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**April 16, 2014**

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**Re: BUTTE MINE FLOODING SITE CD, CV 02-35 Bu-RFC, 2014 First Quarter Report FINAL**

Dear Ms. Capdeville, Mr. Elsen, Mr. Greene and Mr. Reed:

The Settling Defendants (Atlantic Richfield Company and the MR Group, as defined in the Consent Decree) continue to implement the remedial action requirements as specified in the Statement of Work to the Consent Decree. The attached *revised* report summarizes those activities conducted during the first quarter of 2014. This advance electronic copy will be followed by the hardcopy via certified mail. This first quarter report submittal was deemed timely as the electronic copy has been submitted on the tenth day of the April 2014 as required under section X. Reporting Requirements of the CD. This revised FINAL report is being sent to provide a correct record of the activities conducted during the first quarter of 2014.

Please contact us if you would like to schedule a meeting to discuss the implementation of the RA or the BMFOU 2014 First Quarter Report.

On behalf of the Settling Defendants,

A handwritten signature in black ink that reads 'Stephen F. Walsh'.

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Attachments

**SETTLING DEFENDANTS BMFOU QUARTERLY REPORT  
CONSENT DECREE FOR THE  
BUTTE MINE FLOODING SITE CD, CV 02-35 Bu-RFC  
REMEDIAL ACTION – IMPLEMENTATION OF THE REMEDY  
QUARTER 1, 2014**

**FINAL REPORT**

The Settling Defendants<sup>1</sup> continue to implement the remedial action requirements specified in the Statement of Work to the Consent Decree. This report summarizes those activities conducted during the first quarter of 2014 as required under section **X. Reporting Requirements, Paragraph 31** of the consent decree. **The headings (a-g) in the following report correspond to the categories identified in paragraph 31. The sections captioned Issues Encountered and Information about MR Operations have been added at the request of the EPA.**

**a) Actions Taken Toward Achieving Compliance with the Consent Decree**

To achieve compliance with the Consent Decree the Settling Defendants conducted remedial action activities under the seven components identified in the Statement of Work for Remedial Design/Remedial Action (“SOW”) which is part of the Consent Decree. These seven components and the remedial action activities undertaken by the Settling Defendants (hereinafter referred to as “SD”) in the first quarter of this year include:

- 1. Monitoring Program** - The Montana Bureau of Mines and Geology (“MBMG”) conducted all monitoring activities as required by the SOW with the exception of the semi-annually Berkeley Pit Lake water quality sampling program. A rotational slump of the highwall in the southeast sector of the Berkeley Pit occurred on February 8, 2013. This slope failure and the potential of continuing slope instability in the eastern sector of the Berkeley Pit has created a safety issue for persons assigned to sample the Berkeley Pit Lake and other components of the RA. At the request of the Agencies, the SDs are evaluating the necessity for near-term water quality sampling of the Berkeley Pit and potential, safe alternative sampling methods and additional migratory waterfowl mitigation efforts.

The SDs continue to monitor three inclinometers/piezometers, six extensometers and six TDR monitoring devices in piezometer wells, eighteen survey points and operate

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<sup>1</sup> The term Settling Defendants as used in this report collectively refers to Atlantic Richfield Company, Montana Resources, Inc., Montana Resources, LLP and Dennis Washington.

four dewatering wells for slope stability issues in and near the Berkeley Pit. The Agencies have requested that the Settling Defendants include the actual measurements from these devices in the BMFOU Quarterly Reports. Please see the attachment to this report for the summary of the monitoring information requested.

The Draft Work Plan for the BMFOU Berkeley Pit Slope Stability Evaluation ("*Evaluation*") was submitted to the agencies on January 31, 2014. The SDs have contracted with **STRATA Geotechnical** consulting firm to perform the evaluation as approved in the Draft Work Plan. Representatives of the Agencies and SDs met with **STRATA** principal, Dr. Stanley Miller, on February 17, 2014 to initiate the *Evaluation*.

The Agencies provided two comments regarding the *Evaluation* to the SDs on February 28, 2014. The comments and current responses are:

Agencies' comment: "**2.0 Background; second paragraph** – ... Please be clear and specific as to when sampling and waterfowl mitigation will continue on the pit lake by the use of the pontoon boat or other alternatives."

SDs response: The rise of the water level in the pit lake has and will continue to cause slope instability problems that pose a significant safety risk to operating the pontoon boat on the pit lake. MR's copper recovery operation from the pit water was suspended on February 8, 2013 because of serious damage to the pumps and piping system caused by the rotational slump and ensuing wave action. Evidence of the height of this wave action was recorded at ten to twelve feet on the shore above the water level. Wave action of this magnitude would pose an extreme hazard to the pontoon boat and risk of serious personal injury or prove fatal to personnel assigned to perform either waterfowl mitigation activities or pit lake sampling. These activities cannot be performed without risk until the *Evaluation* has been completed and the lake elevation at which hydrostatic pressure creates a buttress that reduces slope instability factors has been determined. Potential high risk areas of probable instability and possible mitigation measures will have to be identified, evaluated and any safety risk will need to be eliminated before these activities can be resumed. The *Evaluation* is scheduled for completion on July 25, 2014, and the next steps in the process will be developed after that date and predicated on the results of the *Evaluation*. Normal Waterfowl Mitigation efforts continue according to plan; only lake-surface hazing of birds and bi-monthly mortality counts by the boat have been suspended.

Agencies comment: “**4.1 Task 1, Review of slope stability around the entire Berkeley Pit** – Please add a section that would identify potential worst case volume of material that could slough and the resulting water displacement characterized relevant to the Critical Water Level.”

SDs response: This request will be added to the scope of work for **STRATA** to complete.

*Evaluation* Progress Update: As was previously mentioned, **STRATA** was awarded the contract to conduct the *Evaluation* and the work which commenced on February 17, 2014. MR engineers and geologists continued record searches and cross section development in support of the *Evaluation* requirements. O’Keefe Drilling of Butte, Montana was awarded the contract for the drilling of PZF 14-1 borehole and mobilized a Foremost DR 24-HD dual rotary drill rig onsite on February 24, 2014 on schedule. The hole was drilled to 438-ft. The TDR cable and PVC casing were damaged ostensibly from a shift in the hole or squeezing ground at depth. A new TDR cable was installed and the hole was not able to be completed as a piezometer well. The decision to drill a replacement piezometer well was made along with drilling an additional shallow, piezometer well in the dump material. This TDR hole was completed on March 12, 2014.

Shallow well PZF 14-1B was drilled to 158-ft. and completed as a piezometer in the Pittsmont Dump material. This well was completed on March 14, 2014 and included a TDR cable as well as slotted screen for the piezometer.

PZF 14-1A was located approximately 30-ft. north of PZF 14-1B and drilling commenced March 24, 2014. The hole was drilled to a total depth of 439-ft. and the well was completed as a piezometer and monitoring hole equipped with a TDR cable. Complications with this hole were caused by a faulty casing weld and the 6-in. steel casing was broken when being removed. Completion of the well as a piezometer and TDR monitor was accomplished on April 2, 2014. Each of the holes were sampled and the samples will be analyzed as appropriate within the scope of the Draft Work Plan.

AK Drilling of Butte, Montana was awarded the contract to drill oriented, angled core hole numbered PZF 14-2. AK mobilized the diamond drill on March 18, 2014. Drilling commenced that date and the hole was advanced to 293.5-ft into the south wall of the Berkeley Pit. The hole was completed on

March 23, 2014. Logging of the hole was completed by STRATA principal Stan Miller and core samples have been sent out for compressive strength and shear testing.

Site reconnaissance around the Berkeley Pit Perimeter was conducted by Dr. Miller and Mr. Steven Czehura, MR Manager of Engineering and Geology the week of March 17 to March 21, 2014. A summary of their findings will be included in the next quarterly report.

The SDs cooperated with and assisted the MBMG personnel by providing safe access to the on-site sampling locations and clearing snow from access roads to the Granite Mountain and Pilot Butte mines for monitoring access.

2. **Public Education and Involvement** – The SDs are represented on the Berkeley Pit Public Education Committee which directs the publication of the PITWatch and the website [www.PITWATCH.ORG](http://www.PITWATCH.ORG). These are the primary vehicles for educating the public about BMFOU status and activities. The SDs attended a CTEC meeting on January 28, 2014 in Butte at the invitation of the Agencies to support the discussion of the 4<sup>th</sup> quarter report and BMFOU activities.
3. **Horseshoe Bend (“HsB”) Inflow Control** – The SOW requires integration of the HsB flow into mine operations and/or release of treated water into Silver Bow Creek. Since the issuance of the ROD in 1994 and integration of the entire flow of HsB water into the mining and milling process on April 15, 1996, the flow has become an integral part of the water balance required for efficient active mining and milling operations at Montana Resources, LLP (“MR”). The entire flow of treated HsBWTP effluent has been integrated into MR’s milling water circuit since the HsBWTP was commissioned in November 2003. For the first quarter of 2014, 100% of the flow from HsB was treated as influent into the HsBWTP and no material flow from HsB was bypassed to the Berkeley Pit.

Both blowers that were modified for decreased airflow rate were received and installed during Q1. The final upgrade improvement design of the lime unloading system was selected, firm quotations from three contractors were solicited to perform the work and the contract was awarded to North Side Welding of Helena, MT. The equipment has been ordered and work will be completed in the Q2 2014.

Normal operation and maintenance of the HsBWTP was conducted during Q1 with no significant events.

4. **HsB Water Treatment Plant Upgrade/Sludge Repository** – This specific component of the RA addresses FINAL treatment and disposal of sludge when the “Berkeley Pit” (i.e. East Camp) critical water level is approached and therefore, is not pertinent until four years prior to the projected date that the critical water level will be reached. The Explanation of Significant Differences, Appendix A to the CD allows for placement of sludge into the Berkeley Pit. During Q1 all of the sludge generated by maintaining compliance with the inflow component requirement of the SOW was placed into the Berkeley Pit.
5. **West Camp System** - During the first quarter of 2014, approximately 20 million gallons of water were pumped from the West Camp pump station to the Lower Area One (LAO) for treatment in the Butte Treatment Lagoons(BTL) system.

During the first quarter water levels were drawn below the established Critical Water Level of 5435.5' on January 15th. The water level at the end of the quarter was 5428.99'.

Operators of the BTL will continue to draw water levels down during the second quarter of 2014 to maintain a flexible operating level below the CWL.

6. **Waterfowl Mitigation** – During the reporting period the SDs conducted monitoring, active and passive hazing efforts and reporting as required by the Berkeley Pit Migratory Waterfowl Mitigation Plan, (Exhibit 5 to the CD). The SDs continued to perform waterfowl mitigation efforts under the variance from this requirement of the Waterfowl Mitigation Plan.

On February 14<sup>th</sup> and March 12<sup>th</sup>, 2014 the SDs submitted the January and February **2014 Berkeley Pit Migratory Waterfowl Mitigation Monthly Reports** which included the Observation and Hazing logs as attachments to the report letters. Reduced observations were in effect per the non-migratory season in the Plan and no birds were reported or hazed for the two months. The migratory season observation efforts were recommenced on March 3, 2014 and the report of mitigation efforts is being completed for submittal to the agencies on April 11, 2014. Please reference these reports for a description of the detail of mitigation efforts.

7. **Institutional Controls** – Full SD compliance with this component of the RA SOW was completed by funding provided in 2002 by the SDs past and future cost cash out provisions of the Consent Decree. The Butte Alluvial and Bedrock Controlled

Ground Water Area (“BABCOWA”) was established by the MT DNRC in October 2009 with Butte-Silver Bow as the petitioner. Implementation and monitoring of the BABCOWA was assigned to the MBMG and funding from the SDs cash out amount that was provided in 2002. The outer perimeter of the area was determined and covers approximately 8.11 square miles<sup>2</sup>. Please reference the **Butte Mine Flooding Operable Unit, Water-Level Monitoring and Water-Quality Sampling, 2012 Consent Decree Update, 1982-2012** and consult Mr. Terrence E. Duaine, Project Manager of the Montana Bureau of Mines and Geology for more detailed information.

**Access** - The SDs have fully complied with the CD requirement to provide access to the Agencies. During the reporting period the SDs have fully cooperated with the MBMG Monitoring Program.

**b) Summary of all results of sampling and tests and all other data generated by Settling Defendants in the previous quarter**

The following table summarizes the performance of the HsBWTP in Quarter 1 2014:

<b>Period</b>	<b>Influent (MG)</b>	<b>Effluent (MG)</b>	<b>Sludge Wasted (MG)</b>	<b>Lime Delivered (tons)</b>	<b>Average Influent Flow (MGD)</b>	<b>Average Lime Usage (mg/L)</b>
<b>Quarter 1</b>	396	375	37	4,713	4.4	2,854

Additionally, Horseshoe Bend water is sampled at multiple locations including the HsBWTP influent and effluent (analytes include Cu, Fe<sup>++</sup>, Fe<sup>+++</sup>, pH and CaO titration to pH 10.7.)

**c) Identify all work plans and other deliverables required by this Consent Decree completed and submitted in the previous quarter**

Please see the response in **Actions Taken Toward Achieving Compliance, 1. Monitoring Program** for details to the answers to this reporting requirement.

<sup>2</sup> Please reference the **Butte Mine Flooding Operable Unit, Water-Level Monitoring and Water-Quality Sampling, 2012 Consent Decree Update 1982-2012** report dated September 2013 and prepared by the MBMG.

d) **Describe all actions, data collection and implementation or work plans that may be required under this CD scheduled for the next quarter and provide other information relating to the progress of the work**

**RA Activity** - The RA activity required in this section is congruent with that reported at the beginning of this document and is aligned with the seven general components of the SOW and RA. The first quarter 2014 activity summary is as follows:

1. The Monitoring Plan will continue to be implemented during the next quarter and the SD's will continue to provide unfettered access, cooperation and assistance to the MBMG in performing this task.
2. The SDs will provide information to the Agencies as requested and participate in any public education meetings or activities that the Agencies deem necessary to fulfill this requirement of the CD.
3. The HsBWTP will continue to operate in the next quarter with the goal of capturing and treating 100% of the flow emanating from HsB seep. Plant optimization efforts by SD's will continue along with monthly meetings of the SD technical advisory team. Modifications to the lime unloading system is planned to improve the efficiency of this operation and is planned to be completed in Q2. The Inflow Control requirement will continue to be met with 100% of the HsBWTP effluent integrated into the mining and milling operations.
4. Sludge from the HsBWTP will continue to be placed into the Berkeley Pit during the next quarter.
5. Pumping from WCP-1 will continue during Q2 of 2014 to maintain West Camp water levels below the CWL.
6. Waterfowl mitigation efforts will be continued during Q2 as required by the Berkeley Pit Migratory Waterfowl Mitigation Plan, Exhibit 5 to the CD with frequency of observations commensurate with the migratory season. Monthly reports will continue to be submitted to the Agencies.
7. The Institutional Controls required by the CD will continue to be met with full access provided to the Agencies, the MBMG and all SDs at all reasonable times. MR plans to continue to operate the active mining and milling operation within the 70,000

tpd crushing and concentration of ore and active leaching of dumps at less than 350-acres stipulations of **IX. Access and Institutional Controls** section of the CD.

**Future Work Plans** – The SDs have no plans to submit Future Work Plans as required by the CD to the Agencies during Q2.

e) **Include information regarding unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work.**

Unresolved delays include in part, waterfowl mitigation and water quality sampling of the pit water, due to safety issues and resumption is contingent upon slope stability evaluation results.

f) **Include any modifications to the RA or RD Work Plans or other work plans or schedules that Settling Defendants have proposed to EPA or that have been approved by the EPA.**

Please see the discussion regarding “The Draft Work Plan for the BMFOU Berkeley Pit Slope Stability Evaluation” on pages 2 and 3 of this report. The Agencies’ comments to the Draft Work Plan and the SDs responses are discussed in detail.

g) **Describe all activities undertaken in support of the Community Relations Plan during the previous quarter and those to be undertaken in the next quarter**

Please see the response in **Actions Taken Toward Achieving Compliance, 2. Public Education and Involvement** for details to the answers to this reporting requirement.

h) **Issues Encountered**

The current issue that has impacted the mandated BMFOU remedy was the development of slope instability problems in the Berkeley Pit in 2013. Please see the discussion regarding “The Draft Work Plan for the BMFOU Berkeley Pit Slope Stability Evaluation” on pages 2 and 3 of this report and the attachment to this report titled “**Berkeley Pit Slope Stability Quarterly Summary**”.

### **Information about MR Operations**

**At the request of EPA, and to facilitate a more comprehensive understanding of its mining activities regulated under State-issued permits within the Butte Active Mine Area Operable Unit, MR provides the following information about its operations in this report:**

MR has not placed material into the Berkeley Pit in Q1 2014 nor does it plan to place fill into the Berkeley Pit in the Q2 2014.

MR has re-purposed the Ecology pond with reduced volume potential to act as surge capacity for extreme Concentrator operational upsets and for storm water runoff control. MR in conjunction with AR have backfilled the Ecology Pond with non-acid generating alluvium, compacted, and installed a compacted clay liner in response to a request from EPA. Installation of an alluvium cover over the clay liner, spreading top soil and final seeding of the topsoil cover with MR's reclamation seed mix has been completed. A completion report will be provided to the Agencies with as-built drawings as required in Q2 2014.

## BMFOU QUARTERLY REPORT

Q1 2014

ATTACHMENT:

**Berkeley Pit Slope Stability Quarterly Summary**

## MEMORANDUM

**TO:** Stephen Walsh  
**FROM:** S. Czehura  
**DATE:** April 9, 2014  
**SUBJECT:** Berkeley Pit Slope Stability First Quarter Summary 2014

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During this period “no movement” was detected with our monitoring network incorporating an array of 18 survey points, six wire extensometers, three inclinometer/piezometer wells, and six TDR/piezometer wells (Plate I, attached).

Four survey points in the Bird Watch Sector, four survey points in the Concentrator Sector, seven survey points in the Southeast Sector and three prisms in the Pittsmtont Sector were monitored throughout this period. Survey points in the Bird Watch Sector are checked bimonthly. The western two survey points in the Concentrator Sector are, likewise, monitored bimonthly and the two eastern points are monitored daily. Seven survey points in the Southeast Sector and three prisms in the Pittsmtont Sector are monitored daily. Wire extensometers, i.e. Section 2 (West), in the Concentrator Sector are, routinely, checked three times on dayshift and once on nightshift. Wire extensometers, i.e. Section 1 (East), in the Southeast Sector are, routinely, monitored three times per shift. All inclinometers are read daily. All TDR wells are read weekly.

**Bird Watch Sector:** Four survey points were checked in this sector during this period with “no abnormal movement” being indicated, but slow displacement of the outer portion of the dump continues at a rate of less than 0.6 inch per month. The TDR cable in B06-1 showed no progressive distress.

**Concentrator Sector:** Six survey points were checked in this sector with “no movement” being indicated. Extensometers, likewise, showed no progressive movement during this time period; however, from March 7 through March 13, 2014 heavy mud and inclement weather prevented daily reading of the extensometer array in this sector.

TDR cables were read weekly during this time period in four wells and no progressive movement was detected. Some incipient movement was noticed in January on the B axis of PZF12-4 at 255 feet. This indicated movement had developed slowly, but evidently has stabilized. The total displacement of this anomaly in PZF12-4 is 0.15 feet. At no time in the monitoring process have any of the daily measurements in PZF12-4 exceeded our warning velocity of 0.1 feet per day. The total movement detected in PZF12-4 developed over the course of 3-4 months with stabilization being reached in mid-February 2014.

**Southeast Sector:** The seven survey points monitored showed no progressive movement. The wire extensometers showed random movement ( $< \pm 1/4$  inch) throughout this period. The eastern extensometer continues to be the most active and subject to displacement, slowly increasing in total displacement throughout the quarter.

Inclinometers PZF12-4, PZF12-5, and PZF12-8 are currently being monitored daily. No movement was detected in these wells during this period.

All four dewatering pumps in the Southeast Sector ran during this time period as indicated in Table 1.

Table 1. Average flows for dewatering wells (First Quarter 2014).

Dewatering Well	January		February		March	
	Flow (gpm)	Availability	Flow (gpm)	Availability	Flow (gpm)	Availability
PZF12-1	86.4	100%	85.3	100%	83.7	100%
PZF12-2	39.8	93%	39.0	100%	38.9	100%
PZF12-3	21.9	100%	21.7	100%	21.8	100%
LP-15	44.0	100%	43.7	100%	43.0	100%

The pump in Well PZF12-2 dropped out a few times during January, but otherwise has operated without interruption.

**Pittsmont Sector:** Three prisms on the Pittsmont dump were surveyed daily during the quarter with a total station. No slope movements have been detected to date.

The TDR cable in Well PZF13-1 was read weekly during this time period with no indicated distress.

**Hydrographs:** Water levels are tracked in all sectors. No excursions were noted during the quarter.

### **Berkeley 360 Study:**

During March, an oriented core hole, PZF14-2 (TD 293.5 feet), was completed in the Birdwatch Sector as close to the Concentrator Sector as possible. Seven core samples were selected for further test work: three for Direct Shear (DS) testing and four for Unconfined Compressive Strength (UCS) testing. Structural logging was completed in our "Berkeley Core Lab." Analysis of the data is ongoing.

Three TDR wells were drilled on the east side of the Berkeley Pit in the Pittsmont Sector. Squeezing ground necessitated the drilling of multiple wells. The new TDR/piezometer wells are PZF 14-1, PZF 14-1A, and PZF 14-1B. PZF 14-1 (TD 438 feet) and PZF 14-1A (TD 439 feet) were drilled down to bedrock and PZF 14-1B was a shallow well completed in the overlying dump material (TD 158 feet). The casing in PZF14-1 could not be pulled and well was grouted to surface. Analysis of data acquired with these borings is ongoing.

There are now nine TDR wells around the pit; one in the Bird Watch Sector, four in the Concentrator Sector, and four in the Pittsmont Sector (Figure 1).

On March 6, an erosional mudslide occurred in the Neversweat Sector as a result of storm water that is diverted into the pit in this area. Investigation is in progress, but the area has been flagged and signage posted to prevent inadvertent access (Plate II, attached).

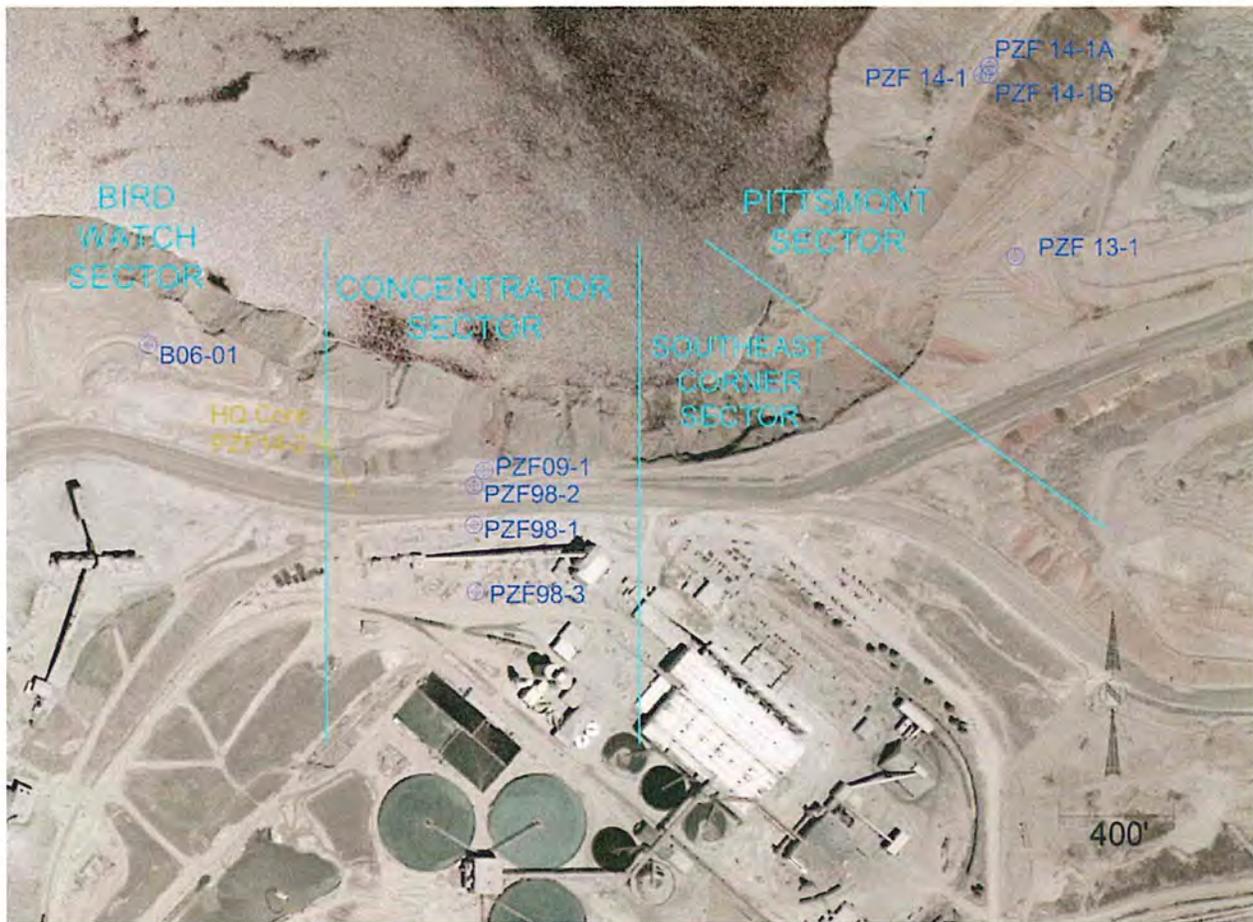


Figure 1. TDR wells as of April 9, 2014.