	5YR 4/4	SC	Clayey sand. Reddish brown. Soft clay. Well-graded sand (medium dominant), no cementation, overall felsic grains - quartz, feldspar, siltstone, some caliche. Fine gravels, same lithology as sand plus quartzite, angular.	Drilling with mud, 9.875-inch Tri-cone bit. 4/24/15, 11:25. Mud will obscure munsell color and fines percentage.
40	30	60	10				20	M	5YR 4/6	SC	Clayey sand. Yellowish red. Soft sticky clay, very hydrated. Well-graded sand, increase in coarse sand. Fine gravel. Sands and gravel same lithology as above.	
50	20	70	10				20	S	7.5YR 4/6	SC	Clayey sand. Strong brown. Soft clay present, forming very soft clay balls. Fine to coarse sand, coarse dominant, no cementation, angular to subround. Gravels as described above, plus presence of limestone. Clay balls are brown (7.5YR 5/4) after washing.	
60	30	60	10				20	S	7.5YR 4/6	SC	Clayey sand. Same as described above with greater clay content.	

Notes: Unified Soil Classification System (ASTM D2488-00)
bls = below land surface; HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

CLEAR CREEK ASSOCIATES

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/hr)	HCl Rxn	Munsell Color	USCS	Sample Description	Remarks
	F	S	G	F	S	G						
70	20	60	20				20	M	7.5YR 5/4	SC	Clayey sand with gravel. Brown. Clay balls are soft, saturated. Well-graded sand, no cementation, subangular to subround. Fine gravels are angular to subround. The angularity of some suggest they were broken by drill bit. Present lithology includes quartz, feldspar, siltstone, sandstone, quartzite (felsic grains dominant).	
80	10	70	20				20	M	7.5YR 5/4	SP-SC	Poorly graded sand with clay and gravel. Brown. Soft clay. Poorly graded sand (medium to coarse), subangular to subround. Fine gravels are angular to subround. Sands and gravel have same lithology as above.	
90	20	50	30				20	M	5YR 5/4	SC	Clayey sand with gravel. Reddish brown. Soft clay. Well-graded sand, subangular to subround. Gravel as described above. Sands and gravel have same lithology as above.	
100	20	60	20				20	M	7.5YR 5/4	SC	Clayey sand with gravel. Brown. Soft clay balls. Well-graded sand (predominantly fine and coarse), angular to subround. Gravels are angular to subangular. Lithology as above with more siltstone present.	
110	30	60	10				20	W	5YR 5/4	SC	Clayey sand. Reddish brown. Soft, sticky clay. Poorly-graded sand (fine to medium), subangular, and few coarse sands. Fine gravels. Sands and gravel have same lithology as above.	
120	20	50	30				20	N	7.5YR 5/4	SC	Clayey sand with gravel. Brown. Soft clay. Well-graded sand, subangular. Angular to subround gravels. Sands and gravel have same lithology as above.	
130	20	70	10				20	W	5YR 5/4	SC	Clayey sand. Reddish brown. Soft clay. Well-graded sand (fine dominant), subangular to subround. Gravels are angular to subround. Sands and gravel have same lithology as above..	
140	10	50	40				16	W	7.5YR 5/4	SW-SC	Well-graded sand with clay and gravel. Brown. Soft clay. Well-graded sand, lots of coarse sand, angular to subangular. Gravels are also angular to subangular. Overall more angular than above units. Sands and gravel have same lithology as above.	

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/hr)	HCl Rxn	Munsell Color	USCS	Sample Description	Remarks
	F	S	G	F	S	G						
150	10	50	40				16	W	7.5YR 5/4	SW-SC	Well-graded sand with clay and gravel. Brown. Clay is soft. Sand is well-graded, angular to subangular, coarse. Gravel is angular to subangular, coarse. Sand and gravel have same lithology as above (quartz, feldspar, siltstone, sandstone, quartzite (felsic grains dominant)).	140 ft: Resume drilling 9/25/15, 08:00 Logging by RDT.
160	10	20	70				20	W	7.5YR 5/4	GW-GC	Well-graded gravel with clay and sand. Brown. Clay is soft. Sand is well-graded, angular to subangular. Gravel is well-graded, predominately medium, angular to subangular. Sand and gravel have same lithology as above.	Difficult to distinguish fines due to mud content.
170	20	50	30				20	W	7.5YR 5/4	SC	Clayey sand with gravel. Brown. Soft clay. Sand is well-graded (lots of coarse grains), angular to subangular. Gravel is fine to medium, angular to subangular, well-graded. Sand and gravel have same lithology as above	Viscosity of mud = 44s
180	20	50	30				20	W	7.5YR 5/4	SC	Same as described above.	
190	20	60	20				20	W	7.5YR 5/4	SC	Clayey sand with gravel. Brown. Clay is soft. Sand is well-graded (predominately medium). Gravel is well-graded (predominately fine to medium), subround to subangular. Sand and gravel have same lithology as above.	Viscosity of mud = 46s
200	20	60	20				40	W	7.5YR 5/4	SC	Clayey sand with gravel. Brown. Clay is soft. Sand is same as described above. Gravel is well-graded, angular to subangular, some cementation on medium gravel grains (white to light brown cementation), lithology as above.	
210	20	50	30				40	W	7.5YR 5/4	SC	Clayey sand with gravel. Brown. Same as described above. Slightly more gravel present.	Viscosity of mud = 44s
220	20	40	40				40		7.5YR 5/4	SC	Clayey sand with gravel. Brown. Soft clays. Sand is well-graded, angular to subangular, medium to coarse with same lithology as above. Gravel is well-graded (fine to medium), subangular to subround, lithology as above with an increase in mafic grains, some grains contain light brown cementation.	

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/hr)	HCl Rxn	Munsell Color	USCS	Sample Description	Remarks
	F	S	G	F	S	G						
230	20	40	40				40	W	7.5YR 5/4	SC	Clayey sand with gravel. Brown. Soft clay. Sand is well-graded (medium to coarse), angular to subangular. Gravel is well-graded (fine to medium), subangular to subround. Mixed lithology present in both sand and gravel: sandstone, quartz, feldspar, quartzite, trace limestone.	
240	10	30	60				40	N	7.5YR 5/4	GW-GC	Well-graded gravel with clay and sand. Brown. Fines are soft clay. Sand is well-graded (medium to coarse), angular to subangular. Gravel is well-graded (predominately medium), subangular to subround. Sand and gravel have same lithology as above.	
250	30	40	30				40	N	7.5YR 5/4	SC	Clayey sand with gravel. Brown. Fines are clay dominant, clay balls present in hands. Sand is well-graded, medium to coarse, subangular to subround. Gravel is well-graded, mostly fine to medium grains, subangular to subround. Sand and gravel have same lithology as above.	Viscocity of mud: 45s
260	20	30	50				20	M	7.5YR 5/4	GC	Clayey gravel with sand. Brown. Fines: soft clay balls. Sand: subangular to subround, well-graded, medium to coarse. Gravel is well-graded, fine to medium, angular to subangular, weak cementation. Sand and gravel have same lithology as above plus some olive green grains.	
270	10	90	T				20	N	7.5YR 5/4	SW-SC	Well-graded sand with clay. Brown. Fines: clay dominant. Sand is well-graded, medium to coarse, subangular to subround with same lithology as above.	Viscocity of mud: 43s
280	10	90	T				20	M	7.5YR 5/4	SW-SC	Well-graded sand with clay. Brown. Same as described above with slightly more coarse sand.	
290	10	80	10				20	N	7.5YR 5/4	SW-SM	Well-graded sand with silt. Brown. Fines are silt dominant. Sand is same as described above. Gravel is fine to medium grained, larger grains show evidence of fragmentation, subangular to subround with same lithology as above.	280 ft: Resume drilling 4/26/15, 08:58. Viscosity of mud = 44s
300	10	70	20				27	M	7.5YR 5/4	SW-SC	Well-graded sand with clay and gravel. Brown. Fines have more clay than in previous interval. Sand is medium to coarse grained with same mixed lithology as above. Gravel as described above.	

Depth (feet)	* Est. %			* Est. %			Drill Rate (ft/hr)	HCl Rxn	Munsell Color	USCS	Sample Description	Remarks
	F	S	G	F	S	G						
310	10	70	20				27	M	7.5YR 5/4	SW-SC	Well-graded sand with clay and gravel. Brown. Fines are clay dominant. Sand is well-graded, medium to coarse, subangular to subround. Gravel is well-graded, fine to medium, subangular to subround, evidence of fragmented grains. Mixed lithology present (sandstone, quartz, quartzite, feldspar, limestone, some trace green minerals).	
320	10	60	30				27	M	7.5YR 5/4	SW-SM	Well-graded sand with silt and gravel. Brown. Fines are silt dominant. Sand and gravel as described above. Lithology as described above with some pieces of conglomerate also present.	
330	10	80	10				27	W	7.5YR 5/4	SW-SM	Well-graded sand with silt. Brown. Fines are silt dominant. Sand is well-graded, medium to coarse grains, subangular to subround. Gravel as above with less evidence of larger grain fragmentation. Sand and gravel have same lithology as above.	Viscosity = 46s
340	10	80	10				20	W	7.5YR 5/4	SW-SM	Same as described above.	
350	10	30	60				20	M	7.5YR 5/4	GW-GM	Well-graded gravel with silt and sand. Brown. Fines are silt. Sand is well-graded (medium to coarse). Gravel is well-graded (fine to medium), more evidence of fragmenting from drill bit. Sand and gravel have same lithology as above.	
360	10	30	60				20	M	7.5YR 5/4	GW-GM	Same as described above.	
370	10	40	50				20	W	7.5YR 5/4	GW-GM	Well-graded gravel with silt and sand. Same as described above with slightly more coarse sand. Lithology as described above but mafic dominant.	
380	10	30	60				20	W	7.5YR 5/4	GW-GM	Well-graded gravel with silt and sand. Same as described above with slight increase in gravels.	

Notes: Unified Soil Classification System (ASTM D2488-00)
bls = below land surface; HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	* Est. % F	S	G	* Est. % F	S	G	Drill Rate (ft/hr)	HCl Rxn	Munsell Color	USCS	Sample Description	Remarks
390	10	30	60				20	W	7.5YR 5/4	GW-GM	Well-graded gravel with silt and sand. Brown. Fines are silt dominant. Sand is well-graded, medium to coarse, subangular to subround. Gravel is well-graded, fine to medium, subangular to subround. Lithology is mixed: sandstone, quartz, quartzite, feldspar, limestone, siltstone.	Intervals have been very similar lithilogically
400	20	30	50				20	W	7.5YR 5/4	GC	Clayey gravel with sand. Brown. Fines are fat clay. Sand and gravel as described above.	
410	20	20	60				20	W	7.5YR 5/4	GC	Clayey gravel with sand. Brown. Fines are clay dominant. Sand is well-graded, medium to coarse, subangular to subround, with same lithology as above.Sand and gravel have same lithology as above. Gravel is well-graded, fine to medium, fragmented from drilling, exhibit some cementation, calcite and some conglomerate grains present along with above mentioned lithology, angular to round (predominantly subangular).	
420	10	60	30				20	W	7.5YR 5/4	SW-SM	Well-graded sand with silt and gravel. Fines are silt dominant with some soft clay. Sand is moderately graded, medium to coarse grains, predominantly coarse, subangular to subround. Gravel is mostly fine, subangular. Sand and gravel have same lithology as above but gravel are sandstone and siltstone dominant.	
430	10	60	30				20	W	7.5YR 5/4	SW-SM	Same as described above.	
440	10	50	40				40	W	7.5YR 5/4	SW-SM	Well-graded sand with silt and gravel. Brown. Same as described above, slightly more fine gravel.	
450	10	50	40				40	N	7.5YR 5/4	SW-SC	Well-graded sand with clay and gravel. Same as described above except fines are clay dominant (formed weak clay balls).	Mud viscosity = 46s
460	20	20	60				20	W	7.5YR 5/4	GC	Clayey gravel with sand. Brown. Fines are clay dominant, form weak clay balls. Sand is well-graded, medium to coarse, predominantly coarse grained, subangular to subround. Gravel is fine to medium grained with evidence of fragmentation, subangular. Sand and gravel have same lithology as above.	

Depth (feet)	* Est. % F	S	G	* Est. % F	S	G	Drill Rate (ft/hr)	HCl Rxn	Munsell Color	USCS	Sample Description	Remarks
470	30	40	30				20	M	7.5YR 5/4	SC	Clayey sand. Brown. Clay dominant fines, soft clay balls are greyish brown. Fine to coarse sand but fine dominant. Gravel up to 2 cm, angular to subround. Sand and gravel have mixed lithology: sandstone, siltstone, limestone, quartzite, quartz, calcite.	460 ft: Resume drilling 4/27/15, 08:05 Logging by MML.
480	40	50	10				20	M	7.5YR 5/4	SC	Clayey sand. Same as described above, increase in amount of fine grained, grey sandstone.	
490							20				Bedrock. Brown sandstone.	**BEDROCK**
500							40				Weathered brown, medium-grained sandstone.	
510							20				As described above with more competent chips, very angular, platy.	
515											Same as described above plus some light reddish brown coloration.	
												TD=515ft; 4/27/15

Notes: Unified Soil Classification System (ASTM D2488-00)
bls = below land surface; HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

CLEAR CREEK ASSOCIATES

Project No.: 287052	Boring Name: WMD-2015-01
Project Name: Water Supply Study	Date Started: 6/24/2015
ADWR Number: 55-918242	Date Completed: 8/24/2015
Location Cadastral: T23S R24E S20 AAA	Drilling Equipment: STAR 50K-CH
Location NAD 83: N 31.41211 W 109.93228	Drilling Method: Reverse Air Rotary (0-860 ft), Direct Air Rotary (860-1100 ft)
Drill Company: Yellow Jacket Drilling	Bit Size/Type: *22-in hammer bit 0-22ft; 9.875-in hammer bit 22-1100ft*
Driller(s): J Chaves	Conductor Casing (type; diameter; depth): *steel; 16-in; 22 feet bls)*
Logged By: M Lindsey and R Toomey	Total Borehole Depth: 1100 feet bls

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
10	17	Strong	Alluvium. No sample collected.	Start drilling 22-inch hammer bit 6/24/15, 12:15. Add water for dust control, aid cuttings removal
	7.5	Strong	Alluvium. No sample collected.	22 ft: Resume drilling 9.875-inch Hammer bit 6/26/15, 13:42 **24 ft: Bedrock -**
25				**Escabrosa Limestone**
35	12	Strong	Dry, unweathered face of limestone is grey (GLEY 1, 5N), fine grained, conchoidal fragmentation from drill bit. No visible fossils.	Logging by MML
45	5.5	Strong	As above, with at least two poorly preserved fossils on larger pieces. Few pieces of chert present, some milky white limestone (10%), 90% grey limestone.	42 ft: Resume drilling 6/27/15, 08:11
55	9	Strong	Grey limestone as above (no evidence of fossils).	

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

CLEAR CREEK ASSOCIATES

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
65	9	Strong	Light grey limestone, chips are platy, angular to subangular, mostly <0.5 cm, no evident fossils.	**Escabrosa Limestone**
75	14	Strong	Light grey limestone as above. Also dark grey (GLEY1, 4N) limestone with more abundant oxide streaks. 70% dark limestone and 30% light limestone.	
85	14	Strong	Cuttings as above, 50% dark grey limestone and 50% light grey limestone.	
95	13	Strong	90% dark grey limestone, 10% light grey.	
105	13	Strong	Increase in weathering - reddish brown hue on the dark limestone (50% of cuttings) with dendritic staining. One fossil noted. Weathered portion increases to 70% at 104ft.	104ft: Driller notes color change, faster penetration.
115	22	Strong	Highly weathered limestone (90%), weak red (2.5 YR 5/2) (dry). Dendritic staining. Few chips up to 3 cm. Some small platy chips are breakable by hand. Cuttings coated in very pale brown clay (10YR 8/2).	
125	9	Strong	Decrease in weathered limestone (40%), large loose calcite crystals present in white, clear, and pink.	
135	13	Strong	80% dark grey, micritic limestone, conchoidal fragmentation from drill bit. 20% weak red weathered limestone.	

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
145	9	Strong	80% dark grey limestone, crystalline faces, conchoidal fragmentation (from drill bit), angular to subangular chips up to approximately 1 cm, platy, unweathered. 20% weathered limestone (weak red), some pieces have cemented calcite (yellow) or large calcite crystals (white). One 2 cm piece of quartzite.	**Escabrosa Limestone**
155	15	Strong	Dark grey limestone (80%), weathered (weak red) limestone (20%). Overall, same as above but fragments are smaller than above.	145 ft: Resume drilling 6/28/15, 08:25
165	3	Strong	As above, 90% unweathered. White calcite crystals present.	
175	15	Strong	As above with smaller fragments (predominantly <0.5 cm). Appearance of dull grey chert with minute calcite veins (trace amounts).	165 ft: switch to blank choke
185	20	Strong	80% dark grey limestone, 20% weak red limestone. Trace chert.	Less recovery
195	28	Strong	Same as described above.	Minimal recovery
205	28	Strong	80% dark grey limestone. 10% dull grey chert with minute calcite veins. 10% weathered limestone.	
215	37		No cuttings retrieved.	Add foam to aid removal

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
225	18		No cuttings retrieved.	**Escabrosa Limestone** 220 ft: Driller notes harder drilling
235	18	Strong	50% light grey limestone, 50% dark grey limestone, unweathered, angular, fine grained. Pinkish weathering of ~10% of cuttings.	225 ft: Resume drilling 6/29/15, 08:26.
245	14	Strong	Mixture of light to dark limestone, calcite, dull grey chert. 10% weathered.	Minimal recovery
255	11	Strong	Same as described above. One piece of red sandstone.	Minimal recovery
265	23		No cuttings retrieved.	No recovery
275	10	Strong	Light to dark grey limestone, chert and loose calcite.	Minimal recovery
285	10	Strong	90% limestone, 10% chert, slight increase in size of cuttings.	Good recovery
295	12	Strong	Same as described above. Limestone is angular to subround.	

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
305	13	Strong	Cuttings are mostly angular, <0.5 cm, grey limestone with minute veins of red oxide staining. Trace amounts of grey chert.	**Escabrosa Limestone**
315	15	Strong	Grey limestone dominant. Trace amounts of weathered limestone, loose calcite crystals.	305 ft: Resume drilling 6/30/15, 11:25 Minimal recovery
325	10	Strong	Same as described above.	Minimal recovery
335	11		No cuttings retrieved.	No recovery
345		Strong	Very dark grey (black when wet) limestone, fine grained, crystalline, largest piece is approximately 0.5 cm, angular and platy, brittle. Trace loose calcite crystals.	
355	40	Strong	Same as described above except weathered.	345 ft: Resume drilling 7/1/15, 10:58 (new hammer)
365	40	Strong	Medium grey limestone, fine grained, crystalline, streaked with calcite veins. Cuttings are much larger (50% are 1 to 2 cm), platy, subround to subangular. Trace amounts of weak red (7.5R 4/2) siliceous siltstone.	Good recovery
375	46	Strong	Medium to dark grey limestone as above intervals. Cuttings are overall smaller, more angular. Trace weak red siltstone, some blueish grey siltstone (siliceous).	

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
385	29	Strong	Same as previous interval: Medium to dark grey limestone, fine grained and crystalline, calcite veins (very fine), mostly subangular, platy, up to 1.5 cm. Trace amounts of weak red siltstone and blueish grey siltstone (both siliceous).	**Escabrosa Limestone** Using foam to lift cuttings
395	40	Strong	Same as described above, plus trace amounts of micritic, greenish grey (GLEY1 5/1) limestone and grey chert. One fossil.	
405	14	Strong	Same as described above, no evident fossils.	
415	43	Strong	Same as described above.	
425	23	Strong	Grey limestone, platy, up to 1 cm, subangular to subround cuttings. Loss of siltstone. Coated in very pale brown clay.	
435	46	Strong	Same as described above with smaller cuttings.	
445	13	Strong	70% dark grey limestone, 30% light grey limestone. Cuttings are angular, size of coarse sand (only 10% larger), coated with pale brown clay.	
455	24	Strong	70% light to medium grey limestone, 30% dark grey limestone. Trace amounts of chert. Coated with pale brown clay.	445 ft: Resume drilling 7/2/15, 08:17.

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
465	19	Strong	Grey limestone. 50% dark grey limestone has fine grained crystalline structure, mostly weathered, thin platy pieces can be brittle. 50% light grey limestone is hard, unweathered, very fine grained, crystalline. Overall cuttings are angular and size of coarse sand.	**Escabrosa Limestone**
475	24	Strong	Same as described above except 80% dark grey limestone and 20% light grey limestone plus loose calcite crystals.	
485	13	Strong	Cuttings are coated in light olive grey (5Y 5/2) clay. Medium to dark grey limestone with calcite crystals (white and pink) with trace amounts of chert.	
495	33	Strong	Cuttings are angular light grey limestone with some tan and white calcite crystals, size of coarse sand.	485 ft: Pause drilling for 4 days off. - Conduct zonal sample (445-485 ft) pH = 8.41; EC = 513.5 µS/cm; Field sulfate = 53 mg/L. -Resume drilling 7/11/15, 10:30. Logging by RDT.
505	22	S	Light grey limestone, as described in above interval with some loose quartz and pink to light red and reddish brown calcite crystals. Trace amounts of chert.	
515	11	Strong	Same as described above. Light grey limestone, trace pink to light red fragments of quartzite and limestone.	
525	6	Moderate	60% grey limestone, 40% pink to light red and white limestone, sandstone and chert. Interval is more diverse with pink, tan and white coloration. Cuttings are size of coarse sand up to 1 cm. Some loose calcite crystals. 40% of cuttings will only react to HCl if surface is scratched with tool.	
535	13	Moderate	Same as described above. Limestone is dominant. Calcite crystals are size of medium sand. Pink and light red limestone have sparry calcite and quartz, react to HCl when scratched with tool on surface. Light grey and tan chert is size of medium sand.	

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
545	5	Strong	Limestone 80% light grey (GLEY1 7/10Y), 20% dark grey (GLEY1 6/N). Cuttings are size of medium to coarse sand, up to 1 cm. Cuttings are on average smaller than previous interval, pink and light red cuttings are limestone. Abundance of calcite crystals (med sand size). Trace amounts of chert. Limestone has more micritic texture than above.	**Escabrosa Limestone** Change in limestone texture.
555	12	Strong	Limestone 50% light grey and 50% dark grey. Cuttings are size of coarse sand. Some fragments of grey chert present and small pieces of pink to red limestone.	545 ft: Resume drilling 7/12/15, 09:10
565	8	Strong	Limestone 80% light grey, 20% dark grey, medium to coarse sand sized, trace amounts of chert, quartzite, sandstone and limestone with green alteration. Abundance of calcite crystals size of coarse sand.	Good recovery
575	12	Strong	Limestone 90% light grey, 10% dark grey. Cuttings range from medium sand to fine gravel in size. Trace chert, quartzite, and red to pink limestone (very fine grained, crystalline).	
585	12	Strong	Same as described above with 10% more weak red (10R 5/4) limestone .	
595	10	Strong	Light grey limestone, as described above. About 10% of cuttings are a light grey dolomite.	
605	13	Strong	Blueish grey dolomite dominant (70%), 20% pinkish grey dolomite, 10% light grey limestone.	Good recovery **Escabrosa Limestone**
615	8	Moderate	Blueish grey (GLEY2 6/10B) and pale red (10R 6/2) dolomite, both very fine grained, cuttings range from coarse sand to fine gravel in size, trace medium gravel sized pieces.	**Martin Limestone** 605 ft: Resume drilling 7/13/15, 08:20, cuttings only react if surface is scratched with tool to increase surface area of grains.

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
625	10	Moderate	Blueish grey (GLEY2 6/10B) and pale red (10R 6/2) dolomite, coarse sand to medium gravel in size (predominantly fine gravel sized). Cuttings only react to HCl if surface is scratched with tool.	**Martin Limestone** Only react to HCl if surface of cuttings are scratched
635	10	Moderate	Same as described above.	
645	5	Moderate	50% blueish grey dolomite, 50% pale red dolomite and trace chert. Cuttings are coarse sand to fine gravel in size.	
655	5	Moderate	90% light to medium grey limestone, finely crystalline. Cuttings are fine sand to fine gravel in size. 10% pink limestone. Trace amounts of chert and loose calcite.	645 ft: Drill bit stopped hammering 7/13/15, 15:38. Resume drilling 7/25/15, 13:58 with foam. Logging by MML.
665	9	Strong	Medium grey limestone, finely crystalline with 10% loose calcite.	Driller notes formation making more water than above.
675	8	Strong	Same as described above.	665 ft: Resume drilling 7/26/15, 08:31
685	3	Strong	Dark grey limestone, finely crystalline. Trace loose calcite.	
695	14	Strong	50% dark grey limestone, coarse sand to fine gravel in size. 40% light grey limestone, fine to coarse sand in size. 10% loose calcite, brownish orange sandstone, and reddish orange siltstone. Trace blueish light grey limestone.	685 ft: Conduct zonal sample (645-685ft): pH 8.60, EC 449.8 uS/cm, Field SO4 15mg/L. Resume drilling 8/4/15, 12:30. Logging by RDT.

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
705	4	Moderate	50% dark grey limestone, 50% dark purple to grey sandstone. Cuttings are fine to coarse sand in size. Trace amounts of quartz crystals and light brown sandstone.	**Martin Limestone** Formation is hard via driller
715	10	Strong	70% medium grey, fine grained, crystalline limestone and 30% dark purple to grey sandstone. Trace loose calcite and quartz crystals. Cuttings are medium to coarse sand in size.	715 ft: Resume drilling 8/5/15, 08:32
725	17	Strong	80% dark grey, fine grained, crystalline limestone and 20% dark purple to grey sandstone. Trace calcite and quartz crystals. Medium to coarse sand in size.	
735	10	Strong	60% medium grey, fine grained, crystalline limestone, 40% weathered brown to reddish orange limestone. Trace calcite crystals. Cuttings are medium to coarse sand in size.	
745	17	Strong	Same as described above.	
755	7	Strong	Very dark grey shaly limestone. Weakly cemented, cuttings are brittle. Trace reddish orange weathered limestone and calcite crystals. Cuttings are medium to coarse sand in size. Almost black when wet.	
765	8	Strong	Same as described above. One 3 cm medium grey limestone piece, silica within the piece is white and pink.	755 ft: Resume drilling 8/6/15, 14:38
775	4	Strong	90% very dark grey shaly limestone, weakly cemented. 10% dark purple sandstone. Cuttings are medium to coarse sand in size.	765 ft: Resume drilling 8/7/15, 14:44

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
785	6	Strong	Very dark grey shaly limestone. Almost black when wet. Cuttings are medium to coarse sand in size, trace up to 2 cm, cuttings are subangular to angular.	**Martin Limestone** 775 ft: Resume drilling 8/8/15, 08:20
795	17	Strong	Same as described above with trace loose calcite.	
805	2	Strong	Same as described above.	
815	12	Strong	60% very dark grey limestone, 40% medium grey limestone with some calcite inclusions. Trace loose calcite present. Cuttings are medium to coarse sand in size.	810 ft: Resume drilling 8/9/15, 08:22
825	8	Strong	50% very dark grey limestone, 50% calcareous medium grey limestone. Trace loose calcite. Cuttings are medium to coarse sand in size and subangular to angular.	**Martin Limestone**
835	8	Strong	Same as described above.	**Abrigo Limestone**
845	1	Strong	70% medium grey limestone, 20% dark grey limestone, 10% free calcite. Trace pieces up to 1 cm of quartz and quartzite. Cuttings are fine to coarse sand in size.	840 ft: Resume drilling 8/10/15, 08:02 Drastic decrease in drill rate.
855	6	None	Pinkish red and medium to dark grey quartzite. Subangular to angular medium sand to medium gravel in size, finely crystalline, gritty.	Upper portion of the Abrigo formation is marked with the "parting quartzite".

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
860	2	Weak	Pinkish red and medium to dark grey quartzite. Medium to coarse sand in size, subangular to angular. Trace light grey limestone.	**Abrigo Limestone** -Upper portion of the Abrigo formation is marked with the "parting quartzite".
870	30	Weak	Same as described above.	860 ft: Resume drilling 8/11/15, 07:35. -very little progress so YJ changed drilling method to direct air rotary and resumed drilling on 8/12/15, 09:40
880	40		No cuttings retrieved.	Large increase in drill rate after changing method of drilling.
890	45	Moderate	60% medium grey, fine grained, crystalline limestone, 40% reddish pink quartzite. Trace loose calcite. Cuttings are medium to coarse sand in size, subangular to angular.	
900	83	Strong	90% medium grey, fine grained, crystalline limestone, 10% reddish pink quartzite. Trace free calcite. Cuttings are medium to coarse sand in size, subangular to angular. Trace dark grey limestone up to 1 cm.	
910	59	Strong	90% dark grey, fine grained, crystalline limestone with weathering around calcite grains, 10% medium grey limestone. Trace reddish pink quartzite and calcite crystals. Cuttings are medium to coarse sand in size, subangular to angular.	
920	100	Strong	Same as described above.	
930	43	Strong	Same as described above with trace quartzose limestone.	

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
940	24	Strong	60% dark grey, fine grained, crystalline limestone, 20% reddish purple weathered calcareous limestone, 20% loose calcite with some blueish grey fine grains. Cuttings are medium to coarse sand in size, subangular to angular.	**Abrigo Limestone**
950	31	Strong	Same as described above.	
960	30	Strong	70% dark grey, fine grained, crystalline limestone, 30% medium grey limestone. Trace loose calcite and trace reddish purple limestone. Cuttings are medium to coarse sand in size and subangular to angular.	
970	19	Strong	Same as described above. One piece of porous silica and one piece of grey chert about 1.5 cm. Trace amount of red malleable clay.	960 ft: Resume drilling 8/13/15, 07:12
980	21	Strong	70% dark grey, fine grained, crystalline limestone, 30% medium grey limestone. Trace free calcite. Cuttings are size of medium to coarse sand.	Fragments of a rubber o-ring present
990	30	Strong	Same as described above.	Poor recovery, little water discharging.
1000		Strong	Same as described above.	Poor recovery
1010		Strong	70% dark grey shaly limestone, 30% medium grey limestone. Trace light brown sandstone and loose calcite. Cuttings are size of medium to coarse sand grains.	1000 ft: Conduct zonal sampling (960-1000 ft): pH = 8.39; EC = 767.4 µS/cm; Field sulfate = 46 mg/L. - resume drilling 8/22/15, 15:58 - 1005 ft: Resume drilling 8/23/15, 15:32

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
1020		Strong	40% dark grey shaly limestone, 40% medium grey fine grained, crystalline limestone and 20% pinkish red and light brown sandstone and free calcite. Trace reddish brown, weak clay present.	**Abrigo Limestone** -Poor recovery
1030		Strong	60% dark grey shaly limestone, 40% light to medium grey weathered limestone. Trace reddish brown weak clay. Cuttings are the size of fine to coarse sand, subangular to angular.	1020 ft: Resume drilling 8/24/15, 07:22. -Good recovery
1040		Strong	Same as described above, no clay present.	
1050		Strong	Same as described above.	
1060		Strong	Same as described above.	
1070		Strong	Same as described above. Limestone cuttings have more sparry calcite veins.	
1080		Strong	Same as described above.	
1090		Strong	Same as described above.	1080 ft: Logging by MML on 8/26/15

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

Depth (feet)	Drill Rate (ft/hr)	HCl Rxn	Sample Description	Remarks
1100			No cuttings retrieved	**Abrigo Limestone** No Sample collected
				Total Depth = 1100 ft; 8/24/2015

Notes: bls = below land surface;
HCL Rxn = Hydrochloric acid reaction (strong, moderate, weak, none)

APPENDIX C

LABORATORY REPORTS

APPENDIX C.1

DEPTH-SPECIFIC RECONNAISSANCE LABORATORY REPORTS

May 22, 2015

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FAX (520) 622-4040

Work Order No.: 15D0779
Order Name: 287052

RE: Water Supply Study

Dear Melanie Lindsey,

Turner Laboratories, Inc. received 1 sample(s) on 04/30/2015 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Terri Garcia
Technical Director

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15D0779
Date Received: 04/30/2015

Order: 287052

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
15D0779-01	635 Zone 1	Ground Water	04/30/2015 1300

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15D0779
Date Received: 04/30/2015

Case Narrative

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND	Not Detected at or above the PQL
PQL	Practical Quantitation Limit
DF	Dilution Factor

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15D0779
Lab Sample ID: 15D0779-01

Client Sample ID: 635 Zone 1
Collection Date/Time: 04/30/2015 1300
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7								
Barium	0.24	0.050		mg/L	1	05/01/2015 0810	05/01/2015 1138	RAD
Beryllium	ND	0.0020		mg/L	1	05/01/2015 0810	05/01/2015 1138	RAD
Cadmium	ND	0.0020		mg/L	1	05/01/2015 0810	05/01/2015 1138	RAD
Calcium	41	4.0		mg/L	1	05/01/2015 0810	05/01/2015 1137	RAD
Chromium	ND	0.030		mg/L	1	05/01/2015 0810	05/01/2015 1138	RAD
Copper	ND	0.020		mg/L	1	05/01/2015 0810	05/01/2015 1138	RAD
Magnesium	7.0	3.0		mg/L	1	05/01/2015 0810	05/01/2015 1137	RAD
Nickel	ND	0.050		mg/L	1	05/01/2015 0810	05/01/2015 1138	RAD
Potassium	ND	5.0		mg/L	1	05/01/2015 0810	05/01/2015 1137	RAD
Sodium	31	5.0		mg/L	1	05/01/2015 0810	05/01/2015 1137	RAD
ICP/MS Dissolved Metals-E 200.8								
Antimony	ND	0.00050		mg/L	1	05/01/2015 0810	05/06/2015 1332	RAD
Arsenic	0.00096	0.00050		mg/L	1	05/01/2015 0810	05/06/2015 1332	RAD
Lead	ND	0.00050		mg/L	1	05/05/2015 0913	05/06/2015 1332	RAD
Selenium	ND	0.0025		mg/L	1	05/01/2015 0810	05/06/2015 1332	RAD
Thallium	ND	0.00050		mg/L	1	05/01/2015 0810	05/06/2015 1332	RAD
Uranium	0.0020	0.00050		mg/L	1	05/01/2015 0810	05/06/2015 1332	RAD
CVAA Dissolved Mercury-E 245.1								
Mercury	ND	0.0010		mg/L	1	05/04/2015 0910	05/04/2015 1451	RAD
Anions by Ion Chromatography-E300								
Chloride	7.7	1.0		mg/L	1	04/30/2015 1524	04/30/2015 2244	MR
Fluoride	ND	0.50		mg/L	1	04/30/2015 1524	04/30/2015 2244	MR
Nitrogen, Nitrate (As N)	0.78	0.50		mg/L	1	04/30/2015 1524	04/30/2015 2244	MR
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	04/30/2015 1524	04/30/2015 2244	MR
Sulfate	10	5.0		mg/L	1	04/30/2015 1524	04/30/2015 2244	MR
Alkalinity-SM2320B								
Alkalinity, Bicarbonate (As CaCO3)	200	2.0		mg/L	1	05/05/2015 1050	05/05/2015 1115	CC
Alkalinity, Carbonate (As CaCO3)	ND	2.0		mg/L	1	05/05/2015 1050	05/05/2015 1115	CC
Alkalinity, Hydroxide (As CaCO3)	ND	2.0		mg/L	1	05/05/2015 1050	05/05/2015 1115	CC
Alkalinity, Total (As CaCO3)	200	2.0		mg/L	1	05/05/2015 1050	05/05/2015 1115	CC
Total Dissolved Solids (Residue, Filterable)-SM2540 C								

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15D0779
Lab Sample ID: 15D0779-01

Client Sample ID: 635 Zone 1
Collection Date/Time: 04/30/2015 1300
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Total Dissolved Solids (Residue, Filterable)	240	20		mg/L	1	05/05/2015 0830	05/06/2015 1410	CC
Silica-SM4500-Si D								
Silica	35	10		mg/L	5	05/05/2015 1450	05/05/2015 1525	CC
Calculation-TDS Balance								
TDS Balance	1.00	0.00		TDS Ratio	1	05/11/2015 1229	05/11/2015 1230	TLG

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15D0779
Date Received: 04/30/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505004 - E 200.7										
Blank (1505004-BLK1)				Prepared & Analyzed: 05/01/2015						
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0020	mg/L							
Cadmium	ND	0.0020	mg/L							
Calcium	ND	4.0	mg/L							
Chromium	ND	0.030	mg/L							
Copper	ND	0.020	mg/L							
Magnesium	ND	3.0	mg/L							
Nickel	ND	0.050	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1505004-BS1)				Prepared & Analyzed: 05/01/2015						
Barium	2.0	0.050	mg/L	2.000		102	85-115			
Beryllium	0.047	0.0020	mg/L	0.05000		94	85-115			
Cadmium	0.048	0.0020	mg/L	0.05000		95	85-115			
Calcium	9.6	4.0	mg/L	10.00		96	85-115			
Chromium	0.19	0.030	mg/L	0.2000		96	85-115			
Copper	0.24	0.020	mg/L	0.2500		97	85-115			
Magnesium	9.8	3.0	mg/L	10.00		98	85-115			
Nickel	0.47	0.050	mg/L	0.5000		95	85-115			
Potassium	9.7	5.0	mg/L	10.00		97	85-115			
Sodium	10	5.0	mg/L	10.00		101	85-115			
LCS Dup (1505004-BSD1)				Prepared & Analyzed: 05/01/2015						
Barium	2.0	0.050	mg/L	2.000		102	85-115	0.2	20	
Beryllium	0.047	0.0020	mg/L	0.05000		94	85-115	0.2	20	
Cadmium	0.048	0.0020	mg/L	0.05000		96	85-115	0.7	20	
Calcium	9.6	4.0	mg/L	10.00		96	85-115	0.4	20	
Chromium	0.19	0.030	mg/L	0.2000		97	85-115	0.5	20	
Copper	0.24	0.020	mg/L	0.2500		98	85-115	0.4	20	
Magnesium	9.8	3.0	mg/L	10.00		98	85-115	0.01	20	
Nickel	0.48	0.050	mg/L	0.5000		95	85-115	0.6	20	
Potassium	9.8	5.0	mg/L	10.00		98	85-115	0.7	20	
Sodium	10	5.0	mg/L	10.00		105	85-115	3	20	
Matrix Spike (1505004-MS1)	**Source: 15D0754-04**			Prepared & Analyzed: 05/01/2015						
Barium	2.0	0.050	mg/L	2.000	0.072	97	70-130			
Beryllium	0.046	0.0020	mg/L	0.05000	ND	93	70-130			
Cadmium	0.044	0.0020	mg/L	0.05000	ND	89	70-130			
Calcium	190	4.0	mg/L	10.00	190	NR	70-130			M3
Chromium	0.19	0.030	mg/L	0.2000	ND	94	70-130			
Copper	0.25	0.020	mg/L	0.2500	0.0098	98	70-130			
Magnesium	49	3.0	mg/L	10.00	42	69	70-130			M3
Nickel	0.46	0.050	mg/L	0.5000	ND	92	70-130			
Potassium	13	5.0	mg/L	10.00	4.0	94	70-130			
Sodium	50	5.0	mg/L	10.00	42	81	70-130			
Batch 1505021 - E 245.1										

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15D0779
Date Received: 04/30/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505021 - E 245.1										
Blank (1505021-BLK1)				Prepared & Analyzed: 05/04/2015						
Mercury	ND	0.0010	mg/L							
LCS (1505021-BS1)				Prepared & Analyzed: 05/04/2015						
Mercury	0.0050	0.0010	mg/L	0.005000		100	85-115			
LCS Dup (1505021-BSD1)				Prepared & Analyzed: 05/04/2015						
Mercury	0.0049	0.0010	mg/L	0.005000		98	85-115	2	20	
Matrix Spike (1505021-MS1)		**Source: 15D0730-04**		Prepared & Analyzed: 05/04/2015						
Mercury	0.0048	0.0010	mg/L	0.005000	ND	96	85-115			
Matrix Spike Dup (1505021-MSD1)		**Source: 15D0730-04**		Prepared & Analyzed: 05/04/2015						
Mercury	0.0049	0.0010	mg/L	0.005000	ND	97	85-115	0.8	20	
Batch 1505031 - E 200.8										
Blank (1505031-BLK1)				Prepared & Analyzed: 05/05/2015						
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Uranium	ND	0.00050	mg/L							
LCS (1505031-BS1)				Prepared & Analyzed: 05/05/2015						
Antimony	0.053	0.00050	mg/L	0.05000		105	85-115			
Arsenic	0.050	0.00050	mg/L	0.05000		101	85-115			
Lead	0.049	0.00050	mg/L	0.05000		99	85-115			
Selenium	0.26	0.0025	mg/L	0.2500		103	85-115			
Thallium	0.049	0.00050	mg/L	0.05000		98	85-115			
Uranium	0.048	0.00050	mg/L	0.05000		97	85-115			
LCS Dup (1505031-BSD1)				Prepared & Analyzed: 05/05/2015						
Antimony	0.052	0.00050	mg/L	0.05000		104	85-115	2	20	
Arsenic	0.050	0.00050	mg/L	0.05000		100	85-115	1	20	
Lead	0.050	0.00050	mg/L	0.05000		99	85-115	0.4	20	
Selenium	0.26	0.0025	mg/L	0.2500		103	85-115	0.2	20	
Thallium	0.050	0.00050	mg/L	0.05000		99	85-115	0.9	20	
Uranium	0.049	0.00050	mg/L	0.05000		97	85-115	0.3	20	
Matrix Spike (1505031-MS1)		**Source: 15E0120-02**		Prepared: 05/05/2015 Analyzed: 05/06/2015						
Antimony	0.051	0.00050	mg/L	0.05000	0.00042	100	70-130			
Arsenic	0.054	0.00050	mg/L	0.05000	0.0022	104	70-130			
Lead	0.053	0.00050	mg/L	0.05000	0.00058	105	70-130			
Selenium	0.26	0.0025	mg/L	0.2500	0.00059	105	70-130			
Thallium	0.053	0.00050	mg/L	0.05000	ND	106	70-130			
Uranium	0.063	0.00050	mg/L	0.05000	0.0039	117	70-130			

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15D0779
Date Received: 04/30/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505035 - SM2320B										
LCS (1505035-BS1)				Prepared & Analyzed: 05/05/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		102	90-110			
LCS Dup (1505035-BSD1)				Prepared & Analyzed: 05/05/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		100	90-110	2	10	
Matrix Spike (1505035-MS1)		**Source: 15E0097-01**		Prepared & Analyzed: 05/05/2015						
Alkalinity, Total (As CaCO3)	350	2.0	mg/L	250.0	100	98	85-115			
Matrix Spike Dup (1505035-MSD1)		**Source: 15E0097-01**		Prepared & Analyzed: 05/05/2015						
Alkalinity, Total (As CaCO3)	350	2.0	mg/L	250.0	100	100	85-115	1	10	
Batch 1505039 - SM2540 C										
Duplicate (1505039-DUP1)		**Source: 15E0120-02**		Prepared: 05/05/2015 Analyzed: 05/06/2015						
Total Dissolved Solids (Residue, Filterable)	390	20	mg/L		380			0.8	5	
Batch 1505042 - SM4500-Si D										
Blank (1505042-BLK1)				Prepared & Analyzed: 05/05/2015						
Silica	ND	2.0	mg/L							
LCS (1505042-BS1)				Prepared & Analyzed: 05/05/2015						
Silica	7.7	2.0	mg/L	8.000		96	90-110			
LCS Dup (1505042-BSD1)				Prepared & Analyzed: 05/05/2015						
Silica	7.9	2.0	mg/L	8.000		99	90-110	3	20	
Matrix Spike (1505042-MS1)		**Source: 15D0779-01**		Prepared & Analyzed: 05/05/2015						
Silica	78	10	mg/L	40.00	35	106	85-115			
Matrix Spike Dup (1505042-MSD1)		**Source: 15D0779-01**		Prepared & Analyzed: 05/05/2015						
Silica	75	10	mg/L	40.00	35	99	85-115	4	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15D0779
Date Received: 04/30/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1504316 - E300										
Blank (1504316-BLK1)				Prepared & Analyzed: 04/30/2015						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1504316-BS1)				Prepared & Analyzed: 04/30/2015						
Chloride	12	1.0	mg/L	12.50		94	90-110			
Fluoride	2.0	0.50	mg/L	2.000		99	90-110			
Nitrogen, Nitrate (As N)	4.8	0.50	mg/L	5.000		96	90-110			
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		94	90-110			
Sulfate	12	5.0	mg/L	12.50		97	90-110			
LCS Dup (1504316-BSD1)				Prepared & Analyzed: 04/30/2015						
Chloride	12	1.0	mg/L	12.50		95	90-110	0.5	10	
Fluoride	2.0	0.50	mg/L	2.000		98	90-110	0.5	10	
Nitrogen, Nitrate (As N)	4.8	0.50	mg/L	5.000		97	90-110	0.7	10	
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		96	90-110	2	10	
Sulfate	12	5.0	mg/L	12.50		98	90-110	1	10	
Matrix Spike (1504316-MS1)		**Source: 15D0754-02**		Prepared & Analyzed: 04/30/2015						
Chloride	22	1.0	mg/L	12.50	9.9	96	80-120			
Fluoride	2.3	0.50	mg/L	2.000	0.45	92	80-120			
Nitrogen, Nitrate (As N)	5.3	0.50	mg/L	5.000	0.52	95	80-120			
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500	ND	93	80-120			
Matrix Spike (1504316-MS2)		**Source: 15D0754-02RE1**		Prepared & Analyzed: 05/01/2015						
Sulfate	22		mg/L	12.50	10	94	80-120			
Matrix Spike (1504316-MS3)		**Source: 15D0770-01**		Prepared & Analyzed: 04/30/2015						
Nitrogen, Nitrate (As N)	6.8	0.50	mg/L	5.000	1.9	98	80-120			
Matrix Spike Dup (1504316-MSD1)		**Source: 15D0754-02**		Prepared & Analyzed: 04/30/2015						
Chloride	22	1.0	mg/L	12.50	9.9	96	80-120	0.2	10	
Fluoride	2.3	0.50	mg/L	2.000	0.45	93	80-120	0.2	10	
Nitrogen, Nitrate (As N)	5.3	0.50	mg/L	5.000	0.52	95	80-120	0.08	10	
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500	ND	94	80-120	1	10	
Matrix Spike Dup (1504316-MSD2)		**Source: 15D0754-02RE1**		Prepared & Analyzed: 05/01/2015						
Sulfate	22		mg/L	12.50	10	96	80-120	0.8	10	
Matrix Spike Dup (1504316-MSD3)		**Source: 15D0770-01**		Prepared & Analyzed: 04/30/2015						
Nitrogen, Nitrate (As N)	6.9	0.50	mg/L	5.000	1.9	101	80-120	2	10	

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 15D0779 DATE 4/30/15 PAGE 1 OF 1

PROJECT NAME Water Supply Study # 287052
CONTACT NAME Melanie Lindsey
COMPANY NAME Clear Creek Associates
ADDRESS 221 N. Court Ave. Ste 101 Tucson, Az
ZIP 85701 PHONE 622-3222 EMAIL mlindsey@clearcreekassociates.com
SAMPLER'S SIGNATURE Melanie Lindsey

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	Base Neutrals 625/8270	Acids	Volatile Organics 624	524.2	8260	THMS	HAA5	Chloride	Sulfate	Resistivity	NO_2	NO_3	TKN	TPH	1664	Oil & Grease	TCLP Analysis VOA	Semi-VOA	Pest.	TCLP	Metals Dissolved	Total	RCRA8	Total	Cyanide Amen.	WAD	SDWA-INORGANICS PRIMARY	SECONDARY	Coliform MPN	PIA	pH	Fecal	Cl	Cr	Turb	TSS	COD	BOD	Radiochemistry	Alkalinity (Total, HCO_3, CO_3, OH) F, Si, TDS (Filterable)	TDS (calc)
635 Zone 1	4/30/15	1350		GW	3								X	X		X										X																	X	X	X

1. RELINQUISHED BY:
Signature: Melanie Lindsey
Printed Name: Melanie Lindsey
Firm: Clear Creek Assoc.
Date/Time: 4/30/15 16:40

2. RECEIVED BY:
Signature:
Printed Name:
Firm:
Date/Time:

3. RELINQUISHED BY:
Signature:
Printed Name:
Firm:
Date/Time:

4. RECEIVED BY:
Signature:
Printed Name:
Firm: TURNER LABORATORIES, INC.
Date/Time: 4/30/15 1640

TURNAROUND REQUIREMENTS:
___ Standard (approx. 10 days)*
N Next Day ___ 2 Day X 5 Day*
___ Email Preliminary Results
* Working Days

REPORT REQUIREMENTS:
___ I. Routine Report
___ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
___ III. Date Validation Report (Includes All Raw Data) Add 10% to invoice

INVOICE INFORMATION:
Account ✓ Y ___ N
P.O. #
Bill to: William Hart
Freeport McMoRan
Copper Queen Branch

SAMPLE RECEIPT:
Total Containers 3
Temperature 3.3
☒ Wet Ice
☐ Ambient
☐ Blue Ice

* LEGEND SAMPLE MATRIX
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

Compliance Analysis: ☐ Yes ☐ No		Custody Seals ☐	Preservation Confirmation ☑
ADEQ Forms: ☐ Yes ☐ No		Container Intact ☑	Appropriate Head Space ☑
Mail ADEQ Forms: ☐ Yes ☐ No		COC / Labels Agree ☑	Received Within Hold Time ☑

SPECIAL INSTRUCTIONS/COMMENTS: Same day SO4 results, else 5-day
*cc results to William_Hart@FMI.com + Christopher_Sherman@FMI.com
*Metals: Sb, As, Ba, Be, Cd, Ca, Cr, Cu, Pb, Mg, Hg, Ni, Se, Na, Tl, U

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. · CHANDLER, ARIZONA 85225-1121
Website: www.radsafe.com
(480) 897-9459
FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: May 04, 2015
Sample Received: May 05, 2015
Analysis Completed: May 18, 2015

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Gross Beta Activity Method 900.0 (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
15D0779-01	4.6 ± 0.4	< 2.3	< 0.5	< 0.7	< 0.7

Date of Analysis	5/11/2015	5/13/2015	5/8/2015	5/8/2015	5/8/2015

Robert L. Metzger, Ph.D., C.H.P.

Laboratory License Number AZ0462

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

May 4, 2015 (Sample Date) 13:00 (Sample Time) (24 hour clock) _____ Owner/Contact Person

_____ Owner/Contact Fax Number _____ Owner/Contact Phone Number

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring Date Q1 collected: _____

☐ Quarterly Date Q2 collected: _____

☐ Composite of four quarterly samples Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result		Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000				
600/00-02		3 pCi/L	Gross Alpha	4002	5/11/2015	4.6 ± 0.4		
7500 - Rn			Radon	4004				
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006			µg/L	
			Uranium 234	4007				
			Uranium 235	4008				
			Uranium 238	4009				
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/8/2015	< 0.7		
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/8/2015	< 0.5		
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/8/2015	< 0.7		

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

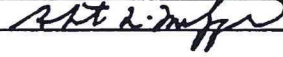
Specimen Number: RSE51759

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15D0779-01

Authorized Signature: 

Date Public Water System Notified: _____

DWAR 6: 11/2007

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

May 4, 2015 (Sample Date) 13:00 (Sample Time) (24 hour clock)

_____ Owner/Contact Person

_____ Owner/Contact Fax Number

_____ Owner/Contact Phone Number

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring

☐ Quarterly

☐ Composite of four quarterly samples

Date Q1 collected: _____

Date Q2 collected: _____

Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
900	4 mrem	4 pCi/L	Gross Beta	4100	5/13/2015	< 4 mrem	
906	20,000 pCi/L	1,000 pCi/L	Tritium	4102			
		10 pCi/L	Strontium-89	4172			
	8 pCi/L	2 pCi/L	Strontium-90	4174			
		1 pCi/L	Iodine-131	4264			
		10 pCi/L	Cesium-134	4270			

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE51759

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15D0779-01

Authorized Signature: _____

Date Public Water System Notified: _____

DWAR 6A: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15D0779

SENDING LABORATORY:	**RECEIVING LABORATORY:**
Turner Laboratories, Inc. 2445 N. Coyote Drive, Ste #104 Tucson, AZ 85745 Phone: 520.882.5880 Fax: 520.882.9788 Project Manager: Terri Garcia	Radiation Safety Engineering, Inc. 3245 N. Washington St. Chandler, AZ 85225-1121 Phone :(480) 897-9459 Fax: (480) 892-5446 Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15D0779-01 Drinking Water Sampled:04/30/2015 13:00			
Radiochemistry, Radium 226/228	05/30/2015 13:00		
Radiochemistry, Gross Alpha Beta	10/27/2015 13:00		Analyse for Uranium if Gross Alpha > 15pCi/l
Containers Supplied:			

51759

Released By	Date	Received By	Date
	5/4/15 1600	Express IT	5/4/15 1600
Released By	Date	Received By	Date
		Nicole Haworth	5/5/15 1200

May 28, 2015

Melanie Lindsey
Clear Creek Associates
221 N. Court Ave., Suite 101
Tucson, AZ 85701

TEL (520) 622-3222
FAX (520) 622-4040

Work Order No.: 15E0323
Order Name: 287052

RE: Water Supply Study

Dear Melanie Lindsey,

Turner Laboratories, Inc. received 1 sample(s) on 05/07/2015 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Terri Garcia
Technical Director

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0323
Date Received: 05/07/2015

Order: 287052

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
15E0323-01	635 Zone 2	Ground Water	05/06/2015 0928

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0323
Date Received: 05/07/2015

Case Narrative

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND	Not Detected at or above the PQL
PQL	Practical Quantitation Limit
DF	Dilution Factor

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0323
Lab Sample ID: 15E0323-01

Client Sample ID: 635 Zone 2
Collection Date/Time: 05/06/2015 0928
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7								
Barium	0.21	0.050		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Beryllium	ND	0.0020		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Cadmium	ND	0.0020		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Calcium	47	4.0		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Chromium	ND	0.030		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Copper	ND	0.020		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Lead	ND	0.040		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Magnesium	7.5	3.0		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Nickel	ND	0.050		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Potassium	ND	5.0		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
Sodium	23	5.0		mg/L	1	05/07/2015 1630	05/08/2015 1108	RAD
ICP/MS Dissolved Metals-E 200.8								
Antimony	ND	0.00050		mg/L	1	05/07/2015 1305	05/12/2015 1228	RAD
Arsenic	0.0013	0.00050		mg/L	1	05/07/2015 1305	05/12/2015 1228	RAD
Lead	ND	0.00050		mg/L	1	05/07/2015 1305	05/12/2015 1228	RAD
Selenium	ND	0.0025		mg/L	1	05/07/2015 1305	05/12/2015 1228	RAD
Thallium	ND	0.00050		mg/L	1	05/07/2015 1305	05/12/2015 1228	RAD
Uranium	0.00075	0.00050		mg/L	1	05/07/2015 1305	05/12/2015 1228	RAD
CVAA Dissolved Mercury-E 245.1								
Mercury	ND	0.0010		mg/L	1	05/12/2015 1320	05/13/2015 1041	RAD
Anions by Ion Chromatography-E300								
Chloride	9.4	1.0		mg/L	1	05/07/2015 1130	05/07/2015 1143	MR
Fluoride	ND	0.50		mg/L	1	05/11/2015 1130	05/11/2015 1321	MR
Nitrogen, Nitrate (As N)	0.71	0.50		mg/L	1	05/07/2015 1130	05/07/2015 1143	MR
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	05/07/2015 1130	05/07/2015 1143	MR
Sulfate	7.4	5.0		mg/L	1	05/07/2015 1130	05/07/2015 1143	MR
Alkalinity-SM2320B								
Alkalinity, Bicarbonate (As CaCO3)	170	2.0		mg/L	1	05/11/2015 1030	05/11/2015 1045	CC
Alkalinity, Carbonate (As CaCO3)	ND	2.0		mg/L	1	05/11/2015 1030	05/11/2015 1045	CC
Alkalinity, Hydroxide (As CaCO3)	ND	2.0		mg/L	1	05/11/2015 1030	05/11/2015 1045	CC
Alkalinity, Total (As CaCO3)	170	2.0		mg/L	1	05/11/2015 1030	05/11/2015 1045	CC
Total Dissolved Solids (Residue, Filterable)-SM2540 C								

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0323
Lab Sample ID: 15E0323-01

Client Sample ID: 635 Zone 2
Collection Date/Time: 05/06/2015 0928
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Total Dissolved Solids (Residue, Filterable)	230	20		mg/L	1	05/11/2015 0830	05/12/2015 1300	CC
Silica-SM4500-Si D								
Silica	34	10		mg/L	5	05/11/2015 1320	05/11/2015 1355	CC
Calculation-TDS Balance								
TDS Balance	1.00	0.00		TDS Ratio	1	05/11/2015 1229	05/14/2015 1230	DW

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0323
Date Received: 05/07/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505070 - E 200.7										
Blank (1505070-BLK1)				Prepared: 05/07/2015 Analyzed: 05/08/2015						
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0020	mg/L							
Cadmium	ND	0.0020	mg/L							
Calcium	ND	4.0	mg/L							
Chromium	ND	0.030	mg/L							
Copper	ND	0.020	mg/L							
Lead	ND	0.040	mg/L							
Magnesium	ND	3.0	mg/L							
Nickel	ND	0.050	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1505070-BS1)				Prepared: 05/07/2015 Analyzed: 05/08/2015						
Barium	2.2	0.050	mg/L	2.000		109	85-115			
Beryllium	0.050	0.0020	mg/L	0.05000		100	85-115			
Cadmium	0.051	0.0020	mg/L	0.05000		101	85-115			
Calcium	10	4.0	mg/L	10.00		102	85-115			
Chromium	0.20	0.030	mg/L	0.2000		102	85-115			
Copper	0.26	0.020	mg/L	0.2500		104	85-115			
Lead	0.51	0.040	mg/L	0.5000		101	85-115			
Magnesium	10	3.0	mg/L	10.00		103	85-115			
Nickel	0.50	0.050	mg/L	0.5000		100	85-115			
Potassium	10	5.0	mg/L	10.00		101	85-115			
Sodium	11	5.0	mg/L	10.00		107	85-115			
LCS Dup (1505070-BSD1)				Prepared: 05/07/2015 Analyzed: 05/08/2015						
Barium	2.2	0.050	mg/L	2.000		108	85-115	0.7	20	
Beryllium	0.050	0.0020	mg/L	0.05000		100	85-115	0.2	20	
Cadmium	0.050	0.0020	mg/L	0.05000		101	85-115	0.5	20	
Calcium	10	4.0	mg/L	10.00		102	85-115	0.4	20	
Chromium	0.20	0.030	mg/L	0.2000		102	85-115	0.2	20	
Copper	0.26	0.020	mg/L	0.2500		104	85-115	0.6	20	
Lead	0.50	0.040	mg/L	0.5000		101	85-115	0.2	20	
Magnesium	10	3.0	mg/L	10.00		103	85-115	0.4	20	
Nickel	0.50	0.050	mg/L	0.5000		99	85-115	0.7	20	
Potassium	10	5.0	mg/L	10.00		101	85-115	0.07	20	
Sodium	11	5.0	mg/L	10.00		107	85-115	0.008	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0323
Date Received: 05/07/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505070 - E 200.7										
Matrix Spike (1505070-MS1)	**Source: 15E0323-01**			Prepared: 05/07/2015 Analyzed: 05/08/2015						
Barium	2.5	0.050	mg/L	2.000	0.21	114	70-130			
Beryllium	0.054	0.0020	mg/L	0.05000	ND	108	70-130			
Cadmium	0.053	0.0020	mg/L	0.05000	ND	106	70-130			
Calcium	56	4.0	mg/L	10.00	47	97	70-130			
Chromium	0.22	0.030	mg/L	0.2000	ND	108	70-130			
Copper	0.28	0.020	mg/L	0.2500	0.0016	112	70-130			
Lead	0.53	0.040	mg/L	0.5000	ND	106	70-130			
Magnesium	18	3.0	mg/L	10.00	7.5	107	70-130			
Nickel	0.53	0.050	mg/L	0.5000	ND	106	70-130			
Potassium	12	5.0	mg/L	10.00	1.6	107	70-130			
Sodium	34	5.0	mg/L	10.00	23	108	70-130			
Batch 1505103 - E 200.8										
Blank (1505103-BLK1)				Prepared: 05/07/2015 Analyzed: 05/12/2015						
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Uranium	ND	0.00050	mg/L							
LCS (1505103-BS1)				Prepared: 05/07/2015 Analyzed: 05/12/2015						
Antimony	0.051	0.00050	mg/L	0.05000		102	85-115			
Arsenic	0.050	0.00050	mg/L	0.05000		99	85-115			
Lead	0.049	0.00050	mg/L	0.05000		98	85-115			
Selenium	0.25	0.0025	mg/L	0.2500		98	85-115			
Thallium	0.048	0.00050	mg/L	0.05000		96	85-115			
Uranium	0.049	0.00050	mg/L	0.05000		99	85-115			
LCS Dup (1505103-BSD1)				Prepared: 05/07/2015 Analyzed: 05/12/2015						
Antimony	0.051	0.00050	mg/L	0.05000		101	85-115	0.7	20	
Arsenic	0.050	0.00050	mg/L	0.05000		99	85-115	0.1	20	
Lead	0.049	0.00050	mg/L	0.05000		99	85-115	0.4	20	
Selenium	0.25	0.0025	mg/L	0.2500		100	85-115	1	20	
Thallium	0.049	0.00050	mg/L	0.05000		97	85-115	2	20	
Uranium	0.050	0.00050	mg/L	0.05000		99	85-115	0.7	20	
Matrix Spike (1505103-MS1)	**Source: 15E0323-01**			Prepared: 05/07/2015 Analyzed: 05/12/2015						
Antimony	0.049	0.00050	mg/L	0.05000	0.000056	98	70-130			
Arsenic	0.051	0.00050	mg/L	0.05000	0.0013	99	70-130			
Lead	0.051	0.00050	mg/L	0.05000	0.00034	101	70-130			
Selenium	0.25	0.0025	mg/L	0.2500	0.00067	99	70-130			
Thallium	0.050	0.00050	mg/L	0.05000	ND	100	70-130			
Uranium	0.055	0.00050	mg/L	0.05000	0.00075	108	70-130			
Batch 1505120 - E 245.1										
Blank (1505120-BLK1)				Prepared: 05/12/2015 Analyzed: 05/13/2015						
Mercury	ND	0.0010	mg/L							

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0323
Date Received: 05/07/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505120 - E 245.1										
LCS (1505120-BS1)				Prepared: 05/12/2015 Analyzed: 05/13/2015						
Mercury	0.0045	0.0010	mg/L	0.005000		90	85-115			
LCS Dup (1505120-BSD1)				Prepared: 05/12/2015 Analyzed: 05/13/2015						
Mercury	0.0045	0.0010	mg/L	0.005000		90	85-115	0.3	20	
Matrix Spike (1505120-MS1)		**Source: 15E0120-01**		Prepared: 05/12/2015 Analyzed: 05/13/2015						
Mercury	0.0044	0.0010	mg/L	0.005000	ND	87	85-115			
Matrix Spike Dup (1505120-MSD1)		**Source: 15E0120-01**		Prepared: 05/12/2015 Analyzed: 05/13/2015						
Mercury	0.0045	0.0010	mg/L	0.005000	ND	90	85-115	3	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0323
Date Received: 05/07/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505091 - SM2540 C										
Duplicate (1505091-DUP1)		**Source: 15E0008-01**		Prepared: 05/11/2015 Analyzed: 05/12/2015						
Total Dissolved Solids (Residue, Filterable)	940	20	mg/L		950			0.5	5	
Batch 1505094 - SM2320B										
LCS (1505094-BS1)				Prepared & Analyzed: 05/11/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		99	90-110			
LCS Dup (1505094-BSD1)				Prepared & Analyzed: 05/11/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		101	90-110	2	10	
Matrix Spike (1505094-MS1)		**Source: 15E0323-01**		Prepared & Analyzed: 05/11/2015						
Alkalinity, Total (As CaCO3)	420	2.0	mg/L	250.0	170	98	85-115			
Matrix Spike Dup (1505094-MSD1)		**Source: 15E0323-01**		Prepared & Analyzed: 05/11/2015						
Alkalinity, Total (As CaCO3)	420	2.0	mg/L	250.0	170	99	85-115	0.5	10	
Batch 1505100 - SM4500-Si D										
Blank (1505100-BLK1)				Prepared & Analyzed: 05/11/2015						
Silica	ND	2.0	mg/L							
LCS (1505100-BS1)				Prepared & Analyzed: 05/11/2015						
Silica	7.8	2.0	mg/L	8.000		98	90-110			
LCS Dup (1505100-BSD1)				Prepared & Analyzed: 05/11/2015						
Silica	8.0	2.0	mg/L	8.000		100	90-110	2	20	
Matrix Spike (1505100-MS1)		**Source: 15E0345-01**		Prepared & Analyzed: 05/11/2015						
Silica	74	10	mg/L	40.00	31	109	85-115			
Matrix Spike Dup (1505100-MSD1)		**Source: 15E0345-01**		Prepared & Analyzed: 05/11/2015						
Silica	73	10	mg/L	40.00	31	106	85-115	1	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0323
Date Received: 05/07/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505059 - E300										
Blank (1505059-BLK1)				Prepared & Analyzed: 05/07/2015						
Chloride	ND	1.0	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1505059-BS1)				Prepared & Analyzed: 05/07/2015						
Chloride	12	1.0	mg/L	12.50		93	90-110			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000		95	90-110			
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		97	90-110			
Sulfate	12	5.0	mg/L	12.50		97	90-110			
LCS Dup (1505059-BSD1)				Prepared & Analyzed: 05/07/2015						
Chloride	12	1.0	mg/L	12.50		93	90-110	0.5	10	
Nitrogen, Nitrate (As N)	4.8	0.50	mg/L	5.000		95	90-110	0.4	10	
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		98	90-110	0.6	10	
Sulfate	12	5.0	mg/L	12.50		98	90-110	0.9	10	
Matrix Spike (1505059-MS1)		**Source: 15E0323-01**		Prepared & Analyzed: 05/07/2015						
Chloride	21	1.0	mg/L	12.50	9.4	94	80-120			
Nitrogen, Nitrate (As N)	5.4	0.50	mg/L	5.000	0.71	95	80-120			
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500	ND	97	80-120			
Sulfate	20	5.0	mg/L	12.50	7.4	97	80-120			
Matrix Spike Dup (1505059-MSD1)		**Source: 15E0323-01**		Prepared & Analyzed: 05/07/2015						
Chloride	21	1.0	mg/L	12.50	9.4	95	80-120	0.6	10	
Nitrogen, Nitrate (As N)	5.5	0.50	mg/L	5.000	0.71	96	80-120	1	10	
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500	ND	99	80-120	2	10	
Sulfate	20	5.0	mg/L	12.50	7.4	97	80-120	0.2	10	
Batch 1505090 - E300										
Blank (1505090-BLK1)				Prepared & Analyzed: 05/11/2015						
Fluoride	ND	0.50	mg/L							
LCS (1505090-BS1)				Prepared & Analyzed: 05/11/2015						
Fluoride	2.0	0.50	mg/L	2.000		102	90-110			
LCS Dup (1505090-BSD1)				Prepared & Analyzed: 05/11/2015						
Fluoride	2.0	0.50	mg/L	2.000		100	90-110	2	10	
Matrix Spike (1505090-MS1)		**Source: 15E0365-01**		Prepared & Analyzed: 05/11/2015						
Fluoride	3.0	0.50	mg/L	2.000	1.1	96	80-120			
Matrix Spike Dup (1505090-MSD1)		**Source: 15E0365-01**		Prepared & Analyzed: 05/11/2015						
Fluoride	3.0	0.50	mg/L	2.000	1.1	94	80-120	1	10	

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 15E0323 DATE 5/7/15 PAGE 1 OF 1

PROJECT NAME Water Supply Study # 287052
CONTACT NAME Melanie Lindsey
COMPANY NAME Clear Creek Associates
ADDRESS 221 N. Court Ave. Ste. 101 Tucson, Az
ZIP 85701 PHONE 622-3222 EMAIL mlindsey@clearcreekassociates.com
SAMPLER'S SIGNATURE Melanie Lindsey

CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX

Analysis columns: Base Neutrals 625/8270 ☐, Acids ☐ | Volatile Organics 624 ☐, 524.2 ☐, 8260 ☐ | THMS ☐, HAA5 ☐ | ☒ Chloride, ☒ Sulfate, ☐ Resistivity | NO_2 ☒, NO_3 ☒, TKN ☐ | 1664 ☐ TPH, ☐ Oil & Grease | TCLP Analysis VOA ☐, Semi-VOA ☐, Pest. ☐ | Metals TCLP ☐, Dissolved ☒, RCRA8 ☐, Total ☐ | Cyanide Total ☐, Amen. ☐, WAD ☐ | SDWA-INORGANICS PRIMARY ☐, SECONDARY ☐ | Coliform MPN ☐, PIA ☐, Fecal ☐ | pH ☐, Cl_2 ☐, Turb ☐ | COD ☐, TSS ☐, BOD ☐ | Radiochemistry | Alkalinity (Total, HCO_3, CO_3, OH), F, Si, TDS (Res. Filterable) | TDS calc

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	Chloride	NO_2	Dissolved Metals
635 Zone 2	5/6/15	0928		GW	3	✓	✓	✓

1. RELINQUISHED BY:
Signature: Melanie Lindsey
Printed Name: Melanie Lindsey
Firm: Clear Creek Assoc.
Date/Time: 5/6/15 12:30

2. RECEIVED BY:
Signature:
Printed Name:
Firm: UPS
Date/Time:

3. RELINQUISHED BY:
Signature:
Printed Name:
Firm: UPS
Date/Time:

4. RECEIVED BY:
Signature: [signature]
Printed Name: [signature]
Firm: TURNER LABORATORIES, INC.
Date/Time: 5/7/15 1030

TURNAROUND REQUIREMENTS:
___ Standard (approx. 10 days)*
✓ Next Day ___ 2 Day ✓ 5 Day*
___ Email Preliminary Results
* Working Days

REPORT REQUIREMENTS:
___ I. Routine Report
___ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
___ III. Date Validation Report (Includes All Raw Data) Add 10% to invoice

INVOICE INFORMATION:
Account ✓ Y ___ N
P.O. # ___
Bill to: William Hart
Freeport McMoRan
Copper Queen Branch

SAMPLE RECEIPT:
Total Containers 3
Temperature 3.8
☒ Wet Ice
☐ Ambient
☐ Blue Ice

* LEGEND
SAMPLE MATRIX
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

Compliance Analysis: ☐ Yes ☐ No
ADEQ Forms: ☐ Yes ☐ No
Mail ADEQ Forms: ☐ Yes ☐ No

Custody Seals ☐
Container Intact ☒
COC / Labels Agree ☒

Preservation Confirmation ☒
Appropriate Head Space ☒
Received Within Hold Time ☒

SPECIAL INSTRUCTIONS/COMMENTS: Same day Results SO_4, else 5-day
* cc results to William_Hart@FMI.com + Christopher_Sherman@FMI.com
* Metals: Sb, As, Ba, Be, Cd, Ca, Cr, Cu, Pb, Mg, Hg, Ni, Se, Na, Tl, U

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. · CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: May 06, 2015
Sample Received: May 08, 2015
Analysis Completed: May 26, 2015

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Gross Beta Activity Method 900.0 (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
15E0323-01	2.3 ± 0.3	< 2.3	< 0.4	< 0.7	< 0.7
Date of Analysis	*5/11/2015*	*5/13/2015*	*5/15/2015*	*5/15/2015*	*5/15/2015*

Robert L. Metzger, Ph.D., C.H.P.

Laboratory License Number AZ0462

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

May 6, 2015 (Sample Date) 9:28 (Sample Time) (24 hour clock) _____ (Owner/Contact Person)

_____ (Owner/Contact Fax Number) _____ (Owner/Contact Phone Number)

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring — Date Q1 collected: _____

☐ Quarterly — Date Q2 collected: _____

☐ Composite of four quarterly samples — Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result		Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000				
600/00-02		3 pCi/L	Gross Alpha	4002	5/11/2015	2.3 ± 0.3		
7500 - Rn			Radon	4004				
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006			µg/L	
			Uranium 234	4007				
			Uranium 235	4008				
			Uranium 238	4009				
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/15/2015	< 0.7		
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/15/2015	< 0.4		
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/15/2015	< 0.7		

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE51788

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15E0323-01

Authorized Signature: Robert L. Metzger

Date Public Water System Notified: _____

DWAR 6: 11/2007

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

May 6, 2015 (Sample Date) 9:28 (Sample Time) (24 hour clock) _____ (Owner/Contact Person)

_____ (Owner/Contact Fax Number) _____ (Owner/Contact Phone Number)

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring — Date Q1 collected: _____

☐ Quarterly — Date Q2 collected: _____

☐ Composite of four quarterly samples — Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
900	4 mrem	4 pCi/L	Gross Beta	4100	5/13/2015	< 4 mrem	
906	20,000 pCi/L	1,000 pCi/L	Tritium	4102			
		10 pCi/L	Strontium-89	4172			
	8 pCi/L	2 pCi/L	Strontium-90	4174			
		1 pCi/L	Iodine-131	4264			
		10 pCi/L	Cesium-134	4270			

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE51788

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15E0323-01

Authorized Signature: Robert L. Metzger

Date Public Water System Notified: _____

DWAR 6A: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15E0323

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone :(480) 897-9459
Fax: (480) 892-5446
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15E0323-01 Drinking Water Sampled:05/06/2015 09:28		[redacted]	
Radiochemistry, Radium 226/228	06/05/2015 09:28		
Radiochemistry, Gross Alpha Beta	11/02/2015 09:28		Analyse for Uranium if Gross Alpha > 15pCi/l
Containers Supplied:		51788	

Released By — Date: 5/7/15 1600 — Received By: Express IT — Date: 5/7/15 1600

Released By — Date — Received By: Michelle Haworth — Date: 5/8/15 1100

August 04, 2015

Melanie Lindsey
Clear Creek Associates
221 N. Court Ave., Suite 101
Tucson, AZ 85701

TEL (520) 622-3222
FAX (520) 622-4040

Work Order No.: 15G0488
Order Name: 287052

RE: Water Supply Study

Dear Melanie Lindsey,

Turner Laboratories, Inc. received 1 sample(s) on 07/14/2015 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Terri L. Garcia

Terri Garcia
Technical Director

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0488
Date Received: 07/14/2015

Order: 287052

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
15G0488-01	55-918242 Zone 1	Ground Water	07/10/2015 1110

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0488
Date Received: 07/14/2015

Case Narrative

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

H3 Sample was received and/or analysis requested past holding time.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND Not Detected at or above the PQL

PQL Practical Quantitation Limit

DF Dilution Factor

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0488
Lab Sample ID: 15G0488-01

Client Sample ID: 55-918242 Zone 1
Collection Date/Time: 07/10/2015 1110
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7								
Barium	0.072	0.050		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
Beryllium	ND	0.0020		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
Cadmium	ND	0.0020		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
Calcium	55	4.0		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
Chromium	ND	0.030		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
Copper	ND	0.020		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
Magnesium	12	3.0		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
Nickel	ND	0.050		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
Potassium	ND	5.0		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
Sodium	31	5.0		mg/L	1	07/15/2015 1420	07/19/2015 1028	RAD
ICP/MS Dissolved Metals-E 200.8								
Antimony	ND	0.00050		mg/L	1	07/15/2015 1420	07/16/2015 1549	RAD
Arsenic	0.00057	0.00050		mg/L	1	07/15/2015 1420	07/16/2015 1549	RAD
Lead	ND	0.00050		mg/L	1	07/15/2015 1420	07/20/2015 1048	RAD
Selenium	0.0027	0.0025		mg/L	1	07/15/2015 1420	07/16/2015 1549	RAD
Thallium	ND	0.00050		mg/L	1	07/15/2015 1420	07/20/2015 1048	RAD
Uranium	0.0031	0.00050		mg/L	1	07/15/2015 1420	07/21/2015 0916	RAD
CVAA Dissolved Mercury-E 245.1								
Mercury	ND	0.0010		mg/L	1	07/15/2015 1210	07/16/2015 1524	RAD
Anions by Ion Chromatography-E300								
Chloride	18	1.0		mg/L	1	07/14/2015 1030	07/14/2015 1113	MR
Fluoride	ND	0.50		mg/L	1	07/14/2015 1030	07/14/2015 1113	MR
Nitrogen, Nitrate (As N)	3.5	0.50	H3	mg/L	1	07/14/2015 1030	07/14/2015 1113	MR
Nitrogen, Nitrite (As N)	0.11	0.10	H3	mg/L	1	07/14/2015 1030	07/14/2015 1113	MR
Sulfate	49	25		mg/L	5	07/14/2015 1139	07/14/2015 1322	MR
Alkalinity-SM2320B								
Alkalinity, Bicarbonate (As CaCO3)	180	2.0		mg/L	1	07/17/2015 1340	07/17/2015 1515	CC
Alkalinity, Carbonate (As CaCO3)	ND	2.0		mg/L	1	07/17/2015 1340	07/17/2015 1515	CC
Alkalinity, Hydroxide (As CaCO3)	ND	2.0		mg/L	1	07/17/2015 1340	07/17/2015 1515	CC
Alkalinity, Total (As CaCO3)	180	2.0		mg/L	1	07/17/2015 1340	07/17/2015 1515	CC
Total Dissolved Solids (Residue, Filterable)-SM2540 C								

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0488
Lab Sample ID: 15G0488-01

Client Sample ID: 55-918242 Zone 1
Collection Date/Time: 07/10/2015 1110
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Total Dissolved Solids (Residue, Filterable)	290	20		mg/L	1	07/14/2015 0815	07/15/2015 1300	CC
Silica-SM4500-Si D								
Silica	14	10		mg/L	5	07/16/2015 1500	07/16/2015 1540	CC
Calculation-TDS Balance								
TDS Balance	1.00	0.00		TDS Ratio	1	07/24/2015 1131	07/24/2015 1132	DW

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0488
Date Received: 07/14/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507150 - E 245.1										
Blank (1507150-BLK1)				Prepared: 07/15/2015 Analyzed: 07/16/2015						
Mercury	ND	0.0010	mg/L							
LCS (1507150-BS1)				Prepared: 07/15/2015 Analyzed: 07/16/2015						
Mercury	0.0049	0.0010	mg/L	0.005000		98	85-115			
LCS Dup (1507150-BSD1)				Prepared: 07/15/2015 Analyzed: 07/16/2015						
Mercury	0.0052	0.0010	mg/L	0.005000		105	85-115	7	20	
Matrix Spike (1507150-MS1)		**Source: 15G0441-01**		Prepared: 07/15/2015 Analyzed: 07/16/2015						
Mercury	0.0049	0.0010	mg/L	0.005000	0.00011	95	85-115			
Matrix Spike Dup (1507150-MSD1)		**Source: 15G0441-01**		Prepared: 07/15/2015 Analyzed: 07/16/2015						
Mercury	0.0044	0.0010	mg/L	0.005000	0.00011	87	85-115	9	20	
Batch 1507156 - E 200.8										
Blank (1507156-BLK1)				Prepared: 07/15/2015 Analyzed: 07/16/2015						
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Uranium	ND	0.00050	mg/L							
LCS (1507156-BS1)				Prepared: 07/15/2015 Analyzed: 07/16/2015						
Antimony	0.049	0.00050	mg/L	0.05000		97	85-115			
Arsenic	0.050	0.00050	mg/L	0.05000		100	85-115			
Lead	0.049	0.00050	mg/L	0.05000		97	85-115			
Selenium	0.25	0.0025	mg/L	0.2500		99	85-115			
Thallium	0.047	0.00050	mg/L	0.05000		94	85-115			
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115			
LCS Dup (1507156-BSD1)				Prepared: 07/15/2015 Analyzed: 07/16/2015						
Antimony	0.049	0.00050	mg/L	0.05000		98	85-115	0.3	20	
Arsenic	0.049	0.00050	mg/L	0.05000		99	85-115	1	20	
Lead	0.049	0.00050	mg/L	0.05000		98	85-115	1	20	
Selenium	0.24	0.0025	mg/L	0.2500		96	85-115	2	20	
Thallium	0.047	0.00050	mg/L	0.05000		95	85-115	0.3	20	
Uranium	0.047	0.00050	mg/L	0.05000		93	85-115	0.7	20	
Matrix Spike (1507156-MS1)		**Source: 15G0586-01**		Prepared: 07/15/2015 Analyzed: 07/16/2015						
Antimony	0.054	0.00050	mg/L	0.05000	0.000080	107	70-130			
Arsenic	0.062	0.00050	mg/L	0.05000	0.0014	121	70-130			
Lead	0.057	0.00050	mg/L	0.05000	0.00030	114	70-130			
Selenium	0.30	0.0025	mg/L	0.2500	0.0010	122	70-130			
Thallium	0.058	0.00050	mg/L	0.05000	ND	116	70-130			
Uranium	0.067	0.00050	mg/L	0.05000	0.0039	127	70-130			
Batch 1507186 - E 200.7										

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0488
Date Received: 07/14/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507186 - E 200.7										
Blank (1507186-BLK1)				Prepared: 07/18/2015 Analyzed: 07/19/2015						
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0020	mg/L							
Cadmium	ND	0.0020	mg/L							
Calcium	ND	4.0	mg/L							
Chromium	ND	0.030	mg/L							
Copper	ND	0.020	mg/L							
Magnesium	ND	3.0	mg/L							
Nickel	ND	0.050	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1507186-BS1)				Prepared: 07/18/2015 Analyzed: 07/19/2015						
Barium	2.0	0.050	mg/L	2.000		98	85-115			
Beryllium	0.048	0.0020	mg/L	0.05000		96	85-115			
Cadmium	0.049	0.0020	mg/L	0.05000		97	85-115			
Calcium	9.7	4.0	mg/L	10.00		97	85-115			
Chromium	0.20	0.030	mg/L	0.2000		98	85-115			
Copper	0.25	0.020	mg/L	0.2500		99	85-115			
Magnesium	9.9	3.0	mg/L	10.00		99	85-115			
Nickel	0.47	0.050	mg/L	0.5000		94	85-115			
Potassium	9.8	5.0	mg/L	10.00		98	85-115			
Sodium	10	5.0	mg/L	10.00		103	85-115			
LCS Dup (1507186-BSD1)				Prepared: 07/18/2015 Analyzed: 07/19/2015						
Barium	2.0	0.050	mg/L	2.000		99	85-115	0.4	20	
Beryllium	0.049	0.0020	mg/L	0.05000		97	85-115	0.5	20	
Cadmium	0.049	0.0020	mg/L	0.05000		98	85-115	1	20	
Calcium	9.6	4.0	mg/L	10.00		96	85-115	0.3	20	
Chromium	0.20	0.030	mg/L	0.2000		99	85-115	0.7	20	
Copper	0.25	0.020	mg/L	0.2500		99	85-115	0.09	20	
Magnesium	9.9	3.0	mg/L	10.00		99	85-115	0.2	20	
Nickel	0.48	0.050	mg/L	0.5000		95	85-115	1	20	
Potassium	9.8	5.0	mg/L	10.00		98	85-115	0.5	20	
Sodium	11	5.0	mg/L	10.00		105	85-115	2	20	
Matrix Spike (1507186-MS1)	**Source: 15G0488-01**			Prepared: 07/18/2015 Analyzed: 07/19/2015						
Barium	2.0	0.050	mg/L	2.000	0.072	97	70-130			
Beryllium	0.049	0.0020	mg/L	0.05000	ND	97	70-130			
Cadmium	0.048	0.0020	mg/L	0.05000	ND	95	70-130			
Calcium	65	4.0	mg/L	10.00	55	96	70-130			
Chromium	0.19	0.030	mg/L	0.2000	0.0013	96	70-130			
Copper	0.25	0.020	mg/L	0.2500	0.0057	99	70-130			
Magnesium	22	3.0	mg/L	10.00	12	103	70-130			
Nickel	0.47	0.050	mg/L	0.5000	ND	94	70-130			
Potassium	13	5.0	mg/L	10.00	2.1	109	70-130			
Sodium	41	5.0	mg/L	10.00	31	98	70-130			

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0488
Date Received: 07/14/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507186 - E 200.7										
Matrix Spike (1507186-MS2)	**Source: 15G0655-01**			Prepared: 07/18/2015 Analyzed: 07/19/2015						
Barium	2.0	0.050	mg/L	2.000	0.035	97	70-130			
Beryllium	0.049	0.0020	mg/L	0.05000	ND	98	70-130			
Cadmium	0.048	0.0020	mg/L	0.05000	ND	96	70-130			
Calcium	60	4.0	mg/L	10.00	52	76	70-130			
Chromium	0.20	0.030	mg/L	0.2000	ND	98	70-130			
Copper	0.25	0.020	mg/L	0.2500	ND	101	70-130			
Magnesium	16	3.0	mg/L	10.00	6.6	92	70-130			
Nickel	0.47	0.050	mg/L	0.5000	ND	95	70-130			
Potassium	11	5.0	mg/L	10.00	1.9	95	70-130			
Sodium	75	5.0	mg/L	10.00	66	85	70-130			

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0488
Date Received: 07/14/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507152 - SM2540 C										
Duplicate (1507152-DUP1)		**Source: 15G0397-01**		Prepared: 07/14/2015 Analyzed: 07/15/2015						
Total Dissolved Solids (Residue, Filterable)	11	20	mg/L		14			24	5	
Duplicate (1507152-DUP2)		**Source: 15G0439-01**		Prepared: 07/14/2015 Analyzed: 07/15/2015						
Total Dissolved Solids (Residue, Filterable)	310	20	mg/L		320			3	5	
Batch 1507169 - SM4500-Si D										
Blank (1507169-BLK1)				Prepared & Analyzed: 07/16/2015						
Silica	ND	2.0	mg/L							
LCS (1507169-BS1)				Prepared & Analyzed: 07/16/2015						
Silica	7.9	2.0	mg/L	8.000		99	90-110			
LCS Dup (1507169-BSD1)				Prepared & Analyzed: 07/16/2015						
Silica	8.0	2.0	mg/L	8.000		100	90-110	0.4	20	
Matrix Spike (1507169-MS1)		**Source: 15G0488-01**		Prepared & Analyzed: 07/16/2015						
Silica	55	10	mg/L	40.00	14	102	85-115			
Matrix Spike Dup (1507169-MSD1)		**Source: 15G0488-01**		Prepared & Analyzed: 07/16/2015						
Silica	57	10	mg/L	40.00	14	105	85-115	3	20	
Batch 1507195 - SM2320B										
LCS (1507195-BS1)				Prepared & Analyzed: 07/17/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		100	90-110			
LCS Dup (1507195-BSD1)				Prepared & Analyzed: 07/17/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		102	90-110	2	10	
Matrix Spike (1507195-MS1)		**Source: 15G0609-02**		Prepared & Analyzed: 07/17/2015						
Alkalinity, Total (As CaCO3)	330	2.0	mg/L	250.0	88	98	85-115			
Matrix Spike Dup (1507195-MSD1)		**Source: 15G0609-02**		Prepared & Analyzed: 07/17/2015						
Alkalinity, Total (As CaCO3)	340	2.0	mg/L	250.0	88	100	85-115	1	10	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0488
Date Received: 07/14/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507130 - E300										
Blank (1507130-BLK1)				Prepared & Analyzed: 07/14/2015						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1507130-BS1)				Prepared & Analyzed: 07/14/2015						
Chloride	12	1.0	mg/L	12.50		97	90-110			
Fluoride	2.1	0.50	mg/L	2.000		103	90-110			
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000		100	90-110			
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500		99	90-110			
Sulfate	13	5.0	mg/L	12.50		100	90-110			
LCS Dup (1507130-BSD1)				Prepared & Analyzed: 07/14/2015						
Chloride	12	1.0	mg/L	12.50		97	90-110	0.5	10	
Fluoride	2.1	0.50	mg/L	2.000		103	90-110	0.2	10	
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000		100	90-110	0.6	10	
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500		100	90-110	0.9	10	
Sulfate	13	5.0	mg/L	12.50		101	90-110	0.4	10	
Matrix Spike (1507130-MS1)		**Source: 15G0488-01**		Prepared & Analyzed: 07/14/2015						
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500	0.11	96	80-120			
Matrix Spike (1507130-MS2)		**Source: 15G0488-01**		Prepared & Analyzed: 07/14/2015						
Chloride	16		mg/L	12.50	3.6	97	80-120			
Sulfate	22		mg/L	12.50	11	92	80-120			
Matrix Spike (1507130-MS3)		**Source: 15G0540-01**		Prepared & Analyzed: 07/14/2015						
Nitrogen, Nitrate (As N)	5.4	0.50	mg/L	5.000	0.42	99	80-120			
Matrix Spike Dup (1507130-MSD1)		**Source: 15G0488-01**		Prepared & Analyzed: 07/14/2015						
Fluoride	2.3	0.50	mg/L	2.000	0.33	101	80-120	1	10	
Nitrogen, Nitrate (As N)	8.7	0.50	mg/L	5.000	3.5	103	80-120	0.5	10	
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500	0.11	97	80-120	0.4	10	
Matrix Spike Dup (1507130-MSD2)		**Source: 15G0488-01**		Prepared & Analyzed: 07/14/2015						
Chloride	16		mg/L	12.50	3.6	97	80-120	0.3	10	
Sulfate	22		mg/L	12.50	11	92	80-120	0.3	10	
Matrix Spike Dup (1507130-MSD3)		**Source: 15G0540-01**		Prepared & Analyzed: 07/14/2015						
Nitrogen, Nitrate (As N)	5.5	0.50	mg/L	5.000	0.42	101	80-120	2	10	

TURNER LABORATORIES INC.
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 1560488 DATE 7/14/15 PAGE 1 OF 1

PROJECT NAME Water Supply Study # 287052
CONTACT NAME Melanie Lindsey
COMPANY NAME Clear Creek Associates
ADDRESS 221 N. Court Ave. Ste# 101 Tucson, AZ
ZIP 85701 PHONE 622-3222 EMAIL mlindsey@clearcreekassociates.com
SAMPLER'S SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	Base Neutrals 625/8270 ☐ / Acids ☐	Volatile Organics 624 ☐ / 524.2 ☐ / 8260 ☐	TTHMS ☐ / HAA5 ☐	Chloride ☒ / Sulfate ☒	NO_2 ☒ / NO_3 ☒ / Resistivity ☐	TPH ☐ / TKN ☐	1664 ☐ / Oil & Grease ☐	VOA ☐ / Semi-VOA ☐ / TCLP Analysis ☐	TCLP ☐ / Pest. ☐	Dissolved ☒ / Total ☐ / Metals	RCRA8 ☐	Total ☐ / Amen. ☐ / Cyanide	SDWA-INORGANICS PRIMARY ☐ / WAD ☐	MPN ☐ / SECONDARY ☐	pH ☐ / PIA ☐ / Coliform	C_6 ☐ / C_1 ☐ / Fecal ☐	COD ☐ / TSS ☐ / Turb ☐	BOD ☐	Radiochemistry	Alkalinity (Total, HCO_3, CO_3, OH) F, Si, TDS (Res. Filterable)	TDS calc
55-918242 Zone 1	7/10/15	11:10		GW	3				✓	✓					✓											

1. RELINQUISHED BY:
Signature
Ryan Toomey
Printed Name
Clear Creek
Firm
7-13-15 10:20
Date/Time

2. RECEIVED BY:
Signature
Printed Name
Fedex
Firm
Date/Time

3. RELINQUISHED BY:
Signature
Printed Name
Fedex
Firm
Date/Time

4. RECEIVED BY:
Signature
Printed Name
TURNER LABORATORIES, INC.
Firm
7/14/15 1000
Date/Time

TURNAROUND REQUIREMENTS:
___ Standard (approx. 10 days)*
✓ Next Day ___ 2 Day ✓ 5 Day* (SO_4 / All Else)
___ Email Preliminary Results
* Working Days

REPORT REQUIREMENTS:
___ I. Routine Report
___ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
___ III. Date Validation Report (Includes All Raw Data) Add 10% to invoice

INVOICE INFORMATION:
Account ✓ Y ___ N
P.O. #
Bill to: William Hart
Freeport McMoran
Copper Queen Branch

SAMPLE RECEIPT:
Total Containers 3
Temperature 5.5
☒ Wet Ice
☐ Ambient
☐ Blue Ice

* LEGEND SAMPLE MATRIX
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

Compliance Analysis: ☐ Yes ☐ No	Custody Seals ☐	Preservation Confirmation ☑
ADEQ Forms: ☐ Yes ☐ No	Container Intact ☑	Appropriate Head Space ☑
Mail ADEQ Forms: ☐ Yes ☐ No	COC / Labels Agree ☑	Received Within Hold Time ☑

SPECIAL INSTRUCTIONS/COMMENTS: Same day results SO_4, else 5-day
* CC results to William_Hart@FMI.com & Christopher_Sherman@FMI.com
*Metals: Sb, As, Ba, Be, Cd, Ca, Cr, Cu, Pb, Mg, Hg, Ni, Se, Na, Tl, Li

TURNER LABORATORIES INC.

Turner Laboratories W.O. #: 1560488

Delivered by: Fedex

1.	Shipping container/cooler in good condition?	☑ Yes	☐ No	☐ Not Present
2.	Custody seals intact on sample bottles?	☐ Yes	☐ No	☑ Not Present
3.	Chain of custody present?	☑ Yes	☐ No	
4.	COC agrees with sample labels?	☑ Yes	☐ No	
5.	Samples in proper container/bottle?	☑ Yes	☐ No	
6.	Sample container intact?	☑ Yes	☐ No	
7.	Sufficient sample volume for requested tests?	☑ Yes	☐ No	
8.	Samples received within holding times?	☐ Yes	☑ No	
9.	VOA vials received with no headspace?	☐ Yes	☐ No	☑ No Vials
10.	Bacti bottles received with appropriate headspace?	☐ Yes		☐ Above 100ml
		☑ Not Applicable		☐ Below 100ml

Additional Comments:

received NO2/NO3 past hold Client requested to analyze.
COC stated Li Client requested to analyze for U rather then Li.
KRB 7/14/15

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. · CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: July 10, 2015
Sample Received: July 15, 2015
Analysis Completed: July 27, 2015

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Gross Beta Activity Method 900.0 (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
15G0488-01	6.8 ± 1.2	2.1 ± 0.6	0.7 ± 0.2	< 0.7	0.7 ± 0.2
Date of Analysis	7/15/2015	7/23/2015	7/17/2015	7/17/2015	7/17/2015

Robert L. Metzger, Ph.D., C.H.P.

Laboratory License Number AZ0462

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

July 10, 2015 (Sample Date) 11:10 (Sample Time) (24 hour clock) _____ Owner/Contact Person

_____ Owner/Contact Fax Number _____ Owner/Contact Phone Number

Sample Collection Point

☐ EPDS # 321

Compliance Sample Type:

☐ Reduced Monitoring Date Q1 collected: _____

☐ Quarterly Date Q2 collected: _____

☐ Composite of four quarterly samples Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result		Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000				
600/00-02		3 pCi/L	Gross Alpha	4002	7/15/2015	6.8 ± 1.2		
7500 - Rn			Radon	4004				
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006			µg/L	
			Uranium 234	4007				
			Uranium 235	4008				
			Uranium 238	4009				
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	7/17/2015	0.7 ± 0.2		
GammaRay HPGE		1 pCi/L	Radium 226	4020	7/17/2015	0.7 ± 0.2		
GammaRay HPGE		1 pCi/L	Radium 228	4030	7/17/2015	< 0.7		

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

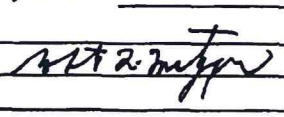
Specimen Number: RSE52255

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15G0488-01

Authorized Signature: 

Date Public Water System Notified: _____

DWAR 6: 11/2007

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

July 10, 2015 (Sample Date) 11:10 (24 hour clock) (Sample Time) _____ Owner/Contact Person

_____ Owner/Contact Fax Number _____ Owner/Contact Phone Number

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring

☐ Quarterly

☐ Composite of four quarterly samples

Date Q1 collected: _____

Date Q2 collected: _____

Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

Combined Uranium must be reported in micrograms per liter

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
900	4 mrem	4 pCi/L	Gross Beta	4100	7/23/2015	< 4 mrem	
906	20,000 pCi/L	1,000 pCi/L	Tritium	4102			
		10 pCi/L	Strontium-89	4172			
	8 pCi/L	2 pCi/L	Strontium-90	4174			
		1 pCi/L	Iodine-131	4264			
		10 pCi/L	Cesium-134	4270			

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE52255

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15G0488-01

Authorized Signature: _____

Date Public Water System Notified: _____

DWAR 6A: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15G0488

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone :(480) 897-9459
Fax: (480) 892-5446
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15G0488-01 Drinking Water Sampled:07/10/2015 11:10			
Radiochemistry, Radium 226/228	08/09/2015 11:10		
Radiochemistry, Gross Alpha Beta	01/06/2016 11:10		Analyse for Uranium if Gross Alpha> 15pCi/l
Containers Supplied:		52255	

Released By	Date	Received By	Date
	7/14/15 1600	Express IT	7/14/15 1600
Released By	Date	Received By	Date
			7/15/15 0830

August 23, 2015

Melanie Lindsey
Clear Creek Associates
221 N. Court Ave., Suite 101
Tucson, AZ 85701

TEL (520) 622-3222
FAX (520) 622-4040

Work Order No.: 15G0880
Order Name: 287052

RE: Water Supply Study

Dear Melanie Lindsey,

Turner Laboratories, Inc. received 1 sample(s) on 07/29/2015 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Terri Garcia
Technical Director

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0880
Date Received: 07/29/2015

Order: 287052

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
15G0880-01	242 Zone 2	Ground Water	07/28/2015 1300

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0880
Date Received: 07/29/2015

Case Narrative

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND	Not Detected at or above the PQL
PQL	Practical Quantitation Limit
DF	Dilution Factor

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0880
Lab Sample ID: 15G0880-01

Client Sample ID: 242 Zone 2
Collection Date/Time: 07/28/2015 1300
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7								
Barium	0.055	0.050		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
Beryllium	ND	0.0020		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
Cadmium	ND	0.0020		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
Calcium	31	4.0		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
Chromium	ND	0.030		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
Copper	ND	0.020		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
Magnesium	20	3.0		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
Nickel	ND	0.050		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
Potassium	ND	5.0		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
Sodium	30	5.0		mg/L	1	08/05/2015 0825	08/06/2015 1423	RAD
ICP/MS Dissolved Metals-E 200.8								
Antimony	ND	0.00050		mg/L	1	07/29/2015 1105	08/10/2015 1237	RAD
Arsenic	0.00061	0.00050		mg/L	1	07/29/2015 1105	08/10/2015 1237	RAD
Lead	0.00066	0.00050		mg/L	1	07/29/2015 1105	08/10/2015 1237	RAD
Selenium	ND	0.0025		mg/L	1	07/29/2015 1105	08/10/2015 1237	RAD
Thallium	ND	0.00050		mg/L	1	07/29/2015 1105	08/10/2015 1237	RAD
Uranium	0.0061	0.00050		mg/L	1	07/29/2015 1105	08/10/2015 1237	RAD
CVAA Dissolved Mercury-E 245.1								
Mercury	ND	0.0010		mg/L	1	08/11/2015 1245	08/12/2015 1436	RAD
Anions by Ion Chromatography-E300								
Chloride	14	1.0		mg/L	1	07/29/2015 1100	07/29/2015 1215	MR
Fluoride	ND	0.50		mg/L	1	07/29/2015 1100	07/29/2015 1215	MR
Nitrogen, Nitrate (As N)	1.4	0.50		mg/L	1	07/29/2015 1100	07/29/2015 1215	MR
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	07/29/2015 1100	07/29/2015 1215	MR
Sulfate	24	10		mg/L	2	07/29/2015 1300	07/29/2015 1406	MR
Alkalinity-SM2320B								
Alkalinity, Bicarbonate (As CaCO3)	190	2.0		mg/L	1	07/29/2015 1530	07/29/2015 1620	CC
Alkalinity, Carbonate (As CaCO3)	ND	2.0		mg/L	1	07/29/2015 1530	07/29/2015 1620	CC
Alkalinity, Hydroxide (As CaCO3)	ND	2.0		mg/L	1	07/29/2015 1530	07/29/2015 1620	CC
Alkalinity, Total (As CaCO3)	190	2.0		mg/L	1	07/29/2015 1530	07/29/2015 1620	CC
Total Dissolved Solids (Residue, Filterable)-SM2540 C								

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0880
Lab Sample ID: 15G0880-01

Client Sample ID: 242 Zone 2
Collection Date/Time: 07/28/2015 1300
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Total Dissolved Solids (Residue, Filterable)	280	20		mg/L	1	07/30/2015 0915	07/31/2015 1315	CC
Silica-SM4500-Si D								
Silica	14	10		mg/L	5	08/11/2015 1500	08/11/2015 1540	CC
Calculation-TDS Balance								
TDS Balance	1.10	0.00		TDS Ratio	1	08/14/2015 0910	08/19/2015 1000	DW

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0880
Date Received: 07/29/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508060 - E 200.7										
Blank (1508060-BLK1)				Prepared: 08/05/2015 Analyzed: 08/06/2015						
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0020	mg/L							
Cadmium	ND	0.0020	mg/L							
Calcium	ND	4.0	mg/L							
Chromium	ND	0.030	mg/L							
Copper	ND	0.020	mg/L							
Magnesium	ND	3.0	mg/L							
Nickel	ND	0.050	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1508060-BS1)				Prepared: 08/05/2015 Analyzed: 08/06/2015						
Barium	2.1	0.050	mg/L	2.000		103	85-115			
Beryllium	0.048	0.0020	mg/L	0.05000		97	85-115			
Cadmium	0.048	0.0020	mg/L	0.05000		96	85-115			
Calcium	9.9	4.0	mg/L	10.00		99	85-115			
Chromium	0.20	0.030	mg/L	0.2000		99	85-115			
Copper	0.26	0.020	mg/L	0.2500		104	85-115			
Magnesium	10	3.0	mg/L	10.00		102	85-115			
Nickel	0.48	0.050	mg/L	0.5000		97	85-115			
Potassium	10	5.0	mg/L	10.00		101	85-115			
Sodium	10	5.0	mg/L	10.00		104	85-115			
LCS Dup (1508060-BSD1)				Prepared: 08/05/2015 Analyzed: 08/06/2015						
Barium	2.0	0.050	mg/L	2.000		102	85-115	0.5	20	
Beryllium	0.048	0.0020	mg/L	0.05000		96	85-115	0.7	20	
Cadmium	0.048	0.0020	mg/L	0.05000		95	85-115	0.6	20	
Calcium	9.9	4.0	mg/L	10.00		99	85-115	0.3	20	
Chromium	0.19	0.030	mg/L	0.2000		96	85-115	3	20	
Copper	0.26	0.020	mg/L	0.2500		103	85-115	0.6	20	
Magnesium	10	3.0	mg/L	10.00		102	85-115	0.4	20	
Nickel	0.48	0.050	mg/L	0.5000		97	85-115	0.3	20	
Potassium	10	5.0	mg/L	10.00		101	85-115	0.03	20	
Sodium	10	5.0	mg/L	10.00		105	85-115	0.5	20	
Matrix Spike (1508060-MS1)	**Source: 15G0880-01**			Prepared: 08/05/2015 Analyzed: 08/06/2015						
Barium	2.1	0.050	mg/L	2.000	0.055	103	70-130			
Beryllium	0.049	0.0020	mg/L	0.05000	ND	98	70-130			
Cadmium	0.047	0.0020	mg/L	0.05000	ND	93	70-130			
Calcium	39	4.0	mg/L	10.00	31	80	70-130			
Chromium	0.20	0.030	mg/L	0.2000	0.00098	98	70-130			
Copper	0.26	0.020	mg/L	0.2500	0.0069	101	70-130			
Magnesium	29	3.0	mg/L	10.00	20	95	70-130			
Nickel	0.48	0.050	mg/L	0.5000	ND	95	70-130			
Potassium	12	5.0	mg/L	10.00	1.8	101	70-130			
Sodium	38	5.0	mg/L	10.00	30	85	70-130			
Batch 1508077 - E 200.8										

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0880
Date Received: 07/29/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508077 - E 200.8										
Blank (1508077-BLK1)				Prepared: 08/05/2015 Analyzed: 08/10/2015						
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Uranium	ND	0.00050	mg/L							
LCS (1508077-BS1)				Prepared: 08/05/2015 Analyzed: 08/10/2015						
Antimony	0.050	0.00050	mg/L	0.05000		99	85-115			
Arsenic	0.051	0.00050	mg/L	0.05000		103	85-115			
Lead	0.050	0.00050	mg/L	0.05000		99	85-115			
Selenium	0.25	0.0025	mg/L	0.2500		99	85-115			
Thallium	0.048	0.00050	mg/L	0.05000		96	85-115			
Uranium	0.050	0.00050	mg/L	0.05000		101	85-115			
LCS Dup (1508077-BSD1)				Prepared: 08/05/2015 Analyzed: 08/10/2015						
Antimony	0.049	0.00050	mg/L	0.05000		98	85-115	0.8	20	
Arsenic	0.052	0.00050	mg/L	0.05000		103	85-115	0.2	20	
Lead	0.047	0.00050	mg/L	0.05000		94	85-115	5	20	
Selenium	0.25	0.0025	mg/L	0.2500		99	85-115	0.3	20	
Thallium	0.048	0.00050	mg/L	0.05000		95	85-115	2	20	
Uranium	0.049	0.00050	mg/L	0.05000		99	85-115	2	20	
Matrix Spike (1508077-MS1)		**Source: 15H0234-04**		Prepared: 08/05/2015 Analyzed: 08/10/2015						
Antimony	0.051	0.00050	mg/L	0.05000	0.00014	101	70-130			
Arsenic	0.062	0.00050	mg/L	0.05000	0.0021	119	70-130			
Lead	0.050	0.00050	mg/L	0.05000	0.00038	100	70-130			
Selenium	0.29	0.0025	mg/L	0.2500	0.00087	115	70-130			
Thallium	0.050	0.00050	mg/L	0.05000	ND	99	70-130			
Uranium	0.056	0.00050	mg/L	0.05000	0.0014	110	70-130			
Batch 1508118 - E 245.1										
Blank (1508118-BLK1)				Prepared: 08/11/2015 Analyzed: 08/12/2015						
Mercury	ND	0.0010	mg/L							
LCS (1508118-BS1)				Prepared: 08/11/2015 Analyzed: 08/12/2015						
Mercury	0.0049	0.0010	mg/L	0.005000		97	85-115			
LCS Dup (1508118-BSD1)				Prepared: 08/11/2015 Analyzed: 08/12/2015						
Mercury	0.0049	0.0010	mg/L	0.005000		97	85-115	0.08	20	
Matrix Spike (1508118-MS1)		**Source: 15H0234-01**		Prepared: 08/11/2015 Analyzed: 08/12/2015						
Mercury	0.0048	0.0010	mg/L	0.005000	0.000061	95	85-115			
Matrix Spike (1508118-MS2)		**Source: 15H0365-01**		Prepared: 08/11/2015 Analyzed: 08/12/2015						
Mercury	0.0048	0.0010	mg/L	0.005000	0.000069	94	85-115			
Matrix Spike Dup (1508118-MSD1)		**Source: 15H0234-01**		Prepared: 08/11/2015 Analyzed: 08/12/2015						
Mercury	0.0048	0.0010	mg/L	0.005000	0.000061	95	85-115	0.1	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0880
Date Received: 07/29/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508118 - E 245.1										
Matrix Spike Dup (1508118-MSD2)	**Source: 15H0365-01**			Prepared: 08/11/2015 Analyzed: 08/12/2015						
Mercury	0.0049	0.0010	mg/L	0.005000	0.000069	97	85-115	3	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0880
Date Received: 07/29/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507320 - SM2320B										
LCS (1507320-BS1)				Prepared & Analyzed: 07/29/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		99	90-110			
LCS Dup (1507320-BSD1)				Prepared & Analyzed: 07/29/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		98	90-110	0.8	10	
Matrix Spike (1507320-MS1)		**Source: 15G0775-01**		Prepared & Analyzed: 07/29/2015						
Alkalinity, Total (As CaCO3)	340	2.0	mg/L	250.0	98	97	85-115			
Matrix Spike Dup (1507320-MSD1)		**Source: 15G0775-01**		Prepared & Analyzed: 07/29/2015						
Alkalinity, Total (As CaCO3)	340	2.0	mg/L	250.0	98	98	85-115	0.6	10	
Batch 1507347 - SM2540 C										
Duplicate (1507347-DUP1)		**Source: 15G0880-01**		Prepared: 07/30/2015 Analyzed: 07/31/2015						
Total Dissolved Solids (Residue, Filterable)	280	20	mg/L		280			0	5	
Duplicate (1507347-DUP2)		**Source: 15G0898-01**		Prepared: 07/30/2015 Analyzed: 07/31/2015						
Total Dissolved Solids (Residue, Filterable)	220	20	mg/L		210			1	5	
Batch 1508109 - SM4500-Si D										
Blank (1508109-BLK1)				Prepared & Analyzed: 08/11/2015						
Silica	ND	2.0	mg/L							
LCS (1508109-BS1)				Prepared & Analyzed: 08/11/2015						
Silica	8.0	2.0	mg/L	8.000		100	90-110			
LCS Dup (1508109-BSD1)				Prepared & Analyzed: 08/11/2015						
Silica	8.1	2.0	mg/L	8.000		101	90-110	1	20	
Matrix Spike (1508109-MS1)		**Source: 15G0880-01**		Prepared & Analyzed: 08/11/2015						
Silica	55	10	mg/L	40.00	14	102	85-115			
Matrix Spike Dup (1508109-MSD1)		**Source: 15G0880-01**		Prepared & Analyzed: 08/11/2015						
Silica	56	10	mg/L	40.00	14	105	85-115	2	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0880
Date Received: 07/29/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507308 - E300										
Blank (1507308-BLK1)				Prepared & Analyzed: 07/29/2015						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1507308-BS1)				Prepared & Analyzed: 07/29/2015						
Chloride	13	1.0	mg/L	12.50		103	90-110			
Fluoride	2.2	0.50	mg/L	2.000		108	90-110			
Nitrogen, Nitrate (As N)	5.2	0.50	mg/L	5.000		105	90-110			
Nitrogen, Nitrite (As N)	2.6	0.10	mg/L	2.500		106	90-110			
Sulfate	13	5.0	mg/L	12.50		102	90-110			
LCS Dup (1507308-BSD1)				Prepared & Analyzed: 07/29/2015						
Chloride	13	1.0	mg/L	12.50		103	90-110	0.2	10	
Fluoride	2.2	0.50	mg/L	2.000		108	90-110	0.09	10	
Nitrogen, Nitrate (As N)	5.2	0.50	mg/L	5.000		105	90-110	0.4	10	
Nitrogen, Nitrite (As N)	2.7	0.10	mg/L	2.500		107	90-110	0.8	10	
Sulfate	13	5.0	mg/L	12.50		103	90-110	0.5	10	
Matrix Spike (1507308-MS1)		**Source: 15G0880-01**		Prepared & Analyzed: 07/29/2015						
Fluoride	2.6	0.50	mg/L	2.000	0.47	105	80-120			
Nitrogen, Nitrate (As N)	6.7	0.50	mg/L	5.000	1.4	105	80-120			
Nitrogen, Nitrite (As N)	2.6	0.10	mg/L	2.500	ND	102	80-120			
Matrix Spike (1507308-MS2)		**Source: 15G0880-01RE1**		Prepared: 07/29/2015 Analyzed: 07/30/2015						
Chloride	16		mg/L	12.50	2.9	102	80-120			
Sulfate	18		mg/L	12.50	4.8	103	80-120			
Matrix Spike Dup (1507308-MSD1)		**Source: 15G0880-01**		Prepared & Analyzed: 07/29/2015						
Fluoride	2.6	0.50	mg/L	2.000	0.47	106	80-120	0.9	10	
Nitrogen, Nitrate (As N)	6.7	0.50	mg/L	5.000	1.4	107	80-120	1	10	
Nitrogen, Nitrite (As N)	2.6	0.10	mg/L	2.500	ND	103	80-120	0.5	10	
Matrix Spike Dup (1507308-MSD2)		**Source: 15G0880-01RE1**		Prepared: 07/29/2015 Analyzed: 07/30/2015						
Chloride	16		mg/L	12.50	2.9	103	80-120	0.6	10	
Sulfate	18		mg/L	12.50	4.8	103	80-120	0.3	10	

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 1560880 DATE 7/29/15 PAGE 1 OF 1

PROJECT NAME Water Supply Study # 28705.2
CONTACT NAME Melanie Lindsey
COMPANY NAME Clear Creek Associates
ADDRESS 221 N. Court Ave. Ste 101 Tucson, Az
ZIP 85701 PHONE 622-3772 EMAIL mlindsey@clearcreekassociates.com
SAMPLER'S SIGNATURE Melanie Lindsey

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX: Base Neutrals 625/8270 ☐ Acids ☐	Volatile Organics ☐ 624 ☐ 524.2 ☐ 8260 ☐	THMS ☐ HAA5 ☐	Chloride ☒ Sulfate ☐ Resistivity ☐	NO_3 ☐ NO_2 ☐ TKN ☐	TPH ☐ 1664 ☐ Oil & Grease ☐	VOA ☐ TCLP Analysis Semi-VOA ☐ Pest. ☐	TCLP ☐ Metals Dissolved ☒ Total ☐ RCRA8 ☐	Total ☐ Cyanide Amen. ☐ WAD ☐	SDWA-INORGANICS PRIMARY ☐ SECONDARY ☐	MPN ☐ Coliform PA ☐ Fecal ☐	pH ☐ Cr_6 ☐ Cl_2 ☐ Turb ☐	COD ☐ TSS ☐ BOD ☐	Radchem	Alkalinity (Total, HCO_3, CO_3, OH) F, SO_4, Si	TDS (filterable and calculated)
242 Zone 2	7/28/15	1300		GW	3				✓	✓				✓						✓			

1. RELINQUISHED BY:
Signature: Melanie Lindsey
Printed Name: Melanie Lindsey
Firm: Clear Creek
Date/Time: 7/28/15 14:05

2. RECEIVED BY:
Signature:
Printed Name:
Firm:
Date/Time:

TURNAROUND REQUIREMENTS:
____ Standard (approx. 10 days)*
____ Next Day ____ 2 Day ____ 5 Day*
____ Email Preliminary Results
* Working Days

REPORT REQUIREMENTS:
____ I. Routine Report
____ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
____ III. Date Validation Report (Includes All Raw Data) Add 10% to invoice

INVOICE INFORMATION:
Account ✓ Y ____ N
P.O. #
Bill to: Copper Queen Branch
William Hart

SAMPLE RECEIPT:
Total Containers 3
Temperature 3.3
☒ Wet Ice
☐ Ambient
☐ Blue Ice

3. RELINQUISHED BY:
Signature:
Printed Name:
Firm:
Date/Time:

4. RECEIVED BY:
Signature:
Printed Name: N. R.
Firm: TURNER LABORATORIES, INC.
Date/Time: 7/29/15 1600

* LEGEND
SAMPLE MATRIX
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

Compliance Analysis: ☐ Yes ☐ No		Custody Seals ☐	Preservation Confirmation ☒
ADEQ Forms: ☐ Yes ☐ No		Container Intact ☒	Appropriate Head Space ☐
Mail ADEQ Forms: ☐ Yes ☐ No		COC / Labels Agree ☒	Received Within Hold Time ☐

SPECIAL INSTRUCTIONS/COMMENTS:
metals: Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mg, Hg, Ni, K, Se, Na, Tl, U (field filtered).
*Please cc results to William_Hart@fmi.com and Christopher_Sherman@FMI.com

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. · CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: July 28, 2015
Sample Received: July 31, 2015
Analysis Completed: August 13, 2015

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Gross Beta Activity Method 900.0 (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
15G0880-01	13.6 ± 1.1	7.6 ± 0.8	< 0.5	< 0.7	< 0.7
Date of Analysis	8/10/2015	8/11/2015	8/7/2015	8/7/2015	8/7/2015

Robert L. Metzger, Ph.D., C.H.P.

Laboratory License Number AZ0462

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

July 28, 2015 (Sample Date) 13:00 (Sample Time) (24 hour clock) _____ (Owner/Contact Person)

_____ (Owner/Contact Fax Number) _____ (Owner/Contact Phone Number)

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring — Date Q1 collected: _____

☐ Quarterly — Date Q2 collected: _____

☐ Composite of four quarterly samples — Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000			
600/00-02		3 pCi/L	Gross Alpha	4002	8/10/2015	13.6 ± 1.1	
7500 - Rn			Radon	4004			
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006		µg/L	
			Uranium 234	4007			
			Uranium 235	4008			
			Uranium 238	4009			
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	8/7/2015	< 0.7	
GammaRay HPGE		1 pCi/L	Radium 226	4020	8/7/2015	< 0.5	
GammaRay HPGE		1 pCi/L	Radium 228	4030	8/7/2015	< 0.7	

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE52439

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15G0880-01

Authorized Signature: _____

Date Public Water System Notified: _____

DWAR 6: 11/2007

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

July 28, 2015 (Sample Date) 13:00 (24 hour clock) (Sample Time) _____ (Owner/Contact Person)

_____ (Owner/Contact Fax Number) _____ (Owner/Contact Phone Number)

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring — Date Q1 collected: _____

☐ Quarterly — Date Q2 collected: _____

☐ Composite of four quarterly samples — Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
900	4 mrem	4 pCi/L	Gross Beta	4100	8/11/2015	< 4 mrem	
906	20,000 pCi/L	1,000 pCi/L	Tritium	4102			
		10 pCi/L	Strontium-89	4172			
	8 pCi/L	2 pCi/L	Strontium-90	4174			
		1 pCi/L	Iodine-131	4264			
		10 pCi/L	Cesium-134	4270			

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE52439

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15G0880-01

Authorized Signature: R L Metzger

Date Public Water System Notified: _____

DWAR 6A: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15G0880

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone :(480) 897-9459
Fax: (480) 892-5446
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15G0880-01 Drinking Water Sampled:07/28/2015 13:00			
Radiochemistry, Radium 226/228	08/27/2015 13:00		
Radiochemistry, Gross Alpha Beta	01/24/2016 13:00		Analyse for Uranium if Gross Alpha> 15pCi/l
Containers Supplied:			52439

Released By	Date	Received By	Date
	7/30/15 1600	Express IT	7/30/15 1600
Released By	Date	Received By	Date
			7/31/15 1080

September 13, 2015

Melanie Lindsey
Clear Creek Associates
221 N. Court Ave., Suite 101
Tucson, AZ 85701

TEL (520) 622-3222
FAX (520) 622-4040

Work Order No.: 15H0744
Order Name: 287052

RE: Water Supply Study

Dear Melanie Lindsey,

Turner Laboratories, Inc. received 1 sample(s) on 08/21/2015 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Terri L. Garcia

Terri Garcia
Technical Director

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15H0744
Date Received: 08/21/2015

Order: 287052

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
15H0744-01	242 Zone 3	Ground Water	08/20/2015 1620

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15H0744
Date Received: 08/21/2015

Case Narrative

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND	Not Detected at or above the PQL
PQL	Practical Quantitation Limit
DF	Dilution Factor

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15H0744
Lab Sample ID: 15H0744-01

Client Sample ID: 242 Zone 3
Collection Date/Time: 08/20/2015 1620
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7								
Barium	0.054	0.050		mg/L	1	08/28/2015 0830	08/28/2015 1555	RAD
Beryllium	ND	0.0020		mg/L	1	08/28/2015 0830	08/28/2015 1555	RAD
Cadmium	ND	0.0020		mg/L	1	08/28/2015 0830	08/28/2015 1555	RAD
Calcium	53	4.0		mg/L	1	08/28/2015 0830	08/28/2015 1554	RAD
Chromium	ND	0.030		mg/L	1	08/28/2015 0830	08/28/2015 1555	RAD
Copper	ND	0.020		mg/L	1	08/28/2015 0830	08/28/2015 1555	RAD
Magnesium	11	3.0		mg/L	1	08/28/2015 0830	08/28/2015 1554	RAD
Nickel	ND	0.050		mg/L	1	08/28/2015 0830	08/28/2015 1555	RAD
Potassium	ND	5.0		mg/L	1	08/28/2015 0830	08/28/2015 1554	RAD
Sodium	73	5.0		mg/L	1	08/28/2015 0830	08/28/2015 1554	RAD
ICP/MS Dissolved Metals-E 200.8								
Antimony	ND	0.00050		mg/L	1	08/26/2015 1540	08/27/2015 1542	RAD
Arsenic	0.00079	0.00050		mg/L	1	08/26/2015 1540	08/27/2015 1542	RAD
Lead	0.00095	0.00050		mg/L	1	08/26/2015 1540	08/27/2015 1542	RAD
Selenium	0.0029	0.0025		mg/L	1	08/26/2015 1540	08/27/2015 1542	RAD
Thallium	ND	0.00050		mg/L	1	08/26/2015 1540	08/27/2015 1542	RAD
Uranium	0.015	0.00050		mg/L	1	08/26/2015 1540	08/27/2015 1542	RAD
CVAA Dissolved Mercury-E 245.1								
Mercury	ND	0.0010		mg/L	1	09/02/2015 1350	09/03/2015 1153	RAD
Anions by Ion Chromatography-E300								
Chloride	100	5.0		mg/L	5	08/21/2015 0830	08/21/2015 1509	MR
Fluoride	ND	0.50		mg/L	1	08/21/2015 0830	08/21/2015 1414	MR
Nitrogen, Nitrate (As N)	1.8	0.50		mg/L	1	08/21/2015 0830	08/21/2015 1414	MR
Nitrogen, Nitrite (As N)	0.11	0.10		mg/L	1	08/21/2015 0830	08/21/2015 1414	MR
Sulfate	45	25		mg/L	5	08/21/2015 0830	08/21/2015 1509	MR
Alkalinity-SM2320B								
Alkalinity, Bicarbonate (As CaCO3)	180	2.0		mg/L	1	08/25/2015 1130	08/25/2015 1155	CC
Alkalinity, Carbonate (As CaCO3)	ND	2.0		mg/L	1	08/25/2015 1130	08/25/2015 1155	CC
Alkalinity, Hydroxide (As CaCO3)	ND	2.0		mg/L	1	08/25/2015 1130	08/25/2015 1155	CC
Alkalinity, Total (As CaCO3)	180	2.0		mg/L	1	08/25/2015 1130	08/25/2015 1155	CC
Total Dissolved Solids (Residue, Filterable)-SM2540 C								

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15H0744
Lab Sample ID: 15H0744-01

Client Sample ID: 242 Zone 3
Collection Date/Time: 08/20/2015 1620
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Total Dissolved Solids (Residue, Filterable)	440	20		mg/L	1	08/25/2015 0900	08/26/2015 1400	CC
Silica-SM4500-Si D								
Silica	16	10		mg/L	5	08/25/2015 1430	08/25/2015 1500	CC
Calculation-TDS Balance								
TDS Balance	1.10	0.00		TDS Ratio	1	09/03/2015 1424	09/11/2015 1337	DW

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15H0744
Date Received: 08/21/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508304 - E 200.8										
Blank (1508304-BLK1)				Prepared: 08/26/2015 Analyzed: 08/27/2015						
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Uranium	ND	0.00050	mg/L							
LCS (1508304-BS1)				Prepared: 08/26/2015 Analyzed: 08/27/2015						
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115			
Arsenic	0.049	0.00050	mg/L	0.05000		98	85-115			
Lead	0.051	0.00050	mg/L	0.05000		101	85-115			
Selenium	0.24	0.0025	mg/L	0.2500		96	85-115			
Thallium	0.048	0.00050	mg/L	0.05000		97	85-115			
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115			
LCS Dup (1508304-BSD1)				Prepared: 08/26/2015 Analyzed: 08/27/2015						
Antimony	0.047	0.00050	mg/L	0.05000		95	85-115	1	20	
Arsenic	0.050	0.00050	mg/L	0.05000		99	85-115	1	20	
Lead	0.051	0.00050	mg/L	0.05000		101	85-115	0.1	20	
Selenium	0.24	0.0025	mg/L	0.2500		96	85-115	0.7	20	
Thallium	0.049	0.00050	mg/L	0.05000		97	85-115	0.7	20	
Uranium	0.047	0.00050	mg/L	0.05000		93	85-115	2	20	
Matrix Spike (1508304-MS1)	**Source: 15H0833-03**			Prepared: 08/26/2015 Analyzed: 08/28/2015						
Antimony	0.48	0.0050	mg/L	0.5000	0.00038	96	70-130			
Arsenic	0.50	0.0050	mg/L	0.5000	0.0022	99	70-130			
Lead	0.48	0.0050	mg/L	0.5000	0.0021	96	70-130			
Selenium	2.5	0.0025	mg/L	2.500	0.0031	101	70-130			
Thallium	0.47	0.00050	mg/L	0.5000	0.00029	94	70-130			
Uranium	0.49	0.0050	mg/L	0.5000	ND	99	70-130			
Batch 1508310 - E 200.7										
Blank (1508310-BLK1)				Prepared & Analyzed: 08/28/2015						
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0020	mg/L							
Cadmium	ND	0.0020	mg/L							
Calcium	ND	4.0	mg/L							
Chromium	ND	0.030	mg/L							
Copper	ND	0.020	mg/L							
Magnesium	ND	3.0	mg/L							
Nickel	ND	0.050	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15H0744
Date Received: 08/21/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508310 - E 200.7										
LCS (1508310-BS1)				Prepared & Analyzed: 08/28/2015						
Barium	2.2	0.050	mg/L	2.000		108	85-115			
Beryllium	0.050	0.0020	mg/L	0.05000		99	85-115			
Cadmium	0.050	0.0020	mg/L	0.05000		101	85-115			
Calcium	9.6	4.0	mg/L	10.00		96	85-115			
Chromium	0.21	0.030	mg/L	0.2000		103	85-115			
Copper	0.26	0.020	mg/L	0.2500		103	85-115			
Magnesium	9.7	3.0	mg/L	10.00		97	85-115			
Nickel	0.50	0.050	mg/L	0.5000		100	85-115			
Potassium	10	5.0	mg/L	10.00		104	85-115			
Sodium	9.8	5.0	mg/L	10.00		98	85-115			
LCS Dup (1508310-BSD1)				Prepared & Analyzed: 08/28/2015						
Barium	2.2	0.050	mg/L	2.000		108	85-115	0.2	20	
Beryllium	0.050	0.0020	mg/L	0.05000		99	85-115	0.09	20	
Cadmium	0.051	0.0020	mg/L	0.05000		101	85-115	0.6	20	
Calcium	9.7	4.0	mg/L	10.00		97	85-115	0.5	20	
Chromium	0.21	0.030	mg/L	0.2000		104	85-115	1	20	
Copper	0.26	0.020	mg/L	0.2500		103	85-115	0.4	20	
Magnesium	9.8	3.0	mg/L	10.00		98	85-115	0.7	20	
Nickel	0.51	0.050	mg/L	0.5000		101	85-115	0.9	20	
Potassium	10	5.0	mg/L	10.00		104	85-115	0.5	20	
Sodium	10	5.0	mg/L	10.00		100	85-115	2	20	
Matrix Spike (1508310-MS1)		**Source: 15H0798-06**		Prepared & Analyzed: 08/28/2015						
Barium	2.3	0.050	mg/L	2.000	0.031	112	70-130			
Beryllium	0.053	0.0020	mg/L	0.05000	ND	106	70-130			
Cadmium	0.053	0.0020	mg/L	0.05000	ND	106	70-130			
Calcium	27	4.0	mg/L	10.00	16	109	70-130			
Chromium	0.22	0.030	mg/L	0.2000	ND	108	70-130			
Copper	0.30	0.020	mg/L	0.2500	0.012	114	70-130			
Magnesium	12	3.0	mg/L	10.00	1.3	105	70-130			
Nickel	0.54	0.050	mg/L	0.5000	ND	108	70-130			
Potassium	27	5.0	mg/L	10.00	16	103	70-130			
Sodium	11	5.0	mg/L	10.00	ND	111	70-130			
Matrix Spike (1508310-MS2)		**Source: 15H0836-02**		Prepared & Analyzed: 08/28/2015						
Barium	2.1	0.050	mg/L	2.000	0.066	101	70-130			
Beryllium	0.047	0.0020	mg/L	0.05000	ND	94	70-130			
Cadmium	0.047	0.0020	mg/L	0.05000	ND	94	70-130			
Calcium	72	4.0	mg/L	10.00	69	29	70-130			M3
Chromium	0.20	0.030	mg/L	0.2000	0.0012	99	70-130			
Copper	0.25	0.020	mg/L	0.2500	0.0024	99	70-130			
Magnesium	24	3.0	mg/L	10.00	16	87	70-130			
Nickel	0.47	0.050	mg/L	0.5000	ND	94	70-130			
Potassium	12	5.0	mg/L	10.00	3.7	87	70-130			
Sodium	75	5.0	mg/L	10.00	72	30	70-130			M3
Batch 1509027 - E 245.1										

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15H0744
Date Received: 08/21/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1509027 - E 245.1										
Blank (1509027-BLK1)				Prepared: 09/02/2015 Analyzed: 09/03/2015						
Mercury	ND	0.0010	mg/L							
LCS (1509027-BS1)				Prepared: 09/02/2015 Analyzed: 09/03/2015						
Mercury	0.0051	0.0010	mg/L	0.005000		102	85-115			
LCS Dup (1509027-BSD1)				Prepared: 09/02/2015 Analyzed: 09/03/2015						
Mercury	0.0050	0.0010	mg/L	0.005000		101	85-115	0.9	20	
Matrix Spike (1509027-MS1)		**Source: 15H0744-01**		Prepared: 09/02/2015 Analyzed: 09/03/2015						
Mercury	0.0045	0.0010	mg/L	0.005000	0.00016	86	85-115			
Matrix Spike (1509027-MS2)		**Source: 15H0868-01**		Prepared: 09/02/2015 Analyzed: 09/03/2015						
Mercury	0.0049	0.0010	mg/L	0.005000	0.00016	95	85-115			
Matrix Spike Dup (1509027-MSD1)		**Source: 15H0744-01**		Prepared: 09/02/2015 Analyzed: 09/03/2015						
Mercury	0.0050	0.0010	mg/L	0.005000	0.00016	96	85-115	11	20	
Matrix Spike Dup (1509027-MSD2)		**Source: 15H0868-01**		Prepared: 09/02/2015 Analyzed: 09/03/2015						
Mercury	0.0049	0.0010	mg/L	0.005000	0.00016	95	85-115	0.02	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15H0744
Date Received: 08/21/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508262 - SM2540 C										
Duplicate (1508262-DUP1)		**Source: 15H0744-01**		Prepared: 08/25/2015 Analyzed: 08/26/2015						
Total Dissolved Solids (Residue, Filterable)	440	20	mg/L		440			0.5	5	
Batch 1508269 - SM2320B										
LCS (1508269-BS1)				Prepared & Analyzed: 08/25/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		99	90-110			
LCS Dup (1508269-BSD1)				Prepared & Analyzed: 08/25/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		99	90-110	0	10	
Matrix Spike (1508269-MS1)		**Source: 15H0724-02**		Prepared & Analyzed: 08/25/2015						
Alkalinity, Total (As CaCO3)	290	2.0	mg/L	250.0	48	98	85-115			
Matrix Spike Dup (1508269-MSD1)		**Source: 15H0724-02**		Prepared & Analyzed: 08/25/2015						
Alkalinity, Total (As CaCO3)	290	2.0	mg/L	250.0	48	98	85-115	0.7	10	
Batch 1508278 - SM4500-Si D										
Blank (1508278-BLK1)				Prepared & Analyzed: 08/25/2015						
Silica	ND	2.0	mg/L							
LCS (1508278-BS1)				Prepared & Analyzed: 08/25/2015						
Silica	8.0	2.0	mg/L	8.000		99	90-110			
LCS Dup (1508278-BSD1)				Prepared & Analyzed: 08/25/2015						
Silica	8.1	2.0	mg/L	8.000		101	90-110	2	20	
Matrix Spike (1508278-MS1)		**Source: 15H0744-01**		Prepared & Analyzed: 08/25/2015						
Silica	56	10	mg/L	40.00	16	101	70-130			
Matrix Spike Dup (1508278-MSD1)		**Source: 15H0744-01**		Prepared & Analyzed: 08/25/2015						
Silica	56	10	mg/L	40.00	16	101	70-130	0.6	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15H0744
Date Received: 08/21/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508239 - E300										
Blank (1508239-BLK1)				Prepared & Analyzed: 08/21/2015						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1508239-BS1)				Prepared & Analyzed: 08/21/2015						
Chloride	12	1.0	mg/L	12.50		98	90-110			
Fluoride	2.1	0.50	mg/L	2.000		104	90-110			
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000		101	90-110			
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500		98	90-110			
Sulfate	13	5.0	mg/L	12.50		101	90-110			
LCS Dup (1508239-BSD1)				Prepared & Analyzed: 08/21/2015						
Chloride	12	1.0	mg/L	12.50		99	90-110	0.4	10	
Fluoride	2.1	0.50	mg/L	2.000		104	90-110	0.3	10	
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000		101	90-110	0.4	10	
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500		98	90-110	0.4	10	
Sulfate	13	5.0	mg/L	12.50		101	90-110	0.2	10	
Matrix Spike (1508239-MS1)	**Source: 15H0744-01**			Prepared & Analyzed: 08/21/2015						
Fluoride	2.3	0.50	mg/L	2.000	0.44	94	80-120			
Nitrogen, Nitrate (As N)	6.9	0.50	mg/L	5.000	1.8	103	80-120			
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500	0.11	94	80-120			
Matrix Spike (1508239-MS2)	**Source: 15H0744-01RE1**			Prepared & Analyzed: 08/21/2015						
Chloride	23		mg/L	12.50	10	106	80-120			
Sulfate	17		mg/L	12.50	4.5	103	80-120			
Matrix Spike Dup (1508239-MSD1)	**Source: 15H0744-01**			Prepared & Analyzed: 08/21/2015						
Fluoride	2.4	0.50	mg/L	2.000	0.44	95	80-120	1	10	
Nitrogen, Nitrate (As N)	6.9	0.50	mg/L	5.000	1.8	104	80-120	0.4	10	
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500	0.11	95	80-120	0.6	10	
Matrix Spike Dup (1508239-MSD2)	**Source: 15H0744-01RE1**			Prepared & Analyzed: 08/21/2015						
Chloride	23		mg/L	12.50	10	104	80-120	1	10	
Sulfate	17		mg/L	12.50	4.5	102	80-120	0.7	10	

TURNER LABORATORIES INC.
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 1510744 DATE 8/21/15 PAGE 1 OF 1

PROJECT NAME Water Supply Study # 287052
CONTACT NAME Ryan Toomey + Melanie Lindsey
COMPANY NAME Clear Creek Associates
ADDRESS 221 N. Court Ave Ste 101 Tucson, AZ
ZIP 85701 PHONE 622-3222 EMAIL mlindsey@clearcreekassociates.com
SAMPLER'S SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	Base Neutrals 625/8270	Acids	Volatile Organics 624	524.2	8260	TTHMS	HAA5	Chloride	Sulfate	Resistivity	NO_2	NO_3	TKN	1664 TPH	Oil & Grease	TCLP Analysis VOA	Semi-VOA	Pest.	Metals TCLP	Dissolved	Total	RCRA8	Cyanide Total	Amen.	WAD	SDWA-INORGANICS PRIMARY	SECONDARY	Coliform MPN	PIA	Fecal	pH	Cr_6	Cl_2	Turb	TSS	COD	BOD	Radiochemistry	Alkalinity (Total, HCO_3, CO_3, OH)	E. Sl. TDS (resistivity)	TDS (calc)
242 Zone 3	8/20/15	1620		GW	3								X			X									X																	X	X	X	

1. RELINQUISHED BY:
Signature
Printed Name Ryan Toomey
Firm Clear Creek
Date/Time 8/21/15 1250

2. RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

3. RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

4. RECEIVED BY:
Signature
Printed Name
Firm TURNER LABORATORIES, INC.
Date/Time 8/21/15 1250

TURNAROUND REQUIREMENTS:
___ Standard (approx. 10 days)*
✓ Next Day (SO4) ___ 2 Day ✓ 5 Day* (else)
___ Email Preliminary Results
* Working Days

REPORT REQUIREMENTS:
___ I. Routine Report
___ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
___ III. Date Validation Report (Includes All Raw Data) Add 10% to invoice

INVOICE INFORMATION:
Account ✓ Y ___ N
P.O. #
Bill to: William Hart
Freeport McMoRan
Copper Queen Branch

SAMPLE RECEIPT:
Total Containers 3
Temperature 0.3
☒ Wet Ice
☐ Ambient
☐ Blue Ice

* LEGEND SAMPLE MATRIX
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

Compliance Analysis: ☐ Yes ☐ No		Custody Seals ☐	Preservation Confirmation ☒
ADEQ Forms: ☐ Yes ☐ No		Container Intact ☒	Appropriate Head Space ☒
Mail ADEQ Forms: ☐ Yes ☐ No		COC / Labels Agree ☒	Received Within Hold Time ☒

SPECIAL INSTRUCTIONS/COMMENTS: Same day SO4 results, Else 5-day
* CC results to William_Hart@FMI.com & Christopher_Sherman@FMI.com
*Metals: Sb, As, Ba, Be, Cd, Ca, Cr, Cu, Pb, Mg, Hg, Ni, Se, Na, TL, U

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. · CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: August 20, 2015
Sample Received: August 24, 2015
Analysis Completed: September 08, 2015

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Gross Beta Activity Method 900.0 (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
15H0744-01	0.5 ± 0.4	10.3 ± 3.5	< 0.4	< 0.7	< 0.7
Date of Analysis	8/26/2015	9/1/2015	8/28/2015	8/28/2015	8/28/2015

Robert L. Metzger, Ph.D., C.H.P.
Laboratory License Number AZ0462

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

August 20, 2015 (Sample Date) 16:20 (Sample Time) (24 hour clock) _____ (Owner/Contact Person)

_____ (Owner/Contact Fax Number) _____ (Owner/Contact Phone Number)

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring — Date Q1 collected: _____

☐ Quarterly — Date Q2 collected: _____

☐ Composite of four quarterly samples — Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result		Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000				
600/00-02		3 pCi/L	Gross Alpha	4002	8/26/2015	0.5 ± 0.4		
7500 - Rn			Radon	4004				
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006			µg/L	
			Uranium 234	4007				
			Uranium 235	4008				
			Uranium 238	4009				
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	8/28/2015	< 0.7		
GammaRay HPGE		1 pCi/L	Radium 226	4020	8/28/2015	< 0.4		
GammaRay HPGE		1 pCi/L	Radium 228	4030	8/28/2015	< 0.7		

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE52639

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15H0744-01

Authorized Signature: Robert L. Metzger

Date Public Water System Notified: _____

DWAR 6: 11/2007

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

August 20, 2015 (Sample Date) 16:20 (Sample Time) (24 hour clock) _____ (Owner/Contact Person)

_____ (Owner/Contact Fax Number) _____ (Owner/Contact Phone Number)

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring — Date Q1 collected: _____

☐ Quarterly — Date Q2 collected: _____

☐ Composite of four quarterly samples — Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
900	4 mrem	4 pCi/L	Gross Beta	4100	9/1/2015	< 4 mrem	
906	20,000 pCi/L	1,000 pCi/L	Tritium	4102			
		10 pCi/L	Strontium-89	4172			
	8 pCi/L	2 pCi/L	Strontium-90	4174			
		1 pCi/L	Iodine-131	4264			
		10 pCi/L	Cesium-134	4270			

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE52639

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 15H0744-01

Authorized Signature: _____

Date Public Water System Notified: _____

DWAR 6A: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15H0744

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone :(480) 897-9459
Fax: (480) 892-5446
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15H0744-01 Drinking Water Sampled:08/20/2015 16:20			
Radiochemistry, Radium 226/228	09/19/2015 16:20		
Radiochemistry, Gross Alpha Beta	02/16/2016 16:20		*Analyse for Uranium if Gross Alpha> 15pCi/l*
Containers Supplied:		57639	

Released By	Date	Received By	Date
	8/24/15 1600	Express IT	8/24/15 1600
Released By	Date	Received By	Date
			8/25/15 1050

APPENDIX C.2

NEW SOURCE APPROVAL SAMPLE LABORATORY REPORTS

June 22, 2015

Melanie Lindsey
Clear Creek Associates
221 N. Court Ave., Suite 101
Tucson, AZ 85701

TEL (520) 622-3222
FAX (520) 622-4040

Work Order No.: 15E0622
Order Name: 287052

RE: Water Supply Study

Dear Melanie Lindsey,

Turner Laboratories, Inc. received 2 sample(s) on 05/20/2015 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Terri Garcia
Technical Director

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Date Received: 05/20/2015

Order: 287052

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
15E0622-01	WM02010-05B	Drinking Water	05/20/2015 1120
15E0622-02	Trip Blank	Trip Blank	05/20/2015 0000

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Date Received: 05/20/2015

Case Narrative

The asbestos analysis was performed by Carolina Environmental, Inc. in Cary, NC.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

Several synthetic organic compound analyses were performed by eurofins Eaton Analytical in South Bend, IN.

H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
N4	The Minimum Reporting Limit (MRL) verificataion check did not meet laboratory acceptance limits.
V1	CCV recovery was above method acceptance limits. This target analyte was not detected in the sample.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND	Not Detected at or above the PQL
PQL	Practical Quantitation Limit
DF	Dilution Factor

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Lab Sample ID: 15E0622-01

Client Sample ID: WM02010-05B
Collection Date/Time: 05/20/2015 1120
Matrix: Drinking Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Langelier Index-Calculation								
Langelier Index	0.10	-8.0		LI	1	06/02/2015 1406	06/15/2015 1628	DW
Hardness, Ca-Calculation								
Hardness, Calcium (As CaCO3)	190			mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Coliform by Colitag-Colitag Mod.								
Total Coliform	Absent					05/20/2015 1650	05/21/2015 1450	CC
pH-E150.1								
pH (pH Units)	7.4	0.0	H5	-	1	05/20/2015 1650	05/20/2015 1652	EK
Temperature (°C)	19		H5	-	1	05/20/2015 1650	05/20/2015 1652	EK
ICP Total Metals-E200.7								
Barium	ND	0.050		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Beryllium	ND	0.0020		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Cadmium	ND	0.0020		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Calcium	75	4.0		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Chromium	ND	0.030		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Copper	ND	0.020		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Iron	ND	0.30		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Magnesium	12	3.0		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Nickel	ND	0.050		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
Sodium	6.9	5.0		mg/L	1	05/21/2015 0820	05/21/2015 1307	RAD
ICP/MS Total Metals-E200.8								
Antimony	ND	0.00050		mg/L	1	05/22/2015 0820	05/22/2015 1457	RAD
Arsenic	0.00051	0.00050		mg/L	1	05/22/2015 0820	05/22/2015 1457	RAD
Lead	0.00089	0.00050		mg/L	1	05/22/2015 0820	05/22/2015 1457	RAD
Selenium	ND	0.0025		mg/L	1	05/22/2015 0820	05/22/2015 1457	RAD
Thallium	ND	0.00050		mg/L	1	05/22/2015 0820	05/22/2015 1457	RAD
CVAA Total Mercury-E245.1								
Mercury	ND	0.0010		mg/L	1	05/26/2015 0945	05/27/2015 1129	RAD
Anions by Ion Chromatography-E300								
Chloride	8.0	1.0		mg/L	1	05/20/2015 1634	05/21/2015 0616	MR
Fluoride	ND	0.50		mg/L	1	05/20/2015 1634	05/21/2015 0616	MR
Nitrogen, Nitrate (As N)	2.6	0.50		mg/L	1	05/20/2015 1634	05/21/2015 0616	MR
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	05/20/2015 1634	05/21/2015 0616	MR
Sulfate	39	10		mg/L	2	05/20/2015 1634	05/21/2015 1550	MR

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Lab Sample ID: 15E0622-01

Client Sample ID: WM02010-05B
Collection Date/Time: 05/20/2015 1120
Matrix: Drinking Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Cyanide-E335.4								
Cyanide	ND	0.10		mg/L	1	05/26/2015 0815	05/26/2015 1525	CC
EDB and DBCP-E504.1								
1,2-Dibromo-3-chloropropane	ND	0.000020		mg/L	1	06/01/2015 0854	06/01/2015 1613	MD
1,2-Dibromoethane	ND	0.000010		mg/L	1	06/01/2015 0854	06/01/2015 1613	MD
Surr: Tetrachloro-m-xylene	*106*	*70-130*		*%REC*	*1*	*06/01/2015 0854*	*06/01/2015 1613*	*MD*
PCBs by 505-E505								
Aroclor 1016	ND	0.0000800		mg/L	1	06/02/2015 0833	06/02/2015 1718	MD
Aroclor 1221	ND	0.0200		mg/L	1	06/02/2015 0833	06/02/2015 1718	MD
Aroclor 1232	ND	0.000500		mg/L	1	06/02/2015 0833	06/02/2015 1718	MD
Aroclor 1242	ND	0.000300		mg/L	1	06/02/2015 0833	06/02/2015 1718	MD
Aroclor 1248	ND	0.000100		mg/L	1	06/02/2015 0833	06/02/2015 1718	MD
Aroclor 1254	ND	0.000100		mg/L	1	06/02/2015 0833	06/02/2015 1718	MD
Aroclor 1260	ND	0.0000800		mg/L	1	06/02/2015 0833	06/02/2015 1718	MD
Chlordane	ND	0.000200		mg/L	1	06/02/2015 0833	06/02/2015 1718	MD
Toxaphene	ND	0.000600		mg/L	1	06/02/2015 0833	06/02/2015 1718	MD
Surr: Decachlorobiphenyl	*126*	*70-130*		*%REC*	*1*	*06/02/2015 0833*	*06/02/2015 1718*	*MD*
Volatile Organic Compounds by GC/MS-EPA 524.2								
1,1,1,2-Tetrachloroethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,1,1-Trichloroethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,1,2,2-Tetrachloroethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,1,2-Trichloroethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,1-Dichloroethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,1-Dichloroethene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,1-Dichloropropene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,2,3-Trichlorobenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,2,3-Trichloropropane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,2,4-Trichlorobenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,2,4-Trimethylbenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,2-Dichlorobenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,2-Dichloroethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,2-Dichloropropane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,3,5-Trimethylbenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,3-Dichlorobenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,3-Dichloropropane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
1,4-Dichlorobenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
2,2-Dichloropropane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Lab Sample ID: 15E0622-01

Client Sample ID: WM02010-05B
Collection Date/Time: 05/20/2015 1120
Matrix: Drinking Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
2-Chlorotoluene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
4-Chlorotoluene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
4-Isopropyltoluene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Benzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Bromobenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Bromochloromethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Bromodichloromethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Bromoform	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Bromomethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Carbon tetrachloride	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Chlorobenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Chloroethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Chloroform	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Chloromethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
cis-1,2-Dichloroethene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
cis-1,3-Dichloropropene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Dibromochloromethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Dibromomethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Dichlorodifluoromethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Ethylbenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Hexachlorobutadiene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Isopropylbenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Methylene chloride	ND	0.00050	N4, V1	mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Naphthalene	ND	0.00050	N4	mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
n-Butylbenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
n-Propylbenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
sec-Butylbenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Styrene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
tert-Butylbenzene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Tetrachloroethene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Toluene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
trans-1,2-Dichloroethene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
trans-1,3-Dichloropropene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Trichloroethene	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Trichlorofluoromethane	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
TTHMs	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Vinyl chloride	ND	0.00050		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Xylenes, Total	ND	0.0015		mg/L	1	05/22/2015 1223	05/22/2015 1559	KP
Surr: 1,2-Dichlorobenzene-d4	*86*	*70-130*		*%REC*	*1*	*05/22/2015 1223*	*05/22/2015 1559*	*KP*
Surr: 4-Bromofluorobenzene	*88*	*70-130*		*%REC*	*1*	*05/22/2015 1223*	*05/22/2015 1559*	*KP*

Client:	Clear Creek Associates	**Client Sample ID:**	WM02010-05B
Project:	Water Supply Study	**Collection Date/Time:**	05/20/2015 1120
Work Order:	15E0622	**Matrix:**	Drinking Water
Lab Sample ID:	15E0622-01	**Order Name:**	287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Alkalinity-SM2320B								
Alkalinity, Bicarbonate (As CaCO3)	230	2.0		mg/L	1	05/27/2015 1155	05/27/2015 1225	CC
Alkalinity, Carbonate (As CaCO3)	ND	2.0		mg/L	1	05/27/2015 1155	05/27/2015 1225	CC
Alkalinity, Hydroxide (As CaCO3)	ND	2.0		mg/L	1	05/27/2015 1155	05/27/2015 1225	CC
Alkalinity, Total (As CaCO3)	230	2.0		mg/L	1	05/27/2015 1155	05/27/2015 1225	CC
Total Dissolved Solids (Residue, Filterable)-SM2540 C								
Total Dissolved Solids (Residue, Filterable)	310	20		mg/L	1	05/21/2015 0815	05/22/2015 1315	CC

Client:	Clear Creek Associates	**Client Sample ID:**	Trip Blank
Project:	Water Supply Study	**Collection Date/Time:**	05/20/2015 0000
Work Order:	15E0622	**Matrix:**	Trip Blank
Lab Sample ID:	15E0622-02	**Order Name:**	287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
EDB and DBCP-E504.1								
1,2-Dibromo-3-chloropropane	ND	0.000020		mg/L	1	06/01/2015 0854	06/01/2015 1647	MD
1,2-Dibromoethane	ND	0.000010		mg/L	1	06/01/2015 0854	06/01/2015 1647	MD
Surr: Tetrachloro-m-xylene	*121*	*70-130*		*%REC*	*1*	*06/01/2015 0854*	*06/01/2015 1647*	*MD*

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Date Received: 05/20/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505202 - E200.7										
Blank (1505202-BLK1)				Prepared & Analyzed: 05/21/2015						
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0020	mg/L							
Cadmium	ND	0.0020	mg/L							
Calcium	ND	4.0	mg/L							
Chromium	ND	0.030	mg/L							
Copper	ND	0.020	mg/L							
Iron	ND	0.30	mg/L							
Magnesium	ND	3.0	mg/L							
Nickel	ND	0.050	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1505202-BS1)				Prepared & Analyzed: 05/21/2015						
Barium	2.1	0.050	mg/L	2.000		105	85-115			
Beryllium	0.049	0.0020	mg/L	0.05000		98	85-115			
Cadmium	0.049	0.0020	mg/L	0.05000		99	85-115			
Calcium	9.9	4.0	mg/L	10.00		99	85-115			
Chromium	0.20	0.030	mg/L	0.2000		100	85-115			
Copper	0.25	0.020	mg/L	0.2500		102	85-115			
Iron	1.0	0.30	mg/L	1.000		101	85-115			
Magnesium	10	3.0	mg/L	10.00		101	85-115			
Nickel	0.49	0.050	mg/L	0.5000		97	85-115			
Sodium	10	5.0	mg/L	10.00		101	85-115			
LCS Dup (1505202-BSD1)				Prepared & Analyzed: 05/21/2015						
Barium	2.1	0.050	mg/L	2.000		105	85-115	0.3	20	
Beryllium	0.049	0.0020	mg/L	0.05000		98	85-115	0.2	20	
Cadmium	0.049	0.0020	mg/L	0.05000		99	85-115	0.1	20	
Calcium	9.8	4.0	mg/L	10.00		98	85-115	0.8	20	
Chromium	0.20	0.030	mg/L	0.2000		100	85-115	0.3	20	
Copper	0.26	0.020	mg/L	0.2500		102	85-115	0.3	20	
Iron	1.0	0.30	mg/L	1.000		101	85-115	0.1	20	
Magnesium	10	3.0	mg/L	10.00		102	85-115	0.2	20	
Nickel	0.49	0.050	mg/L	0.5000		97	85-115	0.1	20	
Sodium	11	5.0	mg/L	10.00		106	85-115	5	20	
Matrix Spike (1505202-MS1)	**Source: 15E0568-02**			Prepared & Analyzed: 05/21/2015						
Barium	2.1	0.050	mg/L	2.000	0.061	103	70-130			
Beryllium	0.049	0.0020	mg/L	0.05000	ND	98	70-130			
Cadmium	0.048	0.0020	mg/L	0.05000	ND	97	70-130			
Calcium	41	4.0	mg/L	10.00	32	90	70-130			
Chromium	0.20	0.030	mg/L	0.2000	ND	99	70-130			
Copper	0.26	0.020	mg/L	0.2500	0.0069	100	70-130			
Iron	0.98	0.30	mg/L	1.000	0.0062	97	70-130			
Magnesium	14	3.0	mg/L	10.00	4.5	96	70-130			
Nickel	0.47	0.050	mg/L	0.5000	ND	94	70-130			
Sodium	37	5.0	mg/L	10.00	28	92	70-130			
Batch 1505221 - E200.8										

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Date Received: 05/20/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505221 - E200.8										
Blank (1505221-BLK1)				Prepared & Analyzed: 05/22/2015						
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
LCS (1505221-BS1)				Prepared & Analyzed: 05/22/2015						
Antimony	0.048	0.00050	mg/L	0.05000		97	85-115			
Arsenic	0.049	0.00050	mg/L	0.05000		98	85-115			
Lead	0.046	0.00050	mg/L	0.05000		93	85-115			
Selenium	0.23	0.0025	mg/L	0.2500		92	85-115			
Thallium	0.045	0.00050	mg/L	0.05000		90	85-115			
LCS Dup (1505221-BSD1)				Prepared & Analyzed: 05/22/2015						
Antimony	0.049	0.00050	mg/L	0.05000		98	85-115	2	20	
Arsenic	0.050	0.00050	mg/L	0.05000		100	85-115	2	20	
Lead	0.048	0.00050	mg/L	0.05000		96	85-115	3	20	
Selenium	0.24	0.0025	mg/L	0.2500		95	85-115	2	20	
Thallium	0.047	0.00050	mg/L	0.05000		93	85-115	3	20	
Matrix Spike (1505221-MS1)		**Source: 15E0667-03**		Prepared & Analyzed: 05/22/2015						
Antimony	0.048	0.00050	mg/L	0.05000	0.000058	95	70-130			
Arsenic	0.060	0.00050	mg/L	0.05000	0.011	99	70-130			
Lead	0.055	0.00050	mg/L	0.05000	0.0031	104	70-130			
Selenium	0.25	0.0025	mg/L	0.2500	0.00087	100	70-130			
Thallium	0.050	0.00050	mg/L	0.05000	ND	101	70-130			
Matrix Spike (1505221-MS2)		**Source: 15E0622-01**		Prepared & Analyzed: 05/22/2015						
Antimony	0.047	0.00050	mg/L	0.05000	ND	94	70-130			
Arsenic	0.049	0.00050	mg/L	0.05000	0.00051	97	70-130			
Lead	0.045	0.00050	mg/L	0.05000	0.00089	88	70-130			
Selenium	0.20	0.0025	mg/L	0.2500	0.0019	81	70-130			
Thallium	0.044	0.00050	mg/L	0.05000	ND	87	70-130			
Batch 1505237 - E245.1										
Blank (1505237-BLK1)				Prepared: 05/26/2015 Analyzed: 05/27/2015						
Mercury	ND	0.0010	mg/L							
LCS (1505237-BS1)				Prepared: 05/26/2015 Analyzed: 05/27/2015						
Mercury	0.0051	0.0010	mg/L	0.005000		102	85-115			
LCS Dup (1505237-BSD1)				Prepared: 05/26/2015 Analyzed: 05/27/2015						
Mercury	0.0052	0.0010	mg/L	0.005000		104	85-115	2	20	
Matrix Spike (1505237-MS1)		**Source: 15E0502-01**		Prepared: 05/26/2015 Analyzed: 05/27/2015						
Mercury	0.0052	0.0010	mg/L	0.005000	ND	103	85-115			
Matrix Spike (1505237-MS2)		**Source: 15E0622-01**		Prepared: 05/26/2015 Analyzed: 05/27/2015						
Mercury	0.0050	0.0010	mg/L	0.005000	ND	100	85-115			

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505237 - E245.1										
Matrix Spike Dup (1505237-MSD1)		**Source: 15E0502-01**		Prepared: 05/26/2015 Analyzed: 05/27/2015						
Mercury	0.0052	0.0010	mg/L	0.005000	ND	104	85-115	0.8	20	
Matrix Spike Dup (1505237-MSD2)		**Source: 15E0622-01**		Prepared: 05/26/2015 Analyzed: 05/27/2015						
Mercury	0.0051	0.0010	mg/L	0.005000	ND	102	85-115	2	20	

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505203 - SM2540 C										
Duplicate (1505203-DUP1)		**Source: 15E0586-09**		Prepared: 05/21/2015 Analyzed: 05/22/2015						
Total Dissolved Solids (Residue, Filterable)	1700	20	mg/L		1700			0.6	5	
Duplicate (1505203-DUP2)		**Source: 15E0586-10**		Prepared: 05/21/2015 Analyzed: 05/22/2015						
Total Dissolved Solids (Residue, Filterable)	1300	20	mg/L		1300			0.6	5	
Duplicate (1505203-DUP3)		**Source: 15E0586-11**		Prepared: 05/21/2015 Analyzed: 05/22/2015						
Total Dissolved Solids (Residue, Filterable)	1300	20	mg/L		1300			1	5	
Batch 1505204 - E150.1										
Duplicate (1505204-DUP1)		**Source: 15E0613-01**		Prepared & Analyzed: 05/20/2015						
pH (pH Units)	7.3	0.0	-		7.3			0	200	
Temperature (°C)	26		-		27			0.8	200	
Duplicate (1505204-DUP2)		**Source: 15E0622-01**		Prepared & Analyzed: 05/20/2015						
pH (pH Units)	7.4	0.0	-		7.4			0.3	200	
Temperature (°C)	19		-		19			0.5	200	
Batch 1505252 - E335.4										
Blank (1505252-BLK1)				Prepared & Analyzed: 05/26/2015						
Cyanide	ND	0.10	mg/L							
LCS (1505252-BS1)				Prepared & Analyzed: 05/26/2015						
Cyanide	1.8	0.10	mg/L	2.000		92	90-110			
LCS Dup (1505252-BSD1)				Prepared & Analyzed: 05/26/2015						
Cyanide	1.9	0.10	mg/L	2.000		94	90-110	2	20	
Matrix Spike (1505252-MS1)		**Source: 15E0551-01**		Prepared & Analyzed: 05/26/2015						
Cyanide	1.8	0.10	mg/L	2.000	ND	91	90-110			
Matrix Spike Dup (1505252-MSD1)		**Source: 15E0551-01**		Prepared & Analyzed: 05/26/2015						
Cyanide	1.8	0.10	mg/L	2.000	ND	92	90-110	1	20	
Batch 1505256 - SM2320B										
LCS (1505256-BS1)				Prepared & Analyzed: 05/27/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		102	90-110			
LCS Dup (1505256-BSD1)				Prepared & Analyzed: 05/27/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		101	90-110	0.8	10	
Matrix Spike (1505256-MS1)		**Source: 15E0616-02**		Prepared & Analyzed: 05/27/2015						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	140	92	85-115			
Matrix Spike Dup (1505256-MSD1)		**Source: 15E0616-02**		Prepared & Analyzed: 05/27/2015						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	140	94	85-115	1	10	

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1506004 - E504.1										
Blank (1506004-BLK1)				Prepared & Analyzed: 06/01/2015						
1,2-Dibromo-3-chloropropane	ND	0.000020	mg/L							
1,2-Dibromoethane	ND	0.000010	mg/L							
Surrogate: Tetrachloro-m-xylene	*0.000233*		*mg/L*	*0.0002000*		*117*	*70-130*			
LCS (1506004-BS1)				Prepared & Analyzed: 06/01/2015						
1,2-Dibromo-3-chloropropane	0.00024	0.000020	mg/L	0.0002500		95	70-130			
1,2-Dibromoethane	0.00027	0.000010	mg/L	0.0002500		107	70-130			
Surrogate: Tetrachloro-m-xylene	*0.000214*		*mg/L*	*0.0002000*		*107*	*70-130*			
LCS Dup (1506004-BSD1)				Prepared & Analyzed: 06/01/2015						
1,2-Dibromo-3-chloropropane	0.00026	0.000020	mg/L	0.0002500		103	70-130	8	30	
1,2-Dibromoethane	0.00028	0.000010	mg/L	0.0002500		110	70-130	3	30	
Surrogate: Tetrachloro-m-xylene	*0.000226*		*mg/L*	*0.0002000*		*113*	*70-130*			
Matrix Spike (1506004-MS1)		**Source: 15E0622-01**		Prepared & Analyzed: 06/01/2015						
1,2-Dibromo-3-chloropropane	0.00026	0.000020	mg/L	0.0002500	ND	104	70-130			
1,2-Dibromoethane	0.00027	0.000010	mg/L	0.0002500	ND	109	70-130			
Surrogate: Tetrachloro-m-xylene	*0.000225*		*mg/L*	*0.0002000*		*112*	*70-130*			
Batch 1506014 - E505										
Blank (1506014-BLK1)				Prepared & Analyzed: 06/02/2015						
Aroclor 1016	ND	0.0000800	mg/L							
Aroclor 1221	ND	0.0200	mg/L							
Aroclor 1232	ND	0.000500	mg/L							
Aroclor 1242	ND	0.000300	mg/L							
Aroclor 1248	ND	0.000100	mg/L							
Aroclor 1254	ND	0.000100	mg/L							
Aroclor 1260	ND	0.0000800	mg/L							
Chlordane	ND	0.000200	mg/L							
Toxaphene	ND	0.000600	mg/L							
Surrogate: Decachlorobiphenyl	*0.000911*		*mg/L*	*0.001000*		*91*	*70-130*			
LCS (1506014-BS1)				Prepared & Analyzed: 06/02/2015						
Aroclor 1016	ND	0.0000800	mg/L				70-130			
Aroclor 1221	ND	0.0200	mg/L				70-130			
Aroclor 1232	0.0012	0.000500	mg/L	0.001250		98	70-130			
Aroclor 1242	ND	0.000300	mg/L				70-130			
Aroclor 1248	ND	0.000100	mg/L				70-130			
Aroclor 1254	ND	0.000100	mg/L				70-130			
Aroclor 1260	ND	0.0000800	mg/L				70-130			
Chlordane	ND	0.000200	mg/L				70-130			
Toxaphene	ND	0.000600	mg/L				70-130			
Surrogate: Decachlorobiphenyl	*0.00103*		*mg/L*	*0.001000*		*103*	*70-130*			

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1506014 - E505										
LCS Dup (1506014-BSD1)				Prepared & Analyzed: 06/02/2015						
Aroclor 1016	ND	0.0000800	mg/L				70-130		30	
Aroclor 1221	ND	0.0200	mg/L				70-130		30	
Aroclor 1232	0.0014	0.000500	mg/L	0.001250		111	70-130	13	30	
Aroclor 1242	ND	0.000300	mg/L				70-130		30	
Aroclor 1248	ND	0.000100	mg/L				70-130		30	
Aroclor 1254	ND	0.000100	mg/L				70-130		30	
Aroclor 1260	ND	0.0000800	mg/L				70-130		30	
Chlordane	ND	0.000200	mg/L				70-130		30	
Toxaphene	ND	0.000600	mg/L				70-130		30	
Surrogate: Decachlorobiphenyl	*0.00114*		*mg/L*	*0.001000*		*114*	*70-130*			
Matrix Spike (1506014-MS1)		**Source: 15E0622-01**		Prepared & Analyzed: 06/02/2015						
Aroclor 1016	ND	0.0000800	mg/L		ND		65-135			
Aroclor 1221	ND	0.0200	mg/L		ND		65-135			
Aroclor 1232	0.0012	0.000500	mg/L	0.001250	ND	98	65-135			
Aroclor 1242	ND	0.000300	mg/L		ND		65-135			
Aroclor 1248	ND	0.000100	mg/L		ND		65-135			
Aroclor 1254	ND	0.000100	mg/L		ND		65-135			
Aroclor 1260	ND	0.0000800	mg/L		ND		65-135			
Chlordane	ND	0.000200	mg/L		ND		65-135			
Toxaphene	ND	0.000600	mg/L		ND		65-135			
Surrogate: Decachlorobiphenyl	*0.00107*		*mg/L*	*0.001000*		*107*	*70-130*			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505224 - EPA 524.2										

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505224 - EPA 524.2										
Blank (1505224-BLK1)				Prepared & Analyzed: 05/22/2015						
1,1,1,2-Tetrachloroethane	ND	0.00050	mg/L							
1,1,1-Trichloroethane	ND	0.00050	mg/L							
1,1,2,2-Tetrachloroethane	ND	0.00050	mg/L							
1,1,2-Trichloroethane	ND	0.00050	mg/L							
1,1-Dichloroethane	ND	0.00050	mg/L							
1,1-Dichloroethene	ND	0.00050	mg/L							
1,1-Dichloropropene	ND	0.00050	mg/L							
1,2,3-Trichlorobenzene	ND	0.00050	mg/L							
1,2,3-Trichloropropane	ND	0.00050	mg/L							
1,2,4-Trichlorobenzene	ND	0.00050	mg/L							
1,2,4-Trimethylbenzene	ND	0.00050	mg/L							
1,2-Dichlorobenzene	ND	0.00050	mg/L							
1,2-Dichloroethane	ND	0.00050	mg/L							
1,2-Dichloropropane	ND	0.00050	mg/L							
1,3,5-Trimethylbenzene	ND	0.00050	mg/L							
1,3-Dichlorobenzene	ND	0.00050	mg/L							
1,3-Dichloropropane	ND	0.00050	mg/L							
1,4-Dichlorobenzene	ND	0.00050	mg/L							
2,2-Dichloropropane	ND	0.00050	mg/L							
2-Chlorotoluene	ND	0.00050	mg/L							
4-Chlorotoluene	ND	0.00050	mg/L							
4-Isopropyltoluene	ND	0.00050	mg/L							
Benzene	ND	0.00050	mg/L							
Bromobenzene	ND	0.00050	mg/L							
Bromochloromethane	ND	0.00050	mg/L							
Bromodichloromethane	ND	0.00050	mg/L							
Bromoform	ND	0.00050	mg/L							
Bromomethane	ND	0.00050	mg/L							
Carbon tetrachloride	ND	0.00050	mg/L							
Chlorobenzene	ND	0.00050	mg/L							
Chloroethane	ND	0.00050	mg/L							
Chloroform	ND	0.00050	mg/L							
Chloromethane	ND	0.00050	mg/L							
cis-1,2-Dichloroethene	ND	0.00050	mg/L							
cis-1,3-Dichloropropene	ND	0.00050	mg/L							
Dibromochloromethane	ND	0.00050	mg/L							
Dibromomethane	ND	0.00050	mg/L							
Dichlorodifluoromethane	ND	0.00050	mg/L							
Ethylbenzene	ND	0.00050	mg/L							
Hexachlorobutadiene	ND	0.00050	mg/L							
Isopropylbenzene	ND	0.00050	mg/L							
Methylene chloride	ND	0.00050	mg/L							
Naphthalene	ND	0.00050	mg/L							
n-Butylbenzene	ND	0.00050	mg/L							
n-Propylbenzene	ND	0.00050	mg/L							
sec-Butylbenzene	ND	0.00050	mg/L							
Styrene	ND	0.00050	mg/L							
tert-Butylbenzene	ND	0.00050	mg/L							

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505224 - EPA 524.2										
Blank (1505224-BLK1)				Prepared & Analyzed: 05/22/2015						
Tetrachloroethene	ND	0.00050	mg/L							
Toluene	ND	0.00050	mg/L							
trans-1,2-Dichloroethene	ND	0.00050	mg/L							
trans-1,3-Dichloropropene	ND	0.00050	mg/L							
Trichloroethene	ND	0.00050	mg/L							
Trichlorofluoromethane	ND	0.00050	mg/L							
TTHMs	ND	0.00050	mg/L							
Vinyl chloride	ND	0.00050	mg/L							
Xylenes, Total	ND	0.0015	mg/L							
Surrogate: 1,2-Dichlorobenzene-d4	*0.87*		*ug/L*	*1.000*		*87*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.90*		*ug/L*	*1.000*		*90*	*70-130*			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505224 - EPA 524.2										
LCS (1505224-BS1)				Prepared & Analyzed: 05/22/2015						
1,1,1,2-Tetrachloroethane	0.0053	0.00050	mg/L	0.005000		105	70-130			
1,1,1-Trichloroethane	0.0054	0.00050	mg/L	0.005000		108	70-130			
1,1,2,2-Tetrachloroethane	0.0058	0.00050	mg/L	0.005000		115	70-130			
1,1,2-Trichloroethane	0.0057	0.00050	mg/L	0.005000		114	70-130			
1,1-Dichloroethane	0.0052	0.00050	mg/L	0.005000		103	70-130			
1,1-Dichloroethene	0.0050	0.00050	mg/L	0.005000		101	70-130			
1,1-Dichloropropene	0.0051	0.00050	mg/L	0.005000		102	70-130			
1,2,3-Trichlorobenzene	0.0048	0.00050	mg/L	0.005000		97	70-130			
1,2,3-Trichloropropane	0.0056	0.00050	mg/L	0.005000		113	70-130			
1,2,4-Trichlorobenzene	0.0048	0.00050	mg/L	0.005000		96	70-130			
1,2,4-Trimethylbenzene	0.0055	0.00050	mg/L	0.005000		109	70-130			
1,2-Dichlorobenzene	0.0054	0.00050	mg/L	0.005000		108	70-130			
1,2-Dichloroethane	0.0059	0.00050	mg/L	0.005000		119	70-130			
1,2-Dichloropropane	0.0054	0.00050	mg/L	0.005000		108	70-130			
1,3,5-Trimethylbenzene	0.0056	0.00050	mg/L	0.005000		111	70-130			
1,3-Dichlorobenzene	0.0052	0.00050	mg/L	0.005000		104	70-130			
1,3-Dichloropropane	0.0057	0.00050	mg/L	0.005000		114	70-130			
1,4-Dichlorobenzene	0.0053	0.00050	mg/L	0.005000		106	70-130			
2,2-Dichloropropane	0.0045	0.00050	mg/L	0.005000		90	70-130			
2-Chlorotoluene	0.0055	0.00050	mg/L	0.005000		109	70-130			
4-Chlorotoluene	0.0055	0.00050	mg/L	0.005000		110	70-130			
4-Isopropyltoluene	0.0054	0.00050	mg/L	0.005000		108	70-130			
Benzene	0.0052	0.00050	mg/L	0.005000		104	70-130			
Bromobenzene	0.0051	0.00050	mg/L	0.005000		103	70-130			
Bromochloromethane	0.0053	0.00050	mg/L	0.005000		106	70-130			
Bromodichloromethane	0.0055	0.00050	mg/L	0.005000		109	70-130			
Bromoform	0.0052	0.00050	mg/L	0.005000		104	70-130			
Bromomethane	0.0052	0.00050	mg/L	0.005000		103	70-130			
Carbon tetrachloride	0.0054	0.00050	mg/L	0.005000		107	70-130			
Chlorobenzene	0.0049	0.00050	mg/L	0.005000		99	70-130			
Chloroethane	0.0047	0.00050	mg/L	0.005000		94	70-130			
Chloroform	0.0043	0.00050	mg/L	0.005000		85	70-130			
Chloromethane	0.0048	0.00050	mg/L	0.005000		95	70-130			
cis-1,2-Dichloroethene	0.0052	0.00050	mg/L	0.005000		103	70-130			
cis-1,3-Dichloropropene	0.0047	0.00050	mg/L	0.005000		94	70-130			
Dibromochloromethane	0.0054	0.00050	mg/L	0.005000		108	70-130			
Dibromomethane	0.0057	0.00050	mg/L	0.005000		114	70-130			
Dichlorodifluoromethane	0.0042	0.00050	mg/L	0.005000		83	70-130			
Ethylbenzene	0.0053	0.00050	mg/L	0.005000		107	70-130			
Hexachlorobutadiene	0.0051	0.00050	mg/L	0.005000		102	70-130			
Isopropylbenzene	0.0053	0.00050	mg/L	0.005000		107	70-130			
Methyl tert-Butyl Ether (MTBE)	0.0040	0.00050	mg/L	0.005000		80	0-200			
Methylene chloride	0.0055	0.00050	mg/L	0.005000		111	70-130			
Naphthalene	0.0042	0.00050	mg/L	0.005000		84	70-130			
n-Butylbenzene	0.0054	0.00050	mg/L	0.005000		108	70-130			
n-Propylbenzene	0.0054	0.00050	mg/L	0.005000		108	70-130			
sec-Butylbenzene	0.0054	0.00050	mg/L	0.005000		108	70-130			
Styrene	0.0055	0.00050	mg/L	0.005000		109	70-130			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505224 - EPA 524.2										
LCS (1505224-BS1)				Prepared & Analyzed: 05/22/2015						
tert-Butylbenzene	0.0053	0.00050	mg/L	0.005000		106	70-130			
Tetrachloroethene	0.0048	0.00050	mg/L	0.005000		96	70-130			
Toluene	0.0051	0.00050	mg/L	0.005000		102	70-130			
trans-1,2-Dichloroethene	0.0049	0.00050	mg/L	0.005000		99	70-130			
trans-1,3-Dichloropropene	0.0049	0.00050	mg/L	0.005000		98	70-130			
Trichloroethene	0.0050	0.00050	mg/L	0.005000		99	70-130			
Trichlorofluoromethane	0.0052	0.00050	mg/L	0.005000		105	70-130			
TTHMs	0.020	0.00050	mg/L				70-130			
Vinyl chloride	0.0046	0.00050	mg/L	0.005000		92	70-130			
Xylenes, Total	0.016	0.0015	mg/L				70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*0.89*		*ug/L*	*1.000*		*89*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.99*		*ug/L*	*1.000*		*99*	*70-130*			

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505224 - EPA 524.2										
LCS Dup (1505224-BSD1)				Prepared & Analyzed: 05/22/2015						
1,1,1,2-Tetrachloroethane	0.0054	0.00050	mg/L	0.005000		109	70-130	3	20	
1,1,1-Trichloroethane	0.0055	0.00050	mg/L	0.005000		110	70-130	2	20	
1,1,2,2-Tetrachloroethane	0.0060	0.00050	mg/L	0.005000		120	70-130	4	20	
1,1,2-Trichloroethane	0.0058	0.00050	mg/L	0.005000		115	70-130	1	20	
1,1-Dichloroethane	0.0054	0.00050	mg/L	0.005000		107	70-130	3	20	
1,1-Dichloroethene	0.0051	0.00050	mg/L	0.005000		103	70-130	2	20	
1,1-Dichloropropene	0.0053	0.00050	mg/L	0.005000		106	70-130	3	20	
1,2,3-Trichlorobenzene	0.0051	0.00050	mg/L	0.005000		103	70-130	6	20	
1,2,3-Trichloropropane	0.0058	0.00050	mg/L	0.005000		116	70-130	3	20	
1,2,4-Trichlorobenzene	0.0050	0.00050	mg/L	0.005000		100	70-130	4	20	
1,2,4-Trimethylbenzene	0.0057	0.00050	mg/L	0.005000		113	70-130	4	20	
1,2-Dichlorobenzene	0.0056	0.00050	mg/L	0.005000		111	70-130	3	20	
1,2-Dichloroethane	0.0060	0.00050	mg/L	0.005000		121	70-130	2	20	
1,2-Dichloropropane	0.0055	0.00050	mg/L	0.005000		111	70-130	3	20	
1,3,5-Trimethylbenzene	0.0057	0.00050	mg/L	0.005000		114	70-130	3	20	
1,3-Dichlorobenzene	0.0054	0.00050	mg/L	0.005000		108	70-130	3	20	
1,3-Dichloropropane	0.0059	0.00050	mg/L	0.005000		118	70-130	3	20	
1,4-Dichlorobenzene	0.0056	0.00050	mg/L	0.005000		112	70-130	5	20	
2,2-Dichloropropane	0.0047	0.00050	mg/L	0.005000		94	70-130	4	20	
2-Chlorotoluene	0.0056	0.00050	mg/L	0.005000		112	70-130	2	20	
4-Chlorotoluene	0.0056	0.00050	mg/L	0.005000		112	70-130	1	20	
4-Isopropyltoluene	0.0056	0.00050	mg/L	0.005000		111	70-130	3	20	
Benzene	0.0055	0.00050	mg/L	0.005000		109	70-130	5	20	
Bromobenzene	0.0053	0.00050	mg/L	0.005000		105	70-130	2	20	
Bromochloromethane	0.0057	0.00050	mg/L	0.005000		115	70-130	8	20	
Bromodichloromethane	0.0057	0.00050	mg/L	0.005000		114	70-130	4	20	
Bromoform	0.0053	0.00050	mg/L	0.005000		106	70-130	2	20	
Bromomethane	0.0053	0.00050	mg/L	0.005000		107	70-130	3	20	
Carbon tetrachloride	0.0054	0.00050	mg/L	0.005000		108	70-130	1	20	
Chlorobenzene	0.0052	0.00050	mg/L	0.005000		103	70-130	4	20	
Chloroethane	0.0050	0.00050	mg/L	0.005000		99	70-130	5	20	
Chloroform	0.0045	0.00050	mg/L	0.005000		90	70-130	6	20	
Chloromethane	0.0049	0.00050	mg/L	0.005000		98	70-130	3	20	
cis-1,2-Dichloroethene	0.0053	0.00050	mg/L	0.005000		107	70-130	3	20	
cis-1,3-Dichloropropene	0.0049	0.00050	mg/L	0.005000		98	70-130	4	20	
Dibromochloromethane	0.0054	0.00050	mg/L	0.005000		109	70-130	0.6	20	
Dibromomethane	0.0058	0.00050	mg/L	0.005000		117	70-130	2	20	
Dichlorodifluoromethane	0.0043	0.00050	mg/L	0.005000		86	70-130	3	20	
Ethylbenzene	0.0055	0.00050	mg/L	0.005000		109	70-130	2	20	
Hexachlorobutadiene	0.0051	0.00050	mg/L	0.005000		102	70-130	0.6	20	
Isopropylbenzene	0.0055	0.00050	mg/L	0.005000		109	70-130	2	20	
Methyl tert-Butyl Ether (MTBE)	0.0041	0.00050	mg/L	0.005000		83	0-200	4	200	
Methylene chloride	0.0055	0.00050	mg/L	0.005000		110	70-130	0.4	20	
Naphthalene	0.0047	0.00050	mg/L	0.005000		95	70-130	12	20	
n-Butylbenzene	0.0056	0.00050	mg/L	0.005000		112	70-130	3	20	
n-Propylbenzene	0.0055	0.00050	mg/L	0.005000		110	70-130	2	20	
sec-Butylbenzene	0.0056	0.00050	mg/L	0.005000		112	70-130	3	20	
Styrene	0.0056	0.00050	mg/L	0.005000		113	70-130	3	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Date Received: 05/20/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505224 - EPA 524.2										
LCS Dup (1505224-BSD1)				Prepared & Analyzed: 05/22/2015						
tert-Butylbenzene	0.0055	0.00050	mg/L	0.005000		110	70-130	4	20	
Tetrachloroethene	0.0050	0.00050	mg/L	0.005000		99	70-130	4	20	
Toluene	0.0053	0.00050	mg/L	0.005000		105	70-130	3	20	
trans-1,2-Dichloroethene	0.0050	0.00050	mg/L	0.005000		99	70-130	0.4	20	
trans-1,3-Dichloropropene	0.0049	0.00050	mg/L	0.005000		99	70-130	0.6	20	
Trichloroethene	0.0051	0.00050	mg/L	0.005000		102	70-130	3	20	
Trichlorofluoromethane	0.0052	0.00050	mg/L	0.005000		105	70-130	0	20	
TTHMs	0.021	0.00050	mg/L				70-130	3	20	
Vinyl chloride	0.0048	0.00050	mg/L	0.005000		95	70-130	3	20	
Xylenes, Total	0.017	0.0015	mg/L				70-130	3	20	
Surrogate: 1,2-Dichlorobenzene-d4	*0.91*		*ug/L*	*1.000*		*91*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*1.0*		*ug/L*	*1.000*		*103*	*70-130*			

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Date Received: 05/20/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505185 - E300										
Blank (1505185-BLK1)				Prepared & Analyzed: 05/20/2015						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1505185-BS1)				Prepared & Analyzed: 05/20/2015						
Chloride	12	1.0	mg/L	12.50		94	90-110			
Fluoride	1.9	0.50	mg/L	2.000		95	90-110			
Nitrogen, Nitrate (As N)	4.8	0.50	mg/L	5.000		96	90-110			
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		97	90-110			
Sulfate	12	5.0	mg/L	12.50		94	90-110			
LCS Dup (1505185-BSD1)				Prepared & Analyzed: 05/20/2015						
Chloride	12	1.0	mg/L	12.50		95	90-110	0.7	10	
Fluoride	1.9	0.50	mg/L	2.000		96	90-110	1	10	
Nitrogen, Nitrate (As N)	4.8	0.50	mg/L	5.000		96	90-110	0.7	10	
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500		99	90-110	2	10	
Sulfate	12	5.0	mg/L	12.50		95	90-110	0.6	10	
Matrix Spike (1505185-MS1)	**Source: 15E0586-02**			Prepared & Analyzed: 05/20/2015						
Nitrogen, Nitrate (As N)	7.6	0.50	mg/L	5.000	3.1	91	80-120			
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500	0.13	93	80-120			
Matrix Spike (1505185-MS2)	**Source: 15E0586-03**			Prepared & Analyzed: 05/20/2015						
Nitrogen, Nitrate (As N)	6.4	0.50	mg/L	5.000	1.6	95	80-120			
Matrix Spike (1505185-MS3)	**Source: 15E0586-04**			Prepared & Analyzed: 05/20/2015						
Nitrogen, Nitrate (As N)	8.8		mg/L	5.000	3.9	99	80-120			
Matrix Spike (1505185-MS4)	**Source: 15E0586-09RE1**			Prepared & Analyzed: 05/20/2015						
Fluoride	2.5		mg/L	2.000	0.72	91	80-120			
Matrix Spike (1505185-MS5)	**Source: 15E0586-09**			Prepared & Analyzed: 05/20/2015						
Chloride	14		mg/L	12.50	1.9	94	80-120			
Matrix Spike (1505185-MS6)	**Source: 15E0586-09**			Prepared & Analyzed: 05/20/2015						
Sulfate	20		mg/L	12.50	8.1	92	80-120			
Matrix Spike (1505185-MS7)	**Source: 15E0586-09RE2**			Prepared & Analyzed: 05/20/2015						
Nitrogen, Nitrate (As N)	8.7		mg/L	5.000	3.7	99	80-120			
Matrix Spike (1505185-MS8)	**Source: 15E0586-10RE1**			Prepared & Analyzed: 05/20/2015						
Fluoride	2.6		mg/L	2.000	0.82	90	80-120			
Matrix Spike (1505185-MS9)	**Source: 15E0586-10**			Prepared & Analyzed: 05/20/2015						
Chloride	17		mg/L	12.50	4.4	99	80-120			
Nitrogen, Nitrate (As N)	7.5		mg/L	5.000	2.5	100	80-120			
Matrix Spike (1505185-MSA)	**Source: 15E0586-10RE2**			Prepared & Analyzed: 05/20/2015						
Sulfate	21		mg/L	12.50	8.7	96	80-120			

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15E0622
Date Received: 05/20/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1505185 - E300										
Matrix Spike (1505185-MSB)	**Source: 15E0586-11RE1**			Prepared & Analyzed: 05/20/2015						
Fluoride	2.7		mg/L	2.000	0.82	92	80-120			
Matrix Spike (1505185-MSC)	**Source: 15E0586-11**			Prepared: 05/20/2015 Analyzed: 05/21/2015						
Chloride	16		mg/L	12.50	4.3	94	80-120			
Nitrogen, Nitrate (As N)	7.2		mg/L	5.000	2.4	95	80-120			
Matrix Spike (1505185-MSD)	**Source: 15E0586-11RE2**			Prepared: 05/20/2015 Analyzed: 05/21/2015						
Sulfate	21		mg/L	12.50	9.1	98	80-120			
Matrix Spike Dup (1505185-MSD1)	**Source: 15E0586-02**			Prepared & Analyzed: 05/20/2015						
Nitrogen, Nitrate (As N)	7.9	0.50	mg/L	5.000	3.1	96	80-120	3	10	
Nitrogen, Nitrite (As N)	2.6	0.10	mg/L	2.500	0.13	97	80-120	4	10	
Matrix Spike Dup (1505185-MSD2)	**Source: 15E0586-03**			Prepared & Analyzed: 05/20/2015						
Nitrogen, Nitrate (As N)	6.4	0.50	mg/L	5.000	1.6	94	80-120	1	10	
Matrix Spike Dup (1505185-MSD3)	**Source: 15E0586-04**			Prepared & Analyzed: 05/20/2015						
Nitrogen, Nitrate (As N)	8.8		mg/L	5.000	3.9	98	80-120	0.1	10	
Matrix Spike Dup (1505185-MSD4)	**Source: 15E0586-09RE1**			Prepared & Analyzed: 05/20/2015						
Fluoride	2.6		mg/L	2.000	0.72	91	80-120	0.4	10	
Matrix Spike Dup (1505185-MSD5)	**Source: 15E0586-09**			Prepared & Analyzed: 05/20/2015						
Chloride	14		mg/L	12.50	1.9	98	80-120	3	10	
Matrix Spike Dup (1505185-MSD6)	**Source: 15E0586-09**			Prepared & Analyzed: 05/20/2015						
Sulfate	19		mg/L	12.50	8.1	89	80-120	2	10	
Matrix Spike Dup (1505185-MSD7)	**Source: 15E0586-09RE2**			Prepared & Analyzed: 05/20/2015						
Nitrogen, Nitrate (As N)	8.6		mg/L	5.000	3.7	98	80-120	0.6	10	
Matrix Spike Dup (1505185-MSD8)	**Source: 15E0586-10RE1**			Prepared & Analyzed: 05/20/2015						
Fluoride	2.7		mg/L	2.000	0.82	92	80-120	1	10	
Matrix Spike Dup (1505185-MSD9)	**Source: 15E0586-10**			Prepared & Analyzed: 05/20/2015						
Chloride	17		mg/L	12.50	4.4	98	80-120	1	10	
Nitrogen, Nitrate (As N)	7.4		mg/L	5.000	2.5	99	80-120	1	10	
Matrix Spike Dup (1505185-MSDA)	**Source: 15E0586-10RE2**			Prepared & Analyzed: 05/20/2015						
Sulfate	21		mg/L	12.50	8.7	100	80-120		10	
Matrix Spike Dup (1505185-MSDB)	**Source: 15E0586-11RE1**			Prepared: 05/20/2015 Analyzed: 05/21/2015						
Fluoride	2.7		mg/L	2.000	0.82	92	80-120	0.04	10	
Matrix Spike Dup (1505185-MSDC)	**Source: 15E0586-11**			Prepared: 05/20/2015 Analyzed: 05/21/2015						
Chloride	16		mg/L	12.50	4.3	94	80-120	0.4	10	
Nitrogen, Nitrate (As N)	7.2		mg/L	5.000	2.4	95	80-120	0.3	10	
Matrix Spike Dup (1505185-MSDD)	**Source: 15E0586-11RE2**			Prepared: 05/20/2015 Analyzed: 05/21/2015						
Sulfate	22		mg/L	12.50	9.1	99	80-120		10	

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 15E0622 DATE 5/20/15 PAGE 1 OF 1

PROJECT NAME Water Supply Study # 287052
CONTACT NAME Melanie Lindsey
COMPANY NAME Clear Creek Associates
ADDRESS 221 N. Court Ave Sto 101 Tucson AZ
ZIP 85701 PHONE 622-3222 EMAIL mlindsey@clearcreekassociates.com
SAMPLER'S SIGNATURE Melanie Lindsey

NUMBER OF CONTAINERS

CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*																		New Source	SO4		
WMD2016-05B	5/20/15	11:20		GW																		X			
Trip Blank		—																				X			

1. RELINQUISHED BY:
Signature: Melanie Lindsey
Printed Name: Melanie Lindsey
Firm: Clear Creek Assoc.
Date/Time: 5/20/15 16:27

2. RECEIVED BY:
Signature:
Printed Name:
Firm:
Date/Time:

TURNAROUND REQUIREMENTS:
____ Standard (approx. 10 days)*
____ Next Day ____ 2 Day ____ 5 Day*
____ Email Preliminary Results
* Working Days

REPORT REQUIREMENTS:
____ I. Routine Report
____ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
____ III. Date Validation Report (Includes All Raw Data) Add 10% to invoice

INVOICE INFORMATION:
Account ____ Y ____ N
P.O. #
Bill to:

SAMPLE RECEIPT:
Total Containers 27
Temperature 5.4
☐ Wet Ice
☐ Ambient
☐ Blue Ice

3. RELINQUISHED BY:
Signature:
Printed Name:
Firm:
Date/Time:

4. RECEIVED BY:
Signature:
Printed Name:
Firm: TURNER LABORATORIES, INC.
Date/Time: 5/20/15 1627

* LEGEND
SAMPLE MATRIX
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

Compliance Analysis: ☐ Yes ☐ No		Custody Seals ☐	Preservation Confirmation ☒
ADEQ Forms: ☐ Yes ☐ No		Container Intact ☒	Appropriate Head Space ☐
Mail ADEQ Forms: ☐ Yes ☐ No		COC / Labels Agree ☒	Received Within Hold Time ☒

SPECIAL INSTRUCTIONS/COMMENTS:

FIBERQUANT ANALYTICAL SERVICES

Determination of Asbestos in Water using TEM

JobNumber: 201505459

Client: TURNER LABORATORIES INC

2445 N COYOTE DR STE 104

TUCSON, AZ 85745-0000

Office Phone: (520) 882-5880
FAX: (520) 882-9788

 # Samples: 1 TEM **Rec:** 5/21/2015 **Method:** EPA 100.1 TEM Water

Client Job: 15E0622 **PO Number:**

Report Date: 5/29/2015 **Date Analyzed:** 5/28/2015 **Routing Number:** -

Method and Analysis Information: **Fiberquant Internal SOP:** TEMw

Samples are analyzed using the protocols given in EPA method 100.1, as amended by the 1993 EPA guidence. Samples should be un-preserved water in 1 L containers having about 200 ml headspace for shaking. There is a 48 hr deadline between the time the sample is taken and the time it is filtered to minimize loss of asbestos fibers due to biological interference. Each sample is shook for 1 minute, and ultrasonicated for at least 10 minutes, shaking every 5 minutes to disperse any fibers that are present. A measured amount of sample is then filtered through a 0.1 um pore size polycarbonate filter, backed by a 5 um pore size MCE filter and a glass frit. Several volumes of liquid may be filtered for each sample in order to assure that a properly loaded sample is obtained. A portion of each resulting filter (and blanks) is then coated with 100-200 um of carbon in a Denton 502A Carbon Evaporator. The carbon encapsulates all of the larger and most of the smaller particulate on the filter. Three mm square pieces of the coated filter are placed on three or more copper TEM grids, and the original filter material is dissolved away in a Jaffe wick and/or condensation washer. The finished replica in carbon containing the particulate is then examined on a JEOL 1200 or Phillips CM 10 transmission electrom microscope at 10,000 to 20,000x magnification. All asbestos fibers >10um in length are tabulated and characterized as asbestos or non-asbestos using a combination of morphology, electron diffraction characteristics, and elemental composition. The result is calculated in millions of fibers per liter (MFL). The grid is scanned until 20 grid openings have been observed, or until an analytical sensitivity (the hypothetical observation of one fiber) of 0.2 MFL has been reached. The nominal 20 grid opening cut-off is used for those samples containing so much non-asbestos particulate that the desired analytical sensitivity is impractical to attain.

The method was designed to determine EPA drinking water compliance. The standard for drinking water is <7 MFL as measured by this method. Fiberquant maintains Arizona Environmental Laboratory license #AZ0633 covering EPA Method 100.1.

Overall, the coefficient of variation can be expected to be approximately 0.5 for analyses in which >20 asbestos fibers have been counted, ranging up to 1.00 for analyses in which only a few asbestos fibers are counted.

The analysis was performed under an ongoing quality assurance program which includes: Lab blanks, prepared with each set of samples and analyzed. Each analyst has suitable background credentials, such as at least a bachelor's degree in geology or chemistry, and has undergone extensive 2-6 month training in TEM techniques and mineralogy specific to TEM asbestos analysis before being allowed to perform client analyses. Unknown reference samples are routinely identified to ensure that each analyst can collect and correctly interpret TEM information. The TEM is aligned and its performance checked daily. Magnification, electron diffraction pattern size, and analytical performance characteristics are calibrated routinely. Samples are re-analyzed sometimes by the same analyst and sometimes by a different analyst in order to determine accuracy and precision. The total of QC analyses (blanks + recounts) are greater than 10% of analyzed samples. Each analyst participates in interlab round robins and proficiency testing in order to show correlation to other lab's analyses. Because TEM samples are not analyzed in batches, which would be traditional for most water analyses, and not every sample has a duplicate or replicate analysis associated with it, it is not possible to include a traditional QC report with the analysis. QC reports are produced monthly, and are available on request. All quality checks performed for these samples were in control except as detailed in the "Analytical Notes" below. Fiberquant is accredited by NVLAP to perform TEM analysis of asbestos in air samples, and has been found to be proficient in the EPA water proficiency program. Accreditation or proficiency does not imply endorsement by the EPA, any other United States governmental agency or any private agency or association. Each lab analysis refers only to the sample tested, and may not, due to the sampling process, be representative of the material sampled. This report may not be reproduced except in full, without the approval of Fiberquant Analytical Services.

Some results may have been calculated using client supplied data, such as volume or area sampled, for which Fiberquant assumes no liability for accuracy.

Job Analysis Notes:

Sampled:	5/20/2015	11:20	**By:**	Lindsey, Melanie
Received:	5/21/2015	14:28		
Filtered:	5/21/2015	15:10		
Analyzed:	5/28/2015	17:05		

Analysis Results:

Lab Number	Client Number	Date	Condition	Filtered Vol (ml)	#GOs	GO Area	MFL>10um	AsbestosType	Sensitivity (MFL>10um)
							Job Number:		201505459
2015-05459- 1	15E0622-01	5/20/2015	acceptable	90	5	0.00993	<0.2	-	0.2

Analyst: DAVID M. SCHALLER

Printed: 29-May-15

Original Print Date: 28-May-15

Larry S. Pierce, Approved Accreditation Signatory

Job Number:	201505459

QA Report: Job Number:	201505459

1. Calibrations	
TEM magnification. date of last.	5/11/2015
TEM camera constant. date of last.	5/22/2015
EDS performance check (k-factors, resolution, low-e perf.). date of last.	5/21/2014
TEM stage drift, minimum beam size. date of last.	5/21/2014
plasma asher. date of last.	4/15/2015

2. Blanks (1/25 samples required)	Not Required This Job

3. Recounts (1/17 samples required)	Pending

4. Analyst Performance	
NVLAP proficiency testing	Current
verified counts. cum. % true positives	90.1
verification of diffraction pattern identifications. cum. % correct	99.6
verification of EDS spectra. cum. % correct	97.4

Fiberquant Analytical Services

Fiberquant, Inc. 5025 S. 33rd St., Phoenix, Arizona 85040 602-276-6139 Fax 602-276-4558

TEM Water Sample Count Sheet

Method: EPA 100.1 (600/4-84-043)

Sample Information

Client: TURNER LABORATORIES INC

Client Smp #: **15E0622-01**

Lab #: **2015-05459- 1** Vol Filtered (ml) 90

___ MCE _Y_ PC Pore um: ___ 0.4 ___ 0.22 _0_ 0.1

Grid Orientation
Draw Asym Spot

E6	E7	E8	E9	E10	E11	E12	E13	E14	E15
F6	F7	F8	F9	F10	E11	F12	F13	F14	F15
G6	G7	G8	G9	G10	G11	G12	G13	G14	G15
H6	H7	H8	H9	H10	H11	H12	H13	H14	H15
I6	I7	I8	I9			I12	I13	I14	I15
J6	J7	J8	J9			J12	J13	J14	J15
K6	K7	K8	K9	K10	K11	K12	K13	K14	K15
L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
N6	N7	N8	N9	N10	N11	N12	N13	N14	N15

Grid Map
X denotes GO's on 1st grid; O denotes GO's on 2nd

Grid Information

#Grids Prepped: 3 GO Area: 0 #GOs to Count 5

System Information

Est. % Loading 1

TEM: _Y_Jeol N ___Jeol S Ac. Volatage: 120kV or other: ____ keV

Measured @20K Scanned @ 15 K Alignment: _Y_checked EDS: ___calib _Y_not used

Fiber Counts:

Grid Storage # 1382M2 Acceptable Prep _Y_ (>50% coverage, >50% intact, no folds, <5% opaque, 20 good GOs

Location		Str. Type				Size		Morphology			Diffraction Data							EDXA Data							Ident.'n	
GO #	STR #	FIBER	BUNDLE	MATRIX	CLUSTER	Length	Width	TUBULAR	BLOCKY	Negative #	5.2 A Row Spacing	Estimated In-Row Spacing	CHRY	AMPH	NONASB	NO PATT	File #	Na	Mg	Si	Ca	Fe	Other	File #	ASBTYPE	NONASB
H13	NM																									
K8	NM																									

Grid Storage # 1382M4 Acceptable Prep _Y_ (>50% coverage, >50% intact, no folds, <5% opaque, 20 good GOs

M12	NM																									
G9	NM																									

Grid Storage # 1382M6 Acceptable Prep _Y_ (>50% coverage, >50% intact, no folds, <5% opaque, 20 good GOs

F11	NM																									

Abbreviations: NSD=No structures Detected; CH=chrysotile, GR=grunnerite; AN=anthophyllite, TR=tremolite, AP=amphibole, GO=grid opening, NA=non-asbestos

Notes:

Totals:	CH > 10 0	AP > 10 0	GOs Counted 5	*Results:*	Str/mm2 < 20	MFL < 0.2

Analyst: D. M. Schultz *Date:* 5-28-15

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15E0622

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Fiberquant
5025 S. 33rd St
Phoenix, AZ 85040
Phone :(602) 276-6139
Fax: (602) 276-4558
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15E0622-01 Drinking Water Sampled:05/20/2015 11:20			
Asbestos	05/22/2015 11:20		

Containers Supplied:

Sampled by Melanie Lindsey

DW AR 9 Som.

Released By	Date	Received By	Date
	5/21/15 1100	Fedex LT	5/21/15 1100
Released By	Date	Received By	Date
DLWDI			5.21.15 0228

Review of Analysis Request (Initials)

2015054 59

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER SOURCE APPROVAL FORM
SAMPLES TO BE TAKEN AT SOURCE ONLY

System ID	System Name
05/20/2015 Sample Date	**11:20** Sample Time **(24 hr clock)**
ADEQ Project	**55-** Well ID Number
NEW SYSTEM YES ___ NO ___	Surface Water Intake ID Number
NEW POE YES ___ NO ___	
Owner/Contact Person Name	Owner/Contact Person Phone Number
Owner/Contact Person Fax Number	Sample Site ID
Submitters Sample ID	**2015-05459- 1** Analyzing Laboratory Specimen Number
SAMPLE TYPE ☐ Compliance Monitoring ___	SAMPLE COLLECTION POINT/ID ☐ Point of Entry # ___

This form is to be filled out completely, and all pages are to be submitted together. If more than one laboratory participated in the analyses, please attach a copy of the original laboratory report, signed by the performing laboratory, to the back of this form.

All Results Shall Be Reported In Milligrams Per Liter (mg/L) Unless Otherwise Specified.

Please note:
The Arsenic MCL is currently .05 mg/L. However, on Jan. 23, 2006, the Arsenic MCL will be .01 mg/L.

Please Mail This Completed Form To:

Arizona Department Of Environmental Quality
Technical Review Unit
Drinking Water Section (5415b-2)
1110 W Washington St,
Phoenix, AZ 85007

Inorganic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
_____	0.05	0.05	Arsenic	1005	_____	_____	☐	☐
_____	2	2	Barium	1010	_____	_____	☐	☐
_____	0.005	0.005	Cadmium	1015	_____	_____	☐	☐
_____	0.1	0.1	Chromium	1020	_____	_____	☐	☐
_____	1.3*	0.050	Copper	1022	_____	_____	☐	☐
_____	4.0	2.0	Fluoride	1025	_____	_____	☐	☐
_____	0.015*	0.0025	Lead	1030	_____	_____	☐	☐
_____	0.002	0.002	Mercury	1035	_____	_____	☐	☐
_____	10	5	Nitrate (as N)	1040	_____	_____	☐	☐
_____	1	0.5	Nitrite	1041	_____	_____	☐	☐
_____	0.05	0.05	Selenium	1045	_____	_____	☐	☐
_____	0.006	0.006	Antimony	1074	_____	_____	☐	☐
_____	0.004	0.004	Beryllium	1075	_____	_____	☐	☐
_____	0.2	0.2	Cyanide (as free	1024	_____	_____	☐	☐
_____	0.1	0.1	Nickel	1036	_____	_____	☐	☐
_____	0.002	0.002	Thallium	1085	_____	_____	☐	☐

*Action Level

Laboratory Information

Specimen Number:_____
Lab ID Number:_____Name:_____
Comments:_____
Authorized Signature:_____

Physical Analysis

Analysis Method	Contaminant Name	Cont. Code	Analysis Run Date	Result
_____	Sulfate	1055	_____	_____
_____	Sodium	1052	_____	_____
_____	PH	1925	_____	_____
_____	Alkalinity	1927	_____	_____
_____	Hardness/Calcium	1918	_____	_____
_____	Langelier Index	1997	_____	_____
_____	Temperature (°C)	1996	_____	_____
_____	Total Dissolved Solids-TDS	1930	_____	_____

Laboratory Information

Specimen Number:_____
Lab ID Number:_____Name:_____
Comments:_____
Authorized Signature:_____

Synthetic Organic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	0.07	0.0001	2,4-D	2105			☐	☐
	0.05	0.0002	2,4,5-TP (Silvex)	2110			☐	☐
	0.002	0.0002	Alachlor	2051			☐	☐
	0.003	0.001	Toxaphene	2020			☐	☐
	0.003	0.0001	Atrazine	2050			☐	☐
	0.04	0.0009	Carbofuran	2046			☐	☐
	0.001	0.00004	Pentachlorophenol	2326			☐	☐
	0.002	0.0002	Chlorodane	2959			☐	☐
	0.0002	0.00002	Dibromochloropropane(DBCP)	2931			☐	☐
	0.00005	0.00001	Ethylene Dibromide (EDB)	2946			☐	☐
	0.0004	0.00004	Heptachlor	2065			☐	☐
	0.0002	0.00002	Heptachlor Epoxide	2067			☐	☐
	0.0002	0.00002	Lindane	2010			☐	☐
	0.04	0.0001	Methoxychlor	2015			☐	☐
	0.0005	0.0001	PCB (Polychlorinated Biohenyls)	2383			☐	☐
	0.0002	0.00002	Benzo(a)Pyrene	2306			☐	☐
	0.2	0.001	Dalapon	2031			☐	☐
	0.006	0.0006	Di(2-ethylhexyl)phthalate	2039			☐	☐
	0.4	0.0006	Di(2-ethylhexyl)adipate	2035			☐	☐
	0.007	0.0002	Dinoseb	2041			☐	☐
	$3x10^{-8}$	$5x10^{-9}$	2,3,7,8-TCDD (Dioxin)	2063			☐	☐
	0.02	0.0004	Diquat	2032			☐	☐
	0.1	0.0009	Endothall	2033			☐	☐
	0.002	0.00001	Endrin	2005			☐	☐
	0.7	0.006	Glyphosate	2034			☐	☐
	0.001	0.0001	Hexachlorobenzene	2274			☐	☐
	0.05	0.0001	Hexachlorocyclopentadiene	2042			☐	☐
	0.2	0.002	Oxamyl	2036			☐	☐
	0.5	0.0001	Picloram	2040			☐	☐
	0.004	0.0007	Simazine	2037			☐	☐

*Aroclor results may be submitted in lieu of PCB

Laboratory Information

Specimen Number:_____
Lab ID Number:_____ Name:_____
Comments:_____
Authorized Signature:_____

Aroclor (PCB Screening Test)

Analysis Method	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds Reporting Limit
_____	0.00008	Aroclor 1016	2388	_____	_____	☐
_____	0.02	Aroclor 1221	2390	_____	_____	☐
_____	0.0005	Aroclor 1232	2392	_____	_____	☐
_____	0.0003	Aroclor 1242	2394	_____	_____	☐
_____	0.0001	Aroclor 1248	2396	_____	_____	☐
_____	0.0001	Aroclor 1254	2398	_____	_____	☐
_____	0.0002	Aroclor 1260	2400	_____	_____	☐

Laboratory Information

Specimen Number:_____
Lab ID Number:_____Name:_____
Comments:_____
Authorized Signature:_____

Volatile Organic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
_____	0.007	0.0005	1,1Dichloroethlene	2977	_____	_____	☐	☐
_____	0.2	0.0005	1,1,1-Trichlorethane	2981	_____	_____	☐	☐
_____	0.005	0.0005	1,1,2-Trichloroethane	2985	_____	_____	☐	☐
_____	0.005	0.0005	1,2-Dichloroethane	2980	_____	_____	☐	☐
_____	0.005	0.0005	1,2-Dichloropropane	2983	_____	_____	☐	☐
_____	0.005	0.0005	Benzene	2990	_____	_____	☐	☐
_____	0.005	0.0005	Carbon Tetrachloride	2982	_____	_____	☐	☐
_____	0.07	0.0005	cis-1,2 Dichloroethylene	2380	_____	_____	☐	☐
_____	0.7	0.0005	Ethylbenzene	2992	_____	_____	☐	☐
_____	0.1	0.0005	(mono) Chlorobenzene	2989	_____	_____	☐	☐
_____	0.6	0.0005	o-Dichlorobenzene	2968	_____	_____	☐	☐
_____	0.075	0.0005	para-Dichlorobenzene	2969	_____	_____	☐	☐
_____	0.1	0.0005	Styrene	2996	_____	_____	☐	☐
_____	0.005	0.0005	Tetrachloroethylene	2987	_____	_____	☐	☐
_____	1	0.0005	Tolune	2991	_____	_____	☐	☐
_____	0.1	0.0005	Trans-1,2-Dichloroethylene	2979	_____	_____	☐	☐
_____	0.005	0.0005	Trichloroethlene	2984	_____	_____	☐	☐
_____	0.002	0.0005	Vinyl Chloride	2976	_____	_____	☐	☐
_____	10	0.0015	Xylenes, Total	2955	_____	_____	☐	☐
_____	0.07	0.0005	1,2,4-Trichlorobenzene	2378	_____	_____	☐	☐
_____	0.005	0.0005	Dichloromethane	2964	_____	_____	☐	☐

Laboratory Information

Specimen Number:_____
Lab ID Number:_____Name:_____
Comments:_____
Authorized Signature:_____

Radiochemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Reuslts	Exceeds MCL	Exceeds Limit
	15 pCi.L		Adjusted Gross Alpha	4000			☐	
		3 pCi/L	Gross Alpha	4002				☐
	30ppb	(reserved)	Combined Uranium		4006		☐	
☐								
			Uranium 234	4007				
			Uranium 235	4008				
			Uranium 238	4009				
	5 pCi/L	1 pCi/L	Combined Radium	4010			☐	☐
		1 pCi/L	Radium 226	4020				☐
		1 pCi/L	Radium 228	4030				
*	4 mrem	3 pCi/L	Gross Beta	4100			☐	☐
*	20,000 pCi/L	1,000 pCi/L	Tritium	4102				☐
*		10 pCi/L	Strontium-89	4172				☐
*	8 pCi/L	2 pCi/L	Strontium-90	4174				☐
*		1 pCi/L	Iodine-131	4264				☐
*		10 pCi/L	Cesium-134_	4270				☐

*Do Not analyze for this contaminant unless notified by ADEQ

Laboratory Information

Specimen Number:_____

ID Number _____ Name: _____

Comments: _____

Authorized Signature: _____

Date Public Water System Notified:_____

Asbestos Analysis

Analysis Method	MCL	Contaminant Name	Cont. Code	Analysis Run Date	Analytical Results	Exceeds MCL
EPA 100.1	**7 MFL**	**Asbestos**	**1094**	**05/28/15**	**<0.2 MFL**	**No**

Laboratory Information

Laboratory Name: **Fiberquant Analytical Services 5025 S 33rd St Phoenix AZ 85040 (800) 743-2687 or (602) 276-6139**

Lab ID Number: **AZ 0/6/3/3** Specimen Number: **2015-05459- 1**

Laboratory Comments: _____

Authorized Signature: David M. Schaller **Name Printed: David M. Schaller**

Date PWS Notified: _____

MICROBIOLOGICAL ANALYSIS

Analysis Method	MCL	Contaminant Name	Cont. Code	Test Start Date/Time	Analysis Run Date/Time	Result
_____	Present 1 or More Coliform	Total Coliform	3000	_____	_____	_____

ONLY REPORT FECAL RESULT IF TOTAL COLIFORM RESULT IS POSITIVE

Analysis Method	MCL	Contaminant Name	Cont. Code	Test Start Date/Time	Analysis Run Date/Time	Result
_____	Present 1 or More Coliform	Total Coliform	3013	_____	_____	_____

LABORATORY INFORMATION

>>>To be filled out by laboratory personnel<<<

Specimen Number_____
Lab ID Number_____ Name_____
Comments:_____
Authorized Signature:_____

DWAR 9: Revised 2004

INSTRUCTIONS FOR USING THE ARIZONA DRINKING WATER SOURCE APPROVAL REPORTING FORM

Revised 2003

SYSTEM ID: This is a unique 5 digit Public Water System Identification (PWSID) number assigned to each public water system by ADEQ.

SYSTEM NAME: Should be in the legal name which the water system will be known as when the system is built. Always notify the Department in writing of any name or ownership change.

ADEQ PROJECT NUMBER: This is the number assigned by ADEQ when the project is first submitted for an "Approval to Construct".

NEW SYSTEM: If this is a new system and a system in number has not yet been assigned by ADEQ, then mark "YES", and be sure that the project number is filled in.

NEW POE: If this source represents a new point of entry (POE) for your system, then mark "YES" on the form. This will allow ADEQ to assign a new point of entry number and the appropriate monitoring year for this point of entry.

WELL ID NUMBER: The Department of Water Resources' registration number goes here. This number always begins with a 55-. If the new source does not constitute a new point of entry, fill in the existing point of entry number that this source is joining.

SURFACE WATER INTAKE ID NUMBER: This number must be assigned by ADEQ. If the new source does not constitute a new point of entry, fill in the existing point of entry number that this source is joining.

SAMPLE DATE: The date the specimen was collected in mm/dd/yy format.

SAMPLE TIME: The time the specimen was collected in hh:mm format (24 hr clock time).

OWNER/CONTACT PERSON NAME: The first and last name of the owner or owner's representative, (contact person) who should be contacted with sample results.

OWNER/CONTACT PHONE#: The daytime phone number of the owner's representative, (contact person) who should be contacted with sample results.

SAMPLE TYPE: The compliance reason for specimen collection. Only the relevant sample types for each contaminant group are provided on the ADEQ forms.

SPECIMEN NUMBER: A unique 15 character (max) alphanumeric code that identifies a particular sample used to test one contaminant or one category of contaminants. If reporting on different reporting forms, a different (unique) number is required for each contaminant group and for each report.

NOTE: These definitions are general in nature. For specific questions regarding your laboratory submittal, please contact the Arizona Department of Environmental Quality (ADEQ) **Water Quality Compliance Section at 1-800-234-5677, ext. 4624, or 602-771-4624. www.adeq.state.az.us**

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. · CHANDLER, ARIZONA 85225-1121
Website: www.radsafe.com
(480) 897-9459
FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: May 20, 2015
Sample Received: May 22, 2015
Analysis Completed: June 09, 2015

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Gross Beta Activity Method 900.0 (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
15E0622-01	7.4 ± 0.5	10.0 ± 1.0	< 1.0	< 2.4	0.5 ± 0.2	1.7 ± 0.4	2.2 ± 0.4
Date of Analysis	6/2/2015	5/26/2015	6/2/2015	6/1/2015	5/29/2015	5/29/2015	5/29/2015

Robert L. Metzger, Ph.D., C.H.P.

Laboratory License Number AZ0462

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. · CHANDLER, ARIZONA 85225-1121
Website: www.radsafe.com
(480) 897-9459
FAX (480) 892-5446

Isotopic Uranium Analysis

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: May 20, 2015
Sample Received: May 22, 2015
Uranium Analysis Date: May 26, 2015

Sample No.	^{238}U	^{235}U	^{234}U	Total	
15E0622-01	2.3 ± 0.4	0.105 ± 0.003	7.6 ± 0.7	10.0 ± 1.0	Activity (pCi/L)
	6.7 ± 1.1	0.049 ± 0.001	0.00122 ± 0.00011	6.8 ± 1.1	Content (µg/L)
	Comments:				

Robert L. Metzger, Ph.D., C.H.P.

Laboratory License Number AZ0462

Arizona Department Of Environmental Quality

Drinking Water Source Approval Form

Samples To Be Taken At Source Only

System ID #	System Name
May 20, 2015 Sample Date	11:20 (24 Hr Clock)
ADEQ Project Number	55- Well ID Number
New System: **YES** ____ **NO** ____	
New POE **YES** ____ **NO** ____	Surface Water Intake *ID* Number
Owner/Contact Person Name	Owner/Contact Person Phone Number
Sample Type ☐ Compliance Monitoring	Sample Collection Point/ID ☐ Point of Entry# ____

This form is to be filled out completely, and all pages are to be submitted together. If more than one laboratory participated in the analyses, please attach a copy of the original laboratory report, signed by the performing laboratory, to the back of this form.

All Results Shall Be Reported In Milligrams Per Liter (mg/L) Unless Otherwise Specified.

Please Mail This Completed Form To:

Arizona Department Of Environmental Quality
Technical Review Unit
Drinking Water Section (5415b-2)
1110 W Washington St,
Phoenix, AZ 85007

Radiochemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	15 pCi.L		Adjusted Gross Alpha	4000	6/2/2015	< 1.0		
600/00-02		3 pCi/l	Gross Alpha	4002	6/2/2015	7.4 ± 0.5		
	30ppb	(reserved)	Combined Uranium	4006	5/26/2015	6.8 ± 1.1		
			Uranium 234	4007	5/26/2015	0.00122 ± 0.00011		
			Uranium 235	4008	5/26/2015	0.049 ± 0.001		
			Uranium 238	4009	5/26/2015	6.7 ± 1.1		
	5 pCi/L	1 pCi/l	Combined Radium	4010	5/29/2015	2.2 ± 0.4		
GammaRay HPGE		1 pCi/l	Radium 226	4020	5/29/2015	0.5 ± 0.2		
GammaRay HPGE		1 pCi/l	Radium 228	4030	5/29/2015	1.7 ± 0.4		
*	4 mrem	3 pCi/l	Gross Beta	4100	6/1/2015	< 4 mrem		
*	20,000 pCi/l	1,000 pCi/l	Tritium	4102				
*		10 pCi/l	Strontium-89	4172				
*	8 pCi/l	2 pCi/l	Strontium-90	4174				
*		1 pCi/l	Iodine-131	4264				
*		10 pCi/l	Cesium-134	4270				

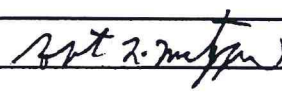
* Do not analyze for this contaminant unless notified by ADEQ

Laboratory Information

Speciman Number: RSE51925

Lab ID Number: AZ0462 Name: Radiation Safety Engineering, Inc.

Comments 15E0622-01

Authorized Signature: 

Date Public Water System Notified:

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15E0622

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone :(480) 897-9459
Fax: (480) 892-5446
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15E0622-01 Drinking Water Sampled:05/20/2015 11:20			
Radiochemistry, Uranium	11/16/2015 11:20		
Radiochemistry, Radium 226/228	06/19/2015 11:20		
Radiochemistry, Gross Alpha Beta	11/16/2015 11:20		
Containers Supplied:			

51925

DWAR 9 Form

Released By — Date: 5/21/15 1100 — Received By: Express IT — Date: 5/21/15 1100

Released By — Date — Received By: Michelle Harbor — Date: 5/22/15 1015

eurofins | Eaton Analytical

LABORATORY REPORT

If you have any questions concerning this report, please do not hesitate to call us at (800) 332-4345 or (574) 233-4777.

eurofins | Eaton Analytical

STATE CERTIFICATION LIST

State	Certification	State	Certification
Alabama	40700	Montana	CERT0026
Alaska	IN00035	Nebraska	E87775
Arizona	AZ0432	Nevada	IN000352015-1
Arkansas	IN035	New Hampshire*	2124
California	2920	New Mexico	IN00035
Colorado	IN035	New Jersey*	IN598
Colorado Radiochemistry	IN035	New York*	11398
Connecticut	PH-0132	North Carolina	18700
Delaware	IN035	North Dakota	R-035
Florida (Primary AB)*	E87775	Ohio	87775
Georgia	929	Oklahoma	D9508
Hawaii	IN035	Oregon*	IN200001
Idaho	IN00035/E87775	Pennsylvania*	68-00466
Illinois*	200001	Puerto Rico	IN00035
Illinois Microbiology	200001	Rhode Island	LAO00241
Indiana Chemistry	C-71-01	South Carolina	95005
Indiana Microbiology	M-76-07	South Dakota	IN00035
Iowa	098	Tennessee	TN02973
Kansas*	E-10233	Texas*	T104704187-14-7
Kentucky	90056	Texas/TCEQ	TX207
Louisiana*	LA150003	Utah*	IN00035
Maine	IN00035	Vermont	VT-8775
Maryland	209	Virginia*	00127
Massachusetts	M-IN035	Washington	C837
Michigan	9926	West Virginia	9927 C
Minnesota*	018-999-338	Wisconsin	999766900
Mississippi	IN035	Wyoming	IN035
Missouri	880		

*NELAP/TNI Recognized Accreditation Bodies

eurofins | Eaton Analytical

LABORATORY CASE NARRATIVE

Client: Turner Laboratories

Report #: 340867QC

All method QC was within acceptance limits, with the exception of:

Note: Dioxin analysis was performed by EEA, Monrovia, CA.

Method 515.3

The batch matrix spike does not meet method criteria. The matrix spike performed was not from your sample site. This is being communicated as required by the Arizona administrative code.

In the analysis, the 2,4-D recovery in the RLC (157%) was outside the acceptance limits of 24-138%.

Method 525.2

The batch matrix spike does not meet method criteria. The matrix spike performed was not from your sample site. This is being communicated as required by the Arizona administrative code.

Jim Van Horst ASM 06/22/2015

Authorized Signature Title Date

Page 1 of 1

eurofins | Eaton Analytical

110 South Hill Street
South Bend, IN 46617
Tel: (574) 233-4777
Fax: (574) 233-8207
1 800 332 4345

Laboratory Report

Client: Turner Laboratories

Attn: Dawn Weyer
2445 North Coyote Drive
Suite 104
Tucson, AZ 85745

Copies to: Terri Garcia, Mike McGovern

Report: 340867
Priority: Standard Written
Status: Final
PWS ID: Not Supplied
Lab ID#: AZ0432

Sample Information

EEA ID #	Client ID	Method	Collected Date / Time	Collected By:	Received Date / Time
3248390	15E0622-01	525.2	05/20/15 11:20	Client	05/22/15 09:30
3248391	15E0622-01	515.3	05/20/15 11:20	Client	05/22/15 09:30
3248392	15E0622-01	547	05/20/15 11:20	Client	05/22/15 09:30
3248393	15E0622-01	549.2	05/20/15 11:20	Client	05/22/15 09:30
3248394	15E0622-01	1613	05/20/15 11:20	Client	05/22/15 09:30
3248395	15E0622-01	531.2	05/20/15 11:20	Client	05/22/15 09:30
3248396	15E0622-01	548.1	05/20/15 11:20	Client	05/22/15 09:30

Report Summary

Note: See attached page for additional comments.

Detailed quantitative results are presented on the following pages. The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call James Van Fleit at (574) 233-4777.

Note: This report may not be reproduced, except in full, without written approval from EEA.

James Van Fleit ASM

Authorized Signature | Title | 06/22/2015 Date

Client Name: Turner Laboratories
Report #: 340867

Client Name: Turner Laboratories

Report #: 340867

Sampling Point: 15E0622-01

PWS ID: Not Supplied

Semi-volatile Organic Chemicals

Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed	EEA ID #	Data Qualifiers
2,4-D	515.3	0.07 *	0.0001	< 0.0001	mg/L	05/27/15 08:00	06/02/15 05:56	3248391	N4
Dalapon	515.3	0.2 *	0.0010	< 0.0010	mg/L	05/27/15 08:00	06/02/15 05:56	3248391	---
Dicamba	515.3	---	0.0001	< 0.0001	mg/L	05/27/15 08:00	06/02/15 05:56	3248391	---
Dinoseb	515.3	0.007 *	0.0002	< 0.0002	mg/L	05/27/15 08:00	06/02/15 05:56	3248391	---
Pentachlorophenol	515.3	0.001 *	0.00004	< 0.00004	mg/L	05/27/15 08:00	06/02/15 05:56	3248391	---
Picloram	515.3	0.5 *	0.0001	< 0.0001	mg/L	05/27/15 08:00	06/02/15 05:56	3248391	---
2,4,5-TP (Silvex)	515.3	0.05 *	0.0002	< 0.0002	mg/L	05/27/15 08:00	06/02/15 05:56	3248391	---
Alachlor	525.2	0.002 *	0.0002	< 0.0002	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Aldrin	525.2	---	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Atrazine	525.2	0.003 *	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Benzo(a)pyrene	525.2	0.0002 *	0.00002	< 0.00002	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
gamma-BHC (Lindane)	525.2	0.0002 *	0.00002	< 0.00002	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Butachlor	525.2	---	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Dieldrin	525.2	---	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Di(2-ethylhexyl)adipate	525.2	0.4 *	0.0006	< 0.0006	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Di(2-ethylhexyl)phthalate	525.2	0.006 *	0.0006	< 0.0006	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Endrin	525.2	0.002 *	0.00001	< 0.00001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Heptachlor	525.2	0.0004 *	0.00004	< 0.00004	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Heptachlor epoxide	525.2	0.0002 *	0.00002	< 0.00002	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Hexachlorobenzene	525.2	0.001 *	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Hexachlorocyclopentadiene	525.2	0.05 *	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Methoxychlor	525.2	0.04 *	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Metolachlor	525.2	---	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Metribuzin	525.2	---	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Propachlor	525.2	---	0.0001	< 0.0001	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Simazine	525.2	0.004 *	0.00007	< 0.00007	mg/L	05/27/15 09:43	05/28/15 08:14	3248390	---
Aldicarb	531.2	---	0.0005	< 0.0005	mg/L	06/12/15 10:00	06/15/15 14:32	3248395	---
Aldicarb sulfone	531.2	---	0.0008	< 0.0008	mg/L	06/12/15 10:00	06/15/15 14:32	3248395	---
Aldicarb sulfoxide	531.2	---	0.0005	< 0.0005	mg/L	06/12/15 10:00	06/15/15 14:32	3248395	---
Carbaryl	531.2	---	0.0005	< 0.0005	mg/L	06/12/15 10:00	06/15/15 14:32	3248395	---
Carbofuran	531.2	0.04 *	0.0009	< 0.0009	mg/L	06/12/15 10:00	06/15/15 14:32	3248395	---
3-Hydroxycarbofuran	531.2	---	0.0005	< 0.0005	mg/L	06/12/15 10:00	06/15/15 14:32	3248395	---
Methomyl	531.2	---	0.0005	< 0.0005	mg/L	06/12/15 10:00	06/15/15 14:32	3248395	---
1-Naphthol	531.2	---	0.0010	< 0.0010	mg/L	06/12/15 10:00	06/15/15 14:32	3248395	---
Oxamyl	531.2	0.2 *	0.0020	< 0.0020	mg/L	06/12/15 10:00	06/15/15 14:32	3248395	---
Glyphosate	547	0.7 *	0.0060	< 0.0060	mg/L	05/22/15 15:20	05/23/15 01:38	3248392	---
Endothall	548.1	0.1 *	0.0090	< 0.0090	mg/L	05/26/15 08:50	05/27/15 15:04	3248396	---
Diquat	549.2	0.02 *	0.0004	< 0.0004	mg/L	05/26/15 07:30	05/26/15 20:42	3248393	---

Reference Lab Tests

Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed	UL ID #	Data Qualifiers
Dioxin	1613	3 e-8 *	5.0 e-9	< 5.0 e-9	mg/L	06/03/15 12:00	06/09/15 03:40	3248394	---

Client Name: Turner Laboratories

Report #: 340867

† EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.

Reg Limit Type:	MCL	SMCL	AL
Symbol:	*	^	!

Client Name: Turner Laboratories

Report #: 340867

Lab Definitions

Continuing Calibration Check Standard (CCC) / Continuing Calibration Verification (CCV) / Initial Calibration Verification Standard (ICV) / Initial Performance Check (IPC) - is a standard containing one or more of the target analytes that is prepared from the same standards used to calibrate the instrument. This standard is used to verify the calibration curve at the beginning of each analytical sequence, and may also be analyzed throughout and at the end of the sequence. The concentration of continuing standards may be varied, when prescribed by the reference method, so that the range of the calibration curve is verified on a regular basis.

Internal Standards (IS) - are pure compounds with properties similar to the analytes of interest, which are added to field samples or extracts, calibration standards, and quality control standards at a known concentration. They are used to measure the relative responses of the analytes of interest and surrogates in the sample, calibration standard or quality control standard.

Laboratory Duplicate (LD) - is a field sample aliquot taken from the same sample container in the laboratory and analyzed separately using identical procedures. Analysis of laboratory duplicates provides a measure of the precision of the laboratory procedures.

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) - is an aliquot of reagent water to which known concentrations of the analytes of interest are added. The LFB is analyzed exactly the same as the field samples. LFBs are used to determine whether the method is in control.

Laboratory Method Blank (LMB) / Laboratory Reagent Blank (LRB) - is a sample of reagent water included in the sample batch analyzed in the same way as the associated field samples. The LMB is used to determine if method analytes or other background contamination have been introduced during the preparation or analytical procedure. The LMB is analyzed exactly the same as the field samples.

Laboratory Trip Blank (LTB) / Field Reagent Blank (FRB) - is a sample of laboratory reagent water placed in a sample container in the laboratory and treated as a field sample, including storage, preservation, and all analytical procedures. The FRB/LTB container follows the collection bottles to and from the collection site, but the FRB/LTB is not opened at any time during the trip. The FRB/LTB is primarily a travel blank used to verify that the samples were not contaminated during shipment.

Matrix Spike Duplicate Sample (MSD) / Laboratory Fortified Sample Matrix Duplicate (LFSMD) - is a sample aliquot taken from the same field sample source as the Matrix Spike Sample to which known quantities of the analytes of interest are added in the laboratory. The MSD is analyzed exactly the same as the field samples. Analysis of the MSD provides a measure of the precision of the laboratory procedures in a specific matrix.

Matrix Spike Sample (MS) / Laboratory Fortified Sample Matrix (LFSM) - is a sample aliquot taken from field sample source to which known quantities of the analytes of interest are added in the laboratory. The MS is analyzed exactly the same as the field samples. The purpose is to demonstrate recovery of the analytes from a sample matrix to determine if the specific matrix contributes bias to the analytical results.

Quality Control Standard (QCS) / Second Source Calibration Verification (SSCV) - is a solution containing known concentrations of the analytes of interest prepared from a source different from the source of the calibration standards. The solution is obtained from a second manufacturer or lot if the lot can be demonstrated by the manufacturer as prepared independently from other lots. The QCS sample is analyzed using the same procedures as field samples. The QCS is used as a check on the calibration standards used in the method on a routine basis.

Reporting Limit Check (RLC) / Initial Calibration Check Standard (ICCS) - is a procedural standard that is analyzed each day to evaluate instrument performance at or below the minimum reporting limit (MRL).

Surrogate Standard (SS) / Surrogate Analyte (SUR) - is a pure compound with properties similar to the analytes of interest, which is highly unlikely to be found in any field sample, that is added to the field samples, calibration standards, blanks and quality control standards before sample preparation. The SS is used to evaluate the efficiency of the sample preparation process.

Arizona Department Of Environmental Quality

Drinking Water Source Approval Form

Samples To Be Taken At Source Only

System ID#	System Name
05/20/15 Sample Date	11:20 (24 hr clock) Sample Time
ADEQ Project Number	Well ID Number
New System **YES** ____ **NO** ____ New POE **YES** ____ **NO** ____	Surface Water Intake ID Number
Owner/Contact Person Name	Owner/Contact Person Phone Number
Sample Type ☐ Compliance Monitoring	Sample Collection Point / ID ☐ Point of Entry # ____

This form is to be filled out completely, and all pages are to be submitted together. If more than one laboratory participated in the analyses, please attach a copy of the original laboratory report, signed by the performing laboratory, to the back of this form.

All Results Shall Be Reported In Milligrams Per Liter (mg/L) Unless Otherwise Specified.

Please note:

The Arsenic MCL is currently 0.05 mg/L. However, on Jan. 23, 2006, the Arsenic MCL will be 0.01 mg/L.

Please Mail This Completed Form To:

Arizona Department Of Environmental Quality
Technical Review Unit
Drinking Water Section (5415B-2)
1110 W Washington St,
Phoenix, AZ 85007

Inorganic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	0.01	0.01	Arsenic	1005			☐	☐
	2	2	Barium	1010			☐	☐
	0.005	0.005	Cadmium	1015			☐	☐
	0.1	0.1	Chromium	1020			☐	☐
	1.3*	0.050	Copper	1022			☐	☐
	4.0	4.0	Fluoride	1025			☐	☐
	0.015*	0.0025	Lead	1030			☐	☐
	0.002	0.002	Mercury	1035			☐	☐
	10	5	Nitrate (as N)	1040			☐	☐
	1	0.5	Nitrite (as N)	1041			☐	☐
	0.05	0.05	Selenium	1045			☐	☐
	0.006	0.006	Antimony	1074			☐	☐
	0.004	0.004	Beryllium	1075			☐	☐
	0.2	0.2	Cyanide	1024			☐	☐
	0.1	0.1	Nickel	1036			☐	☐
	0.002	0.002	Thallium	1085			☐	☐

* Action Level

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Physical Analysis

Analysis Method	Contaminant Name	Cont. Code	Analysis Run Date	Result
	Sulfate	1055		
	Sodium	1052		
	pH	1925		
	Alkalinity	1927		
	Hardness/Calcium	1914		
	Langlier Index	1910		
	Temperature (°C)	1996		
	Total Dissolved Solids-TDS	1930		

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Synthetic Organic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit	
515.3	0.07	0.0001	2,4-D	2105	06/02/2015	< 0.0001	☐	☐	N4
515.3	0.05	0.0002	2,4,5-TP (Silvex)	2110	06/02/2015	< 0.0002	☐	☐	
525.2	0.002	0.0002	Alachlor	2051	05/28/2015	< 0.0002	☐	☐	
	0.003	0.001	Toxaphene	2020			☐	☐	
525.2	0.003	0.0001	Atrazine	2050	05/28/2015	< 0.0001	☐	☐	
531.2	0.04	0.0009	Carbofuran	2046	06/15/2015	< 0.0009	☐	☐	
515.3	0.001	0.00004	Pentachlorophenol	2326	06/02/2015	< 0.00004	☐	☐	
	0.002	0.0002	Chlordane	2959			☐	☐	
	0.0002	0.00002	Dibromochloropropane (DBCP)	2931			☐	☐	
	0.00005	0.00001	Ethylene Dibromide (EDB)	2946			☐	☐	
525.2	0.0004	0.00004	Heptachlor	2065	05/28/2015	< 0.00004	☐	☐	
525.2	0.0002	0.00002	Heptachlor Epoxide	2067	05/28/2015	< 0.00002	☐	☐	
525.2	0.0002	0.00002	Lindane	2010	05/28/2015	< 0.00002	☐	☐	
525.2	0.04	0.0001	Methoxychlor	2015	05/28/2015	< 0.0001	☐	☐	
	0.0005	0.0001	PCB (Polychlorinated Biphenyls)	2383			☐	☐	
525.2	0.0002	0.00002	Benzo(a)Pyrene	2306	05/28/2015	< 0.00002	☐	☐	
515.3	0.2	0.001	Dalapon	2031	06/02/2015	< 0.001	☐	☐	
525.2	0.006	0.0006	Di(2-ethylhexyl)phthalate	2039	05/28/2015	< 0.0006	☐	☐	
525.2	0.4	0.0006	Di(2-ethylhexyl)adipate	2035	05/28/2015	< 0.0006	☐	☐	
515.3	0.007	0.0002	Dinoseb	2041	06/02/2015	< 0.0002	☐	☐	
1613	3 e-8	5.0 e-9	2,3,7,8-TCDD (Dioxin)	2063	06/09/2015	< 5.0 e-9	☐	☐	
549.2	0.02	0.0004	Diquat	2032	05/26/2015	< 0.0004	☐	☐	
548.1	0.1	0.009	Endothall	2033	05/27/2015	< 0.009	☐	☐	
525.2	0.002	0.00001	Endrin	2005	05/28/2015	< 0.00001	☐	☐	
547	0.7	0.006	Glyphosate	2034	05/23/2015	< 0.006	☐	☐	
525.2	0.001	0.0001	Hexachlorobenzene	2274	05/28/2015	< 0.0001	☐	☐	
525.2	0.05	0.0001	Hexachlorocyclopentadiene	2042	05/28/2015	< 0.0001	☐	☐	
531.2	0.2	0.002	Oxamyl	2036	06/15/2015	< 0.002	☐	☐	
515.3	0.5	0.0001	Picloram	2040	06/02/2015	< 0.0001	☐	☐	
525.2	0.004	0.00007	Simazine	2037	05/28/2015	< 0.00007	☐	☐	

* Aroclor results may be submitted in lieu of PCB

Laboratory Information

Specimen Number: 3248390

Lab ID Number: AZ0432 Name: EEA

Comments: Turner Laboratories sample 15E0622-01

Authorized Signature: Jami Van Nuis ASM

Aroclor (PCB Screening Test)

Analysis Method	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds Reporting Limit
	0.00008	Aroclor 1016	2388			☐
	0.02	Aroclor 1221	2390			☐
	0.0005	Aroclor 1232	2392			☐
	0.0003	Aroclor 1242	2394			☐
	0.0001	Aroclor 1248	2396			☐
	0.0001	Aroclor 1254	2398			☐
	0.0002	Aroclor 1260	2400			☐

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Volatile Organic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	0.007	0.0005	1,1-Dichloroethylene	2977			☐	☐
	0.2	0.0005	1,1,1-Trichloroethane	2981			☐	☐
	0.005	0.0005	1,1,2-Trichloroethane	2985			☐	☐
	0.005	0.0005	1,2-Dichloroethane	2980			☐	☐
	0.005	0.0005	1,2-Dichloropropane	2983			☐	☐
	0.005	0.0005	Benzene	2990			☐	☐
	0.005	0.0005	Carbon Tetrachloride	2982			☐	☐
	0.07	0.0005	cis-1,2-Dichloroethylene	2380			☐	☐
	0.7	0.0005	Ethylbenzene	2992			☐	☐
	0.1	0.0005	(mono)chlorobenzene	2989			☐	☐
	0.6	0.0005	o-Dichlorobenzene	2968			☐	☐
	0.075	0.0005	para-Dichlorobenzene	2969			☐	☐
	0.1	0.0005	Styrene	2996			☐	☐
	0.005	0.0005	Tetrachloroethylene	2987			☐	☐
	1	0.0005	Toluene	2991			☐	☐
	0.1	0.0005	trans-1,2-Dichloroethylene	2979			☐	☐
	0.005	0.0005	Trichloroethylene	2984			☐	☐
	0.002	0.0005	Vinyl Chloride	2976			☐	☐
	10	0.00050	Xylenes, total	2955			☐	☐
	0.07	0.0005	1,2,4-Trichlorobenzene	2378			☐	☐
	0.005	0.0005	Dichloromethane	2964			☐	☐

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Radiochemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	15 pCi/L		Adjusted Gross Alpha	4000			☐	
		3 pCi/L	Gross Alpha	4002				☐
	30 ug/L	1 ug/L	Combined Uranium	4006			☐	☐
			Uranium-234	4007				
			Uranium-235	4008				
			Uranium-238	4009				
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010			☐	☐
		1 pCi/L	Radium 226	4020				☐
		1 pCi/L	Radium 228	4030				
*	4 mrem/yea	4 pCi/L	Gross Beta	4100			☐	☐
*	20,000 pCi/l	1,000 pCi/L	Tritium	4102			☐	☐
*		10 pCi/L	Strontium-89	4172				☐
*	8 pCi/L	2 pCi/L	Strontium-90	4174			☐	☐
*		1 pCi/L	Iodine-131	4264				☐
*		10 pCi/L	Cesium-134	4270				☐

* Do not analyze for this contaminant unless notified by ADEQ

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Asbestos Analysis

Analysis Method	MCL	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL
	7 MFL	Asbestos	1094			☐

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

*****Microbiological Analysis*****

Analysis Method	MCL	Contaminant Name	Cont. Code	Test Start Date/Time	Analysis Run Date/Time	Result
	Present or More Coliform	Total Coliform	3100			

Only Report Fecal Result if Total Coliform Result is Positive

Analysis Method	MCL	Contaminant Name	Cont. Code	Test Start Date/Time	Analysis Run Date/Time	Result
	Present or More Coliform	Total Coliform	3014			

Laboratory Information

>>>To be filled out by laboratory personnel<<<

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

DWAR9: Revised 2004

Note: The results presented relate only to the samples provided for analysis.

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15E0622

268699

340867

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Underwriters Laboratories
110 S. Hill Street
South Bend, IN 46617
Phone :(800) 332-4345
Fax: (574) 233-8207
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15E0622-01 Drinking Water Sampled:05/20/2015 11:20			
Semivolatile Organic Compounds by E 525.2	06/03/2015 11:20	3248	396
Herbicides by E 515.3	06/03/2015 11:20		391
Glyphosate by E 547	06/03/2015 11:20		392
Diquat by E549	05/27/2015 11:20		393
Dioxin by 1613	05/27/2015 11:20		394
Carbamates by E 531.2	06/17/2015 11:20		395
Containers Supplied:		548	396

Carbamates by E 531.2
Carbofuran
Oxamyl

Client also sent in vials for 548. KD
549 is needed per Dawn Weyer.
5/22/15

DWAR 9 Form

WET 0.8°C

Released By	Date	Received By	Date
	5/21/15 1600	fedex	5/21/15 1600
Released By	Date	Received By	Date
		K Dupree	5-22-15 0930

Arizona Department of Environmental Quality

Drinking Water Source Approval Form

*** Samples To Be Taken At Source Only***

	Clear Creek Associates
System ID #	System Name
05/20/2015	11:20 (24 hr clock)
Sample Date	Sample Time
	55-
ADEQ Project Number	Well ID Number
New System YES___NO___	
New POE YES___NO___	Surface Water Intake ID Number
Melanie Lindsey	(520) 622-3222
Owner / Contact Person Name	Owner / Contact Person Phone Number

Sample Type
☐ Compliance Monitoring

Sample Collection Point/ID
☐ Point of Entry# _____

This form is to be filled out completely, and all pages are to be submitted together. If more than one laboratory particpated in the analyses, please attach a copy of the original laboratory report, signed by the performing laboratory, to the back of this form.

All Results Shall Be Reported In Milligrams Per Liter (mg/L) Unless Otherwise Specified.

Please note:
The Arsenic MCL is currently .05 mg/L However, on Jan. 23, 2006, the Arsenic MCL will be .01 mg/L.

Please mail completed form to:

Arizona Department of Environmental Quality
Water Quality Data Unit 5415B-2
1110 W Washington Street
Phoenix, Arizona 85007

INORGANIC CHEMICAL ANALYSIS

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
E200.8	0.01	0.01	Arsenic	1005	05/22/2015	0.00051	☐	☐
E200.7	2	2	Barium	1010	05/21/2015	<0.050	☐	☐
E200.7	0.005	0.005	Cadmium	1015	05/21/2015	<0.0020	☐	☐
E200.7	0.1	0.1	Chromium	1020	05/21/2015	<0.030	☐	☐
E200.7	1.3*	0.050	Copper	1022	05/21/2015	<0.020	☐	☐
E300	4.0	2.0	Fluoride	1025	05/21/2015	<0.50	☐	☐
E200.8	0.015*	0.0025	Lead	1030	05/22/2015	0.00089	☐	☐
E245.1	0.002	0.002	Mercury	1035	05/27/2015	<0.0010	☐	☐
E300	10	5	Nitrate (as N)	1040	05/21/2015	2.6	☐	☐
E300	1	0.5	Nitrite (as N)	1041	05/21/2015	<0.10	☐	☐
E200.8	0.05	0.05	Selenium	1045	05/22/2015	<0.0025	☐	☐
E200.8	0.006	0.006	Antimony	1074	05/22/2015	<0.00050	☐	☐
E200.7	0.004	0.004	Beryllium	1075	05/21/2015	<0.0020	☐	☐
E335.4	0.2	0.2	Cyanide (as free cyanide)	1024	05/26/2015	<0.10	☐	☐
E200.7	0.1	0.1	Nickel	1036	05/21/2015	<0.050	☐	☐
E200.8	0.002	0.002	Thallium	1085	05/22/2015	<0.00050	☐	☐

* Action Level

LABORATORY INFORMATION

Specimen Number: 15E0622-01(1)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

PHYSICAL ANALYSIS

Analysis Method	Contaminant Name	Cont. Code	Analysis Run Date	Result
E300	Sulfate	1055	05/21/2015	39
E200.7	Sodium	1052	05/21/2015	6.9
E150.1	pH	1925	05/20/2015	7.4
SM2320B	Alkalinity	1927	05/27/2015	230
Calculation	Hardness/Calcium	1918	05/21/2015	190
Calculation	Langelier Index	1997	06/15/2015	0.10
E150.1	Temperature (Celsius)	1996	05/20/2015	19
SM2540 C	Total Dissolved Solids-TDS	1930	05/22/2015	310

LABORATORY INFORMATION

Specimen Number: 15E0622-01(2)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

SYNTHETIC ORGANIC CHEMICAL ANALYSIS

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	0.07	0.0001	2,4-D	2105			☐	☐
	0.05	0.0002	2,4,5-TP (Silvex)	2110			☐	☐
	0.002	0.0002	Alachlor	2051			☐	☐
E505	0.003	0.001	Toxaphene	2020	06/02/2015	<0.000600	☐	☐
	0.003	0.0001	Atrazine	2050			☐	☐
	0.04	0.0009	Carbofuran	2046			☐	☐
	0.001	0.00004	Pentachlorophenol	2326			☐	☐
E505	0.002	0.0002	Chlordane	2959	06/02/2015	<0.000200	☐	☐
E504.1	0.0002	0.00002	Dibromochloropropane (DBCP)	2931	06/01/2015	<0.000020	☐	☐
E504.1	0.00005	0.00001	Ethylene Dibromide (EDB)	2946	06/01/2015	<0.000010	☐	☐
	0.0004	0.00004	Heptachlor	2065			☐	☐
	0.0002	0.00002	Heptachlor Epoxide	2067			☐	☐
	0.0002	0.00002	Lindane	2010			☐	☐
	0.04	0.0001	Methoxychlor	2015			☐	☐
	0.0005	0.0001	PCB:Polychlorinated Biphenyls	2383			☐	☐
	0.0002	0.00002	Benzo (a) Pyrene	2306			☐	☐
	0.2	0.001	Dalapon	2031			☐	☐
	0.006	0.0006	Di(2-ethylhexyl)phthalate	2039			☐	☐
	0.4	0.0006	Di(2-ethylhexyl)adipate	2035			☐	☐
	0.007	0.0002	Dinoseb	2041			☐	☐
	3 x 10(-8)	5 x 10(-9)	2,3,7,8-TCDD (Dioxin)	2063			☐	☐
	0.02	0.0004	Diquat	2032			☐	☐
	0.1	0.0009	Endothall	2033			☐	☐
	0.002	0.00001	Endrin	2005			☐	☐
	0.7	0.006	Glyphosate	2034			☐	☐
	0.001	0.0001	Hexachlorobenzene	2274			☐	☐
	0.05	0.0001	Hexachlorocyclopentadiene	2042			☐	☐
	0.2	0.002	Oxamyl	2036			☐	☐
	0.5	0.0001	Picloram	2040			☐	☐
	0.004	0.0007	Simazine	2037			☐	☐

* Aroclor results may be submitted in lieu of PCB

LABORATORY INFORMATION

Specimen Number: 15E0622-01(3)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

Aroclor (PCB Screening Test)

Analysis Method	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds Reporting Limit
E505	0.00008	Aroclor 1016	2388	06/02/2015	<0.0000800	☐
E505	0.02	Aroclor 1221	2390	06/02/2015	<0.0200	☐
E505	0.0005	Aroclor 1232	2392	06/02/2015	<0.000500	☐
E505	0.0003	Aroclor 1242	2394	06/02/2015	<0.000300	☐
E505	0.0001	Aroclor 1248	2396	06/02/2015	<0.000100	☐
E505	0.0001	Aroclor 1254	2398	06/02/2015	<0.000100	☐
E505	0.0002	Aroclor 1260	2400	06/02/2015	<0.0000800	☐

LABORATORY INFORMATION

Specimen Number: 15E0622-01(4)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

VOLATILE ORGANIC CHEMICAL ANALYSIS

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
EPA 524.2	0.007	0.0005	1,1-Dichloroethylene	2977	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.2	0.0005	1,1,1-Trichloroethane	2981	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	1,1,2-Trichloroethane	2985	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	1,2-Dichloroethane	2980	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	1,2-Dichloropropane	2983	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Benzene	2990	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Carbon Tetrachloride	2982	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.07	0.0005	cis-1,2-Dichloroethylene	2380	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.7	0.0005	Ethylbenzene	2992	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.1	0.0005	(mono)chlorobenzene	2989	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.6	0.0005	o-Dichlorobenzene	2968	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.075	0.0005	para-Dichlorobenzene	2969	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.1	0.0005	Styrene	2996	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Tetrachloroethylene	2987	05/22/2015	<0.00050	☐	☐
EPA 524.2	1	0.0005	Toluene	2991	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.1	0.0005	Trans-1,2-Dichloroethylene	2979	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Trichloroethylene	2984	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.002	0.0005	Vinyl Chloride	2976	05/22/2015	<0.00050	☐	☐
EPA 524.2	10	0.0015	Xylenes, total	2955	05/22/2015	<0.0015	☐	☐
EPA 524.2	0.07	0.0005	1,2,4-Trichlorobenzene	2378	05/22/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Dichloromethane	2964	05/22/2015	<0.00050	☐	☐

LABORATORY INFORMATION

Specimen Number: 15E0622-01(5)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

RADIOCHEMICAL ANALYSIS

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
		3 pCi/L	Gross Alpha	4000			☐	☐
	5 pCi/L	1 pCi/L	Combined Radium	4010			☐	☐
		1 pCi/L	Radium 226	4020			☐	☐
		1 pCi/L	Radium 228	4030			☐	☐
	4 mrem	3 pCi/L	Gross Beta	4100			☐	☐
	20,000 pCi/	1,000 pCi/L	Tritium	4102			☐	☐
	8 pCi/L***	2 pCi/L	Strontium-90	4174			☐	☐

LABORATORY INFORMATION

Specimen Number: _____

ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

ASBESTOS ANALYSIS

Analysis Method	MCL	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL
	7 MFL	Asbestos	1094			☐

LABORATORY INFORMATION

Specimen Number: _____

ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Microbiological Analysis

Analysis Method	MCL*	Contaminant Name	Cont. Code	Analysis Run Date	Result: "P" = Present "A" = Absent
Colitag Mod.	Present / 1 or more Coliform	Total Coliform	3000	05/21/2015	A

(Only Report Fecal/E.Coli Result if Total Coliform Result is Positive)

Analysis Method	MCL*	Contaminant Name	Cont. Code	Analysis Run Date	Result: "P" = Present "A" = Absent

***MCL: If system is ≤ 33,000, then MCL is 2 or more total coliform-positive.**
If system is >33,000, then no more than 5% of the samples may be total coliform-positive.

LABORATORY INFORMATION

Specimen Number: 15E0622-01(9)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

DWAR 9: Revised 2004

August 26, 2015

Melanie Lindsey
Clear Creek Associates
221 N. Court Ave., Suite 101
Tucson, AZ 85701

TEL (520) 622-3222
FAX (520) 622-4040

Work Order No.: 15G0785
Order Name: 287052

RE: Water Supply Study

Dear Melanie Lindsey,

Turner Laboratories, Inc. received 2 sample(s) on 07/23/2015 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Terri L. Garcia

Terri Garcia
Technical Director

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Date Received: 07/23/2015

Order: 287052

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
15G0785-01	55-224635	Ground Water	07/22/2015 1320
15G0785-02	Trip Blank	Trip Blank	07/22/2015 0000

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Date Received: 07/23/2015

Case Narrative

The asbestos analysis was performed by Fiberquant in Phoenix, AZ.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

Several synthetic organic compound analyses were performed by Eurofins Eaton Analytical in South Bend, IN.

C4	Confirmatory analysis was past holding time
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
N4	The Minimum Reporting Limit (MRL) verificataion check did not meet laboratory acceptance limits.
R6	LCS/LCSD RPD exceeded the method acceptance limit. Recovery met the acceptance criteria.
S4	Surrogate recovery was above laboratory and method acceptance limits. No target analytes were detected in the sample.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND	Not Detected at or above the PQL
PQL	Practical Quantitation Limit
DF	Dilution Factor

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Lab Sample ID: 15G0785-01

Client Sample ID: 55-224635
Collection Date/Time: 07/22/2015 1320
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Langelier Index-Calculation								
Langelier Index	0.20	-8.0		LI	1	07/24/2015 1131	08/19/2015 0955	DW
Hardness, Ca-Calculation								
Hardness, Calcium (As CaCO3)	120			mg/L	1	07/29/2015 1015	08/03/2015 1545	RAD
Coliform by Colitag-Colitag Mod.								
Total Coliform	Absent					07/23/2015 1040	07/24/2015 0845	CC
pH-E150.1								
pH (pH Units)	7.8	0.0	H5	-	1	07/23/2015 1035	07/23/2015 1050	MR
Temperature (°C)	20		H5	-	1	07/23/2015 1035	07/23/2015 1050	MR
ICP Total Metals-E200.7								
Barium	0.30	0.050		mg/L	1	07/29/2015 1015	08/03/2015 1546	RAD
Beryllium	ND	0.0020		mg/L	1	07/29/2015 1015	08/03/2015 1546	RAD
Cadmium	ND	0.0020		mg/L	1	07/29/2015 1015	08/03/2015 1546	RAD
Calcium	46	4.0		mg/L	1	07/29/2015 1015	08/03/2015 1545	RAD
Chromium	ND	0.030		mg/L	1	07/29/2015 1015	08/03/2015 1546	RAD
Copper	ND	0.020		mg/L	1	07/29/2015 1015	08/03/2015 1546	RAD
Iron	ND	0.30		mg/L	1	07/29/2015 1015	08/03/2015 1545	RAD
Magnesium	7.3	3.0		mg/L	1	07/29/2015 1015	08/03/2015 1545	RAD
Nickel	ND	0.050		mg/L	1	07/29/2015 1015	08/03/2015 1546	RAD
Sodium	16	5.0		mg/L	1	07/29/2015 1015	08/03/2015 1545	RAD
ICP/MS Total Metals-E200.8								
Antimony	ND	0.00050		mg/L	1	07/27/2015 1100	07/29/2015 1326	RAD
Arsenic	0.0019	0.00050		mg/L	1	07/27/2015 1100	07/29/2015 1326	RAD
Lead	ND	0.00050		mg/L	1	07/27/2015 1100	07/29/2015 1326	RAD
Selenium	ND	0.0025		mg/L	1	07/27/2015 1100	07/29/2015 1326	RAD
Thallium	ND	0.00050		mg/L	1	07/27/2015 1100	07/29/2015 1326	RAD
CVAA Total Mercury-E245.1								
Mercury	ND	0.0010		mg/L	1	07/27/2015 1010	07/27/2015 1546	RAD
Anions by Ion Chromatography-E300								
Chloride	7.5	1.0		mg/L	1	07/23/2015 1130	07/23/2015 1158	MR
Fluoride	ND	0.50		mg/L	1	07/23/2015 1130	07/23/2015 1158	MR
Nitrogen, Nitrate (As N)	1.2	0.50		mg/L	1	07/23/2015 1130	07/23/2015 1158	MR
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	07/23/2015 1130	07/23/2015 1158	MR
Sulfate	6.2	5.0		mg/L	1	07/23/2015 1130	07/23/2015 1158	MR

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Lab Sample ID: 15G0785-01

Client Sample ID: 55-224635
Collection Date/Time: 07/22/2015 1320
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Cyanide-E335.4								
Cyanide	ND	0.10		mg/L	1	08/03/2015 0830	08/04/2015 1535	CC
EDB and DBCP-E504.1								
1,2-Dibromo-3-chloropropane	ND	0.000020	C4	mg/L	1	07/24/2015 0855	07/25/2015 0207	MD
1,2-Dibromoethane	ND	0.000010	C4	mg/L	1	07/24/2015 0855	07/25/2015 0207	MD
Surr: Tetrachloro-m-xylene	*121*	*86.5-128.7*	*C4*	*%REC*	*1*	*07/24/2015 0855*	*07/25/2015 207*	*MD*
PCBs by 505-E505								
Aroclor 1016	ND	0.0000800		mg/L	1	08/05/2015 0846	08/05/2015 1841	MD
Aroclor 1221	ND	0.0200		mg/L	1	08/05/2015 0846	08/05/2015 1841	MD
Aroclor 1232	ND	0.000500		mg/L	1	08/05/2015 0846	08/05/2015 1841	MD
Aroclor 1242	ND	0.000300		mg/L	1	08/05/2015 0846	08/05/2015 1841	MD
Aroclor 1248	ND	0.000100		mg/L	1	08/05/2015 0846	08/05/2015 1841	MD
Aroclor 1254	ND	0.000100		mg/L	1	08/05/2015 0846	08/05/2015 1841	MD
Aroclor 1260	ND	0.0000800		mg/L	1	08/05/2015 0846	08/05/2015 1841	MD
Chlordane	ND	0.000200		mg/L	1	08/05/2015 0846	08/05/2015 1841	MD
Toxaphene	ND	0.000600		mg/L	1	08/05/2015 0846	08/05/2015 1841	MD
Surr: Decachlorobiphenyl	*112*	*70-130*		*%REC*	*1*	*08/05/2015 0846*	*08/05/2015 1841*	*MD*
Volatile Organic Compounds by GC/MS-EPA 524.2								
1,1,1,2-Tetrachloroethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,1,1-Trichloroethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,1,2,2-Tetrachloroethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,1,2-Trichloroethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,1-Dichloroethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,1-Dichloroethene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,1-Dichloropropene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,2,3-Trichlorobenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,2,3-Trichloropropane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,2,4-Trichlorobenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,2,4-Trimethylbenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,2-Dichlorobenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,2-Dichloroethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,2-Dichloropropane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,3,5-Trimethylbenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,3-Dichlorobenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,3-Dichloropropane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
1,4-Dichlorobenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
2,2-Dichloropropane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Lab Sample ID: 15G0785-01

Client Sample ID: 55-224635
Collection Date/Time: 07/22/2015 1320
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
2-Chlorotoluene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
4-Chlorotoluene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
4-Isopropyltoluene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Benzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Bromobenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Bromochloromethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Bromodichloromethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Bromoform	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Bromomethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Carbon tetrachloride	ND	0.00050	N4	mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Chlorobenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Chloroethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Chloroform	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Chloromethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
cis-1,2-Dichloroethene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
cis-1,3-Dichloropropene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Dibromochloromethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Dibromomethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Dichlorodifluoromethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Ethylbenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Hexachlorobutadiene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Isopropylbenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Methylene chloride	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Naphthalene	ND	0.00050	N4	mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
n-Butylbenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
n-Propylbenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
sec-Butylbenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Styrene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
tert-Butylbenzene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Tetrachloroethene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Toluene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
trans-1,2-Dichloroethene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
trans-1,3-Dichloropropene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Trichloroethene	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Trichlorofluoromethane	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
TTHMs	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Vinyl chloride	ND	0.00050		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Xylenes, Total	ND	0.0015		mg/L	1	08/03/2015 1045	08/03/2015 1608	KP
Surr: 1,2-Dichlorobenzene-d4	*90*	*70-130*		*%REC*	*1*	*08/03/2015 1045*	*08/03/2015 1608*	*KP*
Surr: 4-Bromofluorobenzene	*95*	*70-130*		*%REC*	*1*	*08/03/2015 1045*	*08/03/2015 1608*	*KP*

Alkalinity-SM2320B

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Lab Sample ID: 15G0785-01

Client Sample ID: 55-224635
Collection Date/Time: 07/22/2015 1320
Matrix: Ground Water
Order Name: 287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Alkalinity, Bicarbonate (As CaCO3)	180	2.0		mg/L	1	07/29/2015 1530	07/29/2015 1620	CC
Alkalinity, Carbonate (As CaCO3)	ND	2.0		mg/L	1	07/29/2015 1530	07/29/2015 1620	CC
Alkalinity, Hydroxide (As CaCO3)	ND	2.0		mg/L	1	07/29/2015 1530	07/29/2015 1620	CC
Alkalinity, Total (As CaCO3)	180	2.0		mg/L	1	07/29/2015 1530	07/29/2015 1620	CC
Total Dissolved Solids (Residue, Filterable)-SM2540 C								
Total Dissolved Solids (Residue, Filterable)	210	20		mg/L	1	07/23/2015 0850	07/24/2015 1340	CC

Client:	Clear Creek Associates	**Client Sample ID:**	Trip Blank
Project:	Water Supply Study	**Collection Date/Time:**	07/22/2015 0000
Work Order:	15G0785	**Matrix:**	Trip Blank
Lab Sample ID:	15G0785-02	**Order Name:**	287052

Analyses	Result	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
EDB and DBCP-E504.1								
1,2-Dibromo-3-chloropropane	ND	0.000020	C4	mg/L	1	07/24/2015 0855	07/25/2015 0242	MD
1,2-Dibromoethane	ND	0.000010	C4	mg/L	1	07/24/2015 0855	07/25/2015 0242	MD
Surr: Tetrachloro-m-xylene	*131*	*86.5-128.7*	*C4, S4*	*%REC*	*1*	*07/24/2015 0855*	*07/25/2015 242*	*MD*

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Date Received: 07/23/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507289 - E245.1										
Blank (1507289-BLK1)				Prepared & Analyzed: 07/27/2015						
Mercury	ND	0.0010	mg/L							
LCS (1507289-BS1)				Prepared & Analyzed: 07/27/2015						
Mercury	0.0048	0.0010	mg/L	0.005000		96	85-115			
LCS Dup (1507289-BSD1)				Prepared & Analyzed: 07/27/2015						
Mercury	0.0046	0.0010	mg/L	0.005000		93	85-115	4	20	
Matrix Spike (1507289-MS1)		**Source: 15G0739-01**		Prepared & Analyzed: 07/27/2015						
Mercury	0.0050	0.0010	mg/L	0.005000	ND	100	85-115			
Matrix Spike (1507289-MS2)		**Source: 15G0775-01**		Prepared & Analyzed: 07/27/2015						
Mercury	0.0050	0.0010	mg/L	0.005000	0.000016	99	85-115			
Matrix Spike Dup (1507289-MSD1)		**Source: 15G0739-01**		Prepared & Analyzed: 07/27/2015						
Mercury	0.0049	0.0010	mg/L	0.005000	ND	98	85-115	2	20	
Matrix Spike Dup (1507289-MSD2)		**Source: 15G0775-01**		Prepared & Analyzed: 07/27/2015						
Mercury	0.0050	0.0010	mg/L	0.005000	0.000016	99	85-115	0.06	20	
Batch 1507290 - E200.8										
Blank (1507290-BLK1)				Prepared: 07/27/2015 Analyzed: 07/29/2015						
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
LCS (1507290-BS1)				Prepared: 07/27/2015 Analyzed: 07/29/2015						
Antimony	0.050	0.00050	mg/L	0.05000		100	85-115			
Arsenic	0.051	0.00050	mg/L	0.05000		103	85-115			
Lead	0.048	0.00050	mg/L	0.05000		97	85-115			
Selenium	0.26	0.0025	mg/L	0.2500		104	85-115			
Thallium	0.048	0.00050	mg/L	0.05000		96	85-115			
LCS Dup (1507290-BSD1)				Prepared: 07/27/2015 Analyzed: 07/29/2015						
Antimony	0.049	0.00050	mg/L	0.05000		98	85-115	2	20	
Arsenic	0.051	0.00050	mg/L	0.05000		101	85-115	1	20	
Lead	0.048	0.00050	mg/L	0.05000		96	85-115	0.7	20	
Selenium	0.26	0.0025	mg/L	0.2500		103	85-115	0.7	20	
Thallium	0.046	0.00050	mg/L	0.05000		93	85-115	3	20	
Matrix Spike (1507290-MS1)		**Source: 15G0806-02**		Prepared: 07/27/2015 Analyzed: 07/29/2015						
Antimony	0.046	0.00050	mg/L	0.05000	0.000018	91	70-130			
Arsenic	0.060	0.00050	mg/L	0.05000	0.0094	102	70-130			
Lead	0.045	0.00050	mg/L	0.05000	0.00061	90	70-130			
Selenium	0.28	0.0025	mg/L	0.2500	0.00073	111	70-130			
Thallium	0.044	0.00050	mg/L	0.05000	ND	89	70-130			

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Date Received: 07/23/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507290 - E200.8										
Matrix Spike (1507290-MS2)		**Source: 15G0811-04**		Prepared: 07/27/2015 Analyzed: 07/29/2015						
Antimony	0.046	0.00050	mg/L	0.05000	0.000026	92	70-130			
Arsenic	0.050	0.00050	mg/L	0.05000	0.0018	97	70-130			
Lead	0.046	0.00050	mg/L	0.05000	0.00020	91	70-130			
Selenium	0.24	0.0025	mg/L	0.2500	0.0010	94	70-130			
Thallium	0.044	0.00050	mg/L	0.05000	ND	87	70-130			
Batch 1508011 - E200.7										
Blank (1508011-BLK1)				Prepared: 07/29/2015 Analyzed: 08/03/2015						
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0020	mg/L							
Cadmium	ND	0.0020	mg/L							
Calcium	ND	4.0	mg/L							
Chromium	ND	0.030	mg/L							
Copper	ND	0.020	mg/L							
Iron	ND	0.30	mg/L							
Magnesium	ND	3.0	mg/L							
Nickel	ND	0.050	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1508011-BS1)				Prepared: 07/29/2015 Analyzed: 08/03/2015						
Barium	2.1	0.050	mg/L	2.000		106	85-115			
Beryllium	0.049	0.0020	mg/L	0.05000		98	85-115			
Cadmium	0.049	0.0020	mg/L	0.05000		99	85-115			
Calcium	10	4.0	mg/L	10.00		102	85-115			
Chromium	0.20	0.030	mg/L	0.2000		101	85-115			
Copper	0.25	0.020	mg/L	0.2500		102	85-115			
Iron	0.96	0.30	mg/L	1.000		96	85-115			
Magnesium	10	3.0	mg/L	10.00		101	85-115			
Nickel	0.48	0.050	mg/L	0.5000		97	85-115			
Sodium	11	5.0	mg/L	10.00		106	85-115			
LCS Dup (1508011-BSD1)				Prepared: 07/29/2015 Analyzed: 08/03/2015						
Barium	2.1	0.050	mg/L	2.000		106	85-115	0.03	20	
Beryllium	0.049	0.0020	mg/L	0.05000		99	85-115	0.09	20	
Cadmium	0.050	0.0020	mg/L	0.05000		99	85-115	0.5	20	
Calcium	10	4.0	mg/L	10.00		101	85-115	0.6	20	
Chromium	0.20	0.030	mg/L	0.2000		101	85-115	0.5	20	
Copper	0.25	0.020	mg/L	0.2500		101	85-115	0.7	20	
Iron	0.97	0.30	mg/L	1.000		97	85-115	0.7	20	
Magnesium	10	3.0	mg/L	10.00		101	85-115	0.1	20	
Nickel	0.48	0.050	mg/L	0.5000		97	85-115	0.04	20	
Sodium	11	5.0	mg/L	10.00		107	85-115	1	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Date Received: 07/23/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508011 - E200.7										
Matrix Spike (1508011-MS1)	**Source: 15G0739-01**			Prepared: 07/29/2015 Analyzed: 08/03/2015						
Barium	2.1	0.050	mg/L	2.000	0.0053	103	70-130			
Beryllium	0.049	0.0020	mg/L	0.05000	ND	99	70-130			
Cadmium	0.049	0.0020	mg/L	0.05000	ND	97	70-130			
Calcium	55	4.0	mg/L	10.00	45	94	70-130			
Chromium	0.20	0.030	mg/L	0.2000	ND	100	70-130			
Copper	0.25	0.020	mg/L	0.2500	ND	98	70-130			
Iron	1.3	0.30	mg/L	1.000	0.29	96	70-130			
Magnesium	24	3.0	mg/L	10.00	14	94	70-130			
Nickel	0.48	0.050	mg/L	0.5000	ND	95	70-130			
Sodium	32	5.0	mg/L	10.00	22	95	70-130			

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Date Received: 07/23/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507256 - E150.1										
Duplicate (1507256-DUP1)		**Source: 15G0785-01**		Prepared & Analyzed: 07/23/2015						
pH (pH Units)	7.9	0.0	-		7.8			1	200	H5
Temperature (°C)	21		-		20			3	200	H5
Batch 1507266 - SM2540 C										
Duplicate (1507266-DUP1)		**Source: 15G0730-01**		Prepared: 07/23/2015 Analyzed: 07/24/2015						
Total Dissolved Solids (Residue, Filterable)	380	20	mg/L		390			0.8	5	
Batch 1507320 - SM2320B										
LCS (1507320-BS1)				Prepared & Analyzed: 07/29/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		99	90-110			
LCS Dup (1507320-BSD1)				Prepared & Analyzed: 07/29/2015						
Alkalinity, Total (As CaCO3)	250	2.0	mg/L	250.0		98	90-110	0.8	10	
Matrix Spike (1507320-MS1)		**Source: 15G0775-01**		Prepared & Analyzed: 07/29/2015						
Alkalinity, Total (As CaCO3)	340	2.0	mg/L	250.0	98	97	85-115			
Matrix Spike Dup (1507320-MSD1)		**Source: 15G0775-01**		Prepared & Analyzed: 07/29/2015						
Alkalinity, Total (As CaCO3)	340	2.0	mg/L	250.0	98	98	85-115	0.6	10	
Batch 1508009 - E335.4										
Blank (1508009-BLK1)				Prepared: 08/03/2015 Analyzed: 08/04/2015						
Cyanide	ND	0.10	mg/L							
LCS (1508009-BS1)				Prepared: 08/03/2015 Analyzed: 08/04/2015						
Cyanide	2.0	0.10	mg/L	2.000		99	90-110			
LCS Dup (1508009-BSD1)				Prepared: 08/03/2015 Analyzed: 08/04/2015						
Cyanide	2.0	0.10	mg/L	2.000		99	90-110	0.7	20	
Matrix Spike (1508009-MS1)		**Source: 15G0833-01**		Prepared: 08/03/2015 Analyzed: 08/04/2015						
Cyanide	2.0	0.10	mg/L	2.000	ND	101	90-110			
Matrix Spike Dup (1508009-MSD1)		**Source: 15G0833-01**		Prepared: 08/03/2015 Analyzed: 08/04/2015						
Cyanide	1.9	0.10	mg/L	2.000	ND	95	90-110	6	20	

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Date Received: 07/23/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507260 - E504.1										
Blank (1507260-BLK1)				Prepared & Analyzed: 07/24/2015						
1,2-Dibromo-3-chloropropane	ND	0.000020	mg/L							
1,2-Dibromoethane	ND	0.000010	mg/L							
Surrogate: Tetrachloro-m-xylene	*0.000232*		*mg/L*	*0.0002000*		*116*	*86.5-128.7*			
LCS (1507260-BS1)				Prepared & Analyzed: 07/24/2015						
1,2-Dibromo-3-chloropropane	0.00022	0.000020	mg/L	0.0002500		87	70-130			
1,2-Dibromoethane	0.00023	0.000010	mg/L	0.0002500		94	70-130			
Surrogate: Tetrachloro-m-xylene	*0.000232*		*mg/L*	*0.0002000*		*116*	*92.9-132.1*			
LCS (1507260-BS2)				Prepared & Analyzed: 07/24/2015						
1,2-Dibromo-3-chloropropane	0.00024	0.000020	mg/L	0.0002500		94	70-130			
1,2-Dibromoethane	0.00025	0.000010	mg/L	0.0002500		101	70-130			
Surrogate: Tetrachloro-m-xylene	*0.000255*		*mg/L*	*0.0002000*		*128*	*92.9-132.1*			
LCS Dup (1507260-BSD1)				Prepared & Analyzed: 07/24/2015						
1,2-Dibromo-3-chloropropane	0.00024	0.000020	mg/L	0.0002500		95	70-130	8	30	
1,2-Dibromoethane	0.00025	0.000010	mg/L	0.0002500		102	70-130	8	30	
Surrogate: Tetrachloro-m-xylene	*0.000255*		*mg/L*	*0.0002000*		*128*	*92.9-132.1*			
Matrix Spike (1507260-MS1)		**Source: 15G0737-01**		Prepared & Analyzed: 07/24/2015						
1,2-Dibromo-3-chloropropane	0.00022	0.000020	mg/L	0.0002500	ND	89	70-130			
1,2-Dibromoethane	0.00024	0.000010	mg/L	0.0002500	ND	94	70-130			
Surrogate: Tetrachloro-m-xylene	*0.000227*		*mg/L*	*0.0002000*		*113*	*86.5-128.7*			
Matrix Spike (1507260-MS2)		**Source: 15G0775-01**		Prepared: 07/24/2015 Analyzed: 07/25/2015						
1,2-Dibromo-3-chloropropane	0.00023	0.000020	mg/L	0.0002500	ND	92	70-130			
1,2-Dibromoethane	0.00025	0.000010	mg/L	0.0002500	ND	99	70-130			
Surrogate: Tetrachloro-m-xylene	*0.000252*		*mg/L*	*0.0002000*		*126*	*86.5-128.7*			
Batch 1508034 - E505										
Blank (1508034-BLK1)				Prepared & Analyzed: 08/05/2015						
Aroclor 1016	ND	0.0000800	mg/L							
Aroclor 1221	ND	0.0200	mg/L							
Aroclor 1232	ND	0.000500	mg/L							
Aroclor 1242	ND	0.000300	mg/L							
Aroclor 1248	ND	0.000100	mg/L							
Aroclor 1254	ND	0.000100	mg/L							
Aroclor 1260	ND	0.0000800	mg/L							
Chlordane	ND	0.000200	mg/L							
Toxaphene	ND	0.000600	mg/L							
Surrogate: Decachlorobiphenyl	*0.00114*		*mg/L*	*0.001000*		*114*	*70-130*			

Client: Clear Creek Associates
Project: Water Supply Study
Work Order: 15G0785
Date Received: 07/23/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508034 - E505										
LCS (1508034-BS1)				Prepared & Analyzed: 08/05/2015						
Aroclor 1016	ND	0.0000800	mg/L				70-130			
Aroclor 1221	ND	0.0200	mg/L				70-130			
Aroclor 1232	ND	0.000500	mg/L				70-130			
Aroclor 1242	ND	0.000300	mg/L				70-130			
Aroclor 1248	ND	0.000100	mg/L				70-130			
Aroclor 1254	ND	0.000100	mg/L				70-130			
Aroclor 1260	ND	0.0000800	mg/L				70-130			
Chlordane	ND	0.000200	mg/L				70-130			
Toxaphene	0.0014	0.000600	mg/L	0.001500		91	70-130			
Surrogate: Decachlorobiphenyl	*0.000797*		*mg/L*	*0.001000*		*80*	*70-130*			
LCS Dup (1508034-BSD1)				Prepared & Analyzed: 08/05/2015						
Aroclor 1016	ND	0.0000800	mg/L				70-130		30	
Aroclor 1221	ND	0.0200	mg/L				70-130		30	
Aroclor 1232	ND	0.000500	mg/L				70-130		30	
Aroclor 1242	ND	0.000300	mg/L				70-130		30	
Aroclor 1248	ND	0.000100	mg/L				70-130		30	
Aroclor 1254	ND	0.000100	mg/L				70-130		30	
Aroclor 1260	ND	0.0000800	mg/L				70-130		30	
Chlordane	ND	0.000200	mg/L				70-130		30	
Toxaphene	0.0016	0.000600	mg/L	0.001500		103	70-130	12	30	
Surrogate: Decachlorobiphenyl	*0.00107*		*mg/L*	*0.001000*		*107*	*70-130*			
Matrix Spike (1508034-MS1)		**Source: 15H0305-01**		Prepared & Analyzed: 08/05/2015						
Aroclor 1016	ND	0.0000800	mg/L		ND		65-135			
Aroclor 1221	ND	0.0200	mg/L		ND		65-135			
Aroclor 1232	ND	0.000500	mg/L		ND		65-135			
Aroclor 1242	ND	0.000300	mg/L		ND		65-135			
Aroclor 1248	ND	0.000100	mg/L		ND		65-135			
Aroclor 1254	ND	0.000100	mg/L		ND		65-135			
Aroclor 1260	ND	0.0000800	mg/L		ND		65-135			
Chlordane	ND	0.000200	mg/L		ND		65-135			
Toxaphene	0.0016	0.000600	mg/L	0.001500	ND	107	65-135			
Surrogate: Decachlorobiphenyl	*0.00123*		*mg/L*	*0.001000*		*123*	*70-130*			
Batch 1508072 - E504.1										
Blank (1508072-BLK1)				Prepared & Analyzed: 08/07/2015						
1,2-Dibromo-3-chloropropane	ND	0.000020	mg/L							
1,2-Dibromoethane	ND	0.000010	mg/L							
Surrogate: Tetrachloro-m-xylene	*0.000230*		*mg/L*	*0.0002000*		*115*	*86.5-128.7*			
LCS (1508072-BS1)				Prepared & Analyzed: 08/07/2015						
1,2-Dibromo-3-chloropropane	0.00021	0.000020	mg/L	0.0002500		85	70-130			
1,2-Dibromoethane	0.00026	0.000010	mg/L	0.0002500		103	70-130			
Surrogate: Tetrachloro-m-xylene	*0.000222*		*mg/L*	*0.0002000*		*111*	*92.9-132.1*			

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508072 - E504.1										
LCS Dup (1508072-BSD1)				Prepared & Analyzed: 08/07/2015						
1,2-Dibromo-3-chloropropane	0.00022	0.000020	mg/L	0.0002500		86	70-130	1	30	
1,2-Dibromoethane	0.00026	0.000010	mg/L	0.0002500		104	70-130	1	30	
Surrogate: Tetrachloro-m-xylene	*0.000226*		*mg/L*	*0.0002000*		*113*	*92.9-132.1*			
Matrix Spike (1508072-MS1)		**Source: 15H0305-01**		Prepared & Analyzed: 08/07/2015						
1,2-Dibromo-3-chloropropane	0.00021	0.000020	mg/L	0.0002500	ND	84	70-130			
1,2-Dibromoethane	0.00027	0.000010	mg/L	0.0002500	ND	106	70-130			
Surrogate: Tetrachloro-m-xylene	*0.000224*		*mg/L*	*0.0002000*		*112*	*86.5-128.7*			

Client: Clear Creek Associates
Project: Water Supply Study
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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508006 - EPA 524.2										

Client: Clear Creek Associates
Project: Water Supply Study
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Date Received: 07/23/2015

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508006 - EPA 524.2										
Blank (1508006-BLK1)				Prepared & Analyzed: 08/03/2015						
1,1,1,2-Tetrachloroethane	ND	0.00050	mg/L							
1,1,1-Trichloroethane	ND	0.00050	mg/L							
1,1,2,2-Tetrachloroethane	ND	0.00050	mg/L							
1,1,2-Trichloroethane	ND	0.00050	mg/L							
1,1-Dichloroethane	ND	0.00050	mg/L							
1,1-Dichloroethene	ND	0.00050	mg/L							
1,1-Dichloropropene	ND	0.00050	mg/L							
1,2,3-Trichlorobenzene	ND	0.00050	mg/L							
1,2,3-Trichloropropane	ND	0.00050	mg/L							
1,2,4-Trichlorobenzene	ND	0.00050	mg/L							
1,2,4-Trimethylbenzene	ND	0.00050	mg/L							
1,2-Dichlorobenzene	ND	0.00050	mg/L							
1,2-Dichloroethane	ND	0.00050	mg/L							
1,2-Dichloropropane	ND	0.00050	mg/L							
1,3,5-Trimethylbenzene	ND	0.00050	mg/L							
1,3-Dichlorobenzene	ND	0.00050	mg/L							
1,3-Dichloropropane	ND	0.00050	mg/L							
1,4-Dichlorobenzene	ND	0.00050	mg/L							
2,2-Dichloropropane	ND	0.00050	mg/L							
2-Chlorotoluene	ND	0.00050	mg/L							
4-Chlorotoluene	ND	0.00050	mg/L							
4-Isopropyltoluene	ND	0.00050	mg/L							
Benzene	ND	0.00050	mg/L							
Bromobenzene	ND	0.00050	mg/L							
Bromochloromethane	ND	0.00050	mg/L							
Bromodichloromethane	ND	0.00050	mg/L							
Bromoform	ND	0.00050	mg/L							
Bromomethane	ND	0.00050	mg/L							
Carbon tetrachloride	ND	0.00050	mg/L							
Chlorobenzene	ND	0.00050	mg/L							
Chloroethane	ND	0.00050	mg/L							
Chloroform	ND	0.00050	mg/L							
Chloromethane	ND	0.00050	mg/L							
cis-1,2-Dichloroethene	ND	0.00050	mg/L							
cis-1,3-Dichloropropene	ND	0.00050	mg/L							
Dibromochloromethane	ND	0.00050	mg/L							
Dibromomethane	ND	0.00050	mg/L							
Dichlorodifluoromethane	ND	0.00050	mg/L							
Ethylbenzene	ND	0.00050	mg/L							
Hexachlorobutadiene	ND	0.00050	mg/L							
Isopropylbenzene	ND	0.00050	mg/L							
Methylene chloride	ND	0.00050	mg/L							
Naphthalene	ND	0.00050	mg/L							
n-Butylbenzene	ND	0.00050	mg/L							
n-Propylbenzene	ND	0.00050	mg/L							
sec-Butylbenzene	ND	0.00050	mg/L							
Styrene	ND	0.00050	mg/L							
tert-Butylbenzene	ND	0.00050	mg/L							

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508006 - EPA 524.2										
Blank (1508006-BLK1)				Prepared & Analyzed: 08/03/2015						
Tetrachloroethene	ND	0.00050	mg/L							
Toluene	ND	0.00050	mg/L							
trans-1,2-Dichloroethene	ND	0.00050	mg/L							
trans-1,3-Dichloropropene	ND	0.00050	mg/L							
Trichloroethene	ND	0.00050	mg/L							
Trichlorofluoromethane	ND	0.00050	mg/L							
TTHMs	ND	0.00050	mg/L							
Vinyl chloride	ND	0.00050	mg/L							
Xylenes, Total	ND	0.0015	mg/L							
Surrogate: 1,2-Dichlorobenzene-d4	*1.0*		*ug/L*	*1.000*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*1.1*		*ug/L*	*1.000*		*110*	*70-130*			

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508006 - EPA 524.2										
LCS (1508006-BS1)				Prepared & Analyzed: 08/03/2015						
1,1,1,2-Tetrachloroethane	0.0048	0.00050	mg/L	0.005000		95	70-130			
1,1,1-Trichloroethane	0.0051	0.00050	mg/L	0.005000		103	70-130			
1,1,2,2-Tetrachloroethane	0.0042	0.00050	mg/L	0.005000		84	70-130			
1,1,2-Trichloroethane	0.0043	0.00050	mg/L	0.005000		86	70-130			
1,1-Dichloroethane	0.0047	0.00050	mg/L	0.005000		93	70-130			
1,1-Dichloroethene	0.0049	0.00050	mg/L	0.005000		99	70-130			
1,1-Dichloropropene	0.0050	0.00050	mg/L	0.005000		100	70-130			
1,2,3-Trichlorobenzene	0.0047	0.00050	mg/L	0.005000		93	70-130			
1,2,3-Trichloropropane	0.0048	0.00050	mg/L	0.005000		95	70-130			
1,2,4-Trichlorobenzene	0.0049	0.00050	mg/L	0.005000		98	70-130			
1,2,4-Trimethylbenzene	0.0054	0.00050	mg/L	0.005000		107	70-130			
1,2-Dichlorobenzene	0.0047	0.00050	mg/L	0.005000		94	70-130			
1,2-Dichloroethane	0.0053	0.00050	mg/L	0.005000		105	70-130			
1,2-Dichloropropane	0.0044	0.00050	mg/L	0.005000		88	70-130			
1,3,5-Trimethylbenzene	0.0055	0.00050	mg/L	0.005000		109	70-130			
1,3-Dichlorobenzene	0.0048	0.00050	mg/L	0.005000		97	70-130			
1,3-Dichloropropane	0.0046	0.00050	mg/L	0.005000		92	70-130			
1,4-Dichlorobenzene	0.0050	0.00050	mg/L	0.005000		99	70-130			
2,2-Dichloropropane	0.0044	0.00050	mg/L	0.005000		88	70-130			
2-Chlorotoluene	0.0053	0.00050	mg/L	0.005000		106	70-130			
4-Chlorotoluene	0.0054	0.00050	mg/L	0.005000		108	70-130			
4-Isopropyltoluene	0.0054	0.00050	mg/L	0.005000		109	70-130			
Benzene	0.0048	0.00050	mg/L	0.005000		96	70-130			
Bromobenzene	0.0047	0.00050	mg/L	0.005000		94	70-130			
Bromochloromethane	0.0046	0.00050	mg/L	0.005000		92	70-130			
Bromodichloromethane	0.0049	0.00050	mg/L	0.005000		99	70-130			
Bromoform	0.0046	0.00050	mg/L	0.005000		92	70-130			
Bromomethane	0.0044	0.00050	mg/L	0.005000		88	70-130			
Carbon tetrachloride	0.0054	0.00050	mg/L	0.005000		108	70-130			
Chlorobenzene	0.0048	0.00050	mg/L	0.005000		96	70-130			
Chloroethane	0.0045	0.00050	mg/L	0.005000		90	70-130			
Chloroform	0.0050	0.00050	mg/L	0.005000		100	70-130			
Chloromethane	0.0042	0.00050	mg/L	0.005000		83	70-130			
cis-1,2-Dichloroethene	0.0041	0.00050	mg/L	0.005000		81	70-130			
cis-1,3-Dichloropropene	0.0045	0.00050	mg/L	0.005000		90	70-130			
Dibromochloromethane	0.0048	0.00050	mg/L	0.005000		97	70-130			
Dibromomethane	0.0046	0.00050	mg/L	0.005000		92	70-130			
Dichlorodifluoromethane	0.0042	0.00050	mg/L	0.005000		84	70-130			
Ethylbenzene	0.0055	0.00050	mg/L	0.005000		109	70-130			
Hexachlorobutadiene	0.0047	0.00050	mg/L	0.005000		94	70-130			
Isopropylbenzene	0.0055	0.00050	mg/L	0.005000		109	70-130			
Methyl tert-Butyl Ether (MTBE)	0.0039	0.00050	mg/L	0.005000		77	0-200			
Methylene chloride	0.0046	0.00050	mg/L	0.005000		91	70-130			
Naphthalene	0.0039	0.00050	mg/L	0.005000		79	70-130			
n-Butylbenzene	0.0053	0.00050	mg/L	0.005000		106	70-130			
n-Propylbenzene	0.0054	0.00050	mg/L	0.005000		108	70-130			
sec-Butylbenzene	0.0054	0.00050	mg/L	0.005000		108	70-130			
Styrene	0.0053	0.00050	mg/L	0.005000		107	70-130			

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508006 - EPA 524.2										
LCS (1508006-BS1)				Prepared & Analyzed: 08/03/2015						
tert-Butylbenzene	0.0054	0.00050	mg/L	0.005000		109	70-130			
Tetrachloroethene	0.0046	0.00050	mg/L	0.005000		93	70-130			
Toluene	0.0051	0.00050	mg/L	0.005000		102	70-130			
trans-1,2-Dichloroethene	0.0050	0.00050	mg/L	0.005000		101	70-130			
trans-1,3-Dichloropropene	0.0045	0.00050	mg/L	0.005000		89	70-130			
Trichloroethene	0.0048	0.00050	mg/L	0.005000		96	70-130			
Trichlorofluoromethane	0.0056	0.00050	mg/L	0.005000		112	70-130			
TTHMs	0.019	0.00050	mg/L				70-130			
Vinyl chloride	0.0045	0.00050	mg/L	0.005000		91	70-130			
Xylenes, Total	0.016	0.0015	mg/L				70-130			
Surrogate: 1,2-Dichlorobenzene-d4	*1.0*		*ug/L*	*1.000*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*1.1*		*ug/L*	*1.000*		*109*	*70-130*			

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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508006 - EPA 524.2										
LCS Dup (1508006-BSD1)				Prepared & Analyzed: 08/03/2015						
1,1,1,2-Tetrachloroethane	0.0047	0.00050	mg/L	0.005000		94	70-130	2	20	
1,1,1-Trichloroethane	0.0049	0.00050	mg/L	0.005000		98	70-130	5	20	
1,1,2,2-Tetrachloroethane	0.0043	0.00050	mg/L	0.005000		87	70-130	3	20	
1,1,2-Trichloroethane	0.0043	0.00050	mg/L	0.005000		87	70-130	1	20	
1,1-Dichloroethane	0.0046	0.00050	mg/L	0.005000		92	70-130	1	20	
1,1-Dichloroethene	0.0046	0.00050	mg/L	0.005000		91	70-130	8	20	
1,1-Dichloropropene	0.0048	0.00050	mg/L	0.005000		95	70-130	5	20	
1,2,3-Trichlorobenzene	0.0043	0.00050	mg/L	0.005000		86	70-130	8	20	
1,2,3-Trichloropropane	0.0046	0.00050	mg/L	0.005000		92	70-130	4	20	
1,2,4-Trichlorobenzene	0.0045	0.00050	mg/L	0.005000		91	70-130	8	20	
1,2,4-Trimethylbenzene	0.0050	0.00050	mg/L	0.005000		100	70-130	8	20	
1,2-Dichlorobenzene	0.0043	0.00050	mg/L	0.005000		86	70-130	9	20	
1,2-Dichloroethane	0.0050	0.00050	mg/L	0.005000		101	70-130	4	20	
1,2-Dichloropropane	0.0043	0.00050	mg/L	0.005000		85	70-130	4	20	
1,3,5-Trimethylbenzene	0.0050	0.00050	mg/L	0.005000		100	70-130	9	20	
1,3-Dichlorobenzene	0.0045	0.00050	mg/L	0.005000		89	70-130	8	20	
1,3-Dichloropropane	0.0045	0.00050	mg/L	0.005000		91	70-130	1	20	
1,4-Dichlorobenzene	0.0043	0.00050	mg/L	0.005000		86	70-130	14	20	
2,2-Dichloropropane	0.0047	0.00050	mg/L	0.005000		95	70-130	7	20	
2-Chlorotoluene	0.0050	0.00050	mg/L	0.005000		99	70-130	7	20	
4-Chlorotoluene	0.0049	0.00050	mg/L	0.005000		97	70-130	11	20	
4-Isopropyltoluene	0.0049	0.00050	mg/L	0.005000		98	70-130	10	20	
Benzene	0.0046	0.00050	mg/L	0.005000		91	70-130	5	20	
Bromobenzene	0.0045	0.00050	mg/L	0.005000		89	70-130	5	20	
Bromochloromethane	0.0045	0.00050	mg/L	0.005000		89	70-130	3	20	
Bromodichloromethane	0.0048	0.00050	mg/L	0.005000		96	70-130	3	20	
Bromoform	0.0045	0.00050	mg/L	0.005000		90	70-130	2	20	
Bromomethane	0.0044	0.00050	mg/L	0.005000		89	70-130	0.5	20	
Carbon tetrachloride	0.0053	0.00050	mg/L	0.005000		106	70-130	1	20	
Chlorobenzene	0.0047	0.00050	mg/L	0.005000		95	70-130	1	20	
Chloroethane	0.0042	0.00050	mg/L	0.005000		84	70-130	7	20	
Chloroform	0.0049	0.00050	mg/L	0.005000		99	70-130	1	20	
Chloromethane	0.0037	0.00050	mg/L	0.005000		74	70-130	12	20	
cis-1,2-Dichloroethene	0.0050	0.00050	mg/L	0.005000		101	70-130	21	20	R6
cis-1,3-Dichloropropene	0.0043	0.00050	mg/L	0.005000		85	70-130	5	20	
Dibromochloromethane	0.0047	0.00050	mg/L	0.005000		95	70-130	2	20	
Dibromomethane	0.0046	0.00050	mg/L	0.005000		92	70-130	0.2	20	
Dichlorodifluoromethane	0.0041	0.00050	mg/L	0.005000		81	70-130	4	20	
Ethylbenzene	0.0052	0.00050	mg/L	0.005000		105	70-130	4	20	
Hexachlorobutadiene	0.0045	0.00050	mg/L	0.005000		89	70-130	6	20	
Isopropylbenzene	0.0051	0.00050	mg/L	0.005000		101	70-130	8	20	
Methyl tert-Butyl Ether (MTBE)	0.0038	0.00050	mg/L	0.005000		76	0-200	2	200	
Methylene chloride	0.0044	0.00050	mg/L	0.005000		89	70-130	3	20	
Naphthalene	0.0037	0.00050	mg/L	0.005000		75	70-130	5	20	
n-Butylbenzene	0.0048	0.00050	mg/L	0.005000		96	70-130	11	20	
n-Propylbenzene	0.0049	0.00050	mg/L	0.005000		98	70-130	9	20	
sec-Butylbenzene	0.0050	0.00050	mg/L	0.005000		99	70-130	9	20	
Styrene	0.0050	0.00050	mg/L	0.005000		101	70-130	6	20	

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Project: Water Supply Study
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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1508006 - EPA 524.2										
LCS Dup (1508006-BSD1)				Prepared & Analyzed: 08/03/2015						
tert-Butylbenzene	0.0050	0.00050	mg/L	0.005000		101	70-130	8	20	
Tetrachloroethene	0.0045	0.00050	mg/L	0.005000		90	70-130	3	20	
Toluene	0.0050	0.00050	mg/L	0.005000		99	70-130	3	20	
trans-1,2-Dichloroethene	0.0047	0.00050	mg/L	0.005000		93	70-130	8	20	
trans-1,3-Dichloropropene	0.0044	0.00050	mg/L	0.005000		88	70-130	2	20	
Trichloroethene	0.0046	0.00050	mg/L	0.005000		92	70-130	4	20	
Trichlorofluoromethane	0.0052	0.00050	mg/L	0.005000		104	70-130	8	20	
TTHMs	0.019	0.00050	mg/L				70-130	2	20	
Vinyl chloride	0.0043	0.00050	mg/L	0.005000		86	70-130	5	20	
Xylenes, Total	0.015	0.0015	mg/L				70-130	8	20	
Surrogate: 1,2-Dichlorobenzene-d4	*0.98*		*ug/L*	*1.000*		*98*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*1.0*		*ug/L*	*1.000*		*102*	*70-130*			

Client: Clear Creek Associates
Project: Water Supply Study
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QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1507236 - E300										
Blank (1507236-BLK1)				Prepared & Analyzed: 07/23/2015						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1507236-BS1)				Prepared & Analyzed: 07/23/2015						
Chloride	12	1.0	mg/L	12.50		99	90-110			
Fluoride	2.1	0.50	mg/L	2.000		104	90-110			
Nitrogen, Nitrate (As N)	5.1	0.50	mg/L	5.000		103	90-110			
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500		99	90-110			
Sulfate	13	5.0	mg/L	12.50		104	90-110			
LCS Dup (1507236-BSD1)				Prepared & Analyzed: 07/23/2015						
Chloride	12	1.0	mg/L	12.50		99	90-110	0.4	10	
Fluoride	2.1	0.50	mg/L	2.000		103	90-110	0.8	10	
Nitrogen, Nitrate (As N)	5.2	0.50	mg/L	5.000		103	90-110	0.4	10	
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500		100	90-110	0.9	10	
Sulfate	13	5.0	mg/L	12.50		104	90-110	0.4	10	
Matrix Spike (1507236-MS1)	**Source: 15G0785-01**			Prepared & Analyzed: 07/23/2015						
Chloride	20	1.0	mg/L	12.50	7.5	99	80-120			
Fluoride	2.2	0.50	mg/L	2.000	ND	109	80-120			
Nitrogen, Nitrate (As N)	6.4	0.50	mg/L	5.000	1.2	103	80-120			
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500	ND	99	80-120			
Sulfate	19	5.0	mg/L	12.50	6.2	102	80-120			
Matrix Spike Dup (1507236-MSD1)	**Source: 15G0785-01**			Prepared & Analyzed: 07/23/2015						
Chloride	20	1.0	mg/L	12.50	7.5	101	80-120	0.9	10	
Fluoride	2.2	0.50	mg/L	2.000	ND	110	80-120	1	10	
Nitrogen, Nitrate (As N)	6.4	0.50	mg/L	5.000	1.2	105	80-120	0.9	10	
Nitrogen, Nitrite (As N)	2.5	0.10	mg/L	2.500	ND	100	80-120	0.8	10	
Sulfate	19	5.0	mg/L	12.50	6.2	102	80-120	0.02	10	

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 1560785 DATE 7/23/15 PAGE 1 OF 1

PROJECT NAME Water Supply # 287052
CONTACT NAME Melanie Lindsey
COMPANY NAME Clear Creek Associates
ADDRESS 221 N. Court Ave. Ste 101 Tucson, AZ
ZIP 85701 PHONE 520-622-3222 EMAIL mlindsey@clearcreekassociates.com
SAMPLER'S SIGNATURE Melanie Lindsey

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX: New Source Sample
55-224635	7/22/15	1320		GW		X

1. RELINQUISHED BY: Signature: Melanie Lindsey; Printed Name: Melanie Lindsey; Firm: Clear Creek; Date/Time: 7/22/15 1445
2. RECEIVED BY: Signature; Printed Name: UPS; Firm; Date/Time
3. RELINQUISHED BY: Signature; Printed Name: UPS; Firm; Date/Time
4. RECEIVED BY: Signature; Printed Name; Firm: TURNER LABORATORIES, INC.; Date/Time: 7/23/15 1010

TURNAROUND REQUIREMENTS:
- ____ Standard (approx. 10 days)*
- ____ Next Day ____ 2 Day ____ 5 Day*
- X Email Preliminary Results

* Working Days

REPORT REQUIREMENTS:
- ____ I. Routine Report
- ____ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
- ____ III. Date Validation Report (Includes All Raw Data) Add 10% to invoice

INVOICE INFORMATION:
Account ✓ Y ____ N
P.O. #
Bill to: William Hart
Copper Queen Branch

SAMPLE RECEIPT:
Total Containers 28
Temperature 2.9
- [X] Wet Ice
- [ ] Ambient
- [ ] Blue Ice

* LEGEND SAMPLE MATRIX
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

Compliance Analysis: ☐ Yes ☐ No	Custody Seals ☐	Preservation Confirmation ☑
ADEQ Forms: ☐ Yes ☐ No	Container Intact ☑	Appropriate Head Space ☑
Mail ADEQ Forms: ☐ Yes ☐ No	COC / Labels Agree ☑	Received Within Hold Time ☑

SPECIAL INSTRUCTIONS/COMMENTS:
Please cc results to william_hart@fmi.com and christopher_sherman@fmi.com
Cooler 2 of 2

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # _____ DATE _____ PAGE _____ OF _____

PROJECT NAME Water Supply # 287652
CONTACT NAME Melanie Lindsey
COMPANY NAME Clear Creek Associates
ADDRESS 221 N. Court Ave. Ste 101 Tucson, AZ
ZIP 85701 PHONE 520-622-3222 EMAIL mlindsey@clearcreekassociates.com
SAMPLER'S SIGNATURE Melanie Lindsey

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX																						
						Base Neutrals ☐ 625/8270	Acids ☐	Volatile Organics ☐ 624	☐ 524.2	☐ 8260	TTHMS ☐	HAA5 ☐	Chloride ☐	Sulfate ☐	Resistivity ☐	NO_3 ☐	NO_2 ☐	TKN ☐	TPH ☐	1664 ☐	Oil & Grease ☐	VOA ☐	TCLP Analysis Semi-VOA ☐	Pest. ☐	TCLP ☐	Metals Total ☐	Dissolved ☐	RCRA8 ☐	Total ☐	Cyanide Amen. ☐	WAD ☐	SDWA-INORGANICS PRIMARY ☐	SECONDARY ☐	Coliform MPN ☐	PIA ☐	Fecal ☐	pH ☐	Cl_2 ☐	Turb ☐	COD ☐	TSS ☐	BOD ☐	New Source Sample
55-224635	7/22/15	1320		GW																								X

1. RELINQUISHED BY:
Signature
Melanie Lindsey
Printed Name
Clear Creek
Firm
7/22/15 1445
Date/Time

2. RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

3. RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

4. RECEIVED BY:
Signature
Printed Name
TURNER LABORATORIES, INC.
Firm
Date/Time

TURNAROUND REQUIREMENTS:
____ Standard (approx. 10 days)*
____ Next Day ____ 2 Day ____ 5 Day*
X Email Preliminary Results
* Working Days

REPORT REQUIREMENTS:
____ I. Routine Report
____ II. Report (includes DUP, MS, MSD, as required, may be charged as samples)
____ III. Date Validation Report (Includes All Raw Data) Add 10% to invoice

INVOICE INFORMATION:
Account ✓ Y ____ N
P.O. # _____
Bill to: William Hart
Copper Queen Branch

SAMPLE RECEIPT:
Total Containers _____
Temperature _____
☐ Wet Ice
☐ Ambient
☐ Blue Ice

* LEGEND
SAMPLE MATRIX
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

Compliance Analysis: ☐ Yes ☐ No		Custody Seals ☐		Preservation Confirmation ☐	
ADEQ Forms: ☐ Yes ☐ No		Container Intact ☐		Appropriate Head Space ☐	
Mail ADEQ Forms: ☐ Yes ☐ No		COC / Labels Agree ☐		Received Within Hold Time ☐	

SPECIAL INSTRUCTIONS/COMMENTS:
Please cc results to william_hart@fmi.com and christopher_sherman@fmi.com
Cooler 1 of 2

FIBERQUANT ANALYTICAL SERVICES

Determination of Asbestos in Water using TEM

JobNumber: 201507878

Client: TURNER LABORATORIES INC

2445 N COYOTE DR STE 104

TUCSON, AZ 85745-0000

Office Phone: (520) 882-5880
FAX: (520) 882-9788

 # Samples: 1 TEM **Rec:** 7/23/2015 **Method:** EPA 100.1 TEM Water

Client Job: 15G0785 **PO Number:**

Report Date: 7/28/2015 **Date Analyzed:** 7/27/2015 **Routing Number:** -

Method and Analysis Information: **Fiberquant Internal SOP:** TEMw

Samples are analyzed using the protocols given in EPA method 100.1, as amended by the 1993 EPA guidence. Samples should be un-preserved water in 1 L containers having about 200 ml headspace for shaking. There is a 48 hr deadline between the time the sample is taken and the time it is filtered to minimize loss of asbestos fibers due to biological interference. Each sample is shook for 1 minute, and ultrasonicated for at least 10 minutes, shaking every 5 minutes to disperse any fibers that are present. A measured amount of sample is then filtered through a 0.1 um pore size polycarbonate filter, backed by a 5 um pore size MCE filter and a glass frit. Several volumes of liquid may be filtered for each sample in order to assure that a properly loaded sample is obtained. A portion of each resulting filter (and blanks) is then coated with 100-200 um of carbon in a Denton 502A Carbon Evaporator. The carbon encapsulates all of the larger and most of the smaller particulate on the filter. Three mm square pieces of the coated filter are placed on three or more copper TEM grids, and the original filter material is dissolved away in a Jaffe wick and/or condensation washer. The finished replica in carbon containing the particulate is then examined on a JEOL 1200 or Phillips CM 10 transmission electrom microscope at 10,000 to 20,000x magnification. All asbestos fibers >10um in length are tabulated and characterized as asbestos or non-asbestos using a combination of morphology, electron diffraction characteristics, and elemental composition. The result is calculated in millions of fibers per liter (MFL). The grid is scanned until 20 grid openings have been observed, or until an analytical sensitivity (the hypothetical observation of one fiber) of 0.2 MFL has been reached. The nominal 20 grid opening cut-off is used for those samples containing so much non-asbestos particulate that the desired analytical sensitivity is impractical to attain.

The method was designed to determine EPA drinking water compliance. The standard for drinking water is <7 MFL as measured by this method. Fiberquant maintains Arizona Environmental Laboratory license #AZ0633 covering EPA Method 100.1.

Overall, the coefficient of variation can be expected to be approximately 0.5 for analyses in which >20 asbestos fibers have been counted, ranging up to 1.00 for analyses in which only a few asbestos fibers are counted.

The analysis was performed under an ongoing quality assurance program which includes: Lab blanks, prepared with each set of samples and analyzed. Each analyst has suitable background credentials, such as at least a bachelor's degree in geology or chemistry, and has undergone extensive 2-6 month training in TEM techniques and mineralogy specific to TEM asbestos analysis before being allowed to perform client analyses. Unknown reference samples are routinely identified to ensure that each analyst can collect and correctly interpret TEM information. The TEM is aligned and its performance checked daily. Magnification, electron diffraction pattern size, and analytical performance characteristics are calibrated routinely. Samples are re-analyzed sometimes by the same analyst and sometimes by a different analyst in order to determine accuracy and precision. The total of QC analyses (blanks + recounts) are greater than 10% of analyzed samples. Each analyst participates in interlab round robins and proficiency testing in order to show correlation to other lab's analyses. Because TEM samples are not analyzed in batches, which would be traditional for most water analyses, and not every sample has a duplicate or replicate analysis associated with it, it is not possible to include a traditional QC report with the analysis. QC reports are produced monthly, and are available on request. All quality checks performed for these samples were in control except as detailed in the "Analytical Notes" below. Fiberquant is accredited by NVLAP to perform TEM analysis of asbestos in air samples, and has been found to be proficient in the EPA water proficiency program. Accreditation or proficiency does not imply endorsement by the EPA, any other United States governmental agency or any private agency or association. Each lab analysis refers only to the sample tested, and may not, due to the sampling process, be representative of the material sampled. This report may not be reproduced except in full, without the approval of Fiberquant Analytical Services.

Some results may have been calculated using client supplied data, such as volume or area sampled, for which Fiberquant assumes no liability for accuracy.

Job Analysis Notes:

Sampled:	7/22/2015	13:20	**By:**	Lindsay, Melaine
Received:	7/23/2015	15:12		
Filtered:	7/23/2015	16:05		
Analyzed:	7/27/2015	14:30		

Analysis Results:

Lab Number	Client Number	Date	Condition	Filtered Vol (ml)	#GOs	GO Area	MFL>10um	AsbestosType	Sensitivity (MFL>10um)
							Job Number:		201507878
2015-07878- 1	15G0785-01	7/22/2015	acceptable	90	5	0.00993	<0.2	-	0.2

Analyst: DAVID M. SCHALLER

Printed: 28-Jul-15

Original Print Date: 27-Jul-15

Larry S. Pierce, Approved Accreditation Signatory

Job Number:	201507878

QA Report: Job Number:	201507878

1. Calibrations	
TEM magnification. date of last.	7/17/2015
TEM camera constant. date of last.	7/24/2015
EDS performance check (k-factors, resolution, low-e perf.). date of last.	6/26/2015
TEM stage drift, minimum beam size. date of last.	6/26/2015
plasma asher. date of last.	4/15/2015

2. Blanks (1/25 samples required)	Not Required This Job

3. Recounts (1/17 samples required)	Not Required This Job

4. Analyst Performance	
NVLAP proficiency testing	Current
verified counts. cum. % true positives	90.1
verification of diffraction pattern identifications. cum. % correct	99.6
verification of EDS spectra. cum. % correct	97.4

Fiberquant Analytical Services

Fiberquant, Inc. 5025 S. 33rd St., Phoenix, Arizona 85040 602-276-6139 Fax 602-276-4558

TEM Water Sample Count Sheet

Method: EPA 100.1 (600/4-84-043)

Sample Information

Client: TURNER LABORATORIES INC

Client Smp #: **15G0785-01**

Lab #: **2015-07878- 1** Vol Filtered (ml) 90

___ MCE ___PC Pore um: ___ 0.4 ___ 0.22 ___0.1

Grid Orientation
Draw Asym Spot

Grid Information

#Grids Prepped: 3 GO Area: 0.00993 #GOs to Count 5

System Information

Est. % Loading 2

TEM: ___ Jeol N ___Jeol S Mag: 20K or___ Alignment: ___ checked EDS: ___calib ___ not used

Ac. Volatage: ___100keV ___120keV ___ keV

E6	E7	E8	E9	E10	E11	E12	E13	E14	E15
F6	F7	F8	F9	F10	F11	F12	F13	F14	F15
G6	G7	G8	G9	G10	G11	G12	G13	G14	G15
H6	H7	H8	H9	H10	H11	H12	H13	H14	H15
I6	I7	I8	I9			I12	I13	I14	I15
J6	J7	J8	J9			J12	J13	J14	J15
K6	K7	K8	K9	K10	K11	K12	K13	K14	K15
L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
N6	N7	N8	N9	N10	N11	N12	N13	N14	N15

Grid Map
X denotes GO's on 1st grid; O denotes GO's on 2nd

Fiber Counts:

Grid Storage # 1390E3 Acceptable Prep ✓ (>50% coverage, >50% intact, no folds, <5% opaque, 20 good GOs

Location		Str. Type				Size		Morphology			Diffraction Data							EDXA Data							Ident.'n	
GO #	STR #	FIBER	BUNDLE	MATRIX	CLUSTER	Length	Width	TUBULAR	BLOCKY	Negative #	5.2 A Row Spacing	Estimated In-Row Spacing	CHRY	AMPH	NONASB	NO PATT	Negative #	Na	Mg	Si	Ca	Fe	Other	File #	ASBTYPE	NONASB
G11	NM																									
M10	NM																									

Grid Storage # 1390E5 Acceptable Prep ✓ (>50% coverage, >50% intact, no folds, <5% opaque, 20 good GOs

J13	NM																									
I8	NM																									

Grid Storage # 1390E7 Acceptable Prep ✓ (>50% coverage, >50% intact, no folds, <5% opaque, 20 good GOs

H14	NM																									

Abbreviations: NSD=No structures Detected; CH=chrysotile; GR=grunnerite; AN=anthophyllite; TR=tremolite; AP=amphibole; GO=grid opening; NA=non-asbestos

Notes:

Totals:	CH > 10 0	AP > 10 0	GOs Counted 5	*Results:*	Str/mm2 <20	MFL <0.2

Analyst: D. M. Schuh ***Date:*** 7-27-15

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER SOURCE APPROVAL FORM
SAMPLES TO BE TAKEN AT SOURCE ONLY

System ID	System Name
07/22/2015 Sample Date	13:20 Sample Time **(24 hr clock)**
ADEQ Project	55- Well ID Number
NEW SYSTEM YES ___ NO ___ NEW POE YES ___ NO ___	Surface Water Intake ID Number
Owner/Contact Person Name	Owner/Contact Person Phone Number
Owner/Contact Person Fax Number	Sample Site ID
Submitters Sample ID	2015-07878- 1 Analyzing Laboratory Specimen Number
SAMPLE TYPE ☐ Compliance Monitoring ___	SAMPLE COLLECTION POINT/ID ☐ Point of Entry # ___

This form is to be filled out completely, and all pages are to be submitted together. If more than one laboratory participated in the analyses, please attach a copy of the original laboratory report, signed by the performing laboratory, to the back of this form.

All Results Shall Be Reported In Milligrams Per Liter (mg/L) Unless Otherwise Specified.

Please note:
The Arsenic MCL is currently .05 mg/L. However, on Jan. 23, 2006, the Arsenic MCL will be .01 mg/L.

Please Mail This Completed Form To:

Arizona Department Of Environmental Quality
Technical Review Unit
Drinking Water Section (5415b-2)
1110 W Washington St,
Phoenix, AZ 85007

Inorganic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
_____	0.05	0.05	Arsenic	1005	_____	_____	☐	☐
_____	2	2	Barium	1010	_____	_____	☐	☐
_____	0.005	0.005	Cadmium	1015	_____	_____	☐	☐
_____	0.1	0.1	Chromium	1020	_____	_____	☐	☐
_____	1.3*	0.050	Copper	1022	_____	_____	☐	☐
_____	4.0	2.0	Fluoride	1025	_____	_____	☐	☐
_____	0.015*	0.0025	Lead	1030	_____	_____	☐	☐
_____	0.002	0.002	Mercury	1035	_____	_____	☐	☐
_____	10	5	Nitrate (as N)	1040	_____	_____	☐	☐
_____	1	0.5	Nitrite	1041	_____	_____	☐	☐
_____	0.05	0.05	Selenium	1045	_____	_____	☐	☐
_____	0.006	0.006	Antimony	1074	_____	_____	☐	☐
_____	0.004	0.004	Beryllium	1075	_____	_____	☐	☐
_____	0.2	0.2	Cyanide (as free	1024	_____	_____	☐	☐
_____	0.1	0.1	Nickel	1036	_____	_____	☐	☐
_____	0.002	0.002	Thallium	1085	_____	_____	☐	☐

*Action Level

Laboratory Information

Specimen Number:_____
Lab ID Number:_____Name:_____
Comments:_____
Authorized Signature:_____

Physical Analysis

Analysis Method	Contaminant Name	Cont. Code	Analysis Run Date	Result
_____	Sulfate	1055	_____	_____
_____	Sodium	1052	_____	_____
_____	PH	1925	_____	_____
_____	Alkalinity	1927	_____	_____
_____	Hardness/Calcium	1918	_____	_____
_____	Langelier Index	1997	_____	_____
_____	Temperature (°C)	1996	_____	_____
_____	Total Dissolved Solids-TDS	1930	_____	_____

Laboratory Information

Specimen Number:_____
Lab ID Number:_____Name:_____
Comments:_____
Authorized Signature:_____

Synthetic Organic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
_____	0.07	0.0001	2,4-D	2105	_____	_____	☐	☐
_____	0.05	0.0002	2,4,5-TP (Silvex)	2110	_____	_____	☐	☐
_____	0.002	0.0002	Alachlor	2051	_____	_____	☐	☐
_____	0.003	0.001	Toxaphene	2020	_____	_____	☐	☐
_____	0.003	0.0001	Atrazine	2050	_____	_____	☐	☐
_____	0.04	0.0009	Carbofuran	2046	_____	_____	☐	☐
_____	0.001	0.00004	Pentachlorophenol	2326	_____	_____	☐	☐
_____	0.002	0.0002	Chlorodane	2959	_____	_____	☐	☐
_____	0.0002	0.00002	Dibromochloropropane(DBCP)	2931	_____	_____	☐	☐
_____	0.00005	0.00001	Ethylene Dibromide (EDB)	2946	_____	_____	☐	☐
_____	0.0004	0.00004	Heptachlor	2065	_____	_____	☐	☐
_____	0.0002	0.00002	Heptachlor Epoxide	2067	_____	_____	☐	☐
_____	0.0002	0.00002	Lindane	2010	_____	_____	☐	☐
_____	0.04	0.0001	Methoxychlor	2015	_____	_____	☐	☐
_____	0.0005	0.0001	PCB (Polychlorinated Biohenyls)	2383	_____	_____	☐	☐
_____	0.0002	0.00002	Benzo(a)Pyrene	2306	_____	_____	☐	☐
_____	0.2	0.001	Dalapon	2031	_____	_____	☐	☐
_____	0.006	0.0006	Di(2-ethylhexyl)phthalate	2039	_____	_____	☐	☐
_____	0.4	0.0006	Di(2-ethylhexyl)adipate	2035	_____	_____	☐	☐
_____	0.007	0.0002	Dinoseb	2041	_____	_____	☐	☐
_____	$3x10^{-8}$	$5x10^{-9}$	2,3,7,8-TCDD (Dioxin)	2063	_____	_____	☐	☐
_____	0.02	0.0004	Diquat	2032	_____	_____	☐	☐
_____	0.1	0.0009	Endothall	2033	_____	_____	☐	☐
_____	0.002	0.00001	Endrin	2005	_____	_____	☐	☐
_____	0.7	0.006	Glyphosate	2034	_____	_____	☐	☐
_____	0.001	0.0001	Hexachlorobenzene	2274	_____	_____	☐	☐
_____	0.05	0.0001	Hexachlorocyclopentadiene	2042	_____	_____	☐	☐
_____	0.2	0.002	Oxamyl	2036	_____	_____	☐	☐
_____	0.5	0.0001	Picloram	2040	_____	_____	☐	☐
_____	0.004	0.0007	Simazine	2037	_____	_____	☐	☐

*Aroclor results may be submitted in lieu of PCB

Laboratory Information

Specimen Number:_____
Lab ID Number:_____Name:_____
Comments:_____
Authorized Signature:_____

Aroclor (PCB Screening Test)

Analysis Method	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds Reporting Limit
_____	0.00008	Aroclor 1016	2388	_____	_____	☐
_____	0.02	Aroclor 1221	2390	_____	_____	☐
_____	0.0005	Aroclor 1232	2392	_____	_____	☐
_____	0.0003	Aroclor 1242	2394	_____	_____	☐
_____	0.0001	Aroclor 1248	2396	_____	_____	☐
_____	0.0001	Aroclor 1254	2398	_____	_____	☐
_____	0.0002	Aroclor 1260	2400	_____	_____	☐

Laboratory Information

Specimen Number:_____
Lab ID Number:_____Name:_____
Comments:_____
Authorized Signature:_____

Volatile Organic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
_____	0.007	0.0005	1,1Dichloroethlene	2977	_____	_____	☐	☐
_____	0.2	0.0005	1,1,1-Trichlorethane	2981	_____	_____	☐	☐
_____	0.005	0.0005	1,1,2-Trichloroethane	2985	_____	_____	☐	☐
_____	0.005	0.0005	1,2-Dichloroethane	2980	_____	_____	☐	☐
_____	0.005	0.0005	1,2-Dichloropropane	2983	_____	_____	☐	☐
_____	0.005	0.0005	Benzene	2990	_____	_____	☐	☐
_____	0.005	0.0005	Carbon Tetrachloride	2982	_____	_____	☐	☐
_____	0.07	0.0005	cis-1,2 Dichloroethylene	2380	_____	_____	☐	☐
_____	0.7	0.0005	Ethylbenzene	2992	_____	_____	☐	☐
_____	0.1	0.0005	(mono) Chlorobenzene	2989	_____	_____	☐	☐
_____	0.6	0.0005	o-Dichlorobenzene	2968	_____	_____	☐	☐
_____	0.075	0.0005	para-Dichlorobenzene	2969	_____	_____	☐	☐
_____	0.1	0.0005	Styrene	2996	_____	_____	☐	☐
_____	0.005	0.0005	Tetrachloroethylene	2987	_____	_____	☐	☐
_____	1	0.0005	Tolune	2991	_____	_____	☐	☐
_____	0.1	0.0005	Trans-1,2-Dichloroethylene	2979	_____	_____	☐	☐
_____	0.005	0.0005	Trichloroethlene	2984	_____	_____	☐	☐
_____	0.002	0.0005	Vinyl Chloride	2976	_____	_____	☐	☐
_____	10	0.0015	Xylenes, Total	2955	_____	_____	☐	☐
_____	0.07	0.0005	1,2,4-Trichlorobenzene	2378	_____	_____	☐	☐
_____	0.005	0.0005	Dichloromethane	2964	_____	_____	☐	☐

Laboratory Information

Specimen Number:_____
Lab ID Number:_____Name:_____
Comments:_____
Authorized Signature:_____

Radiochemical Analysis

Analysis Reporting Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Reuslts	Exceeds MCL	Exceeds Limit
_____	15 pCi.L		Adjusted Gross Alpha	4000	_____	_____	☐	
_____		3 pCi/L	Gross Alpha	4002	_____	_____		☐
_____ ☐	30ppb	(reserved)	Combined Uranium	4006	_____	_____	☐	
_____			Uranium 234	4007	_____	_____		
_____			Uranium 235	4008	_____	_____		
_____			Uranium 238	4009	_____	_____		
_____	5 pCi/L	1 pCi/L	Combined Radium	4010	_____	_____	☐	☐
_____		1 pCi/L	Radium 226	4020	_____	_____		☐
_____		1 pCi/L	Radium 228	4030	_____	_____		
* _____	4 mrem	3 pCi/L	Gross Beta	4100	_____	_____	☐	☐
* _____	20,000 pCi/L	1,000 pCi/L	Tritium	4102	_____	_____		☐
* _____		10 pCi/L	Strontium-89	4172	_____	_____		☐
* _____	8 pCi/L	2 pCi/L	Strontium-90	4174	_____	_____		☐
* _____		1 pCi/L	Iodine-131	4264	_____	_____		☐
* _____		10 pCi/L	Cesium-134_	4270	_____	_____		☐

*Do Not analyze for this contaminant unless notified by ADEQ

Laboratory Information

Specimen Number:_____

ID Number _____ Name: _____

Comments: _____

Authorized Signature: _____

Date Public Water System Notified:_____

Asbestos Analysis

Analysis Method	MCL	Contaminant Name	Cont. Code	Analysis Run Date	Analytical Results	Exceeds MCL
EPA 100.1	7 MFL	Asbestos	1094	07/27/15	<0.2 MFL	No

Laboratory Information

Laboratory Name: Fiberquant Analytical Services 5025 S 33rd St Phoenix AZ 85040 (800) 743-2687 or (602) 276-6139

Lab ID Number: AZ 0/6/3/3 Specimen Number: 2015-07878- 1

Laboratory Comments: _____

Authorized Signature: David M. Schaller Name Printed: David M. Schaller

Date PWS Notified: _____

MICROBIOLOGICAL ANALYSIS

Analysis Method	MCL	Contaminant Name	Cont. Code	Test Start Date/Time	Analysis Run Date/Time	Result
	Present 1 or More Coliform	Total Coliform	3000			

ONLY REPORT FECAL RESULT IF TOTAL COLIFORM RESULT IS POSITIVE

Analysis Method	MCL	Contaminant Name	Cont. Code	Test Start Date/Time	Analysis Run Date/Time	Result
	Present 1 or More Coliform	Total Coliform	3013			

LABORATORY INFORMATION

>>>To be filled out by laboratory personnel<<<

Specimen Number_____

Lab ID Number_____ Name_____

Comments:_____

Authorized Signature:_____

DWAR 9: Revised 2004

INSTRUCTIONS FOR USING THE ARIZONA DRINKING WATER SOURCE APPROVAL REPORTING FORM

Revised 2003

SYSTEM ID: This is a unique 5 digit Public Water System Identification (PWSID) number assigned to each public water system by ADEQ.

SYSTEM NAME: Should be in the legal name which the water system will be known as when the system is built. Always notify the Department in writing of any name or ownership change.

ADEQ PROJECT NUMBER: This is the number assigned by ADEQ when the project is first submitted for an "Approval to Construct".

NEW SYSTEM: If this is a new system and a system in number has not yet been assigned by ADEQ, then mark "YES", and be sure that the project number is filled in.

NEW POE: If this source represents a new point of entry (POE) for your system, then mark "YES" on the form. This will allow ADEQ to assign a new point of entry number and the appropriate monitoring year for this point of entry.

WELL ID NUMBER: The Department of Water Resources' registration number goes here. This number always begins with a 55-. If the new source does not constitute a new point of entry, fill in the existing point of entry number that this source is joining.

SURFACE WATER INTAKE ID NUMBER: This number must be assigned by ADEQ. If the new source does not constitute a new point of entry, fill in the existing point of entry number that this source is joining.

SAMPLE DATE: The date the specimen was collected in mm/dd/yy format.

SAMPLE TIME: The time the specimen was collected in hh:mm format (24 hr clock time).

OWNER/CONTACT PERSON NAME: The first and last name of the owner or owner's representative, (contact person) who should be contacted with sample results.

OWNER/CONTACT PHONE#: The daytime phone number of the owner's representative, (contact person) who should be contacted with sample results.

SAMPLE TYPE: The compliance reason for specimen collection. Only the relevant sample types for each contaminant group are provided on the ADEQ forms.

SPECIMEN NUMBER: A unique 15 character (max) alphanumeric code that identifies a particular sample used to test one contaminant or one category of contaminants. If reporting on different reporting forms, a different (unique) number is required for each contaminant group and for each report.

NOTE: These definitions are general in nature. For specific questions regarding your laboratory submittal, please contact the Arizona Department of Environmental Quality (ADEQ) **Water Quality Compliance Section at 1-800-234-5677, ext. 4624, or 602-771-4624.** www.adeq.state.az.us

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15G0785

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Fiberquant
5025 S. 33rd St
Phoenix, AZ 85040
Phone :(602) 276-6139
Fax: (602) 276-4558
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15G0785-01 Drinking Water Sampled:07/22/2015 13:20			
Asbestos	07/24/2015 13:20		
Containers Supplied:			

Sampled By Melanie Lindsey

DWAR 9 Form

20150788

Released By	Date	Received By	Date
	7/23/15 1100	Express 9T	7/23/15 1100
Released By	Date	Received By	Date
			7.28.15 0312

DLURY Review of Analysis Request (Initials)

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. · CHANDLER, ARIZONA 85225-1121
Website: www.radsafe.com
(480) 897-9459
FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: July 22, 2015
Sample Received: July 24, 2015
Analysis Completed: August 06, 2015

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Gross Beta Activity Method 900.0 (pCi/L)	Radium 226 Activity Method 903.1 (pCi/L)	Radium 228 Activity Method 904 (pCi/L)	Total Radium (pCi/L)
15G0785-01	2.9 ± 0.3	1.2 ± 0.4	1.7 ± 0.5	4.1 ± 1.1	< 0.5	< 0.7	< 0.7
Date of Analysis	7/27/2015	7/27/2015	7/27/2015	8/4/2015	7/30/2015	7/30/2015	7/30/2015

Robert L. Metzger, Ph.D., C.H.P.

Laboratory License Number AZ0462

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. · CHANDLER, ARIZONA 85225-1121
Website: www.radsafe.com
(480) 897-9459
FAX (480) 892-5446

Isotopic Uranium Analysis

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: July 22, 2015
Sample Received: July 24, 2015
Uranium Analysis Date: July 27, 2015

Sample No.	^{238}U	^{235}U	^{234}U	Total	
15G0785-01	0.4 ± 0.2	0.017 ± 0.001	0.8 ± 0.2	1.2 ± 0.4	Activity (pCi/L)
	1.1 ± 0.5	0.008 ± 0.001	0.00013 ± 0.00004	1.1 ± 0.5	Content (µg/L)
	Comments:				

Robert L. Metzger, Ph.D., C.H.P.

Laboratory License Number AZ0462

Arizona Department Of Environmental Quality
Drinking Water Source Approval Form
Samples To Be Taken At Source Only

System ID # _____ System Name _____

July 22, 2015 Sample Date _____ 13:20 (24 Hr Clock) _____

ADEQ Project Number _____ 55-_____ Well ID Number

New System: **YES** ____ **NO** ____

New POE **YES** ____ **NO** ____ Surface Water Intake ID Number _____

Owner/Contact Person Name _____ Owner/Contact Person Phone Number _____

Sample Type
☐ Compliance Monitoring

Sample Collection Point/ID
☐ Point of Entry# _____

This form is to be filled out completely, and all pages are to be submitted together. If more than one laboratory participated in the analyses, please attach a copy of the original laboratory report, signed by the performing laboratory, to the back of this form.

All Results Shall Be Reported In Milligrams Per Liter (mg/L) Unless Otherwise Specified.

Please Mail This Completed Form To:

Arizona Department Of Environmental Quality
Technical Review Unit
Drinking Water Section (5415b-2)
1110 W Washington St,
Phoenix, AZ 85007

Radiochemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	15 pCi.L		Adjusted Gross Alpha	4000	7/27/2015	1.7 ± 0.5		
600/00-02		3 pCi/l	Gross Alpha	4002	7/27/2015	2.9 ± 0.3		
	30ppb	(reserved)	Combined Uranium	4006	7/27/2015	1.1 ± 0.5		
			Uranium 234	4007	7/27/2015	0.00013 ± 0.00004		
			Uranium 235	4008	7/27/2015	0.008 ± 0.001		
			Uranium 238	4009	7/27/2015	1.1 ± 0.5		
	5 pCi/L	1 pCi/l	Combined Radium	4010	7/30/2015	< 0.7		
903.1		1 pCi/l	Radium 226	4020	7/30/2015	< 0.5		
904.0		1 pCi/l	Radium 228	4030	7/30/2015	< 0.7		
*	4 mrem	3 pCi/l	Gross Beta	4100	8/4/2015	< 4 mrem		
*	20,000 pCi/l	1,000 pCi/l	Tritium	4102				
*		10 pCi/l	Strontium-89	4172				
*	8 pCi/l	2 pCi/l	Strontium-90	4174				
*		1 pCi/l	Iodine-131	4264				
*		10 pCi/l	Cesium-134	4270				

* Do not analyze for this contaminant unless notified by ADEQ

Laboratory Information

Speciman Number: RSE52314

Lab ID Number: AZ0462 Name: Radiation Safety Engineering, Inc.

Comments 15G0785-01

Authorized Signature:

Date Public Water System Notified:

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15G0785

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone :(480) 897-9459
Fax: (480) 892-5446
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15G0785-01 Drinking Water Sampled:07/22/2015 13:20			
Radiochemistry, Uranium	01/18/2016 13:20		
Radiochemistry, Radium 226/228	08/21/2015 13:20		
Radiochemistry, Gross Alpha Beta	01/18/2016 13:20		
Containers Supplied:			

523/4

DWAR 9 Form

Released By	Date	Received By	Date
	7/23/15 1100	Express IT	7/23/15 1100
Released By	Date	Received By	Date
			7/24/15

LABORATORY REPORT

If you have any questions concerning this report, please do not hesitate to call us at (800) 332-4345 or (574) 233-4777.

STATE CERTIFICATION LIST

State	Certification	State	Certification
Alabama	40700	Montana	CERT0026
Alaska	IN00035	Nebraska	E87775
Arizona	AZ0432	Nevada	IN000352015-1
Arkansas	IN035	New Hampshire*	2124
California	2920	New Mexico	IN00035
Colorado	IN035	New Jersey*	IN598
Colorado Radiochemistry	IN035	New York*	11398
Connecticut	PH-0132	North Carolina	18700
Delaware	IN035	North Dakota	R-035
Florida (Primary AB)*	E87775	Ohio	87775
Georgia	929	Oklahoma	D9508
Hawaii	IN035	Oregon*	IN200001
Idaho	IN00035/E87775	Pennsylvania*	68-00466
Illinois*	200001	Puerto Rico	IN00035
Illinois Microbiology	200001	Rhode Island	LAO00241
Indiana Chemistry	C-71-01	South Carolina	95005
Indiana Microbiology	M-76-07	South Dakota	IN00035
Iowa	098	Tennessee	TN02973
Kansas*	E-10233	Texas*	T104704187-14-7
Kentucky	90056	Texas/TCEQ	TX207
Louisiana*	LA150003	Utah*	IN00035
Maine	IN00035	Vermont	VT-8775
Maryland	209	Virginia*	00127
Massachusetts	M-IN035	Washington	C837
Michigan	9926	West Virginia	9927 C
Minnesota*	018-999-338	Wisconsin	999766900
Mississippi	IN035	Wyoming	IN035
Missouri	880		

*NELAP/TNI Recognized Accreditation Bodies

eurofins | Eaton Analytical

LABORATORY CASE NARRATIVE

Client: Turner Laboratories

Report #: 344890QC

All method QC was within acceptance limits, with the exception of:

Method 515.3

Note: The batch matrix spike for method 515.3 does not meet method criteria. The matrix spike performed was not from your sample site. This is being communicated as required by the Arizona administrative code.

Method 549.2

Note: The batch matrix spike for method 549.2 does not meet method criteria. The matrix spike performed was not from your sample site. This is being communicated as required by the Arizona administrative code.

Jennifer Van Kuiken ASM 08/26/2015

Authorized Signature | Title | Date

eurofins | Eaton Analytical

110 South Hill Street
South Bend, IN 46617
Tel: (574) 233-4777
Fax: (574) 233-8207
1 800 332 4345

Laboratory Report

Client: Turner Laboratories

Attn: Dawn Weyer
2445 North Coyote Drive
Suite 104
Tucson, AZ 85745

Copies to: None

Report: 344890
Priority: Standard Written
Status: Final
PWS ID: Not Supplied
Lab ID#: AZ0432

Sample Information

EEA ID #	Client ID	Method	Collected Date / Time	Collected By:	Received Date / Time
3286383	15G0785-01	525.2	07/22/15 13:20	Client	07/24/15 09:15
3286384	15G0785-01	515.3	07/22/15 13:20	Client	07/24/15 09:15
3286385	15G0785-01	547	07/22/15 13:20	Client	07/24/15 09:15
3286386	15G0785-01	548.1	07/22/15 13:20	Client	07/24/15 09:15
3286387	15G0785-01	549.2	07/22/15 13:20	Client	07/24/15 09:15
3286388	15G0785-01	1613	07/22/15 13:20	Client	07/24/15 09:15
3286389	15G0785-01	531.2	07/22/15 13:20	Client	07/24/15 09:15

Report Summary

Note: Dioxin analysis was performed by Eurofins Eaton Analytical, Monrovia, CA.

Detailed quantitative results are presented on the following pages. The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call James Van Fleit at (574) 233-4777.

Note: This report may not be reproduced, except in full, without written approval from EEA.

Jim Van Fleit ASM

Authorized Signature | Title

08/26/2015
Date

Client Name: Turner Laboratories
Report #: 344890

Client Name: Turner Laboratories

Report #: 344890

Sampling Point: 15G0785-01

PWS ID: Not Supplied

Semi-volatile Organic Chemicals

Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed	EEA ID #	Data Qualifiers
2,4-D	515.3	0.07 *	0.0001	< 0.0001	mg/L	07/27/15 07:30	08/01/15 19:40	3286384	---
Dalapon	515.3	0.2 *	0.0010	< 0.0010	mg/L	07/27/15 07:30	08/01/15 19:40	3286384	---
Dicamba	515.3	---	0.0001	< 0.0001	mg/L	07/27/15 07:30	08/01/15 19:40	3286384	---
Dinoseb	515.3	0.007 *	0.0002	< 0.0002	mg/L	07/27/15 07:30	08/01/15 19:40	3286384	---
Pentachlorophenol	515.3	0.001 *	0.00004	< 0.00004	mg/L	07/27/15 07:30	08/01/15 19:40	3286384	---
Picloram	515.3	0.5 *	0.0001	< 0.0001	mg/L	07/27/15 07:30	08/01/15 19:40	3286384	---
2,4,5-TP (Silvex)	515.3	0.05 *	0.0002	< 0.0002	mg/L	07/27/15 07:30	08/01/15 19:40	3286384	---
Alachlor	525.2	0.002 *	0.0002	< 0.0002	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Aldrin	525.2	---	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Atrazine	525.2	0.003 *	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Benzo(a)pyrene	525.2	0.0002 *	0.00002	< 0.00002	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
gamma-BHC (Lindane)	525.2	0.0002 *	0.00002	< 0.00002	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Butachlor	525.2	---	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Dieldrin	525.2	---	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Di(2-ethylhexyl)adipate	525.2	0.4 *	0.0006	< 0.0006	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Di(2-ethylhexyl)phthalate	525.2	0.006 *	0.0006	< 0.0006	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Endrin	525.2	0.002 *	0.00001	< 0.00001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Heptachlor	525.2	0.0004 *	0.00004	< 0.00004	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Heptachlor epoxide	525.2	0.0002 *	0.00002	< 0.00002	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Hexachlorobenzene	525.2	0.001 *	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Hexachlorocyclopentadiene	525.2	0.05 *	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Methoxychlor	525.2	0.04 *	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Metolachlor	525.2	---	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Metribuzin	525.2	---	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Propachlor	525.2	---	0.0001	< 0.0001	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Simazine	525.2	0.004 *	0.00007	< 0.00007	mg/L	07/29/15 08:20	07/30/15 03:38	3286383	---
Aldicarb	531.2	---	0.0005	< 0.0005	mg/L	07/28/15 12:40	07/28/15 22:10	3286389	---
Aldicarb sulfone	531.2	---	0.0008	< 0.0008	mg/L	07/28/15 12:40	07/28/15 22:10	3286389	---
Aldicarb sulfoxide	531.2	---	0.0005	< 0.0005	mg/L	07/28/15 12:40	07/28/15 22:10	3286389	---
Carbaryl	531.2	---	0.0005	< 0.0005	mg/L	07/28/15 12:40	07/28/15 22:10	3286389	---
Carbofuran	531.2	0.04 *	0.0009	< 0.0009	mg/L	07/28/15 12:40	07/28/15 22:10	3286389	---
3-Hydroxycarbofuran	531.2	---	0.0005	< 0.0005	mg/L	07/28/15 12:40	07/28/15 22:10	3286389	---
Methomyl	531.2	---	0.0005	< 0.0005	mg/L	07/28/15 12:40	07/28/15 22:10	3286389	---
1-Naphthol	531.2	---	0.0010	< 0.0010	mg/L	07/28/15 12:40	07/28/15 22:10	3286389	---
Oxamyl	531.2	0.2 *	0.0020	< 0.0020	mg/L	07/28/15 12:40	07/28/15 22:10	3286389	---
Glyphosate	547	0.7 *	0.0060	< 0.0060	mg/L	07/24/15 13:20	07/25/15 00:32	3286385	---
Endothall	548.1	0.1 *	0.0090	< 0.0090	mg/L	07/29/15 08:46	07/30/15 13:19	3286386	---
Diquat	549.2	0.02 *	0.0004	< 0.0004	mg/L	07/28/15 08:30	07/28/15 18:40	3286387	---

Reference Lab Tests

Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed	UL ID #	Data Qualifiers
Dioxin	1613	3 e-8 *	5.0 e-9	< 5.0 e-9	mg/L	08/10/15 12:00	08/12/15 08:30	3286388	---

Client Name: Turner Laboratories

Report #: 344890

† EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.

Reg Limit Type:	MCL	SMCL	AL
Symbol:	*	^	!

Lab Definitions

Continuing Calibration Check Standard (CCC) / Continuing Calibration Verification (CCV) / Initial Calibration Verification Standard (ICV) / Initial Performance Check (IPC) - is a standard containing one or more of the target analytes that is prepared from the same standards used to calibrate the instrument. This standard is used to verify the calibration curve at the beginning of each analytical sequence, and may also be analyzed throughout and at the end of the sequence. The concentration of continuing standards may be varied, when prescribed by the reference method, so that the range of the calibration curve is verified on a regular basis.

Internal Standards (IS) - are pure compounds with properties similar to the analytes of interest, which are added to field samples or extracts, calibration standards, and quality control standards at a known concentration. They are used to measure the relative responses of the analytes of interest and surrogates in the sample, calibration standard or quality control standard.

Laboratory Duplicate (LD) - is a field sample aliquot taken from the same sample container in the laboratory and analyzed separately using identical procedures. Analysis of laboratory duplicates provides a measure of the precision of the laboratory procedures.

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) - is an aliquot of reagent water to which known concentrations of the analytes of interest are added. The LFB is analyzed exactly the same as the field samples. LFBs are used to determine whether the method is in control.

Laboratory Method Blank (LMB) / Laboratory Reagent Blank (LRB) - is a sample of reagent water included in the sample batch analyzed in the same way as the associated field samples. The LMB is used to determine if method analytes or other background contamination have been introduced during the preparation or analytical procedure. The LMB is analyzed exactly the same as the field samples.

Laboratory Trip Blank (LTB) / Field Reagent Blank (FRB) - is a sample of laboratory reagent water placed in a sample container in the laboratory and treated as a field sample, including storage, preservation, and all analytical procedures. The FRB/LTB container follows the collection bottles to and from the collection site, but the FRB/LTB is not opened at any time during the trip. The FRB/LTB is primarily a travel blank used to verify that the samples were not contaminated during shipment.

Matrix Spike Duplicate Sample (MSD) / Laboratory Fortified Sample Matrix Duplicate (LFSMD) - is a sample aliquot taken from the same field sample source as the Matrix Spike Sample to which known quantities of the analytes of interest are added in the laboratory. The MSD is analyzed exactly the same as the field samples. Analysis of the MSD provides a measure of the precision of the laboratory procedures in a specific matrix.

Matrix Spike Sample (MS) / Laboratory Fortified Sample Matrix (LFSM) - is a sample aliquot taken from field sample source to which known quantities of the analytes of interest are added in the laboratory. The MS is analyzed exactly the same as the field samples. The purpose is to demonstrate recovery of the analytes from a sample matrix to determine if the specific matrix contributes bias to the analytical results.

Quality Control Standard (QCS) / Second Source Calibration Verification (SSCV) - is a solution containing known concentrations of the analytes of interest prepared from a source different from the source of the calibration standards. The solution is obtained from a second manufacturer or lot if the lot can be demonstrated by the manufacturer as prepared independently from other lots. The QCS sample is analyzed using the same procedures as field samples. The QCS is used as a check on the calibration standards used in the method on a routine basis.

Reporting Limit Check (RLC) / Initial Calibration Check Standard (ICCS) - is a procedural standard that is analyzed each day to evaluate instrument performance at or below the minimum reporting limit (MRL).

Surrogate Standard (SS) / Surrogate Analyte (SUR) - is a pure compound with properties similar to the analytes of interest, which is highly unlikely to be found in any field sample, that is added to the field samples, calibration standards, blanks and quality control standards before sample preparation. The SS is used to evaluate the efficiency of the sample preparation process.

Arizona Department Of Environmental Quality

Drinking Water Source Approval Form

Samples To Be Taken At Source Only

System ID#	System Name
07/22/15	13:20 (24 hr clock)
Sample Date	Sample Time
ADEQ Project Number	Well ID Number
New System **YES** ___ **NO** ___	
New POE **YES** ___ **NO** ___	Surface Water Intake ID Number
Owner/Contact Person Name	Owner/Contact Person Phone Number
Sample Type	Sample Collection Point / ID
☐ Compliance Monitoring	☐ Point of Entry # ___

This form is to be filled out completely, and all pages are to be submitted together. If more than one laboratory participated in the analyses, please attach a copy of the original laboratory report, signed by the performing laboratory, to the back of this form.

All Results Shall Be Reported In Milligrams Per Liter (mg/L) Unless Otherwise Specified.

Please note:

The Arsenic MCL is currently 0.05 mg/L. However, on Jan. 23, 2006, the Arsenic MCL will be 0.01 mg/L.

Please Mail This Completed Form To:

Arizona Department Of Environmental Quality
Technical Review Unit
Drinking Water Section (5415B-2)
1110 W Washington St,
Phoenix, AZ 85007

Inorganic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	0.01	0.01	Arsenic	1005			☐	☐
	2	2	Barium	1010			☐	☐
	0.005	0.005	Cadmium	1015			☐	☐
	0.1	0.1	Chromium	1020			☐	☐
	1.3*	0.050	Copper	1022			☐	☐
	4.0	4.0	Fluoride	1025			☐	☐
	0.015*	0.0025	Lead	1030			☐	☐
	0.002	0.002	Mercury	1035			☐	☐
	10	5	Nitrate (as N)	1040			☐	☐
	1	0.5	Nitrite (as N)	1041			☐	☐
	0.05	0.05	Selenium	1045			☐	☐
	0.006	0.006	Antimony	1074			☐	☐
	0.004	0.004	Beryllium	1075			☐	☐
	0.2	0.2	Cyanide	1024			☐	☐
	0.1	0.1	Nickel	1036			☐	☐
	0.002	0.002	Thallium	1085			☐	☐

* Action Level

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Physical Analysis

Analysis Method	Contaminant Name	Cont. Code	Analysis Run Date	Result
	Sulfate	1055		
	Sodium	1052		
	pH	1925		
	Alkalinity	1927		
	Hardness/Calcium	1914		
	Langlier Index	1910		
	Temperature (°C)	1996		
	Total Dissolved Solids-TDS	1930		

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Synthetic Organic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
515.3	0.07	0.0001	2,4-D	2105	08/01/2015	< 0.0001	☐	☐
515.3	0.05	0.0002	2,4,5-TP (Silvex)	2110	08/01/2015	< 0.0002	☐	☐
525.2	0.002	0.0002	Alachlor	2051	07/30/2015	< 0.0002	☐	☐
	0.003	0.001	Toxaphene	2020			☐	☐
525.2	0.003	0.0001	Atrazine	2050	07/30/2015	< 0.0001	☐	☐
531.2	0.04	0.0009	Carbofuran	2046	07/28/2015	< 0.0009	☐	☐
515.3	0.001	0.00004	Pentachlorophenol	2326	08/01/2015	< 0.00004	☐	☐
	0.002	0.0001	Chlordane	2959			☐	☐
	0.0002	0.00002	Dibromochloropropane (DBCP)	2931			☐	☐
	0.00005	0.00001	Ethylene Dibromide (EDB)	2946			☐	☐
525.2	0.0004	0.00004	Heptachlor	2065	07/30/2015	< 0.00004	☐	☐
525.2	0.0002	0.00002	Heptachlor Epoxide	2067	07/30/2015	< 0.00002	☐	☐
525.2	0.0002	0.00002	Lindane	2010	07/30/2015	< 0.00002	☐	☐
525.2	0.04	0.0001	Methoxychlor	2015	07/30/2015	< 0.0001	☐	☐
	0.0005	0.0001	PCB (Polychlorinated Biphenyls)	2383			☐	☐
525.2	0.0002	0.00002	Benzo(a)Pyrene	2306	07/30/2015	< 0.00002	☐	☐
515.3	0.2	0.001	Dalapon	2031	08/01/2015	< 0.001	☐	☐
525.2	0.006	0.0006	Di(2-ethylhexyl)phthalate	2039	07/30/2015	< 0.0006	☐	☐
525.2	0.4	0.0006	Di(2-ethylhexyl)adipate	2035	07/30/2015	< 0.0006	☐	☐
515.3	0.007	0.0002	Dinoseb	2041	08/01/2015	< 0.0002	☐	☐
1613	3 e-8	5.0 e-9	2,3,7,8-TCDD (Dioxin)	2063	08/12/2015	< 5.0 e-9	☐	☐
549.2	0.02	0.0004	Diquat	2032	07/28/2015	< 0.0004	☐	☐
548.1	0.1	0.009	Endothall	2033	07/30/2015	< 0.009	☐	☐
525.2	0.002	0.00001	Endrin	2005	07/30/2015	< 0.00001	☐	☐
547	0.7	0.006	Glyphosate	2034	07/25/2015	< 0.006	☐	☐
525.2	0.001	0.0001	Hexachlorobenzene	2274	07/30/2015	< 0.0001	☐	☐
525.2	0.05	0.0001	Hexachlorocyclopentadiene	2042	07/30/2015	< 0.0001	☐	☐
531.2	0.2	0.002	Oxamyl	2036	07/28/2015	< 0.002	☐	☐
515.3	0.5	0.0001	Picloram	2040	08/01/2015	< 0.0001	☐	☐
525.2	0.004	0.00007	Simazine	2037	07/30/2015	< 0.00007	☐	☐

* Aroclor results may be submitted in lieu of PCB

Laboratory Information

Specimen Number: 3286383

Lab ID Number: AZ0432 Name: EEA

Comments: Turner Laboratories ID: 15G0785-01

Authorized Signature: Jan Van Kuik ASM

Aroclor (PCB Screening Test)

Analysis Method	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds Reporting Limit
	0.00008	Aroclor 1016	2388			☐
	0.02	Aroclor 1221	2390			☐
	0.0005	Aroclor 1232	2392			☐
	0.0003	Aroclor 1242	2394			☐
	0.0001	Aroclor 1248	2396			☐
	0.0001	Aroclor 1254	2398			☐
	0.0002	Aroclor 1260	2400			☐

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Volatile Organic Chemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	0.007	0.0005	1,1-Dichloroethylene	2977			☐	☐
	0.2	0.0005	1,1,1-Trichloroethane	2981			☐	☐
	0.005	0.0005	1,1,2-Trichloroethane	2985			☐	☐
	0.005	0.0005	1,2-Dichloroethane	2980			☐	☐
	0.005	0.0005	1,2-Dichloropropane	2983			☐	☐
	0.005	0.0005	Benzene	2990			☐	☐
	0.005	0.0005	Carbon Tetrachloride	2982			☐	☐
	0.07	0.0005	cis-1,2-Dichloroethylene	2380			☐	☐
	0.7	0.0005	Ethylbenzene	2992			☐	☐
	0.1	0.0005	(mono)chlorobenzene	2989			☐	☐
	0.6	0.0005	o-Dichlorobenzene	2968			☐	☐
	0.075	0.0005	para-Dichlorobenzene	2969			☐	☐
	0.1	0.0005	Styrene	2996			☐	☐
	0.005	0.0005	Tetrachloroethylene	2987			☐	☐
	1	0.0005	Toluene	2991			☐	☐
	0.1	0.0005	trans-1,2-Dichloroethylene	2979			☐	☐
	0.005	0.0005	Trichloroethylene	2984			☐	☐
	0.002	0.0005	Vinyl Chloride	2976			☐	☐
	10	0.00050	Xylenes, total	2955			☐	☐
	0.07	0.0005	1,2,4-Trichlorobenzene	2378			☐	☐
	0.005	0.0005	Dichloromethane	2964			☐	☐

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Radiochemical Analysis

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	15 pCi/L		Adjusted Gross Alpha	4000			☐	
		3 pCi/L	Gross Alpha	4002				☐
	30 ug/L	1 ug/L	Combined Uranium	4006			☐	☐
			Uranium-234	4007				
			Uranium-235	4008				
			Uranium-238	4009				
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010			☐	☐
		1 pCi/L	Radium 226	4020				☐
		1 pCi/L	Radium 228	4030				
*	4 mrem/yea	4 pCi/L	Gross Beta	4100			☐	☐
*	20,000 pCi/l	1,000 pCi/L	Tritium	4102			☐	☐
*		10 pCi/L	Strontium-89	4172				☐
*	8 pCi/L	2 pCi/L	Strontium-90	4174			☐	☐
*		1 pCi/L	Iodine-131	4264				☐
*		10 pCi/L	Cesium-134	4270				☐

* Do not analyze for this contaminant unless notified by ADEQ

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Asbestos Analysis

Analysis Method	MCL	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL
	7 MFL	Asbestos	1094			☐

Laboratory Information

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

*****Microbiological Analysis*****

Analysis Method	MCL	Contaminant Name	Cont. Code	Test Start Date/Time	Analysis Run Date/Time	Result
	Present or More Coliform	Total Coliform	3100			

Only Report Fecal Result if Total Coliform Result is Positive

Analysis Method	MCL	Contaminant Name	Cont. Code	Test Start Date/Time	Analysis Run Date/Time	Result
	Present or More Coliform	Total Coliform	3014			

Laboratory Information

>>>To be filled out by laboratory personnel<<<

Specimen Number: _____

Lab ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

DWAR9: Revised 2004

Note: The results presented relate only to the samples provided for analysis.

SUBCONTRACT ORDER

Turner Laboratories, Inc.

15G0785

277494

344890

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Terri Garcia

RECEIVING LABORATORY:

Underwriters Laboratories
110 S. Hill Street
South Bend, IN 46617
Phone :(800) 332-4345
Fax: (574) 233-8207
Please CC Dawn Weyer Dweyer@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 15G0785-01 Drinking Water Sampled:07/22/2015 13:20			
Semivolatile Organic Compounds by E 525.2	08/05/2015 13:20	32856	
Herbicides by E 515.3	08/05/2015 13:20	7-24-2015 ICP	
Glyphosate by E 547	08/05/2015 13:20		
Endothall by E 548	07/29/2015 13:20		
Diquat by E549	07/29/2015 13:20		
Dioxin by 1613	07/29/2015 13:20		
Carbamates by E 531.2	08/19/2015 13:20		
Containers Supplied:			

Carbamates by E 531.2
Carbofuran
Oxamyl

DWAR 9 Form

Wet 1.6°C

Released By	Date	Received By	Date
	7/23/15 1600	FedEx	7/23/15 1600
		K Dennis	7.24.15 0915

Arizona Department of Environmental Quality

Drinking Water Source Approval Form

*** Samples To Be Taken At Source Only***

	Clear Creek Associates
System ID #	System Name
07/22/2015	13:20 (24 hr clock)
Sample Date	Sample Time
	55-
ADEQ Project Number	Well ID Number
New System YES___NO___	
New POE YES___NO___	Surface Water Intake ID Number
Melanie Lindsey	(520) 622-3222
Owner / Contact Person Name	Owner / Contact Person Phone Number

Sample Type
☐ Compliance Monitoring

Sample Collection Point/ID
☐ Point of Entry# _____

This form is to be filled out completely, and all pages are to be submitted together. If more than one laboratory particpated in the analyses, please attach a copy of the original laboratory report, signed by the performing laboratory, to the back of this form.

All Results Shall Be Reported In Milligrams Per Liter (mg/L) Unless Otherwise Specified.

Please note:
The Arsenic MCL is currently .05 mg/L However, on Jan. 23, 2006, the Arsenic MCL will be .01 mg/L.

Please mail completed form to:

Arizona Department of Environmental Quality
Water Quality Data Unit 5415B-2
1110 W Washington Street
Phoenix, Arizona 85007

INORGANIC CHEMICAL ANALYSIS

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
E200.8	0.01	0.01	Arsenic	1005	07/29/2015	0.0019	☐	☐
E200.7	2	2	Barium	1010	08/03/2015	0.30	☐	☐
E200.7	0.005	0.005	Cadmium	1015	08/03/2015	<0.0020	☐	☐
E200.7	0.1	0.1	Chromium	1020	08/03/2015	<0.030	☐	☐
E200.7	1.3*	0.050	Copper	1022	08/03/2015	<0.020	☐	☐
E300	4.0	2.0	Fluoride	1025	07/23/2015	<0.50	☐	☐
E200.8	0.015*	0.0025	Lead	1030	07/29/2015	<0.00050	☐	☐
E245.1	0.002	0.002	Mercury	1035	07/27/2015	<0.0010	☐	☐
E300	10	5	Nitrate (as N)	1040	07/23/2015	1.2	☐	☐
E300	1	0.5	Nitrite (as N)	1041	07/23/2015	<0.10	☐	☐
E200.8	0.05	0.05	Selenium	1045	07/29/2015	<0.0025	☐	☐
E200.8	0.006	0.006	Antimony	1074	07/29/2015	<0.00050	☐	☐
E200.7	0.004	0.004	Beryllium	1075	08/03/2015	<0.0020	☐	☐
E335.4	0.2	0.2	Cyanide (as free cyanide)	1024	08/04/2015	<0.10	☐	☐
E200.7	0.1	0.1	Nickel	1036	08/03/2015	<0.050	☐	☐
E200.8	0.002	0.002	Thallium	1085	07/29/2015	<0.00050	☐	☐

* Action Level

LABORATORY INFORMATION

Specimen Number: 15G0785-01(1)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

PHYSICAL ANALYSIS

Analysis Method	Contaminant Name	Cont. Code	Analysis Run Date	Result
E300	Sulfate	1055	07/23/2015	6.2
E200.7	Sodium	1052	08/03/2015	16
E150.1	pH	1925	07/23/2015	7.8
SM2320B	Alkalinity	1927	07/29/2015	180
Calculation	Hardness/Calcium	1918	08/03/2015	120
Calculation	Langelier Index	1997	08/19/2015	0.20
E150.1	Temperature (Celsius)	1996	07/23/2015	20
SM2540 C	Total Dissolved Solids-TDS	1930	07/24/2015	210

LABORATORY INFORMATION

Specimen Number: 15G0785-01(2)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

SYNTHETIC ORGANIC CHEMICAL ANALYSIS

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
	0.07	0.0001	2,4-D	2105			☐	☐
	0.05	0.0002	2,4,5-TP (Silvex)	2110			☐	☐
	0.002	0.0002	Alachlor	2051			☐	☐
E505	0.003	0.001	Toxaphene	2020	08/05/2015	<0.000600	☐	☐
	0.003	0.0001	Atrazine	2050			☐	☐
	0.04	0.0009	Carbofuran	2046			☐	☐
	0.001	0.00004	Pentachlorophenol	2326			☐	☐
E505	0.002	0.0002	Chlordane	2959	08/05/2015	<0.000200	☐	☐
E504.1	0.0002	0.00002	Dibromochloropropane (DBCP)	2931	07/25/2015	<0.000020	☐	☐
E504.1	0.00005	0.00001	Ethylene Dibromide (EDB)	2946	07/25/2015	<0.000010	☐	☐
	0.0004	0.00004	Heptachlor	2065			☐	☐
	0.0002	0.00002	Heptachlor Epoxide	2067			☐	☐
	0.0002	0.00002	Lindane	2010			☐	☐
	0.04	0.0001	Methoxychlor	2015			☐	☐
	0.0005	0.0001	PCB:Polychlorinated Biphenyls	2383			☐	☐
	0.0002	0.00002	Benzo (a) Pyrene	2306			☐	☐
	0.2	0.001	Dalapon	2031			☐	☐
	0.006	0.0006	Di(2-ethylhexyl)phthalate	2039			☐	☐
	0.4	0.0006	Di(2-ethylhexyl)adipate	2035			☐	☐
	0.007	0.0002	Dinoseb	2041			☐	☐
	3 x 10(-8)	5 x 10(-9)	2,3,7,8-TCDD (Dioxin)	2063			☐	☐
	0.02	0.0004	Diquat	2032			☐	☐
	0.1	0.0009	Endothall	2033			☐	☐
	0.002	0.00001	Endrin	2005			☐	☐
	0.7	0.006	Glyphosate	2034			☐	☐
	0.001	0.0001	Hexachlorobenzene	2274			☐	☐
	0.05	0.0001	Hexachlorocyclopentadiene	2042			☐	☐
	0.2	0.002	Oxamyl	2036			☐	☐
	0.5	0.0001	Picloram	2040			☐	☐
	0.004	0.0007	Simazine	2037			☐	☐

* Aroclor results may be submitted in lieu of PCB

LABORATORY INFORMATION

Specimen Number: 15G0785-01(3)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

Aroclor (PCB Screening Test)

Analysis Method	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds Reporting Limit
E505	0.00008	Aroclor 1016	2388	08/05/2015	<0.0000800	☐
E505	0.02	Aroclor 1221	2390	08/05/2015	<0.0200	☐
E505	0.0005	Aroclor 1232	2392	08/05/2015	<0.000500	☐
E505	0.0003	Aroclor 1242	2394	08/05/2015	<0.000300	☐
E505	0.0001	Aroclor 1248	2396	08/05/2015	<0.000100	☐
E505	0.0001	Aroclor 1254	2398	08/05/2015	<0.000100	☐
E505	0.0002	Aroclor 1260	2400	08/05/2015	<0.0000800	☐

LABORATORY INFORMATION

Specimen Number: 15G0785-01(4)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

VOLATILE ORGANIC CHEMICAL ANALYSIS

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
EPA 524.2	0.007	0.0005	1,1-Dichloroethylene	2977	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.2	0.0005	1,1,1-Trichloroethane	2981	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	1,1,2-Trichloroethane	2985	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	1,2-Dichloroethane	2980	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	1,2-Dichloropropane	2983	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Benzene	2990	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Carbon Tetrachloride	2982	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.07	0.0005	cis-1,2-Dichloroethylene	2380	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.7	0.0005	Ethylbenzene	2992	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.1	0.0005	(mono)chlorobenzene	2989	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.6	0.0005	o-Dichlorobenzene	2968	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.075	0.0005	para-Dichlorobenzene	2969	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.1	0.0005	Styrene	2996	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Tetrachloroethylene	2987	08/03/2015	<0.00050	☐	☐
EPA 524.2	1	0.0005	Toluene	2991	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.1	0.0005	Trans-1,2-Dichloroethylene	2979	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Trichloroethylene	2984	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.002	0.0005	Vinyl Chloride	2976	08/03/2015	<0.00050	☐	☐
EPA 524.2	10	0.0015	Xylenes, total	2955	08/03/2015	<0.0015	☐	☐
EPA 524.2	0.07	0.0005	1,2,4-Trichlorobenzene	2378	08/03/2015	<0.00050	☐	☐
EPA 524.2	0.005	0.0005	Dichloromethane	2964	08/03/2015	<0.00050	☐	☐

LABORATORY INFORMATION

Specimen Number: 15G0785-01(5)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

RADIOCHEMICAL ANALYSIS

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL	Exceeds Reporting Limit
		3 pCi/L	Gross Alpha	4000			☐	☐
	5 pCi/L	1 pCi/L	Combined Radium	4010			☐	☐
		1 pCi/L	Radium 226	4020			☐	☐
		1 pCi/L	Radium 228	4030			☐	☐
	4 mrem	3 pCi/L	Gross Beta	4100			☐	☐
	20,000 pCi/	1,000 pCi/L	Tritium	4102			☐	☐
	8 pCi/L***	2 pCi/L	Strontium-90	4174			☐	☐

LABORATORY INFORMATION

Specimen Number: _____

ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

ASBESTOS ANALYSIS

Analysis Method	MCL	Contaminant Name	Cont. Code	Analysis Run Date	Result	Exceeds MCL
	7 MFL	Asbestos	1094			☐

LABORATORY INFORMATION

Specimen Number: _____

ID Number: _____ Name: _____

Comments: _____

Authorized Signature: _____

Microbiological Analysis

Analysis Method	MCL*	Contaminant Name	Cont. Code	Analysis Run Date	Result: "P" = Present "A" = Absent
Colitag Mod.	Present / 1 or more Coliform	Total Coliform	3000	07/24/2015	A

(Only Report Fecal/E.Coli Result if Total Coliform Result is Positive)

Analysis Method	MCL*	Contaminant Name	Cont. Code	Analysis Run Date	Result: "P" = Present "A" = Absent

***MCL: If system is ≤ 33,000, then MCL is 2 or more total coliform-positive.**
If system is >33,000, then no more than 5% of the samples may be total coliform-positive.

LABORATORY INFORMATION

Specimen Number: 15G0785-01(9)

ID Number: AZ0066 Name: Turner Laboratories, Inc.

Comments:

Authorized Signature: Terri L. Garcia, Technical Director Terri L. Garcia

DWAR 9: Revised 2004

APPENDIX D

HYDRAULIC TESTING

APPENDIX D.1

HYDRAULIC TESTING DATA

TABLE D.1
WMD2010-05B 20-day Constant-Rate Test Manual Data

Aquifer Test Data							
Project:	Water Supply Study	**Project Number:**	287052		**SWL (feet bls):**	386.97	
Well Location:	Eads - WMD2010-05B	**Well Number:**	55-912722		**Measuring Point:**	Top of PVC	
Well Diameter:	5 inch	**Measured By:**	R. Toomey and M. Lindsey		**Correction (feet):**	2.88	
Pump Setting (feet):	510	**Pump On Date, Time:**	4/30/15	10:00	**Available Drawdown (feet):**	123	
Screen Interval (feet):	403-866	**Pump off Date, Time:**	5/20/15	12:03	**Totalizer Start (gal)=**	197,190	
How Q Measured:	Flowmeter	**Duration of Aquifer Test:**	482 hours		**Totalizer End (gal)=**	1,317,700	

Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
4/30/15 10:00	0			387.93	2.88	385.05	0.00			197190	
4/30/15 10:01	1			389.55	2.88	386.67	1.62	40	24.69		
4/30/15 10:02	2			389.70	2.88	386.82	1.77	40	22.60		
4/30/15 10:03	3			389.61	2.88	386.73	1.68	40	23.81		
4/30/15 10:04	4			389.57	2.88	386.69	1.64	40	24.39		
4/30/15 10:05	5			389.61	2.88	386.73	1.68	40	23.81		
4/30/15 10:06	6			389.67	2.88	386.79	1.74	40	22.99		
4/30/15 10:07	7			389.70	2.88	386.82	1.77	40	22.60		
4/30/15 10:08	8			389.73	2.88	386.85	1.80	40	22.22		
4/30/15 10:09	9			389.75	2.88	386.87	1.82	40	21.98		
4/30/15 10:10	10			389.79	2.88	386.91	1.86	40	21.51		
4/30/15 10:15	15			389.86	2.88	386.98	1.93	40	20.73		
4/30/15 10:20	20			389.93	2.88	387.05	2.00	40	20.00		
4/30/15 10:25	25			389.97	2.88	387.09	2.04	40	19.61		
4/30/15 10:30	30			390.01	2.88	387.13	2.08	40	19.23		
4/30/15 10:35	35			390.02	2.88	387.14	2.09	40	19.14		
4/30/15 10:40	40			390.03	2.88	387.15	2.10	40	19.05		
4/30/15 10:45	45			390.04	2.88	387.16	2.11	40	18.96		
4/30/15 10:50	50			390.05	2.88	387.17	2.12	40	18.87		
4/30/15 11:00	60			390.06	2.88	387.18	2.13	40	18.78		
4/30/15 11:10	70			390.08	2.88	387.20	2.15	40	18.60		
4/30/15 11:20	80			390.09	2.88	387.21	2.16	40	18.52		
4/30/15 11:30	90			390.10	2.88	387.22	2.17	40	18.43		

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Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
4/30/15 11:40	100			390.10	2.88	387.22	2.17	40	18.43		
4/30/15 12:00	120			390.11	2.88	387.23	2.18	40	18.35		
4/30/15 12:20	140			390.12	2.88	387.24	2.19	40	18.26		
4/30/15 12:40	160			390.13	2.88	387.25	2.20	40	18.18		
4/30/15 13:00	180			390.13	2.88	387.25	2.20	40	18.18		
4/30/15 13:20	200			390.14	2.88	387.26	2.21	40	18.10		
4/30/15 13:50	230			390.15	2.88	387.27	2.22	40	18.02		
4/30/15 14:20	260			390.16	2.88	387.28	2.23	40	17.94		
4/30/15 14:50	290			390.16	2.88	387.28	2.23	40	17.94		
4/30/15 15:20	320			390.17	2.88	387.29	2.24	40	17.86		
4/30/15 15:50	350			390.19	2.88	387.31	2.26	40	17.70		
4/30/15 16:20	380			390.20	2.88	387.32	2.27	40	17.62		
4/30/15 16:50	410			390.22	2.88	387.34	2.29	40	17.47		
4/30/15 17:20	440			390.24	2.88	387.36	2.31	40	17.32		
4/30/15 17:50	470			390.25	2.88	387.37	2.32	40	17.24		
4/30/15 18:30	510			390.28	2.88	387.40	2.35	40	17.02		
4/30/15 19:00	540			390.31	2.88	387.43	2.38	40	16.81		
4/30/15 20:00	600			390.34	2.88	387.46	2.41	40	16.60		
4/30/15 21:00	660			390.39	2.88	387.51	2.46	40	16.26		
4/30/15 22:00	720			390.41	2.88	387.53	2.48	40	16.13		
4/30/15 23:00	780			390.44	2.88	387.56	2.51	40	15.94		
5/1/15 0:00	840			390.45	2.88	387.57	2.52	40	15.87		
5/1/15 1:00	900			390.45	2.88	387.57	2.52	40	15.87		
5/1/15 2:00	960			390.46	2.88	387.58	2.53	40	15.81		
5/1/15 3:00	1020			390.47	2.88	387.59	2.54	40	15.75		
5/1/15 4:00	1080			390.50	2.88	387.62	2.57	40	15.56		
5/1/15 5:00	1140			390.52	2.88	387.64	2.59	40	15.44		
5/1/15 6:00	1200			390.55	2.88	387.67	2.62	40	15.27		
5/1/15 7:00	1260			390.60	2.88	387.72	2.67	40	14.98		
5/1/15 8:00	1320			390.63	2.88	387.75	2.70	40	14.81		

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Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/1/15 9:00	1380			390.65	2.88	387.77	2.72	40	14.71		
5/1/15 10:00	1440			390.67	2.88	387.79	2.74	40	14.60		
5/1/15 11:00	1500			390.67	2.88	387.79	2.74	40	14.60		
5/1/15 12:00	1560			390.69	2.88	387.81	2.76	40	14.49		
5/1/15 13:00	1620			390.67	2.88	387.79	2.74	40	14.60		
5/1/15 14:00	1680			390.67	2.88	387.79	2.74	40	14.60		
5/1/15 15:00	1740			390.65	2.88	387.77	2.72	40	14.71		
5/1/15 16:00	1800			390.65	2.88	387.77	2.72	40	14.71		
5/1/15 17:00	1860			390.67	2.88	387.79	2.74	40	14.60		
5/1/15 18:00	1920			390.71	2.88	387.83	2.78	40	14.39	272810	
5/1/15 19:00	1980			390.75	2.88	387.87	2.82	40	14.18	275130	
5/1/15 20:00	2040			390.80	2.88	387.92	2.87	40	13.94	277485	
5/1/15 21:00	2100			390.82	2.88	387.94	2.89	40	13.84	279839	
5/1/15 22:00	2160			390.85	2.88	387.97	2.92	40	13.70	282200	
5/1/15 23:00	2220			390.90	2.88	388.02	2.97	40	13.47	284590	
5/2/15 0:00	2280			390.89	2.88	388.01	2.96	40	13.51	287000	
5/2/15 1:00	2340			390.90	2.88	388.02	2.97	40	13.47	289315	
5/2/15 2:00	2400			390.90	2.88	388.02	2.97	40	13.47	291720	
5/2/15 3:00	2460			390.91	2.88	388.03	2.98	40	13.42	294080	
5/2/15 4:00	2520			390.92	2.88	388.04	2.99	40	13.38	296450	
5/2/15 5:00	2580			390.93	2.88	388.05	3.00	40	13.33	298810	
5/2/15 6:00	2640			390.96	2.88	388.08	3.03	40	13.20	301300	
5/2/15 7:00	2700			390.96	2.88	388.08	3.03	40	13.20	303670	
5/2/15 8:15	2775			391.02	2.88	388.14	3.09	40	12.94	306660	
5/2/15 9:00	2820			391.05	2.88	388.17	3.12	40	12.82	308420	
5/2/15 10:00	2880			391.08	2.88	388.20	3.15	40	12.70	310800	
5/2/15 11:00	2940			391.08	2.88	388.20	3.15	40	12.70	313165	
5/2/15 12:00	3000			391.10	2.88	388.22	3.17	40	12.62	315550	
5/2/15 13:00	3060			391.08	2.88	388.20	3.15	40	12.70	317915	
5/2/15 14:00	3120			391.05	2.88	388.17	3.12	40	12.82	320255	

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Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/2/15 15:00	3180			391.02	2.88	388.14	3.09	40	12.94	322610	
5/2/15 16:00	3240			391.05	2.88	388.17	3.12	40	12.82	324950	
5/2/15 17:00	3300			391.09	2.88	388.21	3.16	40	12.66	327280	
5/2/15 18:00	3360			391.09	2.88	388.21	3.16	40	12.66	329590	
5/2/15 19:00	3420			391.13	2.88	388.25	3.20	40	12.50	331905	
5/2/15 20:00	3480			391.17	2.88	388.29	3.24	40	12.35	334241	
5/2/15 21:00	3540			391.22	2.88	388.34	3.29	40	12.16	336600	
5/2/15 22:00	3600			391.24	2.88	388.36	3.31	40	12.08	338920	
5/2/15 23:00	3660			391.25	2.88	388.37	3.32	40	12.05	341260	
5/3/15 0:00	3720			391.27	2.88	388.39	3.34	40	11.98	343600	
5/3/15 1:00	3780			391.26	2.88	388.38	3.33	40	12.01	345940	
5/3/15 2:00	3840			391.24	2.88	388.36	3.31	40	12.08	348275	
5/3/15 3:00	3900			391.25	2.88	388.37	3.32	40	12.05	350610	
5/3/15 4:00	3960			391.25	2.88	388.37	3.32	40	12.05	352945	
5/3/15 5:00	4020			391.27	2.88	388.39	3.34	40	11.98	355290	
5/3/15 6:00	4080			391.30	2.88	388.42	3.37	40	11.87	357670	
5/3/15 7:00	4140			391.36	2.88	388.48	3.43	40	11.66	360020	
5/3/15 8:00	4200			391.37	2.88	388.49	3.44	40	11.63	362360	
5/3/15 9:00	4260			391.40	2.88	388.52	3.47	40	11.53	364700	
5/3/15 10:00	4320			391.41	2.88	388.53	3.48	40	11.49	367016	
5/3/15 11:00	4380			391.42	2.88	388.54	3.49	40	11.46	369365	
5/3/15 12:05	4445			391.41	2.88	388.53	3.48	40	11.49	371860	
5/3/15 13:00	4500			391.40	2.88	388.52	3.47	40	11.53	374040	
5/3/15 14:00	4560			391.39	2.88	388.51	3.46	40	11.56	376360	
5/3/15 15:00	4620			391.38	2.88	388.50	3.45	40	11.59	378690	
5/3/15 16:00	4680			391.39	2.88	388.51	3.46	40	11.56	381040	
5/3/15 17:00	4740			391.39	2.88	388.51	3.46	40	11.56	383370	
5/3/15 18:00	4800			391.41	2.88	388.53	3.48	40	11.49	385645	
5/3/15 19:03	4863			391.43	2.88	388.55	3.50	40	11.43	388140	
5/3/15 20:00	4920			391.48	2.88	388.60	3.55	40	11.27	390330	
5/3/15 21:00	4980			391.52	2.88	388.64	3.59	40	11.14	392660	

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Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/3/15 22:00	5040			391.54	2.88	388.66	3.61	40	11.08	395010	
5/3/15 23:00	5100			391.55	2.88	388.67	3.62	40	11.05	397340	
5/4/15 0:00	5160			391.56	2.88	388.68	3.63	40	11.02	399685	
5/4/15 1:00	5220			391.56	2.88	388.68	3.63	40	11.02	402030	
5/4/15 2:00	5280			391.56	2.88	388.68	3.63	40	11.02	404380	
5/4/15 3:00	5340			391.56	2.88	388.68	3.63	40	11.02	406710	
5/4/15 4:00	5400			391.57	2.88	388.69	3.64	40	10.99	409060	
5/4/15 5:00	5460			391.60	2.88	388.72	3.67	40	10.90	411400	
5/4/15 6:00	5520			391.60	2.88	388.72	3.67	40	10.90	413800	
5/4/15 7:00	5580			391.64	2.88	388.76	3.71	40	10.78	416150	
5/4/15 8:00	5640			391.69	2.88	388.81	3.76	40	10.64	418500	
5/4/15 9:00	5700			391.69	2.88	388.81	3.76	40	10.64	420730	
5/4/15 10:00	5760			391.71	2.88	388.83	3.78	40	10.58	423180	
5/4/15 11:00	5820			391.73	2.88	388.85	3.80	40	10.53	425520	
5/4/15 12:00	5880			391.73	2.88	388.85	3.80	40	10.53	427860	
5/4/15 13:00	5940			391.71	2.88	388.83	3.78	40	10.58	430210	
5/4/15 14:00	6000			391.70	2.88	388.82	3.77	40	10.61	432550	
5/4/15 15:00	6060			391.69	2.88	388.81	3.76	40	10.64	434880	
5/4/15 16:00	6120			391.69	2.88	388.81	3.76	40	10.64	437230	
5/4/15 17:00	6180			391.71	2.88	388.83	3.78	40	10.58	439540	
5/4/15 18:00	6240			391.72	2.88	388.84	3.79	40	10.55	441930	
5/4/15 19:00	6300			391.75	2.88	388.87	3.82	40	10.47	444280	
5/4/15 20:00	6360			391.81	2.88	388.93	3.88	40	10.31	446500	
5/4/15 21:00	6420			391.83	2.88	388.95	3.90	40	10.26	448840	
5/4/15 22:00	6480			391.85	2.88	388.97	3.92	40	10.20	451170	
5/4/15 23:00	6540			391.89	2.88	389.01	3.96	40	10.10	453490	
5/5/15 0:00	6600			391.88	2.88	389.00	3.95	40	10.13	455850	
5/5/15 1:00	6660			391.90	2.88	389.02	3.97	40	10.08	458180	
5/5/15 2:00	6720			391.86	2.88	388.98	3.93	40	10.18	460530	
5/5/15 3:00	6780			391.89	2.88	389.01	3.96	40	10.10	462870	
5/5/15 4:00	6840			391.87	2.88	388.99	3.94	40	10.15	465200	

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5/5/15 5:00	6900			391.90	2.88	389.02	3.97	40	10.08	467530	
5/5/15 6:00	6960			391.91	2.88	389.03	3.98	40	10.05	469915	
5/5/15 7:00	7020			391.94	2.88	389.06	4.01	40	9.98	472270	
5/5/15 8:00	7080			391.96	2.88	389.08	4.03	40	9.93	474600	
5/5/15 9:00	7140			392.00	2.88	389.12	4.07	40	9.83	476930	
5/5/15 10:00	7200			392.02	2.88	389.14	4.09	40	9.78	479270	
5/5/15 11:00	7260			392.03	2.88	389.15	4.10	40	9.76	481610	
5/5/15 12:00	7320			392.02	2.88	389.14	4.09	40	9.78	483930	
5/5/15 13:00	7380			392.02	2.88	389.14	4.09	40	9.78	486265	
5/5/15 14:00	7440			392.02	2.88	389.14	4.09	40	9.78	488600	
5/5/15 15:00	7500			392.01	2.88	389.13	4.08	40	9.80	490940	
5/5/15 16:00	7560			392.01	2.88	389.13	4.08	40	9.80	493275	
5/5/15 17:00	7620			392.02	2.88	389.14	4.09	40	9.78	495615	
5/5/15 18:00	7680			392.02	2.88	389.14	4.09	40	9.78	497955	
5/6/15 6:00	8400			392.18	2.88	389.30	4.25	40	9.41	526000	
5/6/15 7:00	8460			392.19	2.88	389.31	4.26	40	9.39	528280	
5/6/15 8:00	8520			392.21	2.88	389.33	4.28	40	9.35	530570	
5/6/15 9:00	8580			392.23	2.88	389.35	4.30	40	9.30	533970	
5/6/15 10:00	8640			392.25	2.88	389.37	4.32	40	9.26	535240	
5/6/15 11:00	8700			392.26	2.88	389.38	4.33	40	9.24	537560	
5/6/15 12:00	8760			392.28	2.88	389.40	4.35	40	9.20	540000	
5/6/15 13:00	8820			392.26	2.88	389.38	4.33	40	9.24	542230	
5/6/15 14:00	8880			392.26	2.88	389.38	4.33	40	9.24	544615	
5/6/15 15:00	8940			392.26	2.88	389.38	4.33	40	9.24	546890	
5/6/15 16:00	9000			392.26	2.88	389.38	4.33	40	9.24	549260	
5/6/15 17:00	9060			392.26	2.88	389.38	4.33	40	9.24	551600	
5/6/15 18:00	9120			392.26	2.88	389.38	4.33	40	9.24	553940	
5/7/15 6:00	9840			392.44	2.88	389.56	4.51	40	8.87	581910	
5/7/15 7:00	9900			392.47	2.88	389.59	4.54	40	8.81	584190	
5/7/15 8:00	9960			392.50	2.88	389.62	4.57	40	8.75	586510	
5/7/15 9:00	10020			392.50	2.88	389.62	4.57	40	8.75	588870	

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5/7/15 10:00	10080			392.53	2.88	389.65	4.60	40	8.70	591160	
5/7/15 11:00	10140			392.55	2.88	389.67	4.62	40	8.66	593490	
5/7/15 12:00	10200			392.55	2.88	389.67	4.62	40	8.66	595810	
5/7/15 13:00	10260			392.55	2.88	389.67	4.62	40	8.66	598156	
5/7/15 14:00	10320			392.55	2.88	389.67	4.62	40	8.66	600600	
5/7/15 15:00	10380			392.55	2.88	389.67	4.62	40	8.66	602832	
5/7/15 16:00	10440			392.55	2.88	389.67	4.62	40	8.66	605254	
5/7/15 17:00	10500			392.57	2.88	389.69	4.64	40	8.62	607585	
5/7/15 18:00	10560			392.57	2.88	389.69	4.64	40	8.62	609915	
5/8/15 6:00	11280			392.73	2.88	389.85	4.80	40	8.33	637645	
5/8/15 7:00	11340			392.74	2.88	389.86	4.81	40	8.32	640075	
5/8/15 8:00	11400			392.75	2.88	389.87	4.82	40	8.30	642405	
5/8/15 9:00	11460			392.77	2.88	389.89	4.84	40	8.26	644730	
5/8/15 10:00	11520			392.78	2.88	389.90	4.85	40	8.25	647058	
5/8/15 11:00	11580			392.79	2.88	389.91	4.86	40	8.23	649388	
5/8/15 12:00	11640			392.80	2.88	389.92	4.87	40	8.21	651715	
5/8/15 13:00	11700			392.81	2.88	389.93	4.88	40	8.20	654040	
5/8/15 14:00	11760			392.82	2.88	389.94	4.89	40	8.18	656370	
5/8/15 15:00	11820			392.82	2.88	389.94	4.89	40	8.18	658698	
5/8/15 16:00	11880			392.84	2.88	389.96	4.91	40	8.15	661020	
5/8/15 17:00	11940			392.85	2.88	389.97	4.92	40	8.13	663345	
5/8/15 18:00	12000			392.87	2.88	389.99	4.94	40	8.10	665670	
5/9/15 6:00	12720			393.03	2.88	390.15	5.10	40	7.84	693560	
5/9/15 7:00	12780			393.05	2.88	390.17	5.12	40	7.81	695885	
5/9/15 8:00	12840			393.05	2.88	390.17	5.12	40	7.81	698212	
5/9/15 9:00	12900			393.07	2.88	390.19	5.14	40	7.78	700535	
5/9/15 10:00	12960			393.08	2.88	390.20	5.15	40	7.77	702855	
5/9/15 11:00	13020			393.10	2.88	390.22	5.17	40	7.74	705180	
5/9/15 12:00	13080			393.10	2.88	390.22	5.17	40	7.74	707510	
5/9/15 13:00	13140			393.10	2.88	390.22	5.17	40	7.74	709835	
5/9/15 14:00	13200			393.10	2.88	390.22	5.17	40	7.74	712168	

TABLE D.1
WMD2010-05B 20-day Constant-Rate Test Manual Data

Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/9/15 15:00	13260			393.10	2.88	390.22	5.17	40	7.74	714500	
5/9/15 16:00	13320			393.11	2.88	390.23	5.18	40	7.72	716828	
5/9/15 17:00	13380			393.11	2.88	390.23	5.18	40	7.72	719155	
5/9/15 18:00	13440			393.14	2.88	390.26	5.21	40	7.68	721485	
5/10/15 6:00	14160			393.29	2.88	390.41	5.36	40	7.46	749435	
5/10/15 7:00	14220			393.30	2.88	390.42	5.37	40	7.45	751760	
5/10/15 8:00	14280			393.32	2.88	390.44	5.39	40	7.42	754090	
5/10/15 9:00	14340			393.32	2.88	390.44	5.39	40	7.42	756415	
5/10/15 10:00	14400			393.33	2.88	390.45	5.40	40	7.41	758740	
5/10/15 11:00	14460			393.33	2.88	390.45	5.40	40	7.41	761065	
5/10/15 12:00	14520			393.34	2.88	390.46	5.41	40	7.39	763390	
5/10/15 13:00	14580			393.35	2.88	390.47	5.42	40	7.38	765720	
5/10/15 14:00	14640			393.36	2.88	390.48	5.43	40	7.37	768055	
5/10/15 15:00	14700			393.37	2.88	390.49	5.44	40	7.35	770375	
5/10/15 16:00	14760			393.38	2.88	390.50	5.45	40	7.34	772690	
5/10/15 17:00	14820			393.39	2.88	390.51	5.46	40	7.33	775070	
5/10/15 18:00	14880			393.40	2.88	390.52	5.47	40	7.31	777410	
5/11/15 6:00	15600			393.40	2.88	390.52	5.47	40	7.31	805300	
5/11/15 7:00	15660			393.54	2.88	390.66	5.61	40	7.13	807610	
5/11/15 8:00	15720			393.55	2.88	390.67	5.62	40	7.12	809910	
5/11/15 9:00	15780			393.56	2.88	390.68	5.63	40	7.10	812220	
5/11/15 10:00	15840			393.56	2.88	390.68	5.63	40	7.10	814530	
5/11/15 11:00	15900			393.57	2.88	390.69	5.64	40	7.09	816650	
5/11/15 12:00	15960			393.57	2.88	390.69	5.64	40	7.09	819125	
5/11/15 13:00	16020			393.58	2.88	390.70	5.65	40	7.08	821510	
5/11/15 14:00	16080			393.57	2.88	390.69	5.64	40	7.09	823820	
5/11/15 14:17	16097			393.57	2.88	390.69	5.64	40	7.09	824440	
5/11/15 15:00	16140			393.58	2.88	390.70	5.65	40	7.08	826150	
5/11/15 16:00	16200			393.59	2.88	390.71	5.66	40	7.07	828465	
5/11/15 17:00	16260			393.60	2.88	390.72	5.67	40	7.05	830805	
5/11/15 18:00	16320			393.61	2.88	390.73	5.68	40	7.04	833145	

TABLE D.1
WMD2010-05B 20-day Constant-Rate Test Manual Data

Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/12/15 6:03	17043			393.78	2.88	390.90	5.85	40	6.84	861055	
5/12/15 7:00	17100			393.79	2.88	390.91	5.86	40	6.83	863240	
5/12/15 8:00	17160			393.80	2.88	390.92	5.87	40	6.81	865570	
5/12/15 9:00	17220			393.81	2.88	390.93	5.88	40	6.80	867810	
5/12/15 10:00	17280			393.81	2.88	390.93	5.88	40	6.80	870140	
5/12/15 11:00	17340			393.82	2.88	390.94	5.89	40	6.79	872480	
5/12/15 12:04	17404			393.81	2.88	390.93	5.88	40	6.80	875000	
5/12/15 13:00	17460			393.81	2.88	390.93	5.88	40	6.80	877125	
5/12/15 14:00	17520			393.83	2.88	390.95	5.90	40	6.78	879350	
5/12/15 15:00	17580			393.83	2.88	390.95	5.90	40	6.78	881700	
5/12/15 16:00	17640			393.84	2.88	390.96	5.91	40	6.77	884040	
5/12/15 17:00	17700			393.84	2.88	390.96	5.91	40	6.77	886380	
5/12/15 18:00	17760			393.85	2.88	390.97	5.92	40	6.76	888720	
5/13/15 6:00	18480			394.01	2.88	391.13	6.08	39	6.41	916570	
5/13/15 7:00	18540			394.03	2.88	391.15	6.10	39	6.39	918825	
5/13/15 8:00	18600			394.05	2.88	391.17	6.12	39	6.37	921130	
5/13/15 9:00	18660			394.05	2.88	391.17	6.12	39	6.37	923410	
5/13/15 10:00	18720			394.05	2.88	391.17	6.12	39	6.37	925775	
5/13/15 11:00	18780			394.04	2.88	391.16	6.11	39	6.38	928100	
5/13/15 12:00	18840			394.03	2.88	391.15	6.10	39	6.39	930335	
5/13/15 14:00	18960			394.02	2.88	391.14	6.09	39	6.40	935030	
5/13/15 15:00	19020			394.01	2.88	391.13	6.08	39	6.41	937360	
5/13/15 16:00	19080			394.03	2.88	391.15	6.10	39	6.39	939675	
5/13/15 17:00	19140			394.03	2.88	391.15	6.10	39	6.39	942015	
5/13/15 18:00	19200			394.04	2.88	391.16	6.11	39	6.38	944355	
5/14/15 6:00	19920			394.21	2.88	391.33	6.28	39	6.21	972020	
5/14/15 7:00	19980			394.24	2.88	391.36	6.31	39	6.18	974365	
5/14/15 8:00	20040			394.25	2.88	391.37	6.32	39	6.17	976655	
5/14/15 9:00	20100			394.25	2.88	391.37	6.32	39	6.17	978975	
5/14/15 10:00	20160			394.26	2.88	391.38	6.33	39	6.16	981255	
5/14/15 11:00	20220			394.25	2.88	391.37	6.32	39	6.17	983600	

TABLE D.1
WMD2010-05B 20-day Constant-Rate Test Manual Data

Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/14/15 12:00	20280			394.25	2.88	391.37	6.32	39	6.17	985900	
5/14/15 13:00	20340			394.24	2.88	391.36	6.31	39	6.18	988210	
5/14/15 14:00	20400			394.22	2.88	391.34	6.29	39	6.20	990520	
5/14/15 15:00	20460			394.20	2.88	391.32	6.27	39	6.22	992800	
5/14/15 16:00	20520			394.21	2.88	391.33	6.28	39	6.21	995080	
5/14/15 17:00	20580			394.21	2.88	391.33	6.28	39	6.21	997360	
5/14/15 18:00	20640			394.22	2.88	391.34	6.29	39	6.20	999640	
5/15/15 6:05	21365			394.39	2.88	391.51	6.46	39	6.04	1027710	
5/15/15 7:00	21420			394.41	2.88	391.53	6.48	39	6.02	1029780	
5/15/15 8:00	21480			394.44	2.88	391.56	6.51	39	5.99	1032105	
5/15/15 9:00	21540			394.44	2.88	391.56	6.51	39	5.99	1034315	
5/15/15 10:00	21600			394.45	2.88	391.57	6.52	39	5.98	1036730	
5/15/15 11:00	21660			394.44	2.88	391.56	6.51	39	5.99	1039040	
5/15/15 12:00	21720			394.22	2.88	391.34	6.29	39	6.20	1041160	
5/15/15 13:00	21780			394.40	2.88	391.52	6.47	39	6.03	1043600	
5/15/15 14:00	21840			394.40	2.88	391.52	6.47	39	6.03		
5/15/15 15:00	21900			394.41	2.88	391.53	6.48	39	6.02	1048200	
5/15/15 16:00	21960			394.41	2.88	391.53	6.48	39	6.02	1050500	
5/15/15 17:00	22020			394.44	2.88	391.56	6.51	39	5.99	1052800	
5/15/15 18:00	22080			394.46	2.88	391.58	6.53	39	5.97	1055100	
5/16/15 6:00	22800			394.64	2.88	391.76	6.71	39	5.81	1082950	
5/16/15 7:00	22860			394.66	2.88	391.78	6.73	39	5.79	1085175	
5/16/15 8:00	22920			394.70	2.88	391.82	6.77	39	5.76	1087575	
5/16/15 9:00	22980			394.71	2.88	391.83	6.78	39	5.75	1089700	
5/16/15 10:00	23040			394.72	2.88	391.84	6.79	39	5.74	1092100	
5/16/15 11:00	23100			394.74	2.88	391.86	6.81	39	5.73	1094300	
5/16/15 12:00	23160			394.73	2.88	391.85	6.80	39	5.74	1096625	
5/16/15 13:00	23220			394.71	2.88	391.83	6.78	39	5.75	1099000	
5/16/15 14:00	23280			394.71	2.88	391.83	6.78	39	5.75	1101800	
5/16/15 15:00	23340			394.69	2.88	391.81	6.76	39	5.77	1103600	
5/16/15 16:00	23400			394.68	2.88	391.80	6.75	39	5.78	1105900	

TABLE D.1
WMD2010-05B 20-day Constant-Rate Test Manual Data

Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/16/15 17:00	23460			394.69	2.88	391.81	6.76	39	5.77	1108700	
5/16/15 18:00	23520			394.71	2.88	391.83	6.78	39	5.75	1110475	
5/17/15 6:00	24240			394.86	2.88	391.98	6.93	39	5.63	1138250	
5/17/15 7:00	24300			394.88	2.88	392.00	6.95	39	5.61	1140600	
5/17/15 8:00	24360			394.92	2.88	392.04	6.99	39	5.58	1142800	
5/17/15 9:00	24420			394.94	2.88	392.06	7.01	39	5.56	1145150	
5/17/15 10:00	24480			394.94	2.88	392.06	7.01	39	5.56	1147350	
5/17/15 11:00	24540			394.94	2.88	392.06	7.01	39	5.56	1149850	
5/17/15 12:00	24600			394.93	2.88	392.05	7.00	39	5.57	1152000	
5/17/15 13:00	24660			394.93	2.88	392.05	7.00	39	5.57	1154350	
5/17/15 14:00	24720			394.91	2.88	392.03	6.98	39	5.59	1156600	
5/17/15 15:00	24780			394.90	2.88	392.02	6.97	39	5.60	1156925	
5/17/15 16:00	24840			394.89	2.88	392.01	6.96	39	5.60	1161250	
5/17/15 17:00	24900			394.90	2.88	392.02	6.97	39	5.60	1163350	
5/17/15 18:00	24960			394.92	2.88	392.04	6.99	39	5.58	1165810	
5/18/15 6:00	25680			395.04	2.88	392.16	7.11	39	5.49	1193475	
5/18/15 7:00	25740			395.07	2.88	392.19	7.14	39	5.46	1195800	
5/18/15 8:00	25800			395.09	2.88	392.21	7.16	39	5.45	1198025	
5/18/15 9:00	25860			395.10	2.88	392.22	7.17	39	5.44	1200310	
5/18/15 10:00	25920			395.11	2.88	392.23	7.18	39	5.43	1202650	
5/18/15 11:00	25980			395.12	2.88	392.24	7.19	39	5.42	1205075	
5/18/15 12:00	26040			395.12	2.88	392.24	7.19	39	5.42	1207250	
5/18/15 13:00	26100			395.10	2.88	392.22	7.17	39	5.44	1209625	
5/18/15 14:00	26160			395.10	2.88	392.22	7.17	39	5.44	1211810	
5/18/15 15:00	26220			395.08	2.88	392.20	7.15	39	5.45	1214100	
5/18/15 16:00	26280			395.07	2.88	392.19	7.14	39	5.46	1216425	
5/18/15 17:00	26340			395.07	2.88	392.19	7.14	39	5.46	1218790	
5/18/15 18:00	26400			395.10	2.88	392.22	7.17	39	5.44	1221850	
5/19/15 6:00	27120			395.24	2.88	392.36	7.31	39	5.34	1248600	
5/19/15 7:00	27180			395.26	2.88	392.38	7.33	39	5.32	1250910	
5/19/15 8:00	27240			395.29	2.88	392.41	7.36	39	5.30	1253250	

TABLE D.1
WMD2010-05B 20-day Constant-Rate Test Manual Data

Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/19/15 9:00	27300			395.30	2.88	392.42	7.37	39	5.29	1255450	
5/19/15 10:00	27360			395.32	2.88	392.44	7.39	39	5.28	1257800	
5/19/15 11:00	27420			395.33	2.88	392.45	7.40	39	5.27	1260075	
5/19/15 12:00	27480			395.34	2.88	392.46	7.41	39	5.26	1262310	
5/19/15 13:00	27540			395.33	2.88	392.45	7.40	39	5.27	1264675	
5/19/15 14:00	27600			395.32	2.88	392.44	7.39	39	5.28	1266990	
5/19/15 15:00	27660			395.30	2.88	392.42	7.37	39	5.29	1269300	
5/19/15 16:00	27720			395.29	2.88	392.41	7.36	39	5.30	1271510	
5/19/15 17:00	27780			395.29	2.88	392.41	7.36	39	5.30	1274290	
5/19/15 18:00	27840			395.30	2.88	392.42	7.37	39	5.29	1276125	
5/20/15 6:00	28560			395.43	2.88	392.55	7.50	39	5.20	1303650	
5/20/15 7:00	28620			395.46	2.88	392.58	7.53	39	5.18	1306090	
5/20/15 8:00	28680			395.47	2.88	392.59	7.54	39	5.17	1308210	
5/20/15 9:00	28740			395.49	2.88	392.61	7.56	39	5.16	1310610	
5/20/15 10:00	28800			395.51	2.88	392.63	7.58	39	5.15	1312900	
5/20/15 11:00	28860			395.53	2.88	392.65	7.60	39	5.13	1315300	
5/20/15 12:00	28920			395.53	2.88	392.65	7.60	39	5.13	1317690	
5/20/15 12:04	28924	1	28924.00	394.25	2.88	391.37	6.32	0		1317700	
5/20/15 12:05	28925	2	14462.50	394.17	2.88	391.29	6.24				
5/20/15 12:06	28926	3	9642.00	394.07	2.88	391.19	6.14				
5/20/15 12:07	28927	4	7231.75	393.98	2.88	391.10	6.05				
5/20/15 12:08	28928	5	5785.60	393.92	2.88	391.04	5.99				
5/20/15 12:09	28929	6	4821.50	393.88	2.88	391.00	5.95				
5/20/15 12:10	28930	7	4132.86	393.85	2.88	390.97	5.92				
5/20/15 12:11	28931	8	3616.37	393.82	2.88	390.94	5.89				
5/20/15 12:12	28932	9	3214.67	393.77	2.88	390.89	5.84				
5/20/15 12:13	28933	10	2893.30	393.74	2.88	390.86	5.81				
5/20/15 12:14	28934	11	2630.36	393.71	2.88	390.83	5.78				
5/20/15 12:15	28935	12	2411.25	393.69	2.88	390.81	5.76				
5/20/15 12:17	28937	14	2066.93	393.66	2.88	390.78	5.73				
5/20/15 12:19	28939	16	1808.69	393.63	2.88	390.75	5.70				

TABLE D.1
WMD2010-05B 20-day Constant-Rate Test Manual Data

Time of Measurement	Time (minutes)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/20/15 12:21	28941	18	1607.83	393.62	2.88	390.74	5.69				
5/20/15 12:23	28943	20	1447.15	393.59	2.88	390.71	5.66				
5/20/15 12:25	28945	22	1315.68	393.57	2.88	390.69	5.64				
5/20/15 12:29	28949	25	1157.96	393.55	2.88	390.67	5.62				
5/20/15 12:34	28954	30	965.13	393.52	2.88	390.64	5.59				
5/20/15 12:39	28959	35	827.40	393.50	2.88	390.62	5.57				
5/20/15 12:49	28969	45	643.76	393.48	2.88	390.60	5.55				
5/20/15 13:04	28984	60	483.07	393.45	2.88	390.57	5.52				
5/20/15 13:19	28999	75	386.65	393.41	2.88	390.53	5.48				
5/26/15 11:00	37500	7856	4.77	392.33	2.88	389.45	4.40				
5/26/15 14:26	37706	8062	4.68	392.21	2.88	389.33	4.28				
5/27/15 16:58	39298	9654	4.07	392.92	3.78	389.14	4.09				
5/28/15 15:05	40625	10981	3.70	392.83	3.78	389.05	4.00				
6/2/15 9:32	47492	17848	2.66	392.45	3.78	388.67	3.62				
6/11/15 13:51	60711	31067	1.95	392.25	3.78	388.47	3.42				
6/18/15 10:10	70570	40926	1.72	392.37	3.78	388.59	3.54			53% Recovered	

TABLE D.2
Observation Well WMD2010-04B Manual Data from WMD2010-05B 20-day Constant-Rate Test

Aquifer Test Data							
Project:	Water Supply Study	**Project Number:**	287052		**SWL (feet bls):**	411.90	
Well Location:	Eads - WMD2010-04B	**Well Number:**	55-912505		**Measuring Point:**	Top of PVC	
Well Diameter:	2.5 inch	**Measured By:**	R. Toomey and M. Lindsey		**Correction (feet):**	2.33	
Pump Setting (feet):	NA - Observation Well	**Pump On Date, Time:**	4/30/15	10:00	**Available Drawdown (feet):**	NA	
Screen Interval (feet):	430-500	**Pump off Date, Time:**	5/20/15	12:03	**Totalizer Start (gal)=**	NA	
How Q Measured:	NA	**Duration of Aquifer Test:**	482 hours		**Totalizer End (gal)=**	NA	

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
4/30/15 10:00	0			414.23	2.33	411.90	0.00				
4/30/15 10:30	30			414.31	2.33	411.98	0.08				
4/30/15 11:15	75			414.35	2.33	412.02	0.12				
4/30/15 12:47	167			414.40	2.33	412.07	0.17				
4/30/15 15:12	312			414.45	2.33	412.12	0.22				
4/30/15 16:40	400			414.50	2.33	412.17	0.27				
4/30/15 18:43	523			414.56	2.33	412.23	0.33				
5/1/15 6:37	1237			414.86	2.33	412.53	0.63				
5/1/15 10:30	1470			414.96	2.33	412.63	0.73				
5/2/15 10:49	2929			415.30	2.33	412.97	1.07				
5/2/15 14:10	3130			415.30	2.33	412.97	1.07				
5/2/15 17:07	3307			415.36	2.33	413.03	1.13				
5/2/15 20:00	3480			415.97	2.33	413.64	1.32				
5/2/15 23:06	3666			416.05	2.33	413.72	1.40				
5/3/15 1:05	3785			415.54	2.33	413.21	1.31				
5/3/15 4:08	3968			416.08	2.33	413.75	1.43				
5/3/15 7:08	4148			415.63	2.33	413.30	1.40				
5/3/15 10:09	4329			415.65	2.33	413.32	1.42				
5/3/15 13:10	4510			416.68	2.33	414.35	1.45				
5/3/15 15:08	4628			415.66	2.33	413.33	1.43				
5/3/15 16:10	4690			416.69	2.33	414.36	1.46				
5/3/15 20:08	4928			416.27	2.33	413.94	1.62				

TABLE D.2
Observation Well WMD2010-04B Manual Data from WMD2010-05B 20-day Constant-Rate Test

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/3/15 23:03	5103			416.36	2.33	414.03	1.71				
5/4/15 2:06	5286			416.38	2.33	414.05	1.73				
5/4/15 5:07	5467			416.44	2.33	414.11	1.79				
5/4/15 8:10	5650			415.96	2.33	413.63	1.73				
5/4/15 11:08	5828			416.00	2.33	413.67	1.77				
5/4/15 14:10	6010			416.00	2.33	413.67	1.77				
5/4/15 17:08	6188			416.02	2.33	413.69	1.79				
5/4/15 20:03	6363			416.67	2.33	414.34	2.02				
5/4/15 23:04	6544			416.72	2.33	414.39	2.07				
5/5/15 2:04	6724			416.72	2.33	414.39	2.07				
5/5/15 5:05	6905			416.76	2.33	414.43	2.11				
5/5/15 8:10	7090			416.17	2.33	413.84	1.94				
5/5/15 11:10	7270			416.20	2.33	413.87	1.97				
5/5/15 14:10	7450			416.22	2.33	413.89	1.99				
5/5/15 17:10	7630			416.22	2.33	413.89	1.99				
5/6/15 6:00	8400			416.41	2.33	414.08	2.18				
5/6/15 9:00	8580			416.44	2.33	414.11	2.21				
5/6/15 12:00	8760			416.46	2.33	414.13	2.23				
5/6/15 14:00	8880			416.48	2.33	414.15	2.25				
5/6/15 17:00	9060			416.56	2.33	414.23	2.33				
5/7/15 6:00	9840			416.70	2.33	414.37	2.47				
5/7/15 9:00	10020			416.73	2.33	414.40	2.50				
5/7/15 12:00	10200			416.76	2.33	414.43	2.53				
5/7/15 15:05	10385			416.90	2.33	414.57	2.67				
5/7/15 18:05	10565			416.98	2.33	414.65	2.75				
5/8/15 6:05	11285			417.10	2.33	414.77	2.87				
5/8/15 9:05	11465			417.13	2.33	414.80	2.90				
5/8/15 10:13	11533			417.00	2.33	414.67	2.77				
5/8/15 12:04	11644			417.01	2.33	414.68	2.78				

TABLE D.2
Observation Well WMD2010-04B Manual Data from WMD2010-05B 20-day Constant-Rate Test

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/8/15 15:05	11825			417.03	2.33	414.70	2.80				
5/8/15 18:00	12000			417.08	2.33	414.75	2.85				
5/9/15 6:04	12724			417.24	2.33	414.91	3.01				
5/9/15 9:05	12905			417.29	2.33	414.96	3.06				
5/9/15 12:05	13085			417.29	2.33	414.96	3.06				
5/9/15 15:05	13265			417.30	2.33	414.97	3.07				
5/9/15 18:00	13440			417.34	2.33	415.01	3.11				
5/10/15 6:04	14164			417.50	2.33	415.17	3.27				
5/10/15 9:00	14340			417.53	2.33	415.20	3.30				
5/10/15 12:00	14520			417.54	2.33	415.21	3.31				
5/10/15 15:00	14700			417.57	2.33	415.24	3.34				
5/10/15 18:00	14880			417.60	2.33	415.27	3.37				
5/11/15 5:55	15595			417.77	2.33	415.44	3.54				
5/11/15 8:55	15775			417.80	2.33	415.47	3.57				
5/11/15 11:55	15955			417.82	2.33	415.49	3.59				
5/11/15 14:52	16132			417.80	2.33	415.47	3.57				
5/11/15 15:07	16147			417.82	2.33	415.49	3.59				
5/11/15 18:07	16327			417.83	2.33	415.50	3.60				
5/12/15 5:57	17037			418.00	2.33	415.67	3.77				
5/12/15 9:04	17224			418.05	2.33	415.72	3.82				
5/12/15 11:56	17396			418.07	2.33	415.74	3.84				
5/12/15 15:04	17584			418.09	2.33	415.76	3.86				
5/12/15 18:04	17764			418.11	2.33	415.78	3.88				
5/13/15 5:55	18475			418.26	2.33	415.93	4.03				
5/13/15 8:55	18655			418.36	2.33	416.03	4.13				
5/13/15 12:05	18845			418.29	2.33	415.96	4.06				
5/13/15 15:05	19025			418.29	2.33	415.96	4.06				
5/13/15 18:00	19200			418.30	2.33	415.97	4.07				
5/14/15 5:50	19910			418.45	2.33	416.12	4.22				

TABLE D.2
Observation Well WMD2010-04B Manual Data from WMD2010-05B 20-day Constant-Rate Test

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/14/15 8:55	20095			418.52	2.33	416.19	4.29				
5/14/15 9:35	20135			418.49	2.33	416.16	4.26				
5/14/15 12:05	20285			418.54	2.33	416.21	4.31				
5/14/15 15:05	20465			418.49	2.33	416.16	4.26				
5/14/15 16:18	20538			418.50	2.33	416.17	4.27				
5/14/15 18:05	20645			418.52	2.33	416.19	4.29				
5/15/15 6:00	21360			418.66	2.33	416.33	4.43				
5/15/15 9:03	21543			418.71	2.33	416.38	4.48				
5/15/15 12:03	21723			418.70	2.33	416.37	4.47				
5/15/15 15:03	21903			418.70	2.33	416.37	4.47				
5/15/15 18:03	22083			418.74	2.33	416.41	4.51				
5/16/15 6:03	22803			418.90	2.33	416.57	4.67				
5/16/15 9:03	22983			418.94	2.33	416.61	4.71				
5/16/15 12:03	23163			418.97	2.33	416.64	4.74				
5/16/15 15:03	23343			418.96	2.33	416.63	4.73				
5/16/15 18:03	23523			418.99	2.33	416.66	4.76				
5/17/15 6:03	24243			418.13	2.33	415.80	4.72				
5/17/15 9:03	24423			418.17	2.33	415.84	4.76				
5/17/15 12:03	24603			419.19	2.33	416.86	4.96				
5/17/15 15:03	24783			419.19	2.33	416.86	4.96				
5/17/15 18:03	24963			419.21	2.33	416.88	4.98				
5/18/15 6:03	25683			419.34	2.33	417.01	5.11				
5/18/15 9:03	25863			419.37	2.33	417.04	5.14				
5/18/15 12:03	26043			419.38	2.33	417.05	5.15				
5/18/15 15:03	26223			419.37	2.33	417.04	5.14				
5/18/15 18:03	26403			419.40	2.33	417.07	5.17				
5/19/15 6:03	27123			419.54	2.33	417.21	5.31				
5/19/15 9:03	27303			419.64	2.33	417.31	5.41				
5/19/15 12:03	27483			419.65	2.33	417.32	5.42				

TABLE D.2
Observation Well WMD2010-04B Manual Data from WMD2010-05B 20-day Constant-Rate Test

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
5/19/15 15:03	27663			419.65	2.33	417.32	5.42				
5/19/15 18:03	27843			419.70	2.33	417.37	5.47				
5/20/15 6:03	28563			419.80	2.33	417.47	5.57				
5/20/15 9:03	28743			419.83	2.33	417.50	5.60				
5/20/15 12:45	28965	42	689.64	419.69	2.33	417.36	5.46			Pump off @ 12:03	
5/20/15 13:42	29022	99	293.15	419.65	2.33	417.32	5.42				
5/26/15 11:00	37500	8577	4.37	418.52	2.33	416.19	4.29				
5/26/15 15:08	37748	8825	4.28	418.64	2.53	416.11	4.21				
5/27/15 17:09	39309	10386	3.78	418.54	2.53	416.01	4.11				
5/28/15 15:27	40647	11724	3.47	418.46	2.53	415.93	4.03				
6/2/15 9:49	47509	18586	2.56	418.28	2.53	415.75	3.85				
6/11/15 13:04	60664	31741	1.91	417.87	2.53	415.34	3.44				
6/18/15 9:40	70540	41617	1.69	417.93	2.53	415.40	3.50			38% Recovered	

TABLE D.3
LADD 635 Step-Rate Test Manual Data

Aquifer Test Data							
Project:	Water Supply Study	**Project Number:**	287052		**SWL (feet bls):**	168.25	
Well Location:	SE Ladd Property	**Well Number:**	55-224635		**Measuring Point:**	Top of PVC	
Well Diameter:	8 inch	**Measured By:**	M. Lindsey		**Correction (feet):**	1.37	
Pump Setting (feet):	469	**Pump On Date, Time:**	7/17/15	7:45	**Available Drawdown (feet):**	300.75	
Screen Interval (feet):	158-490	**Pump off Date, Time:**	7/17/15	13:45	**Totalizer Start (gal)=**	17,300	
How Q Measured:	Flowmeter	**Duration of Aquifer Test:**	6 hr		**Totalizer End (gal)=**	77,550	

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
7:45	0			169.62	1.37	168.25	0.00	0			Step 1
7:46	1			176.04	1.37	174.67	6.42				
7:47	2			175.96	1.37	174.59	6.34				
7:48	3			175.82	1.37	174.45	6.20	100	16.13		
7:49	4			175.79	1.37	174.42	6.17				
7:50	5			175.75	1.37	174.38	6.13				
7:52	7			175.74	1.37	174.37	6.12				
7:54	9			175.76	1.37	174.39	6.14	97	15.80		
7:56	11			175.81	1.37	174.44	6.19				
7:58	13			175.80	1.37	174.43	6.18	97	15.70		
8:01	16			175.81	1.37	174.44	6.19				
8:05	20			175.82	1.37	174.45	6.20	100	16.13		
8:10	25			175.88	1.37	174.51	6.26	97	15.50		
8:15	30			175.87	1.37	174.50	6.25				
8:20	35			175.85	1.37	174.48	6.23	97	15.57	20780	
8:25	40			175.84	1.37	174.47	6.22	97	15.59		
8:35	50			175.87	1.37	174.50	6.25	98	15.68		
8:45	60			175.88	1.37	174.51	6.26	94	15.02	23120	
8:55	70			175.88	1.37	174.51	6.26	98	15.65		
9:05	80			175.88	1.37	174.51	6.26	97	15.50		
9:15	90			175.88	1.37	174.51	6.26	92	14.70	25890	avg: 95 gpm
9:16	91			178.21	1.37	176.84	8.59				Step 2
9:17	92			179.02	1.37	177.65	9.40				
9:18	93			179.10	1.37	177.73	9.48				
9:19	94			179.15	1.37	177.78	9.53	136	14.27		

TABLE D.3
LADD 635 Step-Rate Test Manual Data

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
9:20	95			179.17	1.37	177.80	9.55				
9:22	97			179.17	1.37	177.80	9.55				
9:23	98			179.65	1.37	178.28	10.03	150	14.96		
9:34	99			179.75	1.37	178.38	10.13	150	14.81		
9:25	100			179.76	1.37	178.39	10.14				
9:27	102			179.80	1.37	178.43	10.18				
9:29	104			179.80	1.37	178.43	10.18	150	14.73		
9:32	107			179.82	1.37	178.45	10.20	150	14.71		
9:35	110			179.82	1.37	178.45	10.20				
9:40	115			179.85	1.37	178.48	10.23	145	14.17	29440	
9:45	120			179.86	1.37	178.49	10.24	149	14.55	30180	
9:50	125			179.90	1.37	178.53	10.28	150	14.59	30900	
9:55	130			179.90	1.37	178.53	10.28	148	14.40	31640	
10:05	140			179.90	1.37	178.53	10.28	145	14.11	33090	
10:15	150			179.93	1.37	178.56	10.31	148	14.35	34560	
10:25	160			179.94	1.37	178.57	10.32	149	14.44	36050	
10:40	175			179.97	1.37	178.60	10.35	145	14.01	38220	
10:45	180			179.97	1.37	178.60	10.35	145	14.01	38970	avg: 145 gpm
10:46	181			183.48	1.37	182.11	13.86				Step 3
10:47	182			184.36	1.37	182.99	14.74				
10:48	183			184.52	1.37	183.15	14.90	175	11.74		
10:49	184			184.58	1.37	183.21	14.96	207	13.84		
10:50	185			184.62	1.37	183.25	15.00	211	14.07		
10:52	187			184.45	1.37	183.08	14.83	200	13.49		
10:54	189			184.40	1.37	183.03	14.78	198	13.40		
10:56	191			184.43	1.37	183.06	14.81	202	13.64		
10:58	193			184.45	1.37	183.08	14.83	202	13.62	41510	
11:00	195			184.44	1.37	183.07	14.82			41950	
11:05	200			184.44	1.37	183.07	14.82			42890	
11:10	205			184.45	1.37	183.08	14.83	198	13.35	43880	
11:15	210			184.45	1.37	183.08	14.83	198	13.35	4487	
11:20	225			184.45	1.37	183.08	14.83	198	13.35	45860	
11:25	220			184.47	1.37	183.10	14.85	198	13.33	46850	

TABLE D.3
LADD 635 Step-Rate Test Manual Data

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
11:35	230			184.45	1.37	183.08	14.83	197	13.28	48820	
11:45	240			184.47	1.37	183.10	14.85	197	13.27	50790	
11:55	250			184.47	1.37	183.10	14.85	197	13.27	52760	
12:05	260			184.46	1.37	183.09	14.84	198	13.34	54740	
12:15	270			184.48	1.37	183.11	14.86	197	13.26	56700	avg: 198 gpm
12:16	271			186.25	1.37	184.88	16.63				Step 4
12:17	272			187.09	1.37	185.72	17.47				
12:18	273			187.45	1.37	186.08	17.83				
12:19	274			187.49	1.37	186.12	17.87			57600	
12:20	275			187.49	1.37	186.12	17.87	240	13.43	57840	
12:21	276			187.49	1.37	186.12	17.87	230	12.87	58070	
12:23	278			187.50	1.37	186.13	17.88	235	13.14	58540	
12:25	280			187.49	1.37	186.12	17.87	230	12.87	59000	
12:30	285			187.51	1.37	186.14	17.89	232	12.97	60160	
12:35	290			187.50	1.37	186.13	17.88	232	12.98	61320	
12:40	295			187.49	1.37	186.12	17.87	232	12.98	62480	
12:45	300			187.49	1.37	186.12	17.87	232	12.98	63640	
12:50	305			187.45	1.37	186.08	17.83	230	12.90	64790	
12:55	310			187.46	1.37	186.09	17.84	234	13.12	65960	
13:05	320			187.47	1.37	186.10	17.85	232	13.00	68280	
13:15	330			187.44	1.37	186.07	17.82	231	12.96	70590	
13:25	340			187.45	1.37	186.08	17.83	231	12.96	72900	
13:35	350			187.45	1.37	186.08	17.83	232	13.01	75220	
13:45	360			187.49	1.37	186.12	17.87	233	13.04	77550	avg: 232 gpm
13:46	361	1	361	169.60	1.37	168.23	-0.02			Pump off	
13:47	362	2	181	170.57	1.37	169.20	0.95				
13:48	363	3	121	170.43	1.37	169.06	0.81				

TABLE D.3
LADD 635 Step-Rate Test Manual Data

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
13:49	364	4	91	170.38	1.37	169.01	0.76				
13:50	365	5	73	170.30	1.37	168.93	0.68				
13:51	366	6	61	170.26	1.37	168.89	0.64				
13:52	367	7	52	170.21	1.37	168.84	0.59				
13:54	369	8	46	170.16	1.37	168.79	0.54				
13:56	371	9	41	170.12	1.37	168.75	0.50				
14:00	375	15	25	170.05	1.37	168.68	0.43			98% recovered	

Table D.4
LADD 635 4-day Constant-Rate Test Manual Data

Aquifer Test Data											
Project:	Water Supply Study			**Project Number:**	287052				**SWL (feet bls):**	168.98	
Well Location:	SE Ladd Property			**Well Number:**	55-224635				**Measuring Point:**	Top of PVC	
Well Diameter:	8 inch			**Measured By:**	M. Lindsey				**Correction (feet):**	1.37	
Pump Setting (feet):	469			**Pump On Date, Time:**	7/19/15	07:10			**Available Drawdown (feet):**	300.02	
Screen Interval (feet):	158-490			**Pump off Date, Time:**	7/23/15	07:10			**Totalizer Start (gal)=**	395,570	
How Q Measured:	Flowmeter			**Duration of Aquifer Test:**	96 hrs				**Totalizer End (gal)=**	1,733,470	
Time of Measurement	**Time (min)**	**Recovery Time (t') (minutes)**	**t/t'**	**Sounder reading (feet)**	**Correction (feet)**	**Water level**	**Drawdown**	**Discharge (gpm)**	**Specific Capacity (gpm/ft)**	**Totalizer**	**Remarks**
7:10	0			170.35	1.37	168.98	0.00	0	--	395570	
7:10:30	0.5			182.66	1.37	181.29	12.31				
7:11	1			184.20	1.37	182.83	13.85				
7:11:30	1.5			184.95	1.37	183.58	14.60				
7:12	2			185.33	1.37	183.96	14.98				
7:12:30	2.5			185.55	1.37	184.18	15.20				
7:13	3			185.69	1.37	184.32	15.34				
7:14	4			185.93	1.37	184.56	15.58			396440	
7:15	5			186.05	1.37	184.68	15.70	240	15.29	396680	
7:16	6			186.15	1.37	184.78	15.80	230	14.56	396910	
7:17	7			186.22	1.37	184.85	15.87	230	14.49	397140	
7:18	8			186.30	1.37	184.93	15.95	230	14.42	397370	
7:19	9			186.35	1.37	184.98	16.00	230	14.38	397600	
7:20	10			186.39	1.37	185.02	16.04	230	14.34	397830	
7:22	12			186.47	1.37	185.10	16.12	235	14.58	398300	
7:24	14			186.52	1.37	185.15	16.17	230	14.22	398760	
7:26	16			186.57	1.37	185.20	16.22	235	14.49	399230	
7:28	18			186.61	1.37	185.24	16.26	230	14.15	399690	
7:30	20			186.67	1.37	185.30	16.32	235	14.40	400160	
7:35	25			186.75	1.37	185.38	16.40	232	14.15	401320	
7:40	30			186.81	1.37	185.44	16.46	232	14.09	402480	
7:45	35			186.87	1.37	185.50	16.52	234	14.16	403650	
7:50	40			186.91	1.37	185.54	16.56	232	14.01	404810	
8:00	50			186.99	1.37	185.62	16.64	234	14.06	407150	
8:10	60			187.07	1.37	185.70	16.72	233	13.94	409480	

Table D.4
LADD 635 4-day Constant-Rate Test Manual Data

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
8:20	70			187.09	1.37	185.72	16.74	233	13.92	411810	
8:40	90			187.17	1.37	185.80	16.82	234	13.88	416480	
9:10	120			187.22	1.37	185.85	16.87	234	13.85	423490	
9:40	150			187.23	1.37	185.86	16.88	233	13.82	430490	
10:10	180			187.27	1.37	185.90	16.92	230	13.57	437380	
11:10	240			187.31	1.37	185.94	16.96	238	14.05	451680	
12:10	300			187.33	1.37	185.96	16.98	232	13.65	465590	
13:10	360			187.35	1.37	185.98	17.00	234	13.76	479630	
14:10	420			187.39	1.37	186.02	17.04	231	13.57	493500	
15:10	480			187.39	1.37	186.02	17.04	233	13.64	507450	
16:10	540			187.40	1.37	186.03	17.05	234	13.73	521500	
17:10	600			187.38	1.37	186.01	17.03	231	13.55	535350	
18:10	660			187.39	1.37	186.02	17.04	233	13.69	549350	
6:30	1400			187.58	1.37	186.21	17.23	233	13.52	721750	
7:30	1460			187.59	1.37	186.22	17.24	233	13.49	735700	
8:30	1520			187.59	1.37	186.22	17.24	233	13.49	749650	
9:30	1580			187.59	1.37	186.22	17.24	232	13.47	763580	
10:30	1640			187.62	1.37	186.25	17.27	234	13.53	777600	
11:30	1700			187.62	1.37	186.25	17.27	233	13.51	791600	
12:30	1760			187.58	1.37	186.21	17.23	232	13.45	805500	
13:30	1820			187.60	1.37	186.23	17.25	234	13.57	819550	
14:30	1880			187.61	1.37	186.24	17.26	233	13.47	833500	
15:30	1940			187.61	1.37	186.24	17.26	231	13.37	847350	
16:30	2000			187.64	1.37	186.27	17.29	235	13.61	861470	
17:30	2060			187.64	1.37	186.27	17.29	231	13.36	875330	
18:00	2090			187.64	1.37	186.27	17.29	233	13.50	882330	
6:15	2825			187.79	1.37	186.42	17.44	233	13.33	1053230	
7:00	2870			187.79	1.37	186.42	17.44	234	13.40	1063750	
8:00	2930			187.78	1.37	186.41	17.43	229	13.15	1077500	
9:00	2990			187.81	1.37	186.44	17.46	236	13.54	1091680	
10:00	3050			187.81	1.37	186.44	17.46	231	13.24	1105550	
11:00	3110			187.80	1.37	186.43	17.45	234	13.42	1119600	

Table D.4
LADD 635 4-day Constant-Rate Test Manual Data

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
12:00	3170			187.79	1.37	186.42	17.44	229	13.14	1133350	
13:00	3230			187.78	1.37	186.41	17.43	234	13.43	1147400	
14:00	3290			187.76	1.37	186.39	17.41	233	13.35	1161350	
15:00	3350			187.75	1.37	186.38	17.40	231	13.29	1175220	
16:00	3410			187.77	1.37	186.40	17.42	233	13.36	1189180	
17:00	3470			187.78	1.37	186.41	17.43	232	13.33	1203120	
17:42	3512			187.82	1.37	186.45	17.47	225	12.85	1212550	
6:15	4265			187.93	1.37	186.56	17.58	232	13.21	1387400	
7:00	4310			187.91	1.37	186.54	17.56	228	12.97	1397650	
8:00	4370			187.90	1.37	186.53	17.55	231	13.15	1411500	
9:00	4430			187.92	1.37	186.55	17.57	233	13.28	1425500	
10:00	4490			187.96	1.37	186.59	17.61	235	13.34	1439600	
11:00	4550			187.96	1.37	186.59	17.61	228	12.92	1453250	
12:00	4610			187.95	1.37	186.58	17.60	231	13.13	1467120	
13:00	4670			187.95	1.37	186.58	17.60	232	13.19	1481050	
14:00	4730			187.94	1.37	186.57	17.59	233	13.22	1495000	
15:00	4790			187.95	1.37	186.58	17.60	230	13.07	1508800	
16:00	4850			187.96	1.37	186.59	17.61	233	13.25	1522800	
17:00	4910			187.97	1.37	186.60	17.62	233	13.21	1536770	
17:50	4960			187.97	1.37	186.60	17.62	234	13.26	1548450	
6:15	5705			188.05	1.37	186.68	17.70	231	13.07	1720850	
7:00	5750			188.05	1.37	186.68	17.70	233	13.18	1731350	
7:10	5760			188.04	1.37	186.67	17.69	232	13.09	1733470	
7:10:30	5800.5	0.5	11601	172.01	1.37	170.64	1.66			Pump Off	
7:11	5801	1	5801	170.94	1.37	169.57	0.59				
7:12	5802	2	2901	171.78	1.37	170.41	1.43				
7:13	5803	3	1934	171.67	1.37	170.30	1.32				
7:14	5804	4	1451	171.58	1.37	170.21	1.23				
7:15	5805	5	1161	171.50	1.37	170.13	1.15				
7:16	5806	6	968	171.45	1.37	170.08	1.10				
7:17	5807	7	830	171.41	1.37	170.04	1.06				
7:18	5808	8	726	171.38	1.37	170.01	1.03				

Table D.4
LADD 635 4-day Constant-Rate Test Manual Data

Time of Measurement	Time (min)	Recovery Time (t') (minutes)	t/t'	Sounder reading (feet)	Correction (feet)	Water level	Drawdown	Discharge (gpm)	Specific Capacity (gpm/ft)	Totalizer	Remarks
7:19	5809	9	645	171.35	1.37	169.98	1.00				
7:20	5810	10	581	171.33	1.37	169.96	0.98				
7:21	5811	11	528	171.30	1.37	169.93	0.95				
7:22	5812	12	484	171.28	1.37	169.91	0.93				
7:23	5813	13	447	171.25	1.37	169.88	0.90				
7:25	5815	15	388	171.22	1.37	169.85	0.87				
7:27	5817	17	342	171.18	1.37	169.81	0.83				
7:30	5820	20	291	171.20	1.37	169.83	0.85				
7:35	5825	25	233	171.18	1.37	169.81	0.83				
7:40	5830	30	194	171.15	1.37	169.78	0.80			96% Recovered	

APPENDIX D.2

WMD2010-05B HYDRAULIC TESTING ANALYSIS AND INTERPRETATION

APPENDIX D.2

WMD2010-05B HYDRAULIC TESTING ANALYSIS AND INTERPRETATION

Prepared for:

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February 5, 2016

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1.0 HYDROGEOLOGIC SETTING

Copper Queen Branch (CQB) property north of Don Luis is underlain by bedrock of Precambrian, Paleozoic, and Mesozoic ages (Ransome, 1904, Hayes and Landis 1965, Stegen et. al., 2005). Figure D1 is a geologic map of the bedrock exploration area as mapped by Hayes and Landis (1964). The Precambrian Pinal Schist unconformably underlies or is in fault contact with younger sedimentary rocks. The Paleozoic rocks consist of the Cambrian Bolsa Quartzite and Abrigo Limestone; the Devonian Martin, Mississippian Escabrosa, Pennsylvanian Horquilla Limestones; and the Permian Earp Formation and Colina Limestone. The Precambrian and Paleozoic rocks are intruded by the Jurassic Juniper Flat Granite, a porphyritic, alkali intrusive stock with associated dikes. The Cretaceous Bisbee Group unconformably or structurally contacts the Precambrian, Paleozoic, and Jurassic rocks. The Bisbee Group is made up of the Glance Conglomerate, Morita Formation, Mural Limestone, and Cintura Formation.

The sedimentary bedrock on CQB property is folded and complexly faulted (Ransome, 1904, Stegen et. al, 2005). Large scale open folds are mapped in the Mule Mountains containing the CQB property, but faults are the primary structural feature on CQB property. Northeast and northwest striking faults with normal separation are commonplace and have disrupted the stratigraphy of the Precambrian and Paleozoic bedrock on CQB property across a range of spatial scales. A later generation of northeast faults cuts the Bisbee Group and older rocks. The complexity and pervasive nature of faulting in the bedrock is evident in the mapping of Ransome (1904) and Hayes and Landis (1965). Ransome (1904) identified various structural domains bounded by the major faults.

The Bisbee West and Abrigo fault zones have numerous offshoots and crosscutting faults that may have caused significant fracturing and breakage in the sedimentary rocks they traverse. Bedrock generally has low permeability compared to basin fill unless its permeability is enhanced by secondary structures such as faults, fractures, and/or dissolution features in the case of limestone. The Bolsa Quartzite probably deformed by brittle failure (faulting and fracturing) due to its indurated, siliceous character. The Abrigo Limestone and overlying formations may also be susceptible to brittle failure. Brittle deformation may result in higher permeability, especially in areas of closely spaced faults. The high degree of faulting in the bedrock, particularly along and between the Bisbee West and Abrigo faults may have developed zones of fracturing and breakage in the Bolsa Quartzite and Abrigo Limestone with sufficient hydraulic communication to constitute a reservoir.

The lithologic log for WMD2010-05B notes two fault zones in the Bolsa Quartzite at depth. The lithologic log for WMD2010-04B does not note any significant faulting however, there was

difficulty maintaining an open borehole during drilling operations suggesting the bedrock (Bolsa Quartzite) had undergone brittle deformation at depth. The mirrored curvature in the drawdown curves and nearly instantaneous response in WMD2010-04B to pumping in WMD2010-05B suggests that the two wells are hydraulically connected by highly conductive and connected developed zones of fractured and broken rock.

2.0 WMD2010-05B CONSTANT-RATE TEST ANALYSIS

Drawdown data were input to Aqtesolv Pro (HydroSOLVE Inc., 2007) to estimate aquifer parameters using curve matching techniques for both an unconfined, homogenous aquifer and a fractured bedrock aquifer. Due to the degree of faulting mapped in the bedrock area as well as the faulting and breakage noted in the lithologic logs for WMD2010-04B and WMD2010-05B, it is possible that the degree of fracturing and breakage in the area is so extensive that the reservoir hydrologically behaves as a homogeneous aquifer. Two solutions used for estimation provided feasible results: Theis (1935) for unconfined aquifers and Gringarten-Ramey (1974) for fractured bedrock with horizontal fracturing. The Gringarten-Witherspoon (1972) solution for vertical fracturing was also investigated but the curve was unable to fit the actual data, even when accounting for the no-flow boundaries and therefore is not included in this discussion. Based on the drilling depth and static water level for WMD2010-05B an aquifer thickness of 612 feet was assumed for aquifer parameter estimation. A late-time window of the drawdown during pumping was used to constrain aquifer parameter estimation to reflect long-term responses from the aquifer. Results from Aqtesolv Pro are summarized in Table D.5.

The linear flow plot (Figure D2) of the drawdown data shows a unit-slope line during late time. The unit-slope line is characteristic of a well emplaced between two no-flow boundaries of parallel relation (HydroSOLVE Inc., 2007). No-flow boundary conditions were characterized in Aqtesolv Pro to constrain parameter estimation accordingly. Two different boundary orientations (north-south, and east-west) were qualified based on the geologic cross section (Figure 4) and previous mapping by Hayes and Landis (1964).

The Theis solution for unconfined aquifers was applied to the pumping test data from both wells (Figures D3 and D4), utilizing a set of parallel no-flow boundaries. Transmissivity ranged from 6,158 to 6,726 feet squared per day (ft^2/day), corresponding to hydraulic conductivity of 10.1 to 10.9 feet per day (ft/day).

The Gringarten-Ramey solution for a horizontal fracture was also used to estimate aquifer parameters utilizing data from both the pumping and observation wells. A transmissivity of 217 ft^2/day and corresponding hydraulic conductivity of 0.35 ft/day was estimated when not accounting for the no-flow boundaries and focusing only on horizontal fracture flow (Figure D5). When adding the parallel no-flow boundaries the transmissivity ranged from 508 to 910 ft^2/day, corresponding to hydraulic conductivity of 0.83 to 1.49 ft/day, respectively (Figures D6 and D7).

The Theis curve offers a decent visual fit to the drawdown data in both wells over the duration of the test, although the pumping well data is underestimated for the first 100 minutes and

overestimated from approximately 2,000 to 10,000 minutes, and the observation well data is overestimating aquifer parameters until approximately 20,000 minutes into the test. The Gringarten-Ramey curve is not able to match the early-time data (before 2,000 minutes), showing substantial underestimation of the aquifer parameters, however the fit of the curve improves greatly during late time (after 5,000 minutes). Although the Theis solution appears to show the general trend of the data overall, the Gringarten-Ramey solution has a better fit to the bulk of the data. The change in the goodness-of-fit of the Gringarten-Ramey curve is not apparent between focusing solely on fracture flow (Figure D5) versus accounting for the parallel no-flow boundaries (Figures D6 and D7), however the statistical fit of the line to the actual data improves by an order of magnitude when accounting for the no-flow boundaries.

Residual and parameter statistics are generated by Aqtesolv Pro for each solution used to match the data. The statistical output from Aqtesolv Pro uses a significance level, $\alpha = 0.05$, or 95% $(1-\alpha)$ confidence interval. The residual is the difference between the actual data and the curve used to match it. Residual statistics examine the goodness-of-it of the solution and the corresponding estimated aquifer parameters. The residual statistics for the Gringarten-Ramey solutions used are an order of magnitude better than the Theis solutions (Table D.5). The parallel oriented, no-flow boundaries in conjunction with the Gringarten-Ramey solution offer the lowest residual statistics (the best fit of the curve to the actual data). To test the significance or the precision of the curve's fit to the data, Aqtesolv Pro calculates the t-ratio (parameter estimate divided by the standard error of the estimate). A large t-ratio value is indicative of a more precise estimate of the data. The t-ratio for hydraulic conductivity for the north-south and east-west trending boundaries was 39.42, and 9.439, respectively. Therefore, the best fit of the data is provided by the Gringarten-Ramey solution with horizontal fracturing and north-south trending no-flow boundaries (transmissivity of 508 ft^2/day and a hydraulic conductivity of 0.83 ft/day).

3.0 HYDRAULIC TESTING INTERPRETATION

Bedrock formations in exploration boring WMD-2015-01 were encountered in the expected sequence but not in the same condition as WMD2010-04B or WMD2010-05B. For the duration of drilling the rock was highly competent (slow drill rates and predominantly clean, angular and small sized drill cuttings). Few weathered zones were encountered and even fewer clay intervals. The competence of the rock and lack of evident faulting suggest a low primary permeability which probably led to the low flow conditions experienced during drilling. The static water levels measured in the completed, developed piezometers have a discrepancy of 18.51 feet, indicating Escabrosa Limestone and the Abrigo Limestone are not hydraulically connected at this location. Low water productivity encountered both during drilling and reconnaissance depth-specific sampling at the exploration boring differs from the productivity and hydraulic connectivity observed at and between WMD2010-04B and WMD2010-05B, suggesting that a no-flow boundary is located between the two areas.

The drilling of the bedrock exploration borehole provided formation contact elevations and static water level information further west than previously documented. The extension of the east-west cross-section shows a series of faults and differences in the equipotential surface at the wells along the cross-section. The static water level in WMD-2015-01 is about 150 feet above the static water levels in WMD2010-04B and WMD2010-05B, which are about 230 feet above the static water levels recorded at WMD-2010-02PS. There was no response to WMD2010-05B pumping in WMD2010-02PS, indicating the two sites are not hydraulically connected and offers a potential location of another impermeable boundary between these two locations. This coincides with the drawdown data on the logarithmic plot behaving as flow constrained by two parallel impermeable boundaries. This “channel aquifer” most likely has sealing faults located between WMD-2015-01 and WMD2010-05B and between WMD2010-05B and WMD2010-02PS as indicated by the change in elevation of the equipotential surface.

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TABLE

TABLE D.5
Summary of Hydraulic Testing Results

Pumped Well	Pumping Rate (gpm)	Pumping Time (minutes)	Maximum Drawdown (ft)	b (ft)	Solution Method	No-Flow Boundary Conditons	Estimation Window (minutes)	T (ft^2/day)	S_s	K (ft/day)	Residual Variance (ft^2)	Residual Standard Deviation (ft)	Residual Mean (ft)
WMD2010-05B	38.9	28923	7.60	612	Gringarten-Ramey	NA	3,000-28,000	217	3.2E-06	0.35	0.01413	0.1189	0.008013
					Gringarten-Ramey	N/S Parallel	3,000-28,000	508	2.1E-06	0.83	0.003886	0.06234	0.000803
					Gringarten-Ramey	E/W Parallel	3,000-28,000	911	7.5E-06	1.49	0.004372	0.06612	0.000865
					Theis	N/S Parallel	8,000-28,000	6726	2.6E-07	10.9	0.06258	0.2502	-0.03761
					Theis	E/W Parallel	8,000-28,000	6158	2.3E-06	10.1	0.05809	0.241	-0.03627

Notes:

gpm = gallons per minute

ft = feet

T = Transmissivity

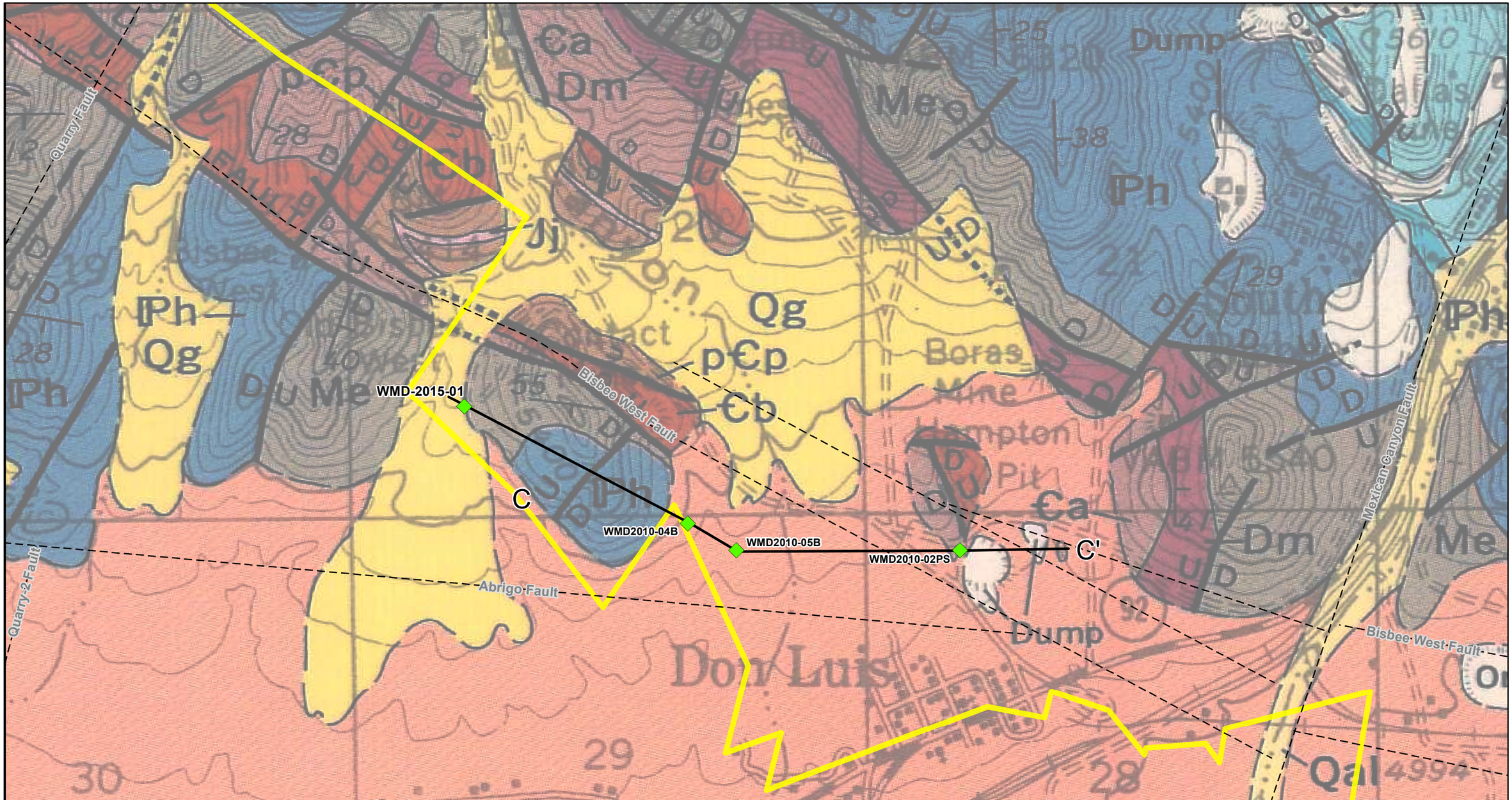
S_s = Specific Storage

b = Assumed aquifer thickness

K = Hydraulic conductivity calculated as T/b

NA = not applicable

FIGURES



Legend

- Groundwater Elevation Contour (ft amsl) (from Golder)
- Monitoring Location
- Faults
- CQB Property Boundary
- Cross Section Line

Area Geology

- Qg - Quaternary Gravel
- QTs - Quaternary Tertiary sediment
- Jj - Juniper Flat Granite
- Pc - Colina Limestone
- PPe - Earp Formation
- Phu, Phm, Phl - Horquilla Limestone
- Me - Escabrosa Limestone
- Dm - Martin Limestone
- Ca - Abrigo Limestone
- Cb - Bolsa Quartzite
- pCp - Pinal Schist

Scale (Feet)

0 1,000 2,000

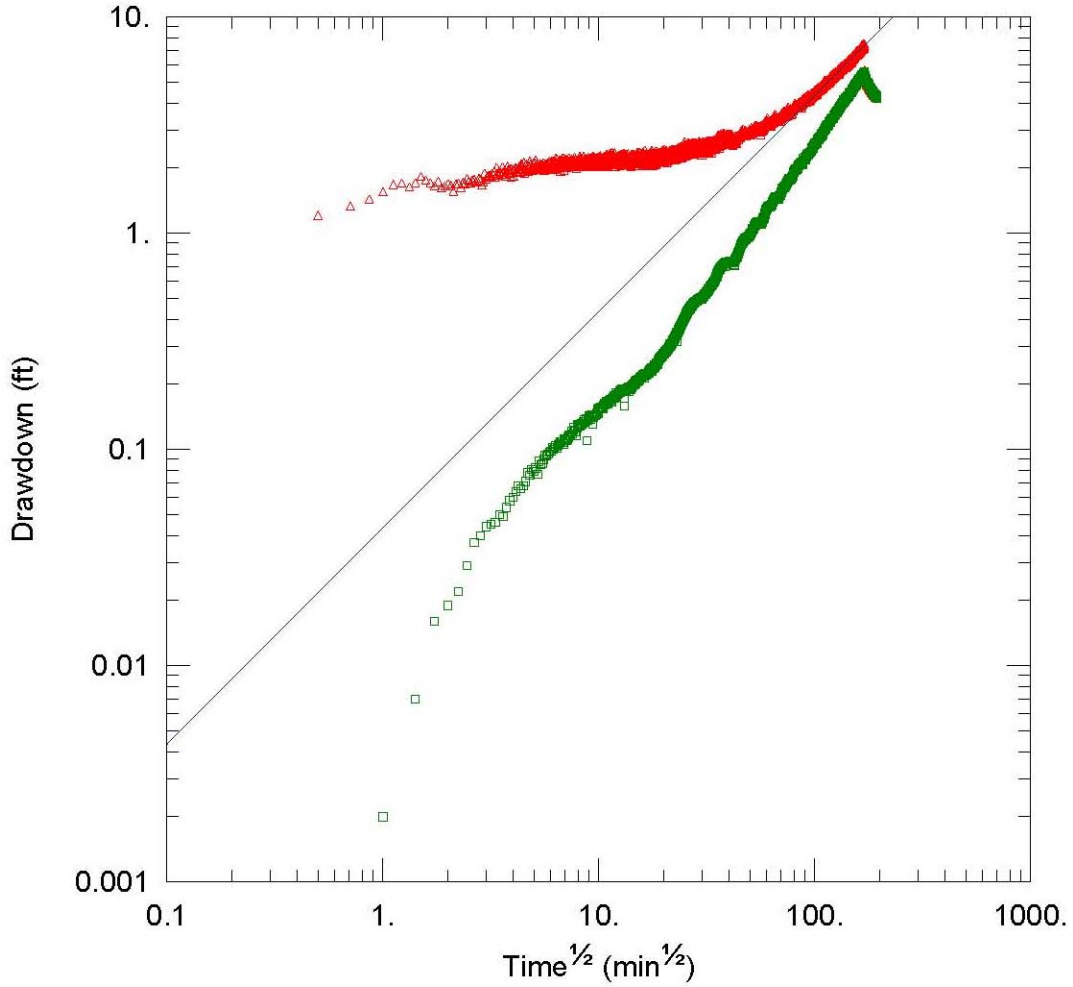
Projection: UTM Zone 12N NAD83
Geology from Hayes and Landis (1964)
USGS Miscellaneous Geologic Investigations I-418

Date: 12/16/15

File ID: 055038-386B

CLEAR CREEK ASSOCIATES

FIGURE D1
Geologic Map



WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
WMD2010-05B	0	0

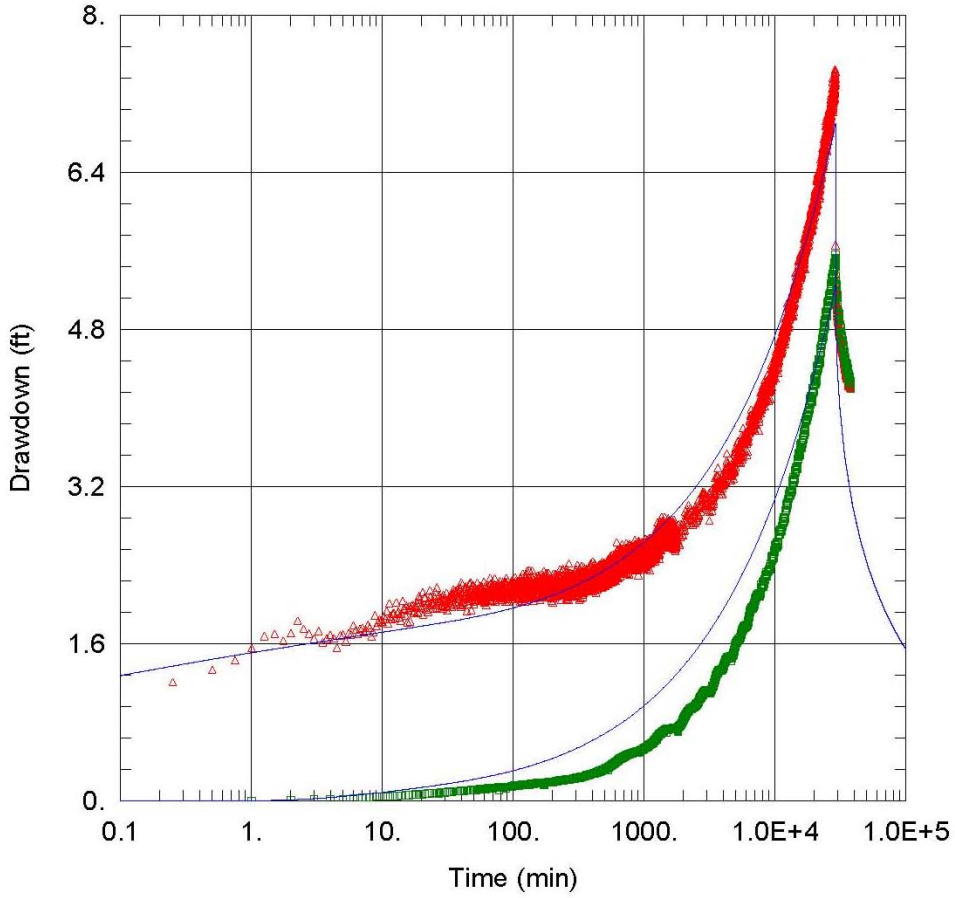
Observation Wells

Well Name	X (ft)	Y (ft)
△ WMD2010-05B	0	0
□ WMD2010-04B	-280	505

Date 12/17/15	File ID

FIGURE D2
WMD2010-05B 20-day
Constant-Rate Test
Linear Flow Plot

CLEAR CREEK ASSOCIATES



WELL TEST ANALYSIS

Data Set: N:\...\homogeneous plus boundaries jrn N-S.aqt
Date: 11/23/15 Time: 15:09:12

PROJECT INFORMATION

Company: Clear Creek
Client: CQB
Project: 287052
Location: Bisbee, AZ
Test Well: WMD2010-05B
Test Date: 4/30/2015

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
WMD2010-05B	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
WMD2010-05B	0	0
WMD2010-04B	-280	505

SOLUTION

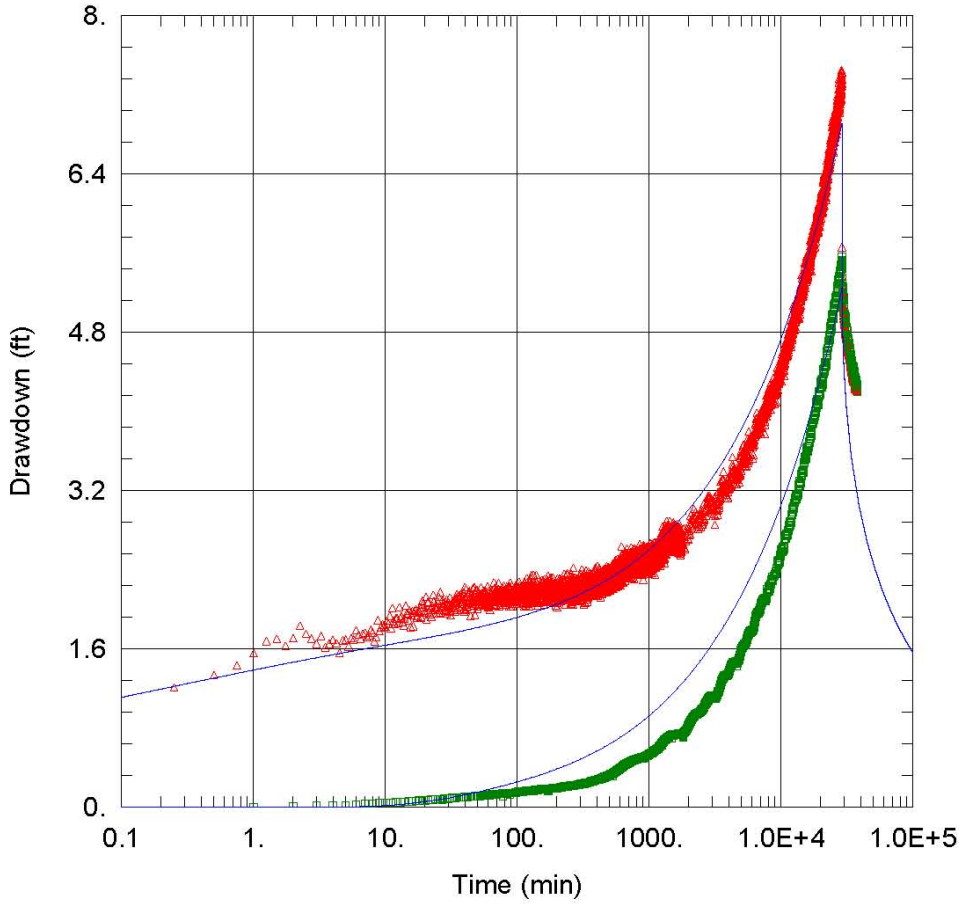
Aquifer Model: Unconfined
Solution Method: Theis

T = 6670.3 ft^2/day
S = 0.0001582
Kz/Kr = 1.
b = 612. ft

Date 12/10/15	File ID

FIGURE D3
Theis Solution
North-South Boundary Conditions

CLEAR CREEK ASSOCIATES



WELL TEST ANALYSIS

Data Set: N:\...\homogeneous plus boundaries E-W.aqt
Date: 11/19/15 Time: 16:22:43

PROJECT INFORMATION

Company: Clear Creek
Client: CQB
Project: 287052
Location: Bisbee, AZ
Test Well: WMD2010-05B
Test Date: 4/30/2015

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
WMD2010-05B	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
△ WMD2010-05B	0	0
□ WMD2010-04B	-280	505

SOLUTION

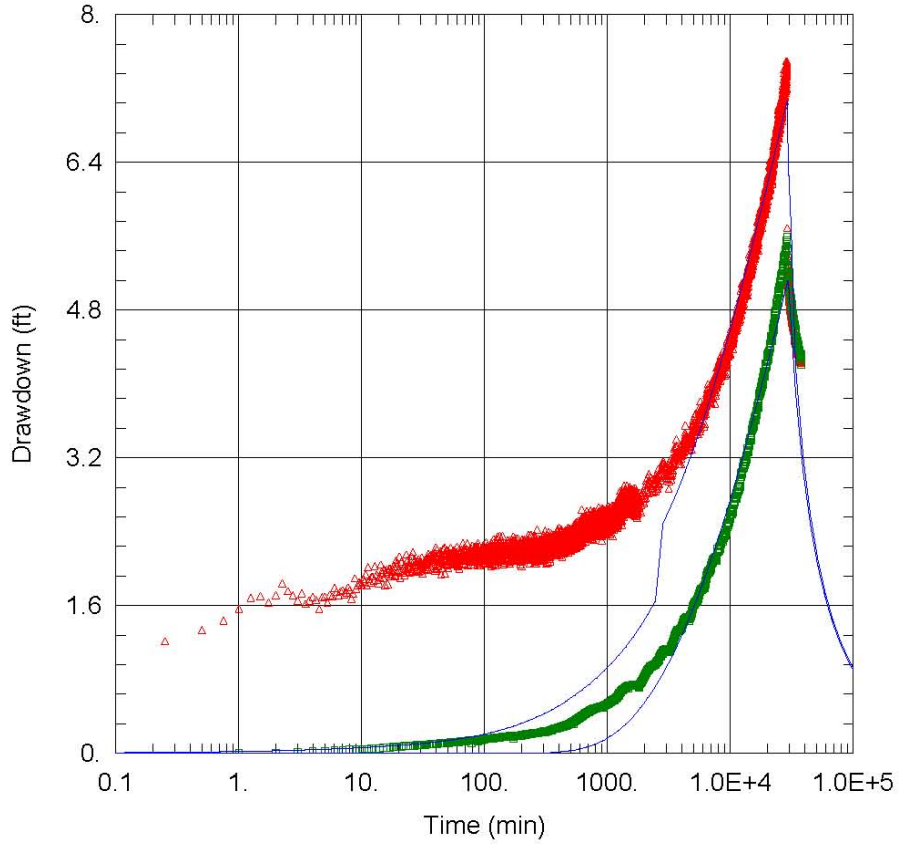
Aquifer Model: Unconfined
Solution Method: Theis

T = 6158.1 ft^2/day
S = 0.001425
Kz/Kr = 1.
b = 612. ft

Date 12/10/15	File ID

FIGURE D4
Theis Solution
East-West Boundary Conditions

CLEAR CREEK ASSOCIATES



WELL TEST ANALYSIS

Data Set: N:\...\All data_gring_all_Parameters.aqt
Date: 12/18/15 Time: 12:14:44

PROJECT INFORMATION

Company: Clear Creek
Client: CQB
Project: 287052
Location: Bisbee, AZ
Test Well: WMD2010-05B
Test Date: 4/30/2015

AQUIFER DATA

Saturated Thickness: 612. ft Fracture Radius: 1320.9 ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
WMD2010-05B	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
△ WMD2010-05B	0	0
▫ WMD2010-04B	-280	505

SOLUTION

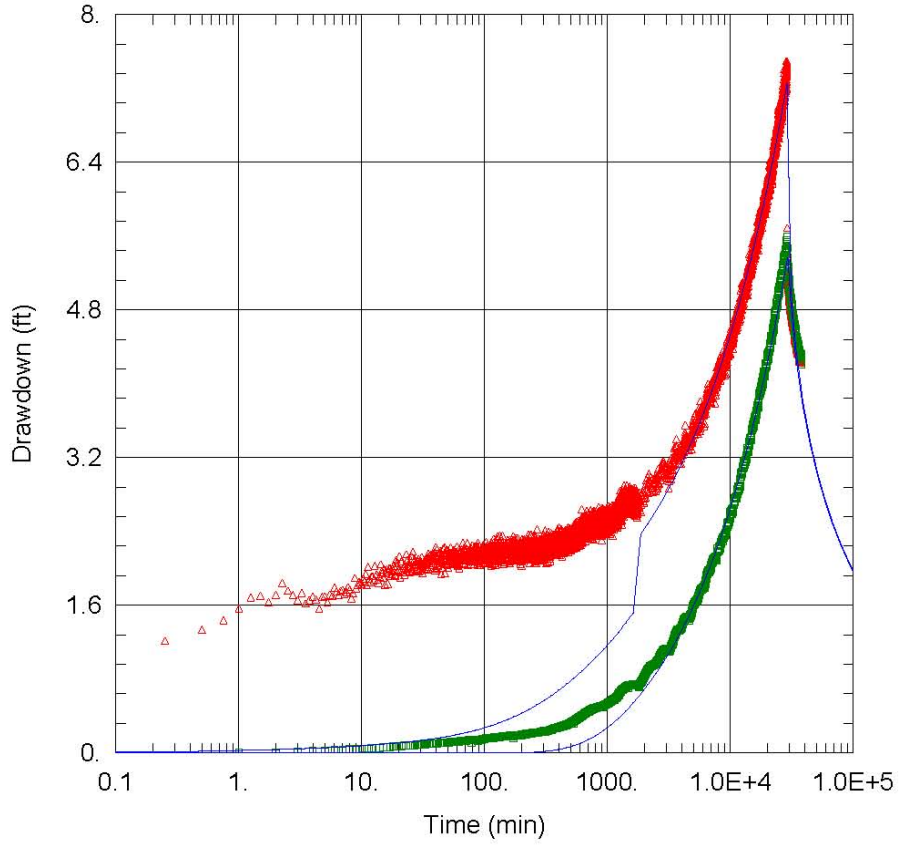
Aquifer Model: Fractured Solution Method: Gringarten (Horizontal)

Kr = 0.3548 ft/day Ss = 3.225E-6 ft^{-1}
Kz/Kr = 1. Rf = 1320.9 ft

Date 12/9/15	File ID

FIGURE D5
Gringarten-Ramey Solution
No Boundary Conditions

CLEAR CREEK ASSOCIATES



WELL TEST ANALYSIS

Data Set: N:\...\All data_gring_NS boundaries.aqt
Date: 12/18/15 Time: 13:04:48

PROJECT INFORMATION

Company: Clear Creek
Client: CQB
Project: 287052
Location: Bisbee, AZ
Test Well: WMD2010-05B
Test Date: 4/30/2015

AQUIFER DATA

Saturated Thickness: 612. ft Fracture Radius: 1360. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
WMD2010-05B	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
△ WMD2010-05B	0	0
□ WMD2010-04B	-280	505

SOLUTION

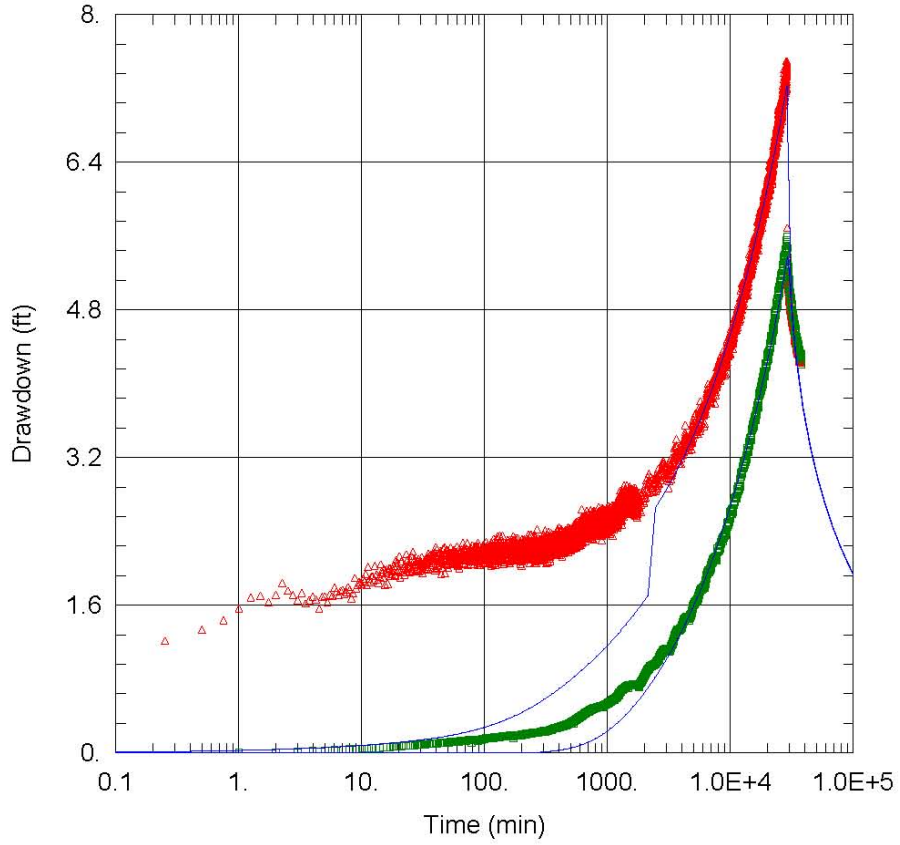
Aquifer Model: Fractured Solution Method: Gringarten (Horizontal)

Kr = 0.8301 ft/day Ss = 2.071E-6 ft^{-1}
Kz/Kr = 0.3709 Rf = 1360. ft

Date 12/18/15	File ID

FIGURE D6
Gringarten-Ramey Solution
North-South Boundary Conditions

CLEAR CREEK ASSOCIATES



WELL TEST ANALYSIS

Data Set: N:\...\All data_gring_EW boundaries.aqt
Date: 12/18/15 Time: 13:09:47

PROJECT INFORMATION

Company: Clear Creek
Client: CQB
Project: 287052
Location: Bisbee, AZ
Test Well: WMD2010-05B
Test Date: 4/30/2015

AQUIFER DATA

Saturated Thickness: 612. ft Fracture Radius: 728.6 ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
WMD2010-05B	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
△ WMD2010-05B	0	0
□ WMD2010-04B	-280	505

SOLUTION

Aquifer Model: Fractured Solution Method: Gringarten (Horizontal)

Kr = 1.487 ft/day Ss = 7.502E-6 ft^{-1}
Kz/Kr = 0.6401 Rf = 728.6 ft

Date 12/18/15	File ID

FIGURE D7
Gringarten-Ramey Solution
East-West Boundary Conditions

CLEAR CREEK ASSOCIATES

APPENDIX E

WMD2010-04B AND WMD2010-05B GEOLOGY AND GEOPHYSICAL LOGS

WARREN MINING DISTRICT APP

WMD2010-04B

GEOLOGY AND GEOPHYSICAL LOGS

WGS 84 UTM ZONE 12 N
GEOID09
SURVEYED COORDINATES
NORTHING 3475390.520 ELEVATION (FT AMSL) 5185.105
EASTING 602195.674

LITHOLOGY & NOTES

0 - 10 Escabrosa Limestone: Light tan gravel, lithics of limestone up to 10 mm, semi-angular to round.

10 - 20 Escabrosa Limestone: Sandy gravel, lithics of limestone up to 5 mm, angular to sub-round.

20 - 30 Escabrosa Limestone: Dark gray limestone, clean, hard.

30 - 40 Escabrosa Limestone: Light gray limestone, hard.

40 - 50 Escabrosa Limestone: Various limestone lithics up to 5 mm, with red fault gauge (clays).

50 - 60 Escabrosa Limestone: Various limestone lithics up to 2 mm, gray, red, and white, angular to sub-round.

60 - 70 Escabrosa Limestone: Medium gray lithics of limestone up to 3 mm, sub-angular to round.

70 - 100 Escabrosa Limestone: Red-brown sandy clay, lithics of limestone.

100 - 110 Escabrosa Limestone: Red clayey sand with limestone lithics.

110 - 120 Escabrosa Limestone: Red-brown clayey sand with limestone lithics.

120 - 130 Escabrosa Limestone: Medium to light gray limestone, lithics up to 2mm, sub-angular to sub-round.

130 - 180 Escabrosa Limestone: Brown clay with limestone lithics up to 1 mm.

180 - 190 Escabrosa Limestone: Light brown clayey sand, lithics of limestone up to 4 mm, angular to sub-round.

190 - 200 Escabrosa Limestone: Brown clay with sand, lithics of limestone up to 4 mm, angular to sub-round.

200 - 210 Escabrosa Limestone: Red-brown sandy clay, lithics of red (possibly altered) limestone up to 3 mm, sub-angular to very round.

210 - 220 Escabrosa Limestone: Reddish-brown sandy clay, lithics of red and gray limestone, sub-angular to sub-round.

220 - 230 Escabrosa Limestone: Light brown clayey sand, lithics of gray and some red limestone, sub-angular to sub-round.

230 - 240 Escabrosa Limestone: Light to medium gray limestone.
Hard to drill, some water.

240 - 270 Escabrosa Limestone: Light to medium gray limestone with 15% red (possibly limestone) lithics, mostly angular to sub-angular.

270 - 300 Escabrosa Limestone: Light gray limestone, granular, hard, angular lithics.

300 - 320 Escabrosa Limestone: Brown clayey sand, lithics of quartz, quartzite, red siltstone, mostly 1 mm size.

320 - 330 Escabrosa Limestone: Clayey sand as above, with some gravel.

330 - 340 Escabrosa Limestone: Clayey sand as above, with no gravel, less clay.

340 - 350 Escabrosa Limestone: Red clayey sand, lithics of red siltstone, mostly 1 mm, very angular.

350 - 360 Bolsa Quartzite: Dark brown sandy gravel, lithics of quartzite.

360 - 370 Bolsa Quartzite: Dark brown sand, lithics of quartzite.

370 - 390 Bolsa Quartzite: Brown gravelly sand, lithics of quartzite.

390 - 400 Bolsa Quartzite: Dark brown sand, lithics of quartzite, angular to round.

AS-BUILT

(0-20) 7 7/8-inch Surface Borehole Sealed with Cement-Bentonite Grout

(20-500) 7 7/8-inch Diameter Borehole

(20-424) Formation Stabilizer

(0-430) 2-inch Schedule 40 Low Carbon Steel Casing

DRILL RATE (FT/HOUR) 0----------200

REACTION TO HCl NONE WEAK MOD STRONG

TELEVIEWER ACOUSTIC IMAGE INTERP OPTICAL IMAGE INTERP

GAMMA LOG (API) 0----------400

CALIPER LOG (INCHES) 0----------30

BOREHOLE No.	WMD2010-04B	TOTAL DEPTH DRILLED	660 FEET			SCALE	AS SHOWN
ADWR REG No.	55-912505	BIT DIAMETER	6-INCH			DATE	11/18/2013
LOCATION	D(23-24)29aba	DRILLING FLUID	AIR			DESIGN	CAP
DRILLING CO	YELLOW JACKET	LOGGED BY	WSH			CHECK	WSH
DRILLING EQUIPMENT	VERSADRILL	DATE STARTED	11/11/2010	DATE FINISHED	11/15/2010	REVIEW	DGA
DRILLING METHOD	AIR HAMMER	COMMENTS	Drillsite Name: DT-05			REV	

TITLE
WARREN MINING DISTRICT APP
WMD2010-04B
GEOLOGY AND GEOPHYSICAL LOGS

FILE WMD2010-04B.dat

PROJECT No. 093-92816

Golder Associates

WARREN MINING DISTRICT APP

WMD2010-04B

GEOLOGY AND GEOPHYSICAL LOGS

WGS 84 UTM ZONE 12 N
GEOID09
SURVEYED COORDINATES
NORTHING 3475390.520 ELEVATION (FT AMSL) 5185.105
EASTING 602195.674

LITHOLOGY & NOTES

400 - 410 Bolsa Quartzite: Red clayey sand, lithics of quartz, quartzite, and siltstone, angular to sub-round.

410 - 430 Bolsa Quartzite: Clayey sand as above, with increase in quartz.

430 - 440 Bolsa Quartzite: Red gravelly sand, lithics of quartzite.

440 - 450 Bolsa Quartzite: Red clayey sand, lithics of quartz and quatzite, sub-angular to round.

450 - 470 Bolsa Quartzite: Sand, lithics of quartzite, angular to sub-round.

470 - 490 Bolsa Quartzite: Gravel, lithics of quartzite up to 20 mm.

490 - 500 Bolsa Quartzite: Gravelly sand, lithics of dark gray/green quartzite, sub-angular to round.

500 - 520 Bolsa Quartzite: Gravelly sand as above, with green siltstone.

520 - 530 Bolsa Quartzite: Gravelly sand, lithics of quartzite, some limonite staining, sub-angular to round.

530 - 630 Bolsa Quartzite: Sandy gravel lithics of quartzite, sub-angular to round, no limonite staining.

630 - 660 Bolsa Quartzite: Gravel, lithics of quartzite up to 20 mm.

11/15/2010 TD = 660 ft bgs.

AS-BUILT

(424-430) Bentonite Pellet seal

(430-500) 2-inch Schedule 40 Low Carbon Steel Screen with 0.045-inch vertical slots

(500) LCS Bottom cap

DRILL RATE (FT/HOUR) 0----200

REACTION TO HCl NONE WEAK MOD STRONG

TELEVIEWER ACOUSTIC IMAGE INTERP | OPTICAL IMAGE INTERP

GAMMA LOG (API) 0----400

CALIPER LOG (INCHES) 0----30

400 450 500 550 600 650

BOREHOLE No.	WMD2010-04B	TOTAL DEPTH DRILLED	660 FEET			SCALE	AS SHOWN
ADWR REG No.	55-912505	BIT DIAMETER	6-INCH			DATE	11/18/2013
LOCATION	D(23-24)29aba	DRILLING FLUID	AIR			DESIGN	CAP
DRILLING CO	YELLOW JACKET	LOGGED BY	WSH			CHECK	WSH
DRILLING EQUIPMENT	VERSADRILL	DATE STARTED	11/11/2010	DATE FINISHED	11/15/2010	REVIEW	DGA
DRILLING METHOD	AIR HAMMER	COMMENTS	Drillsite Name: DT-05			REV	

TITLE
WARREN MINING DISTRICT APP
WMD2010-04B
GEOLOGY AND GEOPHYSICAL LOGS

FILE WMD2010-04B.dat

PROJECT No. 093-92816

Golder Associates

WARREN MINING DISTRICT APP

WMD2010-05B

GEOLOGY AND GEOPHYSICAL LOGS

WGS 84 UTM ZONE 12 N
GEOID09
SURVEYED COORDINATES
NORTHING 3475305.868 ELEVATION (FT AMSL) 5158.276
EASTING 602349.030

LITHOLOGY & NOTES

0 - 83 Alluvium: Light gray, predominately sub-angular to round limestone up to 40 mm, sand and fines increasing with depth, carbonate cementation.
11/17/2010 15:00 Started drilling 16-inch surface borehole to 10 ft.
11/19/2010 07:00 Started drilling 16-inch hole to 41 ft, set 40 ft of 12-inch conductor casing.
11/20/2010 07:00 Drilled 9 5/8-inch stratex to 70 ft and set 70 ft of temporary casing to keep hole open.

40 - 60 Abrigo Limestone: Limestone and alluvium, as above, with very little fines, increased roundness of limestone gravels.

60 - 70 Abrigo Limestone: Limestone and alluvium, as above, with some cherty limestone fragments and cemented conglomerate-like gravels present.

70 - 80 Abrigo Limestone: Dark gray, gray, and white limestone, sub-angular fragments up to 8 mm, white quartz present.
11/20/2010 08:30 Begin drilling 6.25-inch borehole, reverse air.

80 - 90 Abrigo Limestone: Maroon limestone and calcareous sandstone, sub-angular, quartz present, granular granitic intrusive with mineralization.
11/21/2010 07:45 Resume drilling 6.25-inch borehole.

90 - 100 Abrigo Limestone: Limestone and sandstone as above, increased intrusive with hematitic alteration.

100 - 110 Abrigo Limestone: Limestone and sandstone as above, no visible intrusive, increased fine-grained sandstone.
Deviation survey = 1 degree.

110 - 130 Abrigo Limestone: Brown limestone and sandstone, as above.

130 - 140 Abrigo Limestone: Tan limestone and sandstone, mostly very fine-grained, calcareous sandstone.

140 - 170 Abrigo Limestone: Reddish-brown sandstone, very fine-grained, calcareous, with shale interbeds, quartz veins present, very fissile.

170 - 180 Abrigo Limestone: Sandstone as above, some fracture surfaces present.

180 - 220 Abrigo Limestone: Sandstone as above, fissile, calcareous, very fine-grained, some thin shale, trace quartz.
Deviation survey = 1 degree at 200 ft.

220 - 240 Abrigo Limestone: Brown, calcareous sandy shale and sandstone, trace quartz, moderately fissile.

240 - 260 Abrigo Limestone: Reddish-brown shale and sandstone, as above.

260 - 280 Abrigo Limestone: Shale and sandstone as above, less quartz.

280 - 310 Abrigo Limestone: Brown sandstone, calcareous, fine-grained sandstone with some sandy calcareous shale interbeds, sub-angular to sub-round fragments.
Deviation survey = 1.5 degrees at 300 ft.

310 - 330 Abrigo Limestone: Grayish-brown sandstone, as above.

330 - 350 Abrigo Limestone: Limestone and mudstone; dark gray, angular to sub-angular, clean limestone; reddish-brown mudstone; trace reddish-brown sandstone.

350 - 360 Abrigo Limestone: Grayish-brown limestone and mudstone, as above, with brownish mineralization in fractures.

360 - 370 Abrigo Limestone: Reddish-brown limestone and mudstone, as above.

370 - 380 Abrigo Limestone: Reddish-brown shale, calcareous, sandy shale, massive, some sandstone present.

380 - 390 Abrigo Limestone: Shale as above, with calcite veins and crystals present.

390 - 400 Abrigo Limestone: Shale as above, no calcite veins or crystals visible.

AS-BUILT

(0-40) 12-inch LCS Surface Casing Sealed in 16-inch Borehole with Neat Cement

(40-880) 7 7/8-inch Diameter Borehole

(0-403) 5-inch LCS Blank Well Casing (0.250-inch wall)

DRILL RATE (FT/HOUR) 0----------200

REACTION TO HCl NONE WEAK MOD STRONG

TELEVIEWER ACOUSTIC IMAGE INTERP OPTICAL IMAGE INTERP

GAMMA LOG (API) 0----------300

CALIPER LOG (INCHES) 0----------18

0 50 100 150 200 250 300 350 400

BOREHOLE No.	WMD2010-05B	TOTAL DEPTH DRILLED	1,000 FEET			SCALE	AS SHOWN	TITLE	
ADWR REG No.	55-912722	BIT DIAMETER	6 1/4-INCH			DATE	11/18/2013	WARREN MINING DISTRICT APP WMD2010-05B GEOLOGY AND GEOPHYSICAL LOGS	
LOCATION	D(23-24)29aab	DRILLING FLUID	AIR, WATER			DESIGN	CAP		
DRILLING CO	YELLOW JACKET	LOGGED BY	RD, WSH			CHECK	WSH		
DRILLING EQUIPMENT	VERSADRILL	DATE STARTED	11/17/2010	DATE FINISHED	12/2/2010	REVIEW	DGA	FILE WMD2010-05B.dat	Golder Associates
DRILLING METHOD	REVERSE CIRCULATION	COMMENTS	Drillsite Name: DT-27			REV		PROJECT No. 093-92816	

WARREN MINING DISTRICT APP

WMD2010-05B

GEOLOGY AND GEOPHYSICAL LOGS

WGS 84 UTM ZONE 12 N
GEOID09
SURVEYED COORDINATES
NORTHING 3475305.868 ELEVATION (FT AMSL) 5158.276
EASTING 602349.030

LITHOLOGY & NOTES

400 - 410 Abrigo Limestone: Gray, clean limestone; reddish-brown fine-grained, calcareous sandstone.
Deviation survey = 0.5 degrees.

410 - 420 Abrigo Limestone: Reddish-brown shale, sandy texture, calcareous.

420 - 430 Abrigo Limestone: Gray, clean limestone; reddish-brown fine-grained, calcareous sandstone.

430 - 440 Abrigo Limestone: Limestone and sandstone as above, many weathered and mineralized fracture surfaces.

440 - 450 Abrigo Limestone: Limestone and sandstone as above, less fracture surfaces.

450 - 460 Abrigo Limestone: Reddish-brown limestone and sandstone, as above, trace fractures.

460 - 470 Abrigo Limestone: Dark gray limestone and sandstone, as above, mostly limestone with small amount of sandstone.

470 - 480 Abrigo Limestone: Reddish-brown sandstone, very fine-grained sandstone up to 10 mm, angular to sub-angular, quartz (white) rich fragments with fractures.

480 - 490 Abrigo Limestone: Clean, gray limestone, angular to sub-angular; reddish sandstone, fine-grained.

490 - 500 Abrigo Limestone: Reddish-brown and dark gray sandstone, fine-grained, altered, black mineralization, possible intrusion.

500 - 550 Abrigo Limestone: Reddish-brown shale and sandstone, sandy texture shale, very fine-grained sandstone, both calcareous.
Deviation survey = 1.5 degrees at 500 ft.

550 - 560 Abrigo Limestone: Shale and sandstone as above, some quartz.

560 - 570 Abrigo Limestone: Brown shale and sandstone, as above, trace quartz.

570 - 600 Abrigo Limestone: Reddish-brown shale and sandstone, as above, increased shale.

600 - 610 Bolsa Quartzite: Greenish-gray quartzite, fine-grained, clean, some quartz veins and brown mineralization.
Deviation survey = 3.5 degrees at 600 ft.
11/22/2010 Resume drilling.
Static water level = 404.85 ft bgs. Discharge is approximately 8 gpm.

610 - 620 Bolsa Quartzite: Quartzite as above, increased reddish iron oxide mineralization on fracture surfaces.

620 - 630 Bolsa Quartzite: Reddish-brown and gray quartzite, as above, increased reddish alteration and quartz content.

630 - 640 Bolsa Quartzite: Reddish-brown and gray quartzite, increased white quartz fragments.

640 - 650 Bolsa Quartzite: Reddish-brown and tan quartzite, mixed colors, some black spotted mineralization on fracture surfaces.

650 - 660 Bolsa Quartzite: Reddish-brown and tan quartzite, less mineralization, mostly non-fractured surfaces.

660 - 670 Bolsa Quartzite: Pink/buff quartzite, medium-grained, increased quartz content, very clean quartz, well indurated.

670 - 680 Bolsa Quartzite: Pink/buff quartzite, fragments up to 10 mm.

680 - 690 Bolsa Quartzite: Pink/buff quartzite, increased reddish alteration.

690 - 710 Bolsa Quartzite: Pink/buff quartzite, very little alteration, very clean, few fracture surfaces.
Deviation survey = 3.5 degrees at 700 ft.

710 - 720 Bolsa Quartzite: Darker pink quartzite, increased reddish brown mineralization on fragment surfaces.

720 - 740 Fault Zone: Dark red, quartzite, sandstone, mudstone, and sericite, schist present, very little fines (silt).

740 - 750 Fault Zone: Quartzite as above, with gray limestone and red/gray chert present.

750 - 760 Bolsa Quartzite: Medium-grained quartzite, altered, reddish mineralization, dark gray hematite, white quartz veins.
Discharge is approximately 60 gpm.

760 - 770 Bolsa Quartzite: Dark red and brown quartzite, less quartz present.

AS-BUILT

(0-880) Naturally Developed Filter Pack

(403-866) 5-inch LCS Screen with 0.125-inch Vertical Double Mill Slots

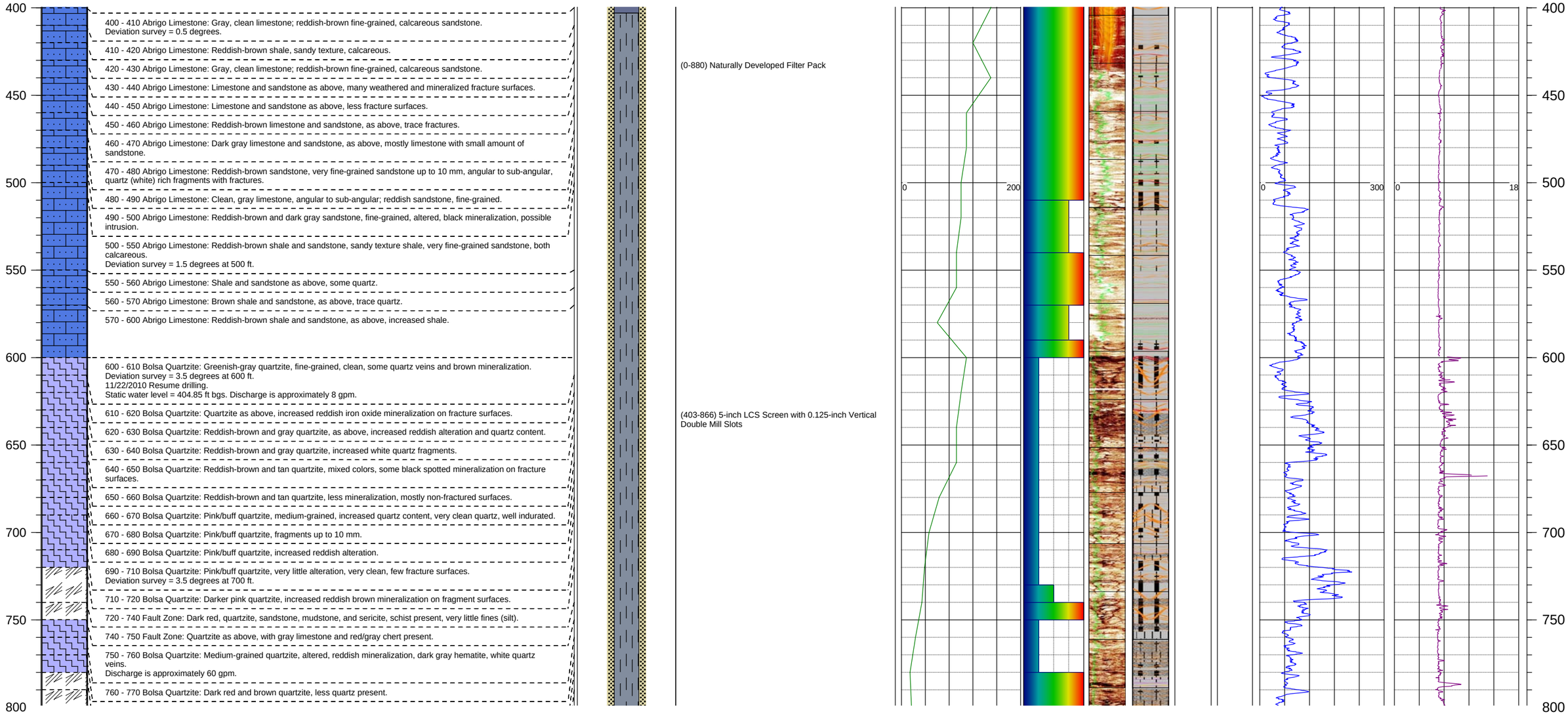
DRILL RATE (FT/HOUR) 0----200

REACTION TO HCl NONE WEAK MOD STRONG

TELEVIEWER ACOUSTIC IMAGE INTERP | OPTICAL IMAGE INTERP

GAMMA LOG (API) 0----300

CALIPER LOG (INCHES) 0----18



BOREHOLE No.	WMD2010-05B	TOTAL DEPTH DRILLED	1,000 FEET			SCALE	AS SHOWN	TITLE	
ADWR REG No.	55-912722	BIT DIAMETER	6 1/4-INCH			DATE	11/18/2013	WARREN MINING DISTRICT APP WMD2010-05B GEOLOGY AND GEOPHYSICAL LOGS	
LOCATION	D(23-24)29aab	DRILLING FLUID	AIR, WATER			DESIGN	CAP		
DRILLING CO	YELLOW JACKET	LOGGED BY	RD, WSH			CHECK	WSH		
DRILLING EQUIPMENT	VERSADRILL	DATE STARTED	11/17/2010	DATE FINISHED	12/2/2010	REVIEW	DGA	FILE WMD2010-05B.dat	Golder Associates
DRILLING METHOD	REVERSE CIRCULATION	COMMENTS	Drillsite Name: DT-27			REV		PROJECT No. 093-92816	

WARREN MINING DISTRICT APP

WMD2010-05B

GEOLOGY AND GEOPHYSICAL LOGS

WGS 84 UTM ZONE 12 N
GEOID09
SURVEYED COORDINATES
NORTHING 3475305.868 ELEVATION (FT AMSL) 5158.276
EASTING 602349.030

LITHOLOGY & NOTES

770 - 780 Bolsa Quartzite: Yellowish-brown quartzite, increased brown weathering.

780 - 790 Fault Zone: Yellowish-brown, white, and gray, quartzite, sandstone, mudstone, limestone, and chert fragments present.

790 - 800 Fault Zone: Reddish-brown and gray quartzite, as above, with sericite schist.

800 - 810 Fault Zone: Quartzite with limestone, chert, siltstone, and limonite staining.

810 - 840 Bolsa Quartzite: Red and whitequartzite, medium-grained, with very little limonite staining.

840 - 850 Bolsa Quartzite: Yellow and red quartzite, quartz fragments with lots of limonite staining.

850 - 860 Bolsa Quartzite: Quartzite as above.
More water.

860 - 870 Bolsa Quartzite: Red and white quartzite, medium-grained, some limonite stains.
Fault zone.

870 - 880 Bolsa Quartzite: Red and green quartzite, as above with a few fragments of andesitic rocks altered to glaugonite, course grained quartzite with some large white quartz (basal Bolsa).
Fault zone.

880 - 940 Bolsa Quartzite: Green quartzite, as above with much more andesitic altered glauconite.
Andesite dike at 880 ft.

940 - 970 Bolsa Quartzite: Quartzite, fragments of white quartz, some altered andesitics.

970 - 1000 Bolsa Quartzite: Lithics of white quartz, schist, and quartzite.
Basal Bolsa at 970.

12/2/2010 TD = 1,000 ft bgs.

AS-BUILT

(866) LCS End Cap

(880) 5 7/8-inch Diameter Borehole

(880-1,000) Sloughed Native Material

DRILL RATE (FT/HOUR) 0----------200

REACTION TO HCl NONE, WEAK, MOD, STRONG

TELEVIEWER ACOUSTIC IMAGE, ACOUSTIC INTERP, OPTICAL IMAGE, OPTICAL INTERP

GAMMA LOG (API) 0----------300

CALIPER LOG (INCHES) 0----------18

800 850 900 950 1000

BOREHOLE No.	WMD2010-05B	TOTAL DEPTH DRILLED	1,000 FEET			SCALE	AS SHOWN
ADWR REG No.	55-912722	BIT DIAMETER	6 1/4-INCH			DATE	11/18/2013
LOCATION	D(23-24)29aab	DRILLING FLUID	AIR, WATER			DESIGN	CAP
DRILLING CO	YELLOW JACKET	LOGGED BY	RD, WSH			CHECK	WSH
DRILLING EQUIPMENT	VERSADRILL	DATE STARTED	11/17/2010	DATE FINISHED	12/2/2010	REVIEW	DGA
DRILLING METHOD	REVERSE CIRCULATION	COMMENTS	Drillsite Name: DT-27			REV	

TITLE
WARREN MINING DISTRICT APP
WMD2010-05B
GEOLOGY AND GEOPHYSICAL LOGS

FILE WMD2010-05B.dat

PROJECT No. 093-92816

Golder Associates