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BUTTE MINE FLOODING SITE CD, CV 02-35 Bu-RFC, 2024 Second Quarter Report

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August 15, 2024

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Re: BUTTE MINE FLOODING SITE CD, CV 02-35 Bu-RFC, 2024 Second Quarter Report

Dear Mr. Lindsey, Mr. Morgan, Mr. Rappe, and Mr. Reed:

The Settling Defendants (Atlantic Richfield Company and the Montana Resources 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 report summarizes those activities conducted during the second quarter of 2024.

Please contact us if you would like to discuss this Butte Mine Flooding Operable Unit (BMFOU) Quarterly Report.

On behalf of the Settling Defendants,

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Eric Hassler, Butte-Silver Bow
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Attachments:

Settling Defendants Butte Mine Flooding Operable Unit (BMFOU) Quarterly Report Consent Decree for the Butte Mine Flooding Site CD, CV 02-35 Bu-RFC Remedial Action – Implementation of the Remedy Second Quarter 2024 (April 1 – June 30, 2024)

SETTLING DEFENDANTS
BUTTE MINE FLOODING OPERABLE UNIT (BMFOU) QUARTERLY REPORT
CONSENT DECREE FOR THE
BUTTE MINE FLOODING SITE CD, CV 02-35 Bu-RFC
REMEDIAL ACTION – IMPLEMENTATION OF THE REMEDY
SECOND QUARTER 2024 (APRIL 1 – JUNE 30, 2024)

The Settling Defendants¹ continue to implement the remedial action (RA) requirements of the Butte Mine Flooding Operable Unit (BMFOU) specified in the Statement of Work to the Consent Decree (CD). This report summarizes those activities conducted during the second quarter of 2024 as required under *Section X. Reporting Requirements, Paragraphs 31 and 35* of the CD. The headings *a)* through *g)* in the following report sections correspond to the categories identified in Paragraph 31. The sections captioned *h) Issues Encountered*, *i) Five-Year Review Recommendations Status*, and *j) Other* have been added at the request of U.S. Environmental Protection Agency (EPA).

a) Actions taken toward achieving compliance with the Consent Decree

To achieve compliance with the CD, the Settling Defendants conducted RA activities under the seven components identified in the *Statement of Work for Remedial Design/Remedial Action* (“SOW”) which is Appendix C of the CD. These seven components, with an eighth component describing other progress of the work not specifically required by the CD, and the RA activities undertaken by the Settling Defendants (hereinafter referred to as “SDs”) in the second quarter of 2024 include:

- 1. Monitoring Program** – The Montana Bureau of Mines and Geology (MBMG) conducted monitoring activities as required by the SOW.
- 2. Public Education and Involvement** – The SDs are represented on the Berkeley Pit Public Education Committee which directs the PitWatch website, www.pitwatch.org, and accompanying social media platforms. These are the primary vehicles for educating the public about the BMFOU status and activities.

In addition, as part of a sponsored research agreement between the SDs and Montana Technological University (Montana Tech), various local waterfowl experts from around Butte and western Montana participate in the Berkeley Pit Waterfowl Advisory Board (Waterfowl Advisory Board), which provides advice to the SDs on avian-related Berkeley Pit (Pit) topics, including, but not limited to, ways to deter birds from landing and remaining in the Pit. The Waterfowl Advisory Board efforts are described further in Section 6: Waterfowl Protection. Further information about Waterfowl Advisory Board activities is in the SD’s Berkeley Pit Migratory Waterfowl Seasonal Reports. Meeting

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

agendas/minutes of the Waterfowl Advisory Board are available upon request. The Waterfowl Advisory Board met on May 28, 2024.

- 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. Treated HsB Water Treatment Plant (WTP) water has been integrated into the Montana Resources (MR) milling water circuit since the HsBWTP was commissioned in November 2003. Additionally, HsB Capture System (CS) operation was started on September 26, 2019. Both the HsBWTP and the HsBCS have the ability to facilitate HsB inflow control, including integrating treated waters into mine operations.

During the second quarter of 2024, a total volume of approximately 258.7 million gallons were treated through the HsBWTP, and approximately 345.4 million gallons were treated via the HsBCS. The treated water was then integrated into MR’s operations or conveyed to the Polishing Facility for polishing treatment and release to Silver Bow Creek. All HsB inflow was controlled during the second quarter of 2024, with the exception of 19.5 million gallons that were bypassed to the Berkeley Pit. Furthermore, 0.4 million gallons of HsB inflow was bypassed to the Berkeley Pit in the first quarter of 2024, which wasn’t included in the first quarter report.

Significant maintenance activities at the HsBWTP completed during the second quarter included:

- Stage One lime control valve replaced.
- Stage Two lime control valve replaced.
- Pinch Valve on Stage One wasting line replaced.
- Stage One recycle pump and outlet hose replaced.
- North Slaker grit conveyor rebuilt.
- Stage Two recycle flow meter replaced.
- Effluent flow meter replaced.
- Stage One clarifier rake lift block replaced.
- Stage Two clarifier rake lift block replaced.

On May 9, 2024, Stage One was bypassed and taken out of service for cleanout and maintenance. On June 6, 2024, Stage Two was shut down and taken out of service for cleanout and maintenance, with the HsBWTP remaining offline for the remainder of the quarter.

Agency comments were received on September 7, 2021, for the *Horseshoe Bend Water Treatment Plant 2020 Annual Report* submitted by the SDs on June 28, 2021. Agency comments were received on January 23, 2023, for the *Horseshoe Bend Water Treatment Plant 2021 Annual Report* submitted by the SDs on November 15, 2022. The SDs addressed the Agency comments in the *Horseshoe Bend Water Treatment Plant 2022 Annual Report* submitted on January 5, 2024; 2020 and 2021 reports will be resubmitted, if necessary.

4. **HsBWTP Upgrade/Sludge Repository** – The SDs submitted the *Draft Butte Mine Flooding Operable Unit Remedial Action Adequacy Review Technical Memorandum* (RAAR Technical Memorandum) on November 22, 2019. Agency comments on the RAAR Technical Memorandum were received on October 6, 2020. On June 16, 2021, the Agencies provided the letter *Re: Interim RAAR Path Forward BMFOU* prompting follow-up discussions during the fourth quarter of 2021. Based on these discussions between the Agencies and the SDs, the SDs submitted a response to the Agencies in a letter *Re: SD Response to the Agencies Proposed RAAR Path Forward* dated March 28, 2022. In a letter dated September 26, 2022, the Agencies concurred with comments to the RAAR with the SDs proposed approach for the RAAR.
5. **West Camp System** – During the second quarter of 2024, approximately 24.5 million gallons of water were pumped from the West Camp Pump Station (WCP-1) to Lower Area One (LAO) for treatment in the Butte Treatment Lagoons (BTL) system. Operators of the BTL maintained normal operating levels below the protective water level for the entire quarter. The water level at the end of the second quarter was 5,420.06 feet (National Geodetic Vertical Datum [NGVD] 29). This is below the WCP-1 protective water level of 5,435 feet (NGVD 29).
6. **Waterfowl Protection** – During the reporting period, the SDs conducted migration monitoring, observation, and active and passive hazing and deterring efforts of waterfowl, as well as reporting as required by the CD.

The following waterfowl protection related documents were submitted to the Agencies in the second quarter:

1. The *February 2024 Berkeley Pit Migratory Waterfowl Protection Monthly Report* was submitted on April 3, 2024.
 2. The *March 2024 Berkeley Pit Migratory Waterfowl Protection Monthly Report* was submitted on April 16, 2024.
 3. The *April 2024 Berkeley Pit Migratory Waterfowl Protection Monthly Report* was submitted on May 30, 2024.
 4. The *May 2024 Berkeley Pit Migratory Waterfowl Protection Monthly Report* was submitted on June 28, 2024.
7. **Institutional Controls** – The SDs achieved full compliance with the requirement to place institutional controls on the use of contaminated groundwater on third-party property by providing funding in 2002, under past and future cost cash-out provisions of the CD, to establish and operate the Butte Alluvial and Bedrock Controlled Ground Water Area (BABCGWA). This BABCGWA was established by the Montana Department of Natural Resources and Conservation (DNRC) in October 2009 with Butte-Silver Bow City-County as the petitioner. The MBMG samples and monitors the BABCGWA. Please see the *Butte Mine Flooding Operable Unit, Water-Level Monitoring and Water-Quality Sampling, 2012 Consent Decree Update, 1982-2012* and consult Mr. Terence E. Duaiame, Project Manager of the MBMG for more detailed information. The BABCGWA 2023

Data Summary Report was submitted by the MBMG to the Agencies for review on March 29, 2024.

Access – The SDs have fully complied with the CD requirement to provide access to the Agencies. Access is provided to MBMG personnel to conduct monitoring.

8. **Other** – Progress of other components of the BMFOU project not specifically required in the CD is summarized in Table 1.

Table 1 – Other Items Second Quarter Status

Items	Quarter 2 2024 Status
<p style="text-align: center;">Berkeley Pit and Discharge Pilot Project</p>	<p>The SDs have initiated the Berkeley Pit and Discharge Pilot Project (Pilot Project) as a temporary, multi-year pilot project. The Pilot Project seeks to evaluate a system to control the rise of water levels in the Berkeley Pit and East Camp points of compliance (POCs) and to test additional methods of treating water from HsB seeps, Berkeley Pit water, and other sources of on-site water in order to discharge treated water to Silver Bow Creek. The Pilot Project initiated discharge of treated water off site on September 30, 2019. During the second quarter of 2024, the Pilot Project continued to operate and discharge treated water off site.</p> <p>The following Pilot Project specific deliverables, information, documents, correspondence, and data were submitted and/or responded to by the Agencies during the second quarter:</p> <ul style="list-style-type: none"> • The Agencies provided comments on the Pilot Project QAPP in their January 29, 2024, letter <i>Re: Comments on Berkeley Pit and Discharge Pilot Project Quality Assurance Project Plan, 2023 Update, dated December 21, 2023</i>. Atlantic Richfield and MR, jointly on behalf of the SDs, resubmitted the Pilot Project QAPP on April 19, 2024. The Agencies provided additional comments on the Pilot Project QAPP in their May 16, 2024, letter <i>Re: Comments on Berkeley Pit and Discharge Pilot Project Quality Assurance Project Plan, 2024 Update, dated April 19, 2024</i>. Atlantic Richfield and MR resubmitted the Pilot Project QAPP on June 3, 2024. • Atlantic Richfield and MR, jointly on behalf of the SDs, submitted the <i>Berkeley Pit and Discharge Pilot Project Discharge System Field Sampling Plan, 2024 Update</i> for review and approval on April 2, 2024. The Agencies provided comments on the Discharge System FSP in their May 16, 2024, letter <i>Re: Comments on: Berkely Pit and Discharge Pilot Project, Discharge System Field Sampling Plan, 2024 Update, dated April 2, 2024</i>.

Items	Quarter 2 2024 Status
	<ul style="list-style-type: none"> • Atlantic Richfield and MR, jointly on behalf of the SDs, submitted the <i>Berkeley Pit and Discharge Pilot Project Quarterly Pilot Project Report – Fourth Quarter 2023</i> on April 8, 2024. • The Downstream FSP was revised and resubmitted on March 29, 2024, to address the Agencies’ comment provided in their September 11, 2023, letter <i>Re: Comments on Berkeley Pit and Discharge Pilot Project Downstream Sampling Plan, 2023 Update, dated August 3, 2023</i>. The Agencies provided additional comments on the Downstream FSP their May 16, 2024, letter <i>Re: Comments on Berkeley Pit and Discharge Pilot Project Downstream Field Sampling Plan, 2024 Update, dated March 29, 2024</i>. • Atlantic Richfield and MR, jointly on behalf of the SDs, submitted the <i>Berkeley Pit and Discharge Pilot Project Discharge System Operations Assurance Plan (OAP), 2024 Update</i> for review on March 29, 2024. The Agencies provided comments on the Discharge System OAP their May 30, 2024, letter <i>Re: Comments on: Berkeley Pit and Discharge Pilot Project Discharge System Operations Assurance Plan 2024 Update, dated March 29, 2024</i>. • Atlantic Richfield, on behalf of MR and the SDs, submitted the <i>Discharge System Operations and Maintenance Manual, 2024 Update</i> for review and approval on April 23, 2024. • Atlantic Richfield, on behalf of MR and the SDs, submitted the <i>Discharge System 2023 Annual Operations and Maintenance Report</i> for review and approval on May 20, 2024. • Atlantic Richfield and MR, jointly on behalf of the SDs, submitted the <i>Berkeley Pit and Discharge Pilot Project Temperature Evaluation, 2023 Update</i> technical memorandum for review on June 28, 2024.
<p style="text-align: center;">MBMG Points of Compliance Monitoring</p>	<p>The <i>Fifth Five-Year Review Report for Silver Bow Creek/Butte Area Superfund Site, EPA ID MTD980502777, Butte-Silver Bow, Deer Lodge Counties, Montana</i>, recommended that monitoring updates clearly present information to show compliance with the 2002 Consent Decree stipulation that all POC water levels remain above the water level in the Berkeley Pit. To address this Five-Year Review recommendation, monitoring updates for all POCs are included in the MBMG monthly reports and in the 2021 Annual Summary Report. This recommendation in the Five-Year Review does not affect current and/or future protectiveness.</p>
<p style="text-align: center;">BMFOU Groundwater Monitoring Program QAPP</p>	<p>The <i>Quality Assurance Project Plan 2024, Butte Mine Flooding Operable Unit, Long-Term Monitoring Program</i> was submitted on</p>

Items	Quarter 2 2024 Status
	November 30, 2023, and was approved by the Agencies and distributed as a signed final document with crosswalk on February 27, 2024.

b) Summary of all results of sampling and tests and all other data generated in the previous quarter.

Final sampling and test results for the Pilot Project are reported in the Pilot Project Monthly Discharge Monitoring Report (DMR). During the second quarter, the SDs submitted the following Pilot Project DMRs to the Agencies:

1. *BMFOU Pilot Project March 2024 Monthly Discharge Monitoring Report* was submitted on April 26, 2024.
2. *BMFOU Pilot Project April 2024 Monthly Discharge Monitoring Report* was submitted on May 28, 2024.
3. *BMFOU Pilot Project May 2024 Monthly Discharge Monitoring Report* was submitted on June 28, 2024.

The HsBCS and the Berkeley Pit Pumping System (BPPS) began operating in the Pilot Project configuration on September 26, 2019. Additional Pilot Project sampling, tests, and other data are being generated consistent with the *Final Berkeley Pit and Discharge Pilot Project Work Plan* (Pilot Project Work Plan) and various attachments to the Pilot Project Work Plan to evaluate Pilot Project objectives. As applicable, this additional Pilot Project sampling, tests, and other data generated will be summarized in the *Quarterly Pilot Project Report – Second Quarter 2024* to be submitted under separate cover.

Table 2 summarizes the performance of the HsBWTP in the second quarter of 2024 and in total for the year.

Table 2 – HsBWTP Performance Table

Period	Influent (MG¹)	HSB Plant Water² (MG)	Sludge Wasted (MG)	Lime Delivered (tons)	Average Influent Flow (MGD¹)	Average Lime Usage (mg/L¹)
Quarter 1	361	355	19.5	2,156 ³	4.0	1,430 ³
Quarter 2	259	256	19.0	1,579	2.8	1,463
Quarter 3						
Quarter 4						
Total	620	611	38.4	3,735	3.4	1,444

¹MG: millions of gallons. MGD: millions of gallons per day. mg/L: milligrams per Liter.

²The treated HsB water that is incorporated in MR’s milling process as required by the CD will be referred to as “HsB Plant Water” instead of the previously used term, “effluent.” This semantics change has been made to distinguish between effluent that eventually will be treated to the discharge standards stipulated in the CD SOW and treated plant water that is included in MR’s milling process.

³Values provide in the first quarter report were updated above for ‘Lime Delivered’ and ‘Average Lime Usage’.

The HsBWTP water is sampled at multiple locations including the HsBWTP influent, Stage 1 Clarifier overflow (during two stage operation), and Plant Water (formerly named plant effluent). Testing demonstrates that the current operation of the HsBWTP satisfactorily complies with the requirement of the CD. The completed summary results of water sampling completed on HsBWTP will be summarized in the *Quarterly Pilot Project Report – Second Quarter 2024* to be submitted under separate cover.

In the vicinity of the HsBWTP, engineering controls associated with groundwater monitoring and dewatering were previously used to manage the groundwater elevations around the HsBWTP. Based upon current water elevations, this dewatering effort has been suspended. If groundwater level reduction efforts resume in the future, it will be described in applicable quarterly reports.

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

The following lists the deliverables required by the CD and relevant to the BMFOU submitted to the Agencies in the second quarter of 2024 and not otherwise listed elsewhere in this document [specifically in Section a)]:

1. *Contract No. 415008-TO-21, Butte Mine Flooding – March 2024 Monthly Report, BMFOU Consent Decree 02-35-BU-SEH* was submitted by MBMG on April 10, 2024.
2. *Contract No. 415008-TO-21, Butte Mine Flooding – April 2024 Monthly Report, BMFOU Consent Decree 02-35-BU-SEH* was dated May 14, 2024, and submitted by MBMG on May 16, 2024.
3. *Contract No. 415008-TO-21, Butte Mine Flooding – May 2024 Monthly Report, BMFOU Consent Decree 02-35-BU-SEH* was dated June 14, 2024, and submitted by MBMG on June 19, 2024.

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 anticipated activity summary for the third quarter of 2024 is organized in the following seven components identified in the SOW, with an eighth component describing other progress of the work not specifically required by the CD:

1. **Monitoring Program** – The Monitoring Program will continue to be implemented during the next quarter.
2. **Public Education and Involvement** – 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. **HsB Inflow Control** – The Pilot Project will continue to operate in the next quarter with the goal of capturing and treating flow emanating from the HsB area. The Inflow Control requirement will continue to be met with HsB area seep water being treated at the HsBWTP and/or through the HsBCS, then integrated into the mining/milling operations and ultimately reporting to the Yankee Doodle Tailings Impoundment (YDTI).
4. **HsBWTP Upgrade/Sludge Repository** – Sludge from the HsBWTP will continue to be placed into the Berkeley Pit during the next quarter.
5. **West Camp System** – Pumping from WCP-1 will continue to maintain West Camp water levels below the respective protective water level.
6. **Waterfowl Protection** – Waterfowl protection efforts will continue as required by the CD.
7. **Institutional Controls** – The Institutional Controls required by the CD will continue to be met with full access provided to the Agencies and MBMG at reasonable times. MR plans to continue to operate the active mining and milling operations within the stipulations of *Section IX. Access and Institutional Controls* of the CD.
8. **Other** – During the third quarter of 2024, the SDs will continue to progress the Pilot Project and other items as described in Table 3.

Table 3 – Upcoming Quarter Other Items

Items	Upcoming Quarter
Berkeley Pit and Discharge Pilot Project	<p>The SDs will continue to operate the Pilot Project and will report Pilot Project data with the following:</p> <ul style="list-style-type: none"> • Polishing Facility Operations and Maintenance Reports. • Monthly DMRs. • Quarterly Pilot Project Reports. <p>The SDs will continue to progress the work plan document preparation associated with the Pilot Project and anticipate providing the following in the third quarter of 2024:</p> <ul style="list-style-type: none"> • Resubmittal of the Discharge System FSP, Downstream FSP, and Discharge System OAP to address the Agencies’ comments. • The <i>Discharge System 2023 Data Quality Assessment</i> for Agency review. • The Pilot Project 2024 Annual Update for Agency review.

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

None.

f) **Include any modifications to the Remedial Action or Remedial Design Work Plans or other work plans or schedules that SDs have proposed to EPA or that have been approved by EPA.**

None.

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 above in Section a. *Actions taken toward achieving compliance with the CD, Subsection 2. Public Education and Involvement* for details to the answer to this reporting requirement.

h) **Issues encountered.**

None.

i) **EPA 5 Year Review Recommendations Status**

In order to determine if the remedy is or will be protective of human health and the environment, EPA conducts 5-year reviews of the site to evaluate implementation and performance of the BMFOU remedy. The EPA published the most recent 5-year review in the third quarter of 2021. As part of the 5-year review, EPA provides recommendations

to address current site issues as presented on page 46 of the *Fifth Five-Year Review Report for Silver Bow Creek/Butte Area Superfund Site, EPA ID MTD980502777, Butte, Silver Bow Deer Lodge Counties, Montana*. The EPA has requested the SDs report the status of these recommendations in the quarterly BMFOU report. The status of the follow-up action associated with the recommendation that the Agencies deemed to have potential to affect future protectiveness is described in Table 4.

Table 4 Most Recent Five-Year Review Recommendations to Address Current Site Issues

Issue	Recommendation/Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?		Status
					Current	Future	
<p>In October 2020, the Settling Defendants voluntarily transitioned from the interim discharge standards to the final discharge standards outlined in the 2002 BMFOU Consent Decree. The final discharge standards include radionuclides and beta/photon emitters. Since October 2020, the radionuclides have been below standards, however, the Settling Defendants are not analyzing for beta/photon emitters. The performance standard for beta/photon emitters is a dose rather than a concentration. Consequently, in order to meet the beta/photon limit, 179 different radionuclides would need to be analyzed. Further data collection for radionuclides is proposed, as such, the settling defendants are planning to request to move back to the interim discharge standards.</p>	<p>In order to ensure compliance with the final discharge standards, the Settling Defendants should evaluate alternative testing methodology for beta/photon emitters. In addition, the applicability of the radionuclide final discharge standards should be evaluated. The EPA, in consultation with Montana Department of Environmental Quality, will consider modification and/or deletion of the final standards of radionuclides, based upon the evaluation of effluent and/or influent monitoring data.</p>	SDs	EPA	09/30/2022	No	Yes	<p>On August 26, 2021, the SDs, submitted the technical memorandum, <i>Reasonable Potential to Exceed Analysis for Radionuclides Berkeley Pit and Discharge Pilot Source and Discharge Water</i>, in a letter requesting modification of the monitoring program for radionuclides. Based on the ongoing related discussions between the SDs and the Agencies, the SDs submitted a follow-up radionuclide standards letter, <i>Butte Mine Flooding Operable Unit (BMFOU) Radionuclide Standards Letter</i> on January 11, 2022. The Agencies provided approval with conditions in a February 8, 2022, letter <i>Re: Approval and response to: Butte Mine Flooding Operable Unit (BMFOU) Radionuclide Standards Letter, dated January 11, 2022</i>. The SDs and the Agencies had additional technical discussions related to the Agencies' approval conditions, EPA guidance on radionuclide standards, revised radionuclide reporting, and the Pilot Project schedule. On August 19, 2022, the SDs submitted a response to the Agencies with additional details that were discussed during these technical discussions and clarified the Agencies' conditions listed in the February 8, 2022, approval letter. MR and Atlantic Richfield submitted a summary of radionuclide data collected during the Pilot Project, an assessment of the monitoring results, and proposed adjustments to radionuclide monitoring requirements in a letter dated September 13, 2023. MR and Atlantic Richfield will continue radionuclide monitoring as described in the <i>Discharge System FSP</i> for the remainder of the Pilot Project.</p>

j) Other

The following information is included in this report at the request of the Agencies and is not part of the BMFOU RA.

MR continued operations during the second quarter in compliance with State-issued permits and the description in the CD that allows for recovery of ore, crushing, concentration, leaching, and importation of water as needed for mining (*CD, Section IX. ACCESS AND INSTITUTIONAL CONTROLS, part 26b., p. 39*).

Attachment 1 is a memorandum from the second quarter titled, *Berkeley Pit Slope Stability Second Quarter Summary 2024* produced by MR's Engineering Department. The report summarizes activities conducted during the quarter related to monitoring and dewatering of the alluvium in the Concentrator, Southeast Corner, and Pittsmont Sectors of the Pit.

Submission of this report does not constitute a statement by Atlantic Richfield or MR concerning responsibility between them for any identified tasks or a statement by Atlantic Richfield or MR that any specific task is required to comply with any existing agreement.

BMFOU QUARTERLY REPORT

SECOND QUARTER 2024

ATTACHMENT 1

Berkeley Pit Slope Stability Second Quarter 2024 Summary

MEMORANDUM

TO: Dan Janney, Tim Boyle
FROM: Mike Harvie
COPY: Mark Thompson, MR; Loren Burmeister, Atlantic Richfield Company
DATE: July 24, 2024
SUBJECT: Berkeley Pit Slope Stability Second Quarter Summary 2024

Summary

Monitoring of the Berkeley Pit highwall slope stability continued throughout the Second Quarter of 2024. The monitoring network is illustrated in Plate I and summarized in Table 1.

Table 1. Berkeley monitoring network Second Quarter 2024.

BERKELEY PIT HIGHWALL STABILITY	Monitor Points & Prisms	Extensometers	Inclinometers	TDR Cables	Dewatering Pumps	Water Levels
Bird Watch Sector	4	-	1	1	-	1
Concentrator Sector	3	0	2	3	-	5
Southeast Sector	8	2	3	-	6	11
Pittsmont Sector	3	-	-	4	-	3

Monitoring

The monitoring network was maintained throughout the quarter and repairs, replacements, and adjustments were completed promptly, as needed, to provide for uninterrupted coverage.

Implementation to real time instrumentation of the dewatering, inclinometer and water level wells continues to get all these wells onto the Sensemetrics real time monitoring

system. Once the system is fully operational, water levels and inclinometer readings will be recorded hourly on the above wells. There are three wells that required additional effort to get real time instrumentation fully installed and working properly at the time of this report. Weekly measurements of these wells have been recorded from water level probes used in the pump control system. Currently Sensemetrics does not support the TDR instruments but it is under development. Once the platform supports TDR, those wells will also be migrated over to Sensemetrics. During the transition to the real time instrumentation, readings had some irregular time frequencies due to implementation and troubleshooting activities. Efforts are also being made to replace monitoring points with prisms that can be surveyed with a total station and improve the accuracy of the readings. All the prisms were installed in Q2 and will be surveyed along with the monitoring points, transition to the prisms will be completed in Q3.

MR's monitoring schedule is as follows:

1. Survey all monitoring points in all sectors weekly,
2. Visually inspect the Southeast and Concentrator Sectors weekly,
3. Measure water levels in TDRs, dewatering wells, and inclinometer wells at least weekly if not connected to real time monitoring system, otherwise levels will be recorded hourly and
4. Ensure inclinometers are reading at least bi-monthly if real time system is lost.

Berkeley Pit - Active Sectors

Sector nomenclature for the Berkeley Pit is detailed on Plate II (attached).

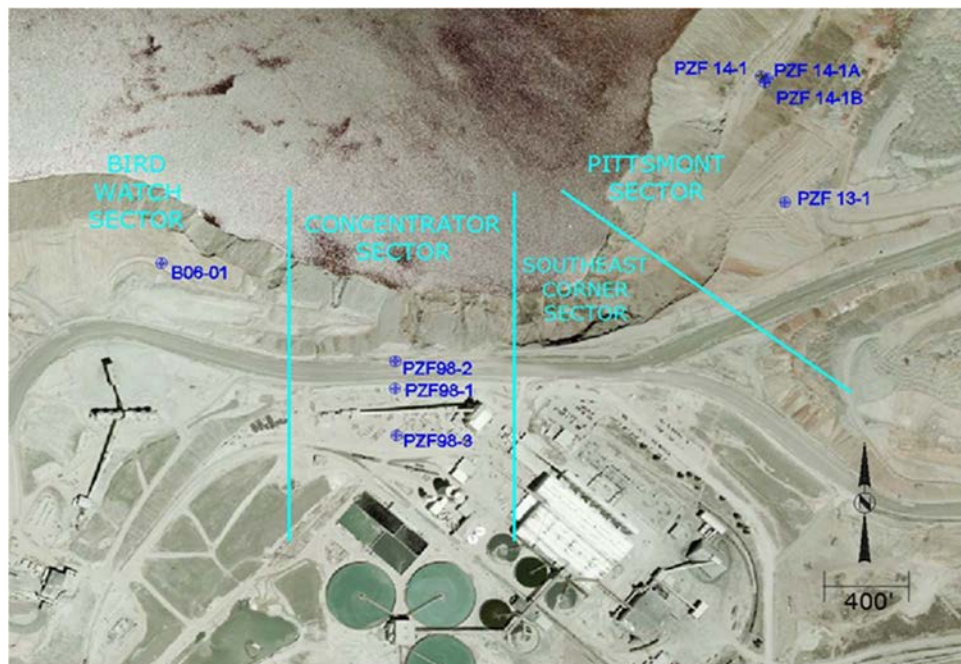


Figure 1. TDR Well locations.

Bird Watch Sector: The Bird Watch Sector monitor points did not exhibit significant movement during the Second Quarter of 2024.

The inclinometer well (Berk-2) did not demonstrate any progressive movement.

Concentrator Sector: The Concentrator Sector monitor points did not exhibit significant movement during the Second Quarter of 2024.

The two inclinometer wells, Berk-1 and Berk-3 also did not indicate any progressive movement.

On January 27th, PZF12-5’s VWP started reporting erroneous low water levels. The erroneous readings were not discovered until end of quarter since all alerts were set to detect high-water levels, not low-water levels. Troubleshooting of VWP has deemed the VWP is bad or the down hole cable is damaged.

Southeast Sector: The Southeast Sector monitoring points did not show any significant progressive movement during the Second Quarter of 2024.

There was no significant movement indicated by the SlideMinder extensometers in the Southeast Sector during the quarter.

Dewatering pumps in the Southeast Sector of the Berkeley Pit continued to operate throughout the Second Quarter of 2024. The pumps installed in PZF15-1 and PZF15-6 did not operate during the entire quarter due to low water flows. There were some electrical issues during this period which resulted in the other pumps being down for short periods of time before pumping resumed. PZF15-2 had some pump issues in late June and repairs were made and returned to service. Slight water elevations increases were noticed in PZF15-1 and PZF15-6 when PZF15-2 was down. All other dewatering wells operated throughout this period without any issues, other than some power faults. Pumping was restored within 24 hours of each power fault. Water levels returned to normal levels soon after pumping was resumed.

Table 2. Average flows for the Dewatering Wells (Second Quarter 2024).

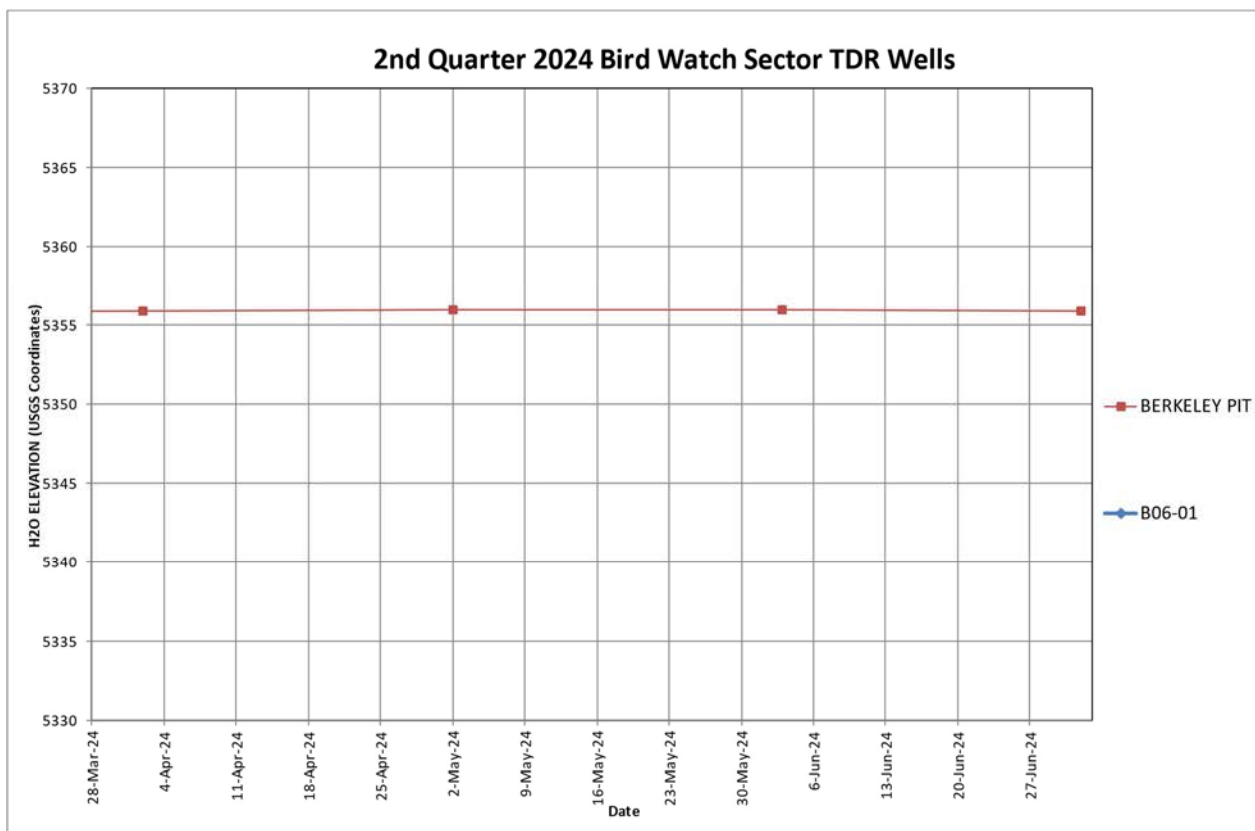
Dewatering Wells	April		May		June		Second Quarter 2024	
	Flow (gpm)	Availability	Flow (gpm)	Availability	Flow (gpm)	Availability	Flow (gpm)	Availability
PZF15-1	0.0	0%	0.0	0%	0.0	0%	0.0	0%
PZF15-2	18.1	100%	18.1	100%	18.1	93%	18.1	98%
PZF15-3	52.9	100%	52.2	100%	52.3	100%	52.5	100%
PZF15-4	9.6	100%	9.2	100%	6.5	100%	8.4	100%
PZF15-5	10.3	100%	10.5	100%	10.9	100%	10.6	100%
PZF15-6	0.0	0%	0.0	0%	0.0	0%	0.0	0%
LP-15	25.5	100%	25.1	100%	24.9	100%	25.2	100%

Pittsmont Sector: Monitoring points on the Pittsmont dump were surveyed once a week during the quarter. No slope movements were detected during the quarter.

PZF14-1B readings indicated the well went dry around February 4, 2020, and has remained dry since that time.

Hydrographs

Water levels are tracked in all sectors. Hydrographs detailing the piezometric surface in each sector are provided in Figures 2 through 8. There were no unexpected water fluctuations of note during the quarter. PZF98-03S VWP was pulled to take manual reading on February 17, 2021, when attempting to re-install VWP the tube seemed to be blocked near water level. Blockage initially thought to be ice, attempts to re-installs were unsuccessful.



- B06-01 Well was recorded as dry throughout this period

Figure 2. TDR Well Hydrographs Bird Watch Sector.

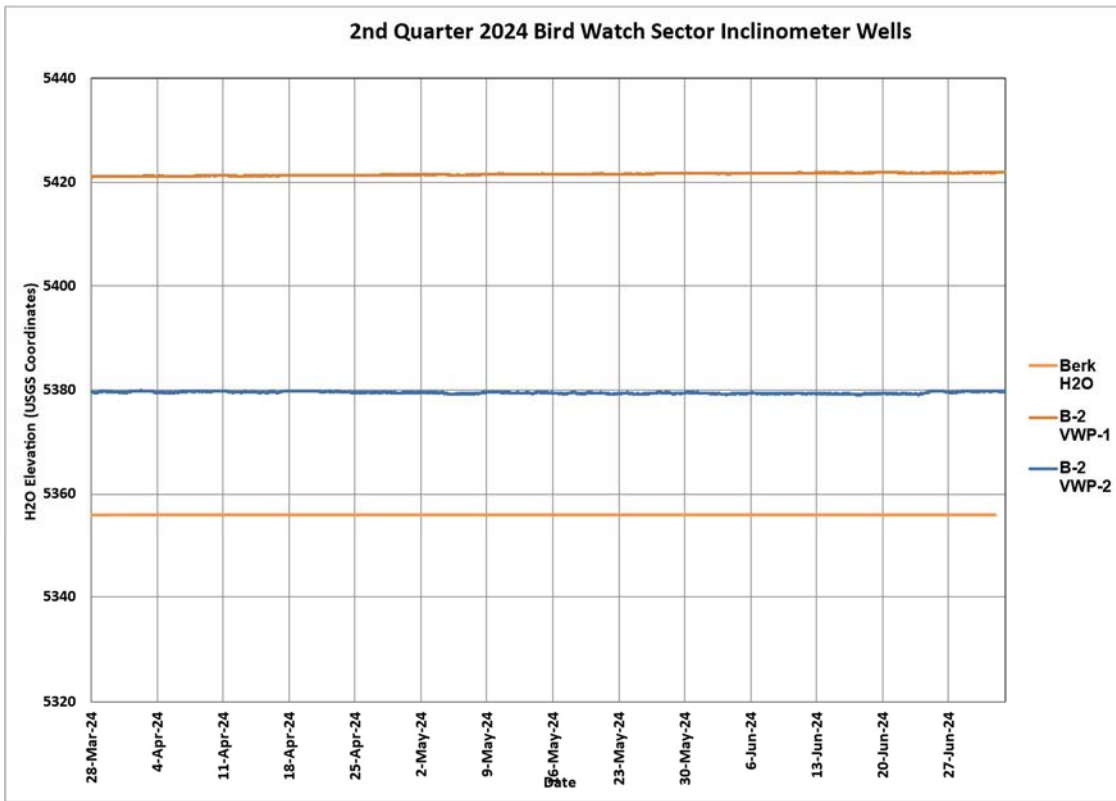


Figure 3. Inclinerometer Well Hydrographs Bird Watch Sector.

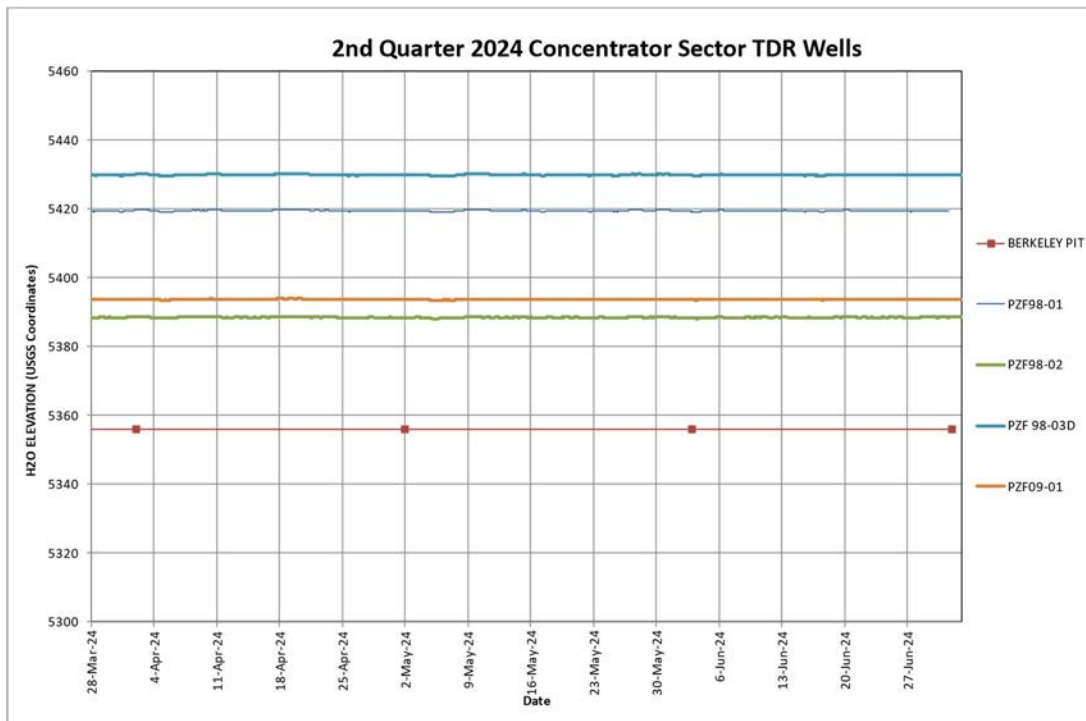


Figure 4. TDR Well Hydrographs Concentrator Sector.

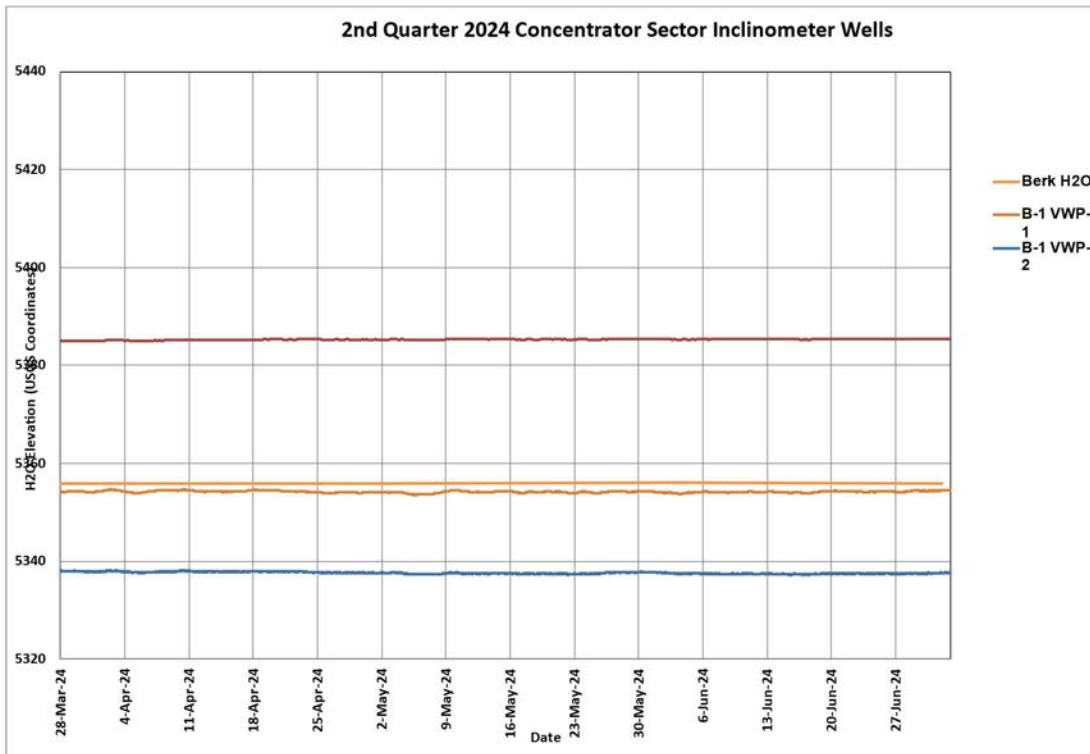


Figure 5. Inclinator Well Hydrographs Concentrator Sector.

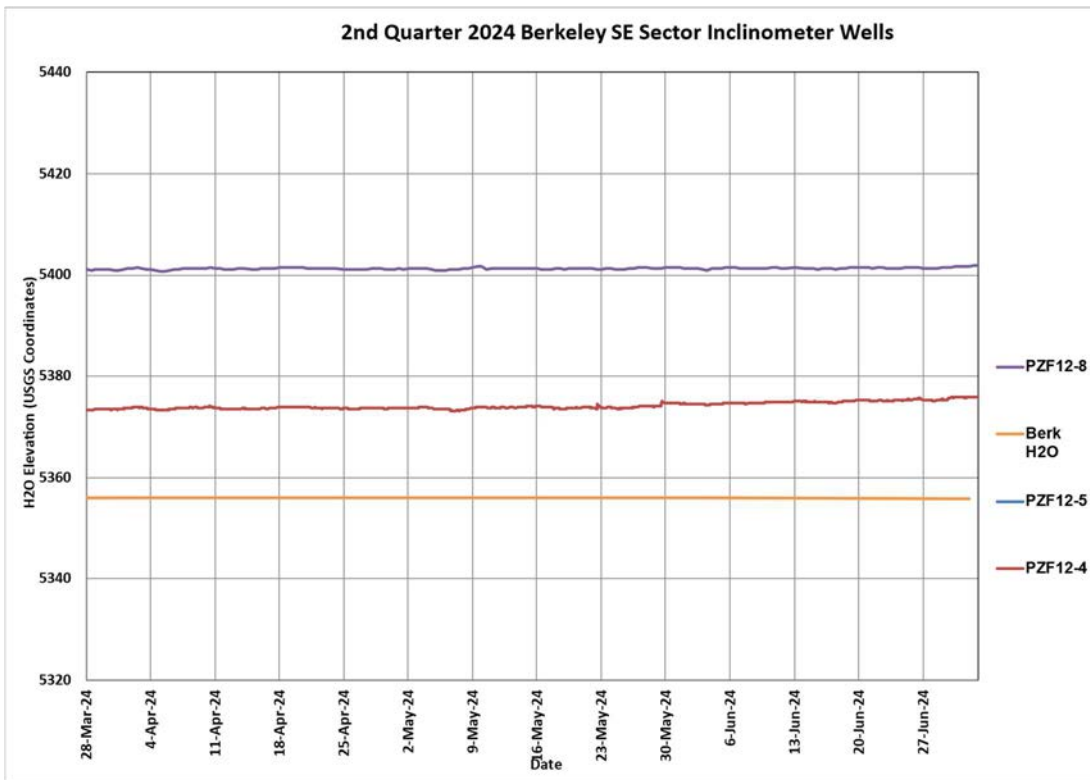


Figure 6. Hydrographs Southeast Sector inclinometer wells.

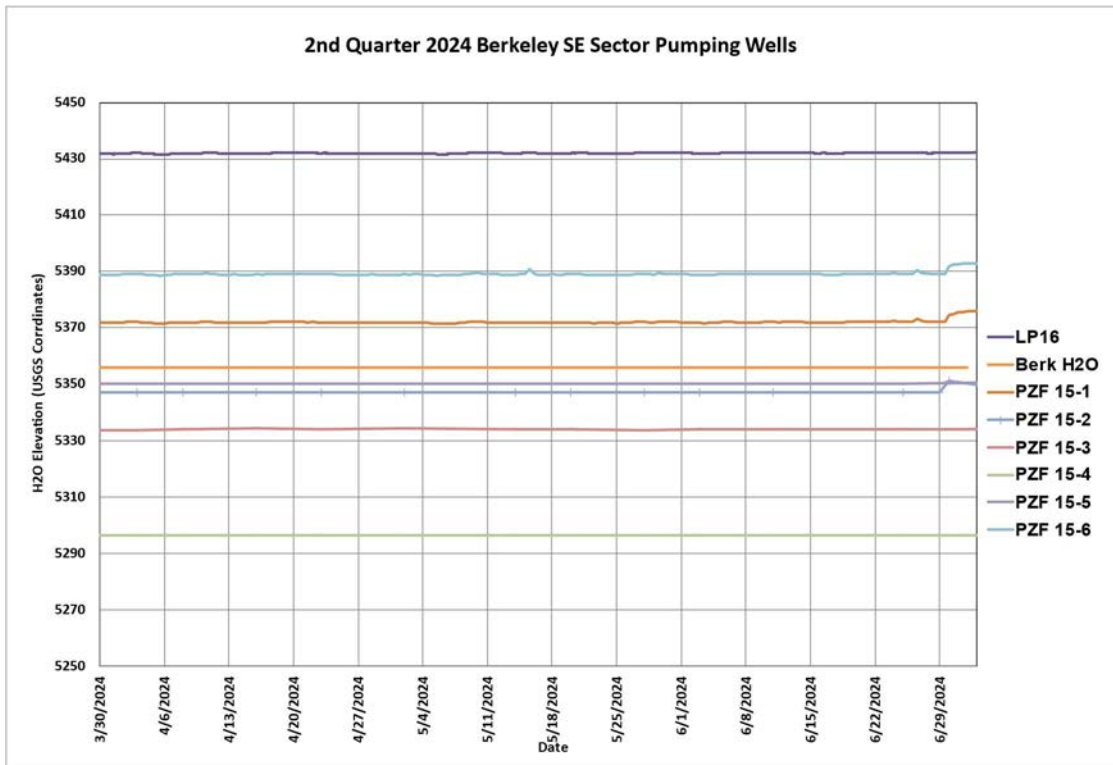
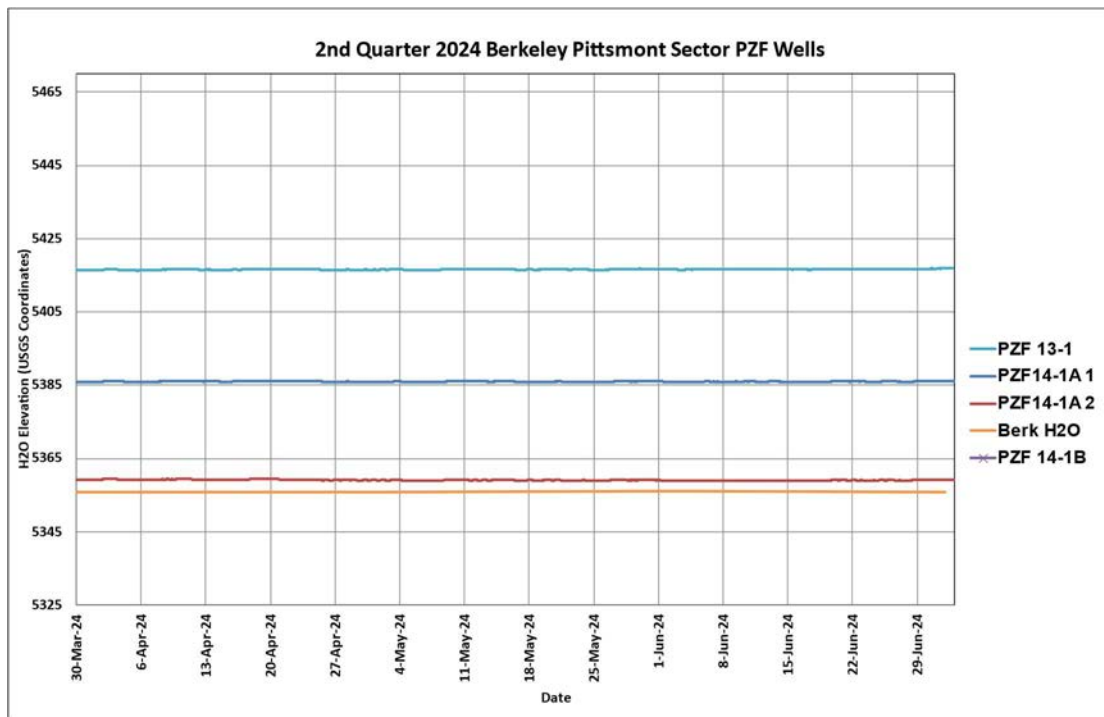


Figure 7. Hydrographs Southeast Sector pumping wells

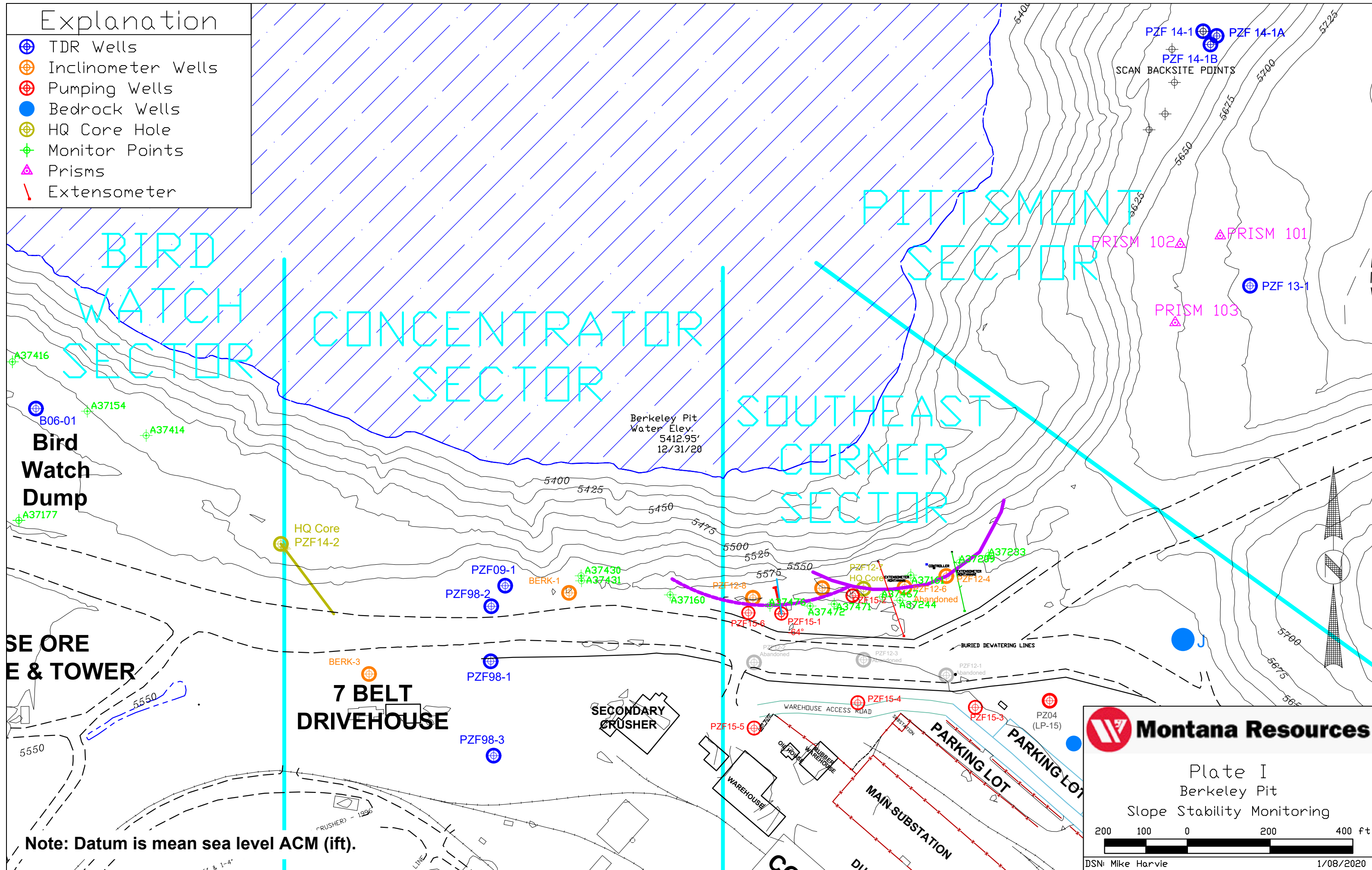


PZF14-1B Well was recorded as dry since Feb 4, 2020

Figure 8. Hydrographs Pittsmond Sector.

Explanation

-  TDR Wells
-  Inclinometer Wells
-  Pumping Wells
-  Bedrock Wells
-  HQ Core Hole
-  Monitor Points
-  Prisms
-  Extensometer



SE ORE
E & TOWER

7 BELT
DRIVEHOUSE

SECONDARY
CRUSHER

WAREHOUSE

MAIN SUBSTATION

PARKING LOT

PARKING LOT



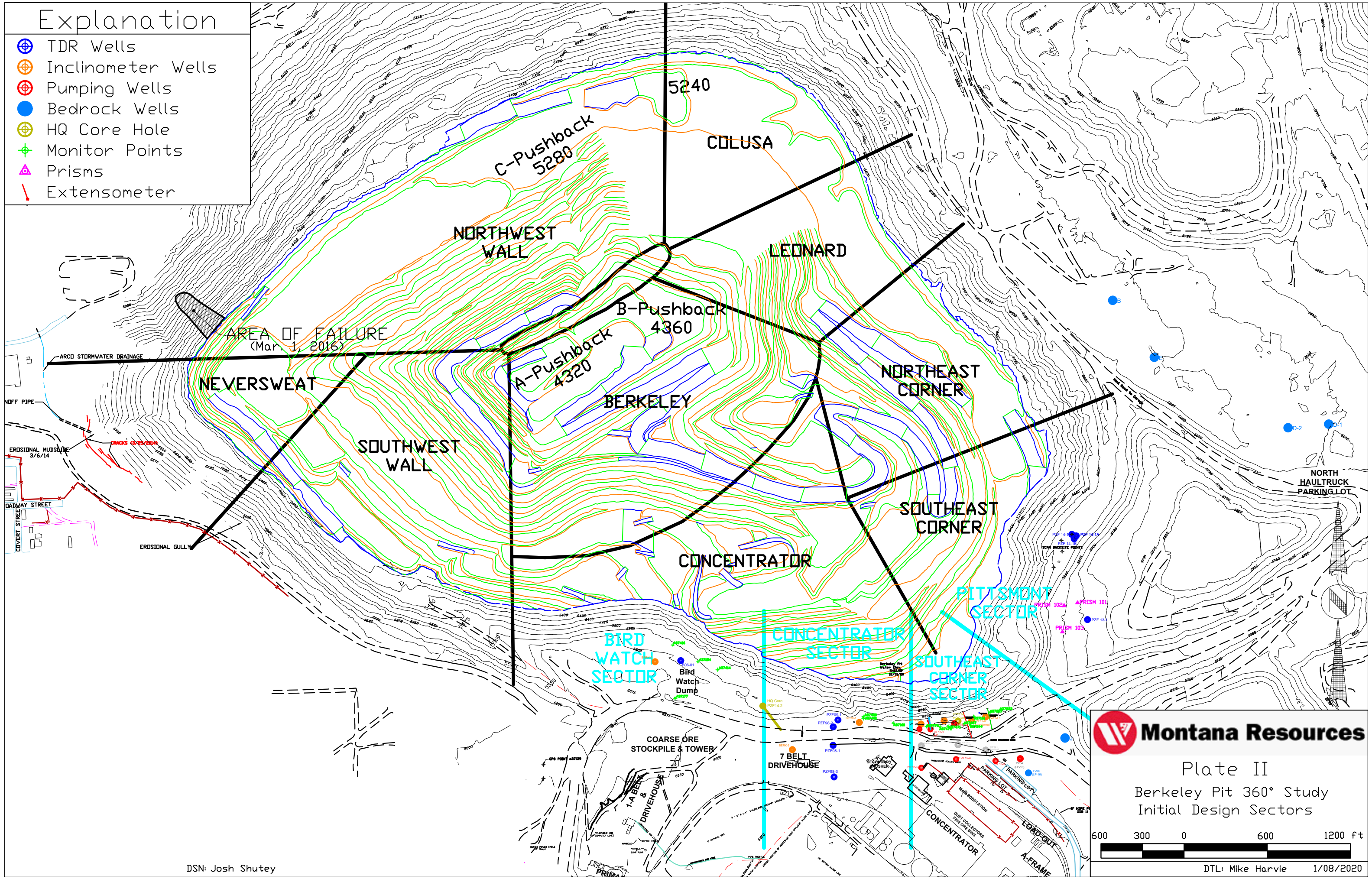
Plate I
Berkeley Pit
Slope Stability Monitoring



Note: Datum is mean sea level ACM (ift).

Explanation

-  TDR Wells
-  Inclinator Wells
-  Pumping Wells
-  Bedrock Wells
-  HQ Core Hole
-  Monitor Points
-  Prisms
-  Extensometer




 **Montana Resources**

Plate II
Berkeley Pit 360° Study
Initial Design Sectors

600 300 0 600 1200 ft

DTL: Mike Harvie 1/08/2020