FREEPORT-McMoRan
Sierrita Operations
Environment, Land & Water Department
6200 W Duval Mine Road
PO Box 527
Green Valley, AZ 85622-0527

January 23, 2015

Via Certified Mail # 7013 1090 0000 3213 4141
Return Receipt Requested

Ms. Danielle Taber
Project Manager
Voluntary Remediation Program
Arizona Department of Environmental Quality
1110 W. Washington St.
Phoenix, AZ 85007

Re: Response to Comments, Voluntary Remediation Program Data Gaps Work Plan, Freeport-McMoRan Sierrita Mine Green Valley, Arizona; Site Code: 100073-03

Dear Ms. Taber:

This letter has been prepared in response to the Arizona Department Environmental Quality (ADEQ) December 24, 2014 letter (Letter) regarding Freeport-McMoRan Sierrita Inc.'s (Sierrita) Voluntary Remediation Program Data Gaps Work Plan (Work Plan) submitted to ADEQ in November 2014. Comments from the Letter are reproduced below in italics, followed by Sierrita's response to each comment. Sierrita proposes to revise the Work Plan to address comments made by ADEQ. Concurrence from ADEQ on the proposed revisions is requested prior to submitting the revised Work Plan to streamline future review and approval process.

Required Information

1. *Any work plan submitted to the VRP is required to be developed in accordance with A.R.S. § 49-175. As this Work Plan is limited in scope to address data gaps only and will be conducted over a relatively short timeframe, the VRP is waiving the requirements cited in A.R.S. § 49-175 in accordance with A.R.S. § 49-175(C), except the following:*
    - *A.R.S. § 49-175A.4 – Schedule for submission of progress reports.*
    - *A.R.S. § 49-175A.5 – A proposal for community involvement as prescribed by A.R.S. § 49-176*
    - *A.R.S. § 49-175A.8 – A list of any permits or legal requirements known to apply to the work.*
    - *A.R.S. § 49-175B – Discussion that remediation levels or controls for remediation conducted pursuant to A.R.S. Title 49 shall be established in accordance with rules adopted pursuant to A.R.S. § 49-282.06 unless one or more of the following applies: see A.R.S. § 49-175B.1 through A.R.S. § 49-175B.4.*
        - *Please note that this requirement was discussed during the November 20, 2014 meeting. The VRP clarified that, while the VRP recognizes that it is not the only regulatory program applicable to the site, providing draft screening levels for soil and groundwater that are based upon other regulatory entities, active permits,*

mitigation orders, and Arizona statue and code would allow the VRP to review submitted data in a comprehensive manner; hence, the VRP would be able to provide guidance on remedial action and closure under the VRP for the same constituents that would not conflict or contradict what has been established elsewhere for the site.

Sierrita Response:

Sierrita acknowledges that ADEQ waives A.R.S. § 49-175 in accordance with A.R.S. § 49-175(C), with the exception of those items listed above. Sierrita intends to include the following information in a revised Work Plan to complete the required information.

1. Schedule for Submission of Progress Reports

   The field activities, starting with pre-mobilization, are estimated to begin 60 days following ADEQ's review and approval of the Work Plan. Sierrita will provide ADEQ with an interim project update 30 days after validated data is received for the first round of monitoring. A draft report will be submitted to ADEQ 90 days after receipt of all validated data.

2. Community Involvement Proposal

   In accordance with A.R.S. § 49-176, Sierrita will provide to the public reasonable notice and information regarding the investigation. Sierrita will follow requirements of A.R.S. § 49-176 including:

   - Identify a primary contact and phone number
   - Provide general public notice
   - Establish a document repository

   The primary contacts for this VRP project will be:

   Stuart Brown
   Freeport-McMoRan Inc.
   333 N Central Ave
   Phoenix, AZ 85004
   Telephone: (602)448-0972

   and

   Danielle Taber
   Arizona Department of Environmental Quality
   1110 W Washington St
   Phoenix, AZ 85007
   Telephone: (602) 771-4414

   Sierrita anticipates providing public notice through local media (e.g., newspaper) and through existing forums, such as the Green Valley Community Coordinating Council's Environment Committee monthly meetings.

To fulfill Sierrita's obligation to maintain a record of materials and to make certain records are available to the public, Sierrita will maintain a document repository at Joyner-Green Valley Branch Library in Green Valley. The project filing structure will parallel the flow of the planning and investigation process. The repository will contain all documents and information required to be prepared or maintained by the VRP. The document repository at the Joyner-Green Valley Branch Library is accessible during normal business hours.

Sierrita will also maintain the internet web site make available published documents in PDF format. The web site is: http://www.fcx.com/sierrita/program.htm

3. Permits and Legal Requirements

Sierrita will obtain all necessary permits and abide by all legal requirements relevant and applicable to the Work Plan. This may include, but is not limited to the following:

- Use of Arizona-registered land surveyors
- Use of Arizona-registered drillers
- Use of Arizona-licensed laboratories (see the Quality Assurance Project Plan for additional guidelines on laboratory requirements)
- Utility clearance in accordance with state laws
- Drilling and well construction in accordance with Arizona Department of Water Resources (ADWR) guidelines and under and ADWR-approved permit
- Investigative derived waste storage, transport, and disposal in accordance with legal requirements
- Transportation or shipment of samples in accordance with DOT and/or FAA rules
- Sierrita will comply with Best Management Practices (BMP) as outlined in the SWPPP

4. Remediation Levels

Sierrita proposes the following language to be added to the Work Plan to address the requirements of A.R.S. § 49-175(B).(4) as stated:

At this stage of the investigation, there is no indication that any source to be addressed in the VRP action will cause or contribute to an exceedance of an aquifer water quality standard beyond the boundary of the facility where the source is located. Consequently, Sierrita has not identified any source for which remediation levels or controls may need to be established in order to meet the requirements of A.R.S. § 49-175B.4. During the course of the investigation, Sierrita will continue to evaluate whether any remediation levels or controls will need to be established to meet the requirements of A.R.S. § 49-175(B).(4). For a constituent of concern in groundwater for which there is no aquifer water quality standard, Sierrita will discuss with ADEQ and propose remediation levels consistent with A.R.S. § 49-282.06, background levels, and the principles of A.R.S. § 49-175(B)(4). In this regard, there are no drinking water sources within the Sierrita facility boundary.

During the course of the investigation, Sierrita will continue to evaluate whether any remediation levels or controls will need to be established to meet the requirements of A.R.S. § 49-175(B).(4) or whether the results of the investigation support a conclusion that no source will cause or contribute to an exceedance of an aquifer water quality standard beyond the boundary of the facility where the source is located, such that A.R.S. § 49-175(B).(4) will be satisfied without any need to establish any remediation levels or controls under the VRP program. The same approach will be taken with regard to any constituent for which no aquifer water quality standard has been set.

Following the receipt of all validated data, a report will be submitted to ADEQ within 90 days with the results of the investigation. This report will provide recommended remediation levels, if needed, for groundwater and locations where compliance with those remediation levels are to be measured in groundwater. In addition to aquifer water quality standards, remediation levels may consider applicable permits, mitigation orders, and other provisions of Arizona statue and code that address hazardous substances. This will allow the VRP to review submitted data in a comprehensive manner and provide guidance on remedial action and closure under the VRP for the same constituents that would not conflict or contradict what has been established elsewhere for the site. Soil data collected in accordance with the proposed Work Plan will be reported as part of the Data Gaps Report; however, soil media is being evaluated in a baseline human health risk assessment (BHHRA). Following the outcome of the BHHRA, draft remediation levels or controls for soil media will be proposed if needed in a feasibility study.

General Comments

VRP requests for Sierrita to provide additional explanation and/or discussion on the comments provided in order to provide clarity and strengthen technical discussions within the Work Plan.

1. General Comment 1:

Please provide a detailed description of the proposed construction of the bedrock groundwater monitoring wells to demonstrate that the screened intervals will be completely sealed from the overlying alluvium unit.

Sierrita Response:

The proposed well construction details and well construction diagrams, relative to the depth of installation, are presented in Attachment 1. The proposed well construction details have been revised based on a review of the most recent groundwater monitoring data. To ensure that the screen intervals will be sealed from the alluvium unit where alluvial materials are present at a proposed location overlying a target bedrock unit, the well advancement and installation procedures will include:

- During advancement of boreholes into bedrock with saturated alluvial materials overlying the bedrock, it is anticipated that a casing advance system will be used. This will seal the bedrock unit from the overlying alluvial unit during advancement. If a casing advance drilling method is not used then a conductor casing will be placed against the alluvial materials, extending approximately 2 to 3 feet into the bedrock unit. The conductor casing will be grouted in place prior to additional advancement into the bedrock unit.

- For well construction, the screen interval of each bedrock groundwater monitoring well and filter pack will only be placed adjacent to the target bedrock formation and will not extend upwards into overlying alluvial materials. A bentonite seal of approximately 5 feet of 3/8 inch chip bentonite will be placed on top of the installed monitoring well filter pack, followed by a 3% to 5% bentonite / 95% to 97% Portland cement grout to the surface. The chip bentonite or cement grout will extend across the bedrock-alluvium contact.

2. General Comment 2:

Please provide the latest potentiometric map to facilitate the demonstration that the proposed groundwater monitor wells are appropriately located.

Sierrita Response:

Potentiometric maps for the most recently sampled wet and dry seasons, which were collected in the third and fourth quarters of 2013 and first and second quarters of 2014, respectively, are presented in Figures 1 and 2. A comparison of the wet and dry season water levels indicates a change in head of approximately 1 to 5 feet might be anticipated seasonally for the areas where new monitoring wells have been proposed. The dry season groundwater elevations have been used to anticipate the proposed monitoring well installation depths and screen intervals, which are provided in Table 1. Additionally, proposed well construction diagrams are presented for wells installed up to 200 feet in depth and then for wells to be installed from depths between 200 feet and 600 feet. Installations beyond 600 feet are not anticipated. This information demonstrates that each of the proposed monitoring wells are appropriately constructed for the requirements proposed in the Work Plan.

3. General Comment 3:

Please clarify if the two groundwater monitoring events are all Sierrita believes to be necessary or if it is an interim schedule before entering another phase of work.

Sierrita Response:

The groundwater data derived from each of the proposed groundwater monitoring locations will be compared to the regional groundwater level and geochemical trends and also to nearby current groundwater monitoring well data collected. Additionally, for each installed well the results of each monitoring event for the wet and dry seasons will be compared. A determination of the requirement for additional monitoring will be based on a comparison of these results, and will be included in the report.

Specific Comments

4. Appendix B, Section 4.1, page 16:

Revision 4.0 of the Arizona Data Qualifiers was developed by the Arizona Environmental Laboratory Advisory Committee in September 2012. The updated list can be located here: http://www.azdhs.gov/lab/license/resources/resources.htm.

Sierrita Response: Comment noted. Sierrita will include Revision 4.0 of the Arizona Data Qualifiers in Appendix B of a revised Work Plan.

Sincerely,

Diana Kelts
Chief Environmental Engineer

DCK:dck
20150123_001

Attachments

xc: Lana Fretz, Sierrita
Debi Chismar, Sierrita
Stuart Brown, Freeport-McMoRan Inc.
Penny Hunter, ARCADIS, Project Manager

FREEPORT-MCMORAN
Sierrita Operations
Environment, Land & Water Department
6200 W Duval Mine Road
PO Box 527
Green Valley, AZ 85622-0527

Attachment 1

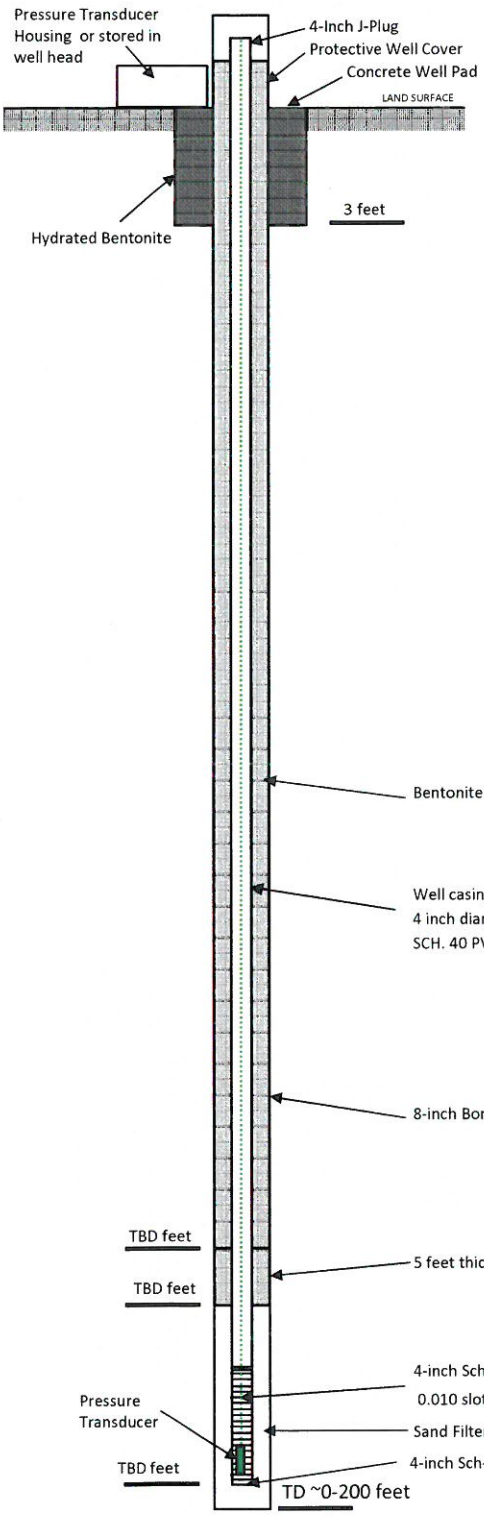
Tal
Anticipated Well C
Freeport-McMo
Green Vall

VRP Well ID	Investigation Area	Site Feature	Anticipated Screened Lithology[1]	Northing	Easting	Ground Elevation (ft)	Anticipated Groundwater Elevation (ft)	Anticipate Depth to Wa (ft)
TW-2014-01	Central Investigation Area (North)	Demetrie Wash	Alluvium	955395.0656	319021.2421	3605	3575	30
MW-2014-01	Central Investigation Area (North)	Demetrie Wash	Bedrock	955395.0656	319021.2421	3605	3575	30
MW-2014-02	Central Investigation Area (South)	Bedrock South of CIA	Bedrock	952010.1906	314441.2464	3690	3640	50
MW-2014-03	Central Investigation Area (South)	Bedrock South of CIA	Bedrock	954507.0214	314663.1319	3660	3570	90
MW-2014-04	Background Area (South)	Background West of STI	Basin Fill Deposits	964724.2840	301936.2289	3315	3050	265

Notes:
All depths are approximated and will be determined in the field based on conditions encountered
1 - Lithology is predicted from the present geological interpretation, but differing field conditions may result in a different screened lithology for bedrock wells.
CIA - Central Investigation Area
ft bgs - feet below ground surface
STI - Sierrita Tailings Impoundment
VRP - Voluntary Remediation Program

ARCADIS
Infrastructure, environment, facilities

Figure E1- Alluvial or Bedrock Monitoring Well Construction (Depth ~0-200 feet)



Project Sierrita Mine Wells Monitoring

Town/City

County State Arizona

Permit No.

Land-Surface Elevation and Datum:

~0-200 feet ☐ Surveyed

☒ Estimated

Installation Date(s)

Drilling Method Air Rotary Casing Hammer (ARCH)

Drilling Contractor TBD

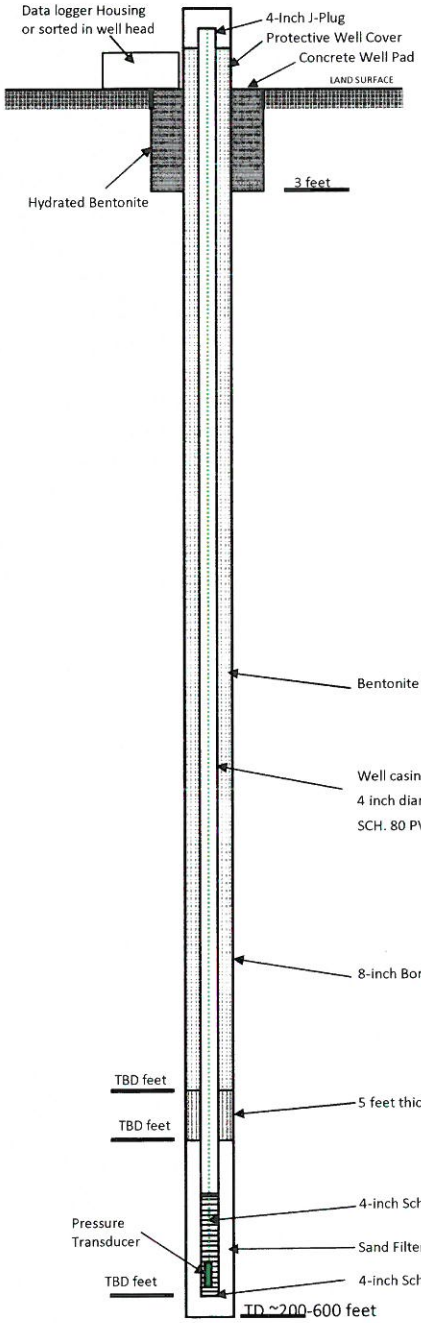
Remarks: Water level and quality monitoring wells

Notes:
Depth Below Land Surface
Pressure transducers to be installed into well

DRAWING IS NOT TO SCALE

ARCADIS
Infrastructure, environment, facilities

Figure E2 - Bedrock Monitoring Well Construction (Depth ~200-600 feet)



Project Sierrita Mine Wells Monitoring

Town/City -

County - State Arizona

Permit No. TBD

Land-Surface Elevation and Datum:

200-600 feet ☐ Surveyed

☒ Estimated

Installation Date(s) TBD

Drilling Method Air Rotary Casing Hammer or Mud Rotary

Drilling Contractor TDB

Remarks: Water level and quality monitoring wells

Notes:

Depth Below Land Surface

Pressure transducer to be installed into one well

DRAWING IS NOT TO SCALE

MO-2007-2
2568.61

MH-21
3655.75

MW-2008-17
3661.16

MW-2008-18
3662.62

MW-2008-19
3667.25

TW-2014-01

MW-2014-01

MW-2
3661.75

MW-1
3665.8

MW-4
3668.64

MW-3
3657.58

MW-2014-03

MW-2014-02

MH-23
3492.43

MH-22
3495.21

MH-1
2735.29

MH-14
2724.95

MH-16W
2714.31

IW-19
2711.80

MH-28
2737.21

IW-15
2706.56

MH-4

IW-13
2716.28

IW-12
2692.09

IW-6a
2688.40

IW-11
2655.81

IW-22
2661.11

IW-28
2650.98

IW-10
2643.77

IW-5A
2577.39

MH-29
2729.81

IW-27
2727.132

IW-4
2743.46

IW-24
2569.13

IW-9
2582.84

IW-8
2728.95

IW-26
2605.81

MH-7
2709.44

MO-2007-6A
2717.14

IW-3A
2669.53

MH-16E
2709.79

MO-2007-6B
2705.53

IW-1
2698.00

IW-25
2639.97

IW-2A
2688.12

MH-10
2813.19

MH-9
2769.85

MW-2014-04

MH-27
3682

PZ-16
3690.92

MH-18
3721.7

MH-19
3683.55

MH-20
3585.18

3700
3600
3500
3400
3300
3200
3100
3000
2900
2800
2700
2600
2700

LEGEND

- Groundwater Monitoring Locations
- Proposed Alluvium Well
- Proposed Ruby Star Bedrock Well
- Proposed Basin Fill Well
- Groundwater Flow Direction
- Water Level Contour

0 1,500 3,000 6,000 Feet

FREEPORT-MCMORAN SIERRITA INC.
GREEN VALLEY, ARIZONA

VOLUNTARY REMEDIATION PROGRAM DATA GAPS WORKPLAN

PROPOSED WELL LOCATIONS AND THIRD AND FOURTH QUARTER 2013 POTENTIOMETRIC SURFACE MAP

ARCADIS

FIGURE 1

CITY:(DEN-TECH) DIV/GROUP:(ENV/GIS) DB: BGRIFFITH LD: PIC: PM: TM:
PROJECT: PATH: W:\ArcGisData\GISPROJECTS_ENV\Sierrita\GIS\ArcMap_MXD\2014\Data Gaps Work Plan\Fig 1 Q3Q42013PotSurMap_ProposedWellLocations.mxd

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

MC-4
2535.175

MO-2007-2
2561.71

MH-21
3653.45

MW-2008-17
3661.81

MW-2008-19
3667.85

MW-2008-18
3663.61

TW-2014-01

MW-2014-01

MW-2
3663.12

MW-1
3666.89

MW-4
3659.23

MW-3
3659.4

MH-30
2803.44

MH-1
2728.9

IW-20
2736.45

IW-19
2685.31

IW-18
2719.51

MH-14
2724.29

MH-3
2719.29

MH-16W
2708.98

IW-17
2724.40

MH-23
3494.67

MW-2014-03

MW-2014-02

MH-22
3496.89

IW-15
2688.52

IW-16
2749.23

MH-28
2730.49

IW-14
2682.53

IW-6a
2691.92

IW-13
2705.59

MH-5
2714.58

IW-12
2751.54

IW-11
2651.47

MH-15W
2702.11

IW-22
2661.11

MH-15E
2700.63

IW-10
2639.50

IW-28
2679.78

IW-23
2600.06

MH-6
2727.07

IW-5A
2560.06

MH-29
2728.9

IW-24
2591.29

IW-27
2725.63

IW-4
2723.38

IW-9
2616.29

MO-2007-6A
2713.43

IW-8
2653.00

IW-26
2719.36

IW-3A
2665.79

MO-2007-6B
2702.44

IW-1
2680.05

MH-16E
2713.11

IW-25
2644.43

MH-10
2813.11

IW-2A
2672.64

MH-9
2769.28

MH-27
3657.02

PZ-16
3691.46

MH-20
3591.04

MH-19
3682.62

MH-18
3721.35

MW-2014-04

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3200
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3000
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2800
2700
2600

LEGEND

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GREEN VALLEY, ARIZONA

VOLUNTARY REMEDIATION PROGRAM DATA GAPS WORKPLAN

PROPOSED WELL LOCATIONS AND FIRST AND SECOND QUARTER 2014 POTENTIOMETRIC SURFACE MAP

ARCADIS

FIGURE 2

CITY:(DEN-TECH) DIV/GROUP:(ENV/GIS) DB: BGRIFFITH LD: PIC: PM: TM:
PROJECT: PATH: W:\ArcGisData\GISPROJECTS_ENV\SierritaGIS\ArcMap_MXD\2014\Data Gaps Work Plan\Fig 2 Q1Q22014PotSurMap_ProposedWellLocations.mxd

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community