

September 11, 2020

C/015/0018
Received 9/14/2020
Task #6190

Utah Coal Program
Utah Division of Oil, Gas, and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Subj: Amendment to Update the Water Monitoring Program for the Deer Creek Mine, Deer Creek Mine (C/015/0018), Emery County, Utah.

PacifiCorp hereby submits and amendment to update the Deer Creek Mine water monitoring program. This update is a result of the recent reclamation of the main mine facilities in Deer Creek Canyon (November 2019) and the 1st Right Rilda Canyon facilities (June 2019). The goal for post reclamation water monitoring program is to monitor the surface waters above and below the mine disturbed area.

As part of this update, PacifiCorp proposes to remove three (3) sites. One (1) site in Deer Creek Canyon and two (2) sites in Rilda Canyon. PacifiCorp also proposes to relocate one (1) site in Rilda Canyon to a location in close proximity above the disturbed area. The proposed status change to the sites are outlined below:

Deer Creek Canyon

- DCR06 – Remove

Rilda Canyon

- RCLF2 – Remove
- RCW4 – Remove
- RCF1 – Relocate (the new location will be titled RCR1-A to denote the change)

PacifiCorp has monitored these sites for up to 34 years and has never experienced any impacts to water quality or quantity associated with the underground operations. Now that PacifiCorp has closed the mine, sealed the portals, and completed reclamation, it can now focus on monitoring for potential impacts due to the reclaimed disturbed areas.

Attached herein is the documentation for justifying each site's removal from the monitoring program or the relocation to a site that better represents the background quantity and quality of the Rilda Canyon stream. Also included are the pages and drawings in the permit that will be required to be revised to accommodate the changes in the monitoring program. These revisions are as follows:

Volume 1, Part 2, replace pages 2-220 thru 2-224.
Volume 1, Part 2, replace Map CE-10478-EM (HM-1A)
Volume 9, Appendix A, Appendix A-1, replace entire appendix.
Volume 9, Maps Tab, replace Map CE-10478-EM (HM-1A)

If you have any questions or concerns regarding this amendment, please contact me at 801-220-4632.

Sincerely,

A handwritten signature in blue ink that reads "Dennis Oakley". The signature is written in a cursive style with a large, looped "D" and "O".

Dennis Oakley
Sr. Mine Engineer

Cc: file

APPLICATION FOR COAL PERMIT PROCESSING

Permit Change New Permit Renewal Exploration Bond Release Transfer

Permittee: PacifiCorp

Mine: Deer Creek Mine

Title: Amendment to Update the Water Monitoring Program for the Deer Creek Mine, Deer Creek Mine (C/015/0018), Emery County, Utah. **Permit Number:** C/015/0018

Description, Include reason for application and timing required to implement:
Revision to water monitoring program for reclamation monitoring only.

Instructions: If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

- Yes No 1. Change in the size of the Permit Area? Acres: _____ Disturbed Area: _____ increase decrease.
- Yes No 2. Is the application submitted as a result of a Division Order? DO# _____
- Yes No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
- Yes No 4. Does the application include operations in hydrologic basins other than as currently approved?
- Yes No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
- Yes No 6. Does the application require or include public notice publication?
- Yes No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
- Yes No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
- Yes No 9. Is the application submitted as a result of a Violation? NOV # _____
- Yes No 10. Is the application submitted as a result of other laws or regulations or policies?
Explain: _____
- Yes No 11. Does the application affect the surface landowner or change the post mining land use?
- Yes No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- Yes No 13. Does the application require or include collection and reporting of any baseline information?
- Yes No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- Yes No 15. Does the application require or include soil removal, storage or placement?
- Yes No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- Yes No 17. Does the application require or include construction, modification, or removal of surface facilities?
- Yes No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- Yes No 19. Does the application require or include certified designs, maps or calculation?
- Yes No 20. Does the application require or include subsidence control or monitoring?
- Yes No 21. Have reclamation costs for bonding been provided?
- Yes No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- Yes No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

Please attach one (1) review copy of the application.

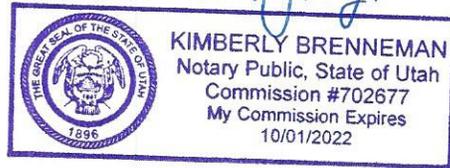
I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Dennis Oakley
 Print Name

Dennis Oakley 9/11/20
 Sign Name, Position, Date
Mine Eng.

Subscribed and sworn to before me this 11 day of September, 2020

Kimberly Brenneman
 Notary Public



My commission Expires: October 1, 2022 }
 Attest: State of Utah } ss:
 County of Utah

For Office Use Only:

Assigned Tracking
 Number:

Received by Oil, Gas & Mining

PacifiCorp
Deer Creek Mine
C/015/0018

**Amendment to Update the Water Monitoring
Program for the Deer Creek Mine**

Justification Documents

Location: DCR06 is located approximately 15000 feet downstream from the Deer Creek Facility. It is situated 1400 feet north and 1100 feet west of the southeast corner of Section 6, Township 16 South, Range 7 East, SLB&M. This site is located outside the Deer Creek mine permit boundary adjacent to the Huntington Power Plant.

Lease Association: This site is located within PacifiCorp fee lands.

Subsidence: There has been no subsidence from mining that has impacted this site.

Water Data: Historical water quantity data is included for DCR06. Historic flow data has been collected for years 1986 through current (approx. 34 years). Maximum flow was recorded in May of 2011 at 5,735 gpm. As shown on the chart, flows typically start in May and dried up by July. This is common for this canyon since runoff is from spring snowmelt. The rest of the year the channel is dry.

It should be noted that between approximately 1998 and 2015, the reported flows were caused mostly by mine discharge. Prior to 1998, there was intermittent mine discharge. After 2015, no mine discharge has occurred.

Justification for removal from monitoring: Site DCR06 has been monitored by Energy West Mining Company (now PacifiCorp) since 1986. There have been no reported occurrences in which mining has impacted the water quantity or quality as monitored from this site.

DCR06 was strategic for monitoring the background flow regime of the Deer Creek Canyon below the mine site as compared to the Deer Creek mine water discharge. Today, there is no mine water discharge coming from the mine. However, PacifiCorp installed a french drain in two of the Deer Creek portals when the mine was sealed in 2015. The discharge pipeline routes south to the reclaimed Deer Creek drainage. The discharge line is monitored monthly as part of PacifiCorp's UPDES permit.

PacifiCorp intends to retain DCR01 and DCR04 which are located above and below the reclaimed mine site. These two monitoring sites are sufficient for collecting and recording data above the and below the disturbed area. DCR01 and DCR04 will be monitored for as outlined in Volume 9 until phase III bond release of the Rilda facilities is approved by the Division.

Location: RCLF-2 is located approximately 1600 feet upstream from the Right and Left fork convergence. It is situated 1600 feet north and 2300 feet west of the southwest corner of Section 29, Township 16 South, Range 7 East, SLB&M. This site is located inside the Deer Creek mine permit boundary.

Lease Association: This site is located within lease UTU-06039 above the historic Rilda Left Fork Portal Area.

Subsidence: There has been no subsidence from mining that has impacted this site.

Water Data: Historical water quantity data is included for RCLF-2. Historic flow data has been collected for years 1995 through current (approx. 25 years). Maximum flow was recorded in June of 2011 at 1,690 gpm. As shown on the chart, flows typically start in May and dried up by July. This is common for this canyon since runoff is from spring snowmelt. The rest of the year the channel is dry.

It is noted every year that when runoff begins, the flow in this canyon is the color of “chocolate milk”. In the head of the left fork, runoff originates from an exposed slide area that produces mass quantities of suspended solids.

Justification for removal from monitoring: Site RCLF-2 has been monitored by Energy West Mining Company (now PacifiCorp) since 1995. There have been no reported occurrences in which mining has impacted the water quantity or quality as monitored from this site.

RCLF-2 was strategic for monitoring the background flow regime of the left fork of Rilda Canyon. In 2016 as a result of the Trail Mountain Fire, the USFS commandeered the site to construct a sediment basin to catch the runoff slurry that consisted of soil, ash, sticks, logs, rocks, etc. In January 2019, PacifiCorp received phase III bond release of the 2.33 acre area of the left fork fan pad.

PacifiCorp intends to retain RCLF-1 which is located in the left fork approximately 200 feet upstream of the confluence of the right and left forks of Rilda Canyon. One monitoring site in the left fork is sufficient for collecting and recording background data above the Rilda facility disturbed area. RCLF-1 will be monitored for as outlined in Volume 9 until phase III bond release of the Rilda facilities is approved by the Division.

Location: Section 22, Township 16 South, Range 7 East, SLB&M. This site is located within the Deer Creek mine permit boundary.

Lease Association: There is no lease associated with this surface monitoring site. The site is located within fee lands owned by Intermountain Power Agency. Historically, the monitoring location was installed by the USGS for monitoring surface flows in Rilda Canyon. The site consists of a 90 degree Triangular Notch Weir and is located above the confluence of the Huntington Creek.

Subsidence: There has been no subsidence from mining that has impacted this site.

Water Data: Historical water quality data is included for RCW4. Historic flow data has been collected for years 1989 through current (approx. 31 years). Maximum flow was recorded in June of 2011 at 21,450 gpm. Average flow equates to 800.8 gpm. Except for seasonal fluctuations due to snowmelt and storm water runoff, the data show insignificant variances between pre-mining, operational, and post-reclamation quality results. Higher flows resulted with increased TSS. Base flows resulted in increases to conductivity and TDS.

Justification for removal from monitoring: Site RCW-4 has been monitored by Energy West Mining Company (now PacifiCorp) since 1989. There have been no reported occurrences in which mining has impacted the water quantity or quality as monitored from this site.

RCW-4 has been strategic for monitoring the entire flow regime of Rilda Canyon. Now that the Rilda portals have been closed and sealed (12/2017) and the mine site reclaimed (6/2019), the reclamation surface water monitoring goals are to sample runoff from those areas above and below the mine site. Sampling above the site records the water quantity and quality from background flows. Sampling below the mine site records the background contributions and any contributions of flow or sediment to the stream from the reclaimed area.

RCW-4 is located approximately 4.0 miles below the disturbed area in Rilda Canyon. There are many other areas that contribute to the water quantity and quality of the Rilda Creek and sampled at this site. In 2016, the Trail Mountain forest fire spread into Rilda Canyon and decimated most of the canyon. During storm events, black flow of ash and sediment from these burned areas have been witnessed flowing from side canyons into the main channel of the stream. These contributions greatly influence the water quality monitored at this site. PacifiCorp proposes to retain RCF-1 and RCF-3 (directly above and below the mine site), where it can monitor any impacts that may occur from the reclaimed area. RCF-1 (proposed to be relocated directly above the mine site) and RCF-3 will be monitored for quantity and quality as outlined in Volume 9 until phase III bond release is approved by the Division.

[PROPOSAL TO RELOCATE AND CHANGE ID OF SITE]

Location: RCF-1 is currently located in Section 30, Township 16 South, Range 7 East, SLB&M in Rilda Canyon. This site is located within the Deer Creek mine permit boundary.

Lease Association: There is no lease associated with this surface monitoring site. The coal lease (UT06039) was partially relinquished in September 2019.

Subsidence: There has been no subsidence from mining that has impacted this site.

Water Data: The historical water data with this site will remain intact for the data that has been collected to this date. However, the permittee proposes to discontinue collecting operational data at this location and begin collecting reclamation data at a site located a few hundred feet above the disturbed area of the 1st Right Portal Facility at a point where the walking trail crosses the Rilda Creek (refer to photo). The site will be identified as RCF-1A to differentiate the two sites. The monitoring schedule for the relocated site will not be revised. Monthly flow data will be collected as well as quarterly field and quality data.

Justification for relocating this site: Site RCF-1 has been monitored by Energy West Mining Company (now PacifiCorp) since 1989 as a surface site to evaluate any impacts to the stream flow and/or water quality due to the Deer Creek mining operations. The site was a USGS monitoring site that included a 12” Parshall Flume encased in concrete. The site has since been obliterated from high flows and debris. Only a concrete base exists at this site. There have been no reported occurrences in which mining has impacted the water quantity or quality as monitored from this site.

Site RCF-1A will be monitored to evaluate the background stream flows and water quality before it enters into the disturbed area of the reclaimed 1st Right Portal Facility area of the Deer Creek Mine in Rilda Canyon. Reclamation was completed in this area in June 2019. The main focus of the reclamation monitoring will be to evaluate whether the reclaimed soils are contributing sediment to the stream flow of Rilda Creek. The data from RCF-1A will be compared to the data collected from RCF-3 (below the disturbed area) and reported to the Division. Each of these sites will be retained until Phase III Bond Release is approved by the Division.

PacifiCorp
Deer Creek Mine
C/015/0018

**Amendment to Update the Water Monitoring
Program for the Deer Creek Mine**

Site Photos

DCR06 is located at the mouth of Deer Creek Canyon just before the drainage flows into Huntington Creek. This site is typically dry as water flow soaks into the alluvium. This site has a high potential for quality to be highly influenced by the Huntington Power Plant operations.



RCLF2 above the Bond Released Rilda Left Fork Facilities in the Left Fork of Rilda Canyon.

This site is considered redundant since RCLF1 is nearer the forks of the Left and Right forks of Rilda Canyon. The site is typically dry.



RCW4 at the mouth of Rilda Canyon.

This site is approximately 2 miles below the 1st Right Portal Facilities disturbed area. The water quality at this site is influenced by many sub-drainages and road drainage below the disturbed area.



Relocation of RCF1 to the stream crossing in the Right Fork of Rilda Canyon.

Stream crossing is approximately 500 feet above the 1st Right Portal Facilities disturbed area.



PacifiCorp
Deer Creek Mine
C/015/0018

**Amendment to Update the Water Monitoring
Program for the Deer Creek Mine**

Volume 9, Appendix A, Appendix A-1
Replace Entire Appendix

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE**

I. MONITORING LOCATIONS – DEER CREEK MINE

A. Surface Water Hydrology (for maps refer to Deer Creek and Wilberg/Cottonwood Mine: Volume 9 Map HM-1A, Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D Mill Fork Lease for East Mountain locations listed below)

1. Huntington Creek Drainage System

a. *Deer Creek* (refer to Deer Creek and Wilberg/Cottonwood-Mines: Volume 9 Map HM-1A)

(1) DCR01 - Above the mine:
(Approximately 600 feet upstream from the mine facility.) 200 feet North, 800 feet West of the Southeast corner of Section 10, Township 17 South, Range 7 East.

(2) DCR04 - Near C1/C2 Belt Intersection:
(Approximately 5,000 feet downstream from the mine facility.) 300 feet North, 2000 feet East of the Southeast corner of Section 2, Township 17 South, Range 7 East.

~~(3) DCR06 @ Huntington Creek Confluence:
(Approximately 15,000 feet downstream from the facility) 1400 feet north, 1100 feet east of the southeast corner of Section 6, Township 16 South, Range 7 East.~~

b. *Rilda Canyon* (refer to Deer Creek and Wilberg/Cottonwood-Mines: Volume 9 Map HM-1A)

(1) RCF **1A** - Rilda Canyon - Right Fork:
(Approximately ~~403500~~ **400 feet South, 200 feet West of the Northeast corner of Section 30** **2900 feet North, 2200 feet West of the Southeast corner of Section 29**, Township 16 South, Range 7 East.

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ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE**

- (2) RCLF1 - Rilda Canyon - Left Fork, below Rilda Canyon Portals: (Approximately 200 feet upstream from the Right and Left fork convergence.) 2400 feet North, 2100 feet West of the Southeast corner of Section 29, Township 16 South, Range 7 East.
- ~~(3) RCLF2 - Rilda Canyon - Left Fork, above Rilda Canyon Portals: (Approximately 1600 feet upstream from the Right and Left fork convergence.) 1600 feet North, 2300 feet West of the Southwest corner of Section 29, Township 16 South, Range 7 East.~~
- ~~(4) RCF2 - Rilda Canyon - Above NEWUSSD springs: 2500 feet South, 400 feet West of the Northeast corner of Section 29, Township 16 South, Range 7 East.~~
- (5) RCF3 - Rilda Canyon - Below NEWUSSD springs: 2550 feet South, 1000 feet East of the Northeast corner of Section 28, Township 16 South, Range 7 East.
- ~~(6) RCW4 - Rilda Canyon: (Approximately 1000 feet upstream from the confluence with Huntington Creek.) 850 feet North, 1900 feet West of the Southeast corner of Section 26, Township 16 South, Range 7 East.~~

3. **Reclamation Monitoring:** Following final reclamation, backfilling and grading hydrologic monitoring will be conducted at points immediately above and below the reclaimed site.

B. UPDES Monitoring Locations – Deer Creek Mine

1. *Deer Creek Mine*

- a. UPDES - UT0023604

001- Sediment Pond – Deer Creek Canyon
002- Mine Discharge – Deer Creek Canyon
003- Mine Discharge – Huntington Creek

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HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE**

***II. MONITORING SCHEDULE – DEER CREEK MINE
(see enclosed monitoring schedules for operational, baseline, and reclamation monitoring)***

A. Field Measurements

Field Measurements collected during quality sampling: Listed below are the sites which will be monitored by PacifiCorp - Energy West in accordance with the guidelines established by DOGM; i.e.

- Date and Time
- Flow
- pH
- Temperature
- Conductivity
- Dissolved oxygen (perennial streams only)

Surface Monitoring

Surface monitoring locations will be field monitored quarterly for all field parameters.

1. Huntington Canyon Drainage

a. Deer Creek

- (1) DCR01
- (2) DCR04
- ~~(3) DCR06~~

b. Rilda Canyon

- (1) RCF1A
- (2) RCLF 1
- ~~(3) RCLF 2~~
- (4) RCF3
- ~~(5) RCW4~~

Groundwater Monitoring

1. Post Mine Closure – Deer Creek Mine Drainage

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ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE**

- a. Rilda Canyon Pipeline – terminus of pipeline DCDRCP
- b. Rilda Canyon Pipeline – integrity evaluation meters – flow only (refer to Volume 11, R645-301-500 Engineering Section, Appendix I, Design Drawings, Water Relief Pipeline 2016 Rilda Canyon for location of upper and lower vaults – meter locations)
 - i. DCDRCP – Meter 1: located near the Rilda Canyon Portals
 - ii. DCDRCP – Meter 2: located near the Huntington Power Plant Raw Water Pond.

UPDES Monitoring

1. Deer Creek

UPDES sites ~~001~~, 002 and 003 will be monitored as specified in the individual permits.

Reclamation Monitoring

Surface Water Resources: (see enclosed summary of operational, baseline, and reclamation monitoring schedules)

Surface monitoring locations will be field monitored monthly for flow and all field parameters quarterly until bond release.

Post Mine Closure:

Post Mine Closure monitoring locations will be field monitored monthly for flow including all field parameter until bond release.

UPDES:

Sites will be monitored as specified in the individual permits

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HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE**

B. Quality Sampling (Laboratory Measurements)

1. **Surface Water Hydrology:** Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table 1-Surface Water Quality Parameter List). Quarterly sampling was initiated during March 1988 and will continue throughout the year; i.e., June, September, and December. Baseline analysis was performed in 2016 and will be repeated every five years there-after.

a. Huntington Creek Drainage

(1) Deer Creek

- (a) DCR01
- (b) DCR04
- ~~(c) DCR06~~

(2) Rilda Canyon

- (a) RCF-1A
- (b) RCLF 1
- ~~(c) RCLF 2~~
- ~~(d) RCF3~~
- ~~(e) RCW4~~

2. **Reclamation Monitoring - Surface Water Hydrology:** Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table 1-Surface Water Quality Parameter List). Sampling will be conducted on a quarterly basis until bond release. Baseline analysis will be performed on the 5th and 9th years following reclamation. In no case will baseline sampling time frame exceed 5 years converting from operational to reclamation monitoring.

a. Post Mine Closures Rilda Canyon Pipeline – terminus of pipeline DCDRCP: One sample will be collected and analyzed per location monthly. Parameters analyzed are those listed in the DOGM

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HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE**

Guidelines for Groundwater Quality (see Table 2 – Ground Water Quality Parameter List.

Baseline analysis was performed in 2016 and will be repeated every five years thereafter.

3. Reclamation Monitoring - Groundwater Hydrology

- a. Post Reclamation Monitoring: PacifiCorp commits to conduct annual survey to identify new discharge locations within and below sealed portals. If discharge occurs, one water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality Parameter List). Baseline analysis will be performed on the 5th and 9th year.

4. UPDES Monitoring Sites

- a. Deer Creek Mine

UPDES sites will be monitored as specified in the individual permits.

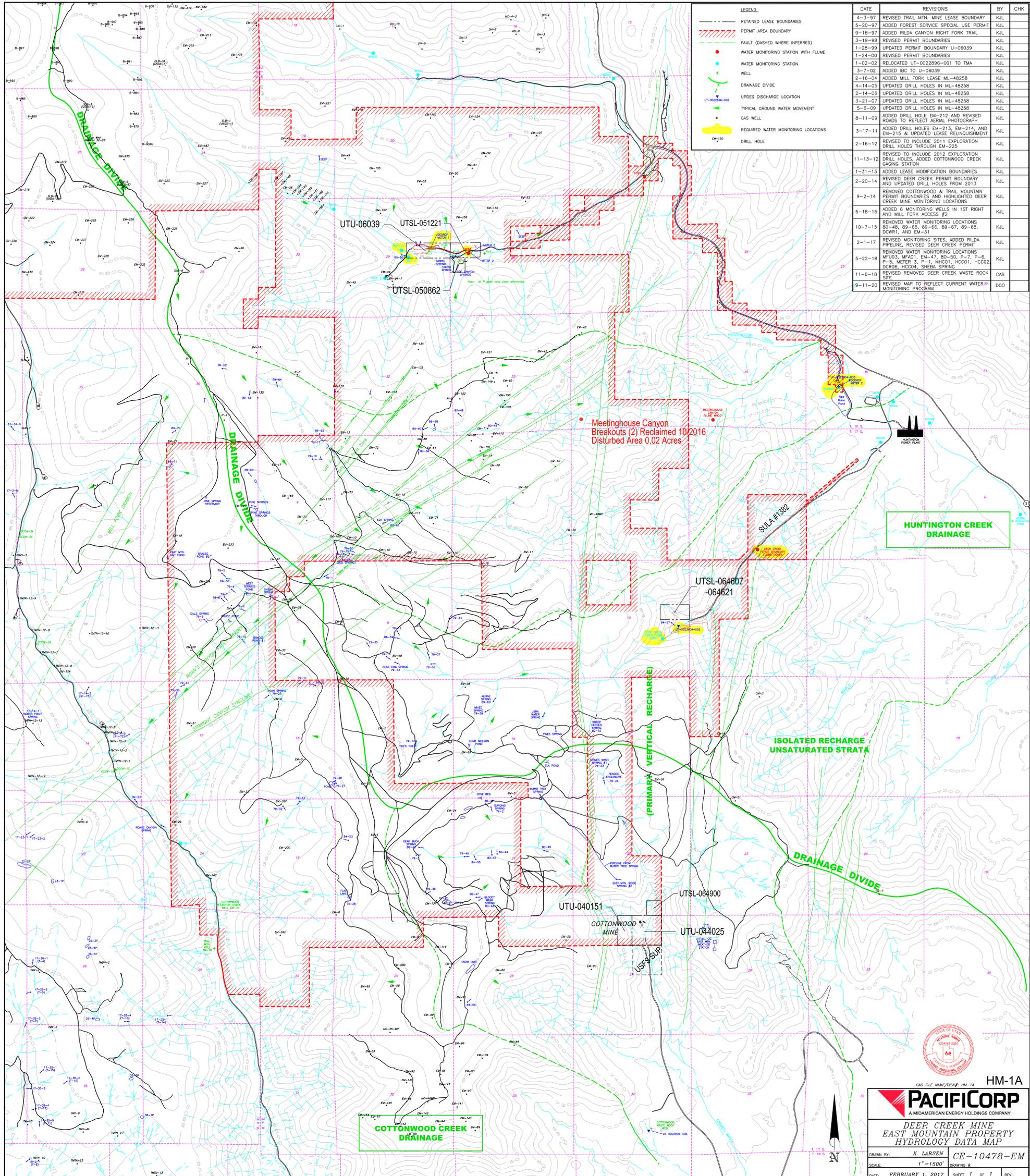
III. ANNUAL REPORTS

All hydrologic data collected regarding reclamation monitoring will be submitted to the Utah State Division of Oil, Gas and Mining on a quarterly basis.

PacifiCorp
Deer Creek Mine
C/015/0018

**Amendment to Update the Water Monitoring
Program for the Deer Creek Mine**

Volume 9, Appendix A, Appendix A-1
Replace Map HM-1A



LEGEND

- RETAINED LEASE BOUNDARIES
- PERMIT AREA BOUNDARY
- - - FAULT (DASHED WHERE INFERRED)
- WATER MONITORING STATION WITH FLUME
- WATER MONITORING STATION
- WELL
- DRAINAGE DIVIDE
- ▲ UPDES DISCHARGE LOCATION
- TYPICAL GROUND WATER MOVEMENT
- ★ GAS WELL
- REQUIRED WATER MONITORING LOCATIONS
- DRILL HOLE

| DATE | REVISIONS | BY | CHK |
|----------|---|-----|-----|
| 4-3-97 | REVISED TRAIL MTN. MINE LEASE BOUNDARY | KJL | |
| 5-20-97 | ADDED FOREST SERVICE SPECIAL USE PERMIT | KJL | |
| 9-18-97 | ADDED RILDA CANYON RIGHT FORK TRAIL | KJL | |
| 3-19-98 | REVISED PERMIT BOUNDARIES | KJL | |
| 1-28-99 | UPDATED PERMIT BOUNDARY U-06039 | KJL | |
| 1-24-00 | REVISED PERMIT BOUNDARIES | KJL | |
| 1-02-02 | RELOCATED UT-0022896-001 TO TMA | KJL | |
| 3-7-02 | ADDED IBC TO U-06039 | KJL | |
| 2-16-04 | ADDED MILL FORK LEASE ML-48258 | KJL | |
| 4-14-05 | UPDATED DRILL HOLES IN ML-48258 | KJL | |
| 2-14-06 | UPDATED DRILL HOLES IN ML-48258 | KJL | |
| 3-21-07 | UPDATED DRILL HOLES IN ML-48258 | KJL | |
| 5-6-09 | UPDATED DRILL HOLES IN ML-48258 | KJL | |
| 8-11-09 | ADDED DRILL HOLE EM-212 AND REVISED ROADS TO REFLECT AERIAL PHOTOGRAPH | KJL | |
| 3-17-11 | ADDED DRILL HOLES EM-213, EM-214, AND EM-215 & UPDATED LEASE RELINQUISHMENT | KJL | |
| 2-16-12 | REVISED TO INCLUDE 2011 EXPLORATION DRILL HOLES THROUGH EM-225 | KJL | |
| 11-13-12 | REVISED TO INCLUDE 2012 EXPLORATION DRILL HOLES, ADDED COTTONWOOD CREEK GAGING STATION | KJL | |
| 1-31-13 | ADDED LEASE MODIFICATION BOUNDARIES | KJL | |
| 2-20-14 | REVISED DEER CREEK PERMIT BOUNDARY AND UPDATED DRILL HOLES FROM 2013 | KJL | |
| 9-2-14 | REMOVED COTTONWOOD & TRAIL MOUNTAIN PERMIT BOUNDARIES AND HIGHLIGHTED DEER CREEK MINE MONITORING LOCATIONS | KJL | |
| 5-18-15 | ADDED 6 MONITORING WELLS IN 1ST RIGHT AND MILL FORK ACCESS #2 | KJL | |
| 10-7-15 | REMOVED WATER MONITORING LOCATIONS 80-48, 89-65, 89-66, 89-67, 89-88, DCWR1, AND EM-31 | KJL | |
| 2-1-17 | REVISED MONITORING SITES, ADDED RILDA PIPELINE, REVISED DEER CREEK PERMIT | KJL | |
| 5-22-18 | REMOVED WATER MONITORING LOCATIONS MFU03, MFAD1, EM-47, 80-50, P-7, P-6, P-5, METER 3, P-11, HCC01, HCC01, HCC02, HCC04, SHEBA SPRING | KJL | |
| 11-6-18 | REVISED DEER CREEK WASTE ROCK SITE | CAS | |
| 9-11-20 | REVISED MAP TO REFLECT CURRENT WATER MONITORING PROGRAM | DCO | |

HM-1A

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

**DEER CREEK MINE
EAST MOUNTAIN PROPERTY
HYDROLOGY DATA MAP**

DRAWN BY: **K. LARSEN** **CE-10478-EM**
SCALE: 1"=1500' DRAWING #
DATE: **FEBRUARY 1, 2017** SHEET 1 OF 1 REV.

PacifiCorp
Deer Creek Mine
C/015/0018

**Amendment to Update the Water Monitoring
Program for the Deer Creek Mine**

Volume 1, Part 2
Replace Pages 2-220 thru 2-224

Hydrology

The Deer Creek Mine is part of the East Mountain property in which PacifiCorp holds coal mining interests. The East Mountain property encompasses multiple adjacent mining operations including; Cottonwood/Wilberg Mine (~~completely reclaimed~~ final reclamation completed March 22, 2018), Deer Creek Mine (final reclamation completed November 2019), and the reclaimed Des Bee Dove Mine (Phase III Bond Release approved August 2014). PacifiCorp has collected comprehensive baseline information on the hydrologic resources of the East Mountain property that consists of ground and surface water investigations, climatological information, baseline cumulative impact area information, and probable hydrologic consequence determination to ensure the protection of the hydrologic balance of the Deer Creek Mine permit area and East Mountain property. This information is found in Volume 9, Volume 9A, and/or Volume 9B.

As part of the requirements of the Utah Coal Regulations R645-301-731.221 through R645-301-731.225, a hydrologic monitoring program has been established in cooperation with Utah Division of Oil, Gas, and Mining. During the operational time period at the Deer Creek Mine, the hydrologic monitoring program involves collecting water quality and quantity samples of ground and surface water for specific sites pertinent the Deer Creek Mine permit area. Now that the mine is reclaimed, reclamation monitoring of the surface waters above and below the mine will be monitored.

PacifiCorp ~~is~~ has ~~reducing~~ reduced the extent of the mine's hydrologic to coincide with the final closure of the Deer Creek Mine. With the closure of the Deer Creek Mine, PacifiCorp has sealed all of the associated portals ~~at the Deer Creek Mine,~~ including Deer Creek Canyon, Meetinghouse Canyon, Rilda Canyon Left Fork, and Rilda Canyon 1st Right portals. Final coal

production from PacifiCorp's mining operations was from the Deer Creek Mine on January 7, 2015. PacifiCorp maintained monitoring sites listed in the approved hydrologic monitoring plan for a minimum of three years after the last date of coal production (2015, 2016, and 2017) as outlined in the Memorandum of Understanding (USDI Bureau of Land Management, USDA Forest Service, State of Utah, Division of Oil, Gas, and Mining "Processing of Requirements to Relinquish Federal Coal Leases," 1996). PacifiCorp ~~proposes to~~ **has** eliminate both surface and groundwater sites **that were** established to monitor active mining operations and **has** transitioned **into** reclamation monitoring. Surface monitoring sites ~~will be~~ **have been** retained above and below **all** completed ~~and on-going~~ reclamation activities.

The following details the hydrologic monitoring program for the Deer Creek Mine permit for surface and UPDES monitoring sites for Reclamation Monitoring, required sampling parameter list, and map showing site locations.

Surface Water Hydrology (for detailed **hydrologic** information for the Deer Creek Mine see Volumes 9, 9A, and 9B)

Huntington Creek Drainage System

Deer Creek Canyon (refer to Volume 9, Hydrologic Section, Cottonwood/Wilberg and Deer Creek Mines, Map HM-1A)

- 1) DCR01
- 2) DCR04
- 3) ~~DCR06~~

Rilda Canyon (refer to Volume 9, Hydrologic Section,
Cottonwood/Wilberg and Deer Creek Mines, Map HM-1A)

- | | |
|---------------------|--------------------|
| 1) RCF-1A | 43) RCF3 |
| 2) RCLF1 | 5) RCW4 |
| 32) RCLF2 | |

UPDES Monitoring Locations - UPDES Permit #UT0023604

- 1) ~~001 - Sediment Pond - Deer Creek Canyon~~
21) 002 - Mine Discharge - Deer Creek Canyon
32) 003 - Mine Discharge - Huntington Creek

Required Monitoring Parameters

Field Measurements shall be collected during monitoring of surface and ground water sites. Field measurements include:

- Date and Time
- Flow
- pH
- Temperature
- Conductivity
- Dissolved Oxygen (perennial streams only)

Surface and ground water samples shall be analyzed for quality utilizing the following parameters (in mg/L). Baseline parameters shall be collected every 5 years. Operational samples shall be collected at all other times and as dictated by the monitoring schedule.

Laboratory Measurements:

- * - Total Settleable Solids (UPDES Only)
- * - Total Suspended Solids (Surface Only)
- * - Total Dissolved Solids
- * - Total Hardness (CaCO₃)
- Acidity (CaCO₃)
- Aluminum (Al) - Dissolved
- Arsenic (As) - Dissolved
- Boron (B) - Dissolved (Waste Rock Sites Only)
- * - Carbonate (CO₃⁻²)
- * - Total Alkalinity/Bicarbonate (CaCO₃)

- Cadmium (Cd) - Dissolved
- * - Calcium (Ca) - Dissolved
- * - Chloride (Cl⁻)
- Copper (Cu) - Dissolved
- * - Iron (Fe) - Total & Dissolved
- Lead (Pb) - Dissolved
- * - Magnesium (Mg) - Dissolved
- * - Manganese (Mn) - Total & Dissolved
- Molybdenum (Mo) - Dissolved
- Nitrogen: Ammonia (NH₃) - reported as N
- Nitrite (NO₂) - reported as N
- Nitrate (NO₃⁻) - reported as N
- * - Potassium (K) - Dissolved
- * - Oil & Grease*
- Ortho Phosphate (PO₄⁻³) - reported as P
- Selenium (Se) - Dissolved (Waste Rock Sites Only)
- * - Sodium (Na) - Dissolved
- * - Sulfate (SO₄⁻²)
- Zinc (Zn) - Dissolved
- * - Cation-Anion Balance

* Operational - Baseline

*UPDES & surface waters above & below mine sites

Monitoring Schedule

Surface monitoring sites shall be field monitored quarterly for all field parameters. Surface sites shall also be analyzed for quality for all quality parameters listed.

PACIFICORP
HYDROLOGIC MONITORING SCHEDULE
DEER CREEK MINE

SURFACE HYDROLOGY - OPERATIONAL SAMPLING (Table 1)

| <u>Drainage System</u> | <u>Drainage</u> | <u>Location</u> | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|-----------------------------------|---------------------|-----------------|------------|------------|-------------|------------|------------|-------------|------------|------------|-------------|------------|------------|-------------|
| | <i>Deer Creek</i> | DCR01 | Flow | Flow | Operational |
| | | DCR04 | Flow | Flow | Operational |
| | | DCR06 | Flow | Flow | Operational |
| <i>Huntington Drainage System</i> | <i>Rilda Canyon</i> | RCF-1A | Flow | Flow | Operational |
| | | RCLF1 | Flow | Flow | Operational |
| | | RCLF2 | Flow | Flow | Operational |
| | | RCF3 | Flow | Flow | Operational |
| | | RCW4 | Flow | Flow | Operational |
| | | RCW4 | Flow | Flow | Operational |

UPDES SAMPLING - (Table 1)

| | | | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|--------------------------------|-------------------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Mine Water Discharge</i> | <i>Deer Creek</i> | DCD 2 Outfalls | Operational |
| <i>Sediment Pond Discharge</i> | <i>Deer Creek</i> | 1-Outfall | Operational |

POST MINE CLOSURE SAMPLING - (Table 2)

| | | | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|---|-------------------|----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Mine Water Rilda Canyon Pipeline</i> | <i>Deer Creek</i> | DCDRCP | Operational |
| | <i>Deer Creek</i> | Meters ^{See Note} | Flow |

Note:
DCDRCP - Meter 1: located near Rilda Canyon Portals
DCDRCP - Meter 2: located near Huntington Plant Raw Water Pond

PACIFICORP
HYDROLOGIC MONITORING SCHEDULE
DEER CREEK MINE

SURFACE HYDROLOGY - BASELINE SAMPLING (Table 1) -

2021

| <u>Drainage System</u> | <u>Drainage</u> | <u>Location</u> | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|---|-------------------------|-----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Huntington Drainage System | Deer Creek | DCR01 | Flow | Flow | Baseline |
| | | DCR04 | Flow | Flow | Baseline |
| | | DCR06 | Flow | Flow | Baseline |
| | Rilda Canyon | RCF1 | Flow | Flow | Baseline |
| | | RCLF1 | Flow | Flow | Baseline |
| | | RCLF2 | Flow | Flow | Baseline |
| | | RCF3 | Flow | Flow | Baseline |
| | | RCW4 | Flow | Flow | Baseline |

UPDES SAMPLING - (Table 1)

| | | | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|------------------------------------|-------------------|-------------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Mine Water Discharge | Deer Creek | DCD | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational |
| | | 2 Outfalls | 002 and 003 | | | | | | | | | | | |
| Sediment Pond Discharge | Deer Creek | 1-Outfall | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational | Operational |

POST MINE CLOSURE SAMPLING - (Table 2)

| | | | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|---|-------------------|-----------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Mine Water Rilda Canyon Pipeline | Deer Creek | DCDRCP | Baseline |
| | Deer Creek | Meters ^{See Note} | Flow |

Note:
DCDRCP - Meter 1: located near Rilda Canyon Portals
DCDRCP - Meter 2: located near Huntington Plant Raw Water Pond

PACIFICORP
HYDROLOGIC MONITORING SCHEDULE
DEER CREEK MINE

SURFACE HYDROLOGY - RECLAMATION SAMPLING (Table 1)

| <u>Drainage Svstem</u> | <u>Drainage</u> | <u>Location</u> | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|------------------------|---------------------|-----------------|------------|------------|-------------|------------|------------|-------------|------------|------------|-------------|------------|------------|-------------|
| | Deer Creek | DCR01 | Flow | Flow | Operational |
| | | DCR04 | Flow | Flow | Operational |
| | | DCR06 | Flow | Flow | Operational |
| | Rilda Canyon | RCF-1A | Flow | Flow | Operational |
| | | RCLF1 | Flow | Flow | Operational |
| | | RCLF2 | Flow | Flow | Operational |
| | | RCF3 | Flow | Flow | Operational |
| | | RCW4 | Flow | Flow | Operational |

* Analyzed for Baseline Parameters During the Fifth (5) and Ninth (9) Year After Final Reclamation
 In no case will baseline sampling time frame exceed 5 years converting from operational to reclamation monitoring.

UPDES SAMPLING - (Table 1)

| | | | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|--------------------------------|-------------------|-------------------|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Mine Water Discharge** | Deer Creek | DCD | As Needed Basis According to UPDES Permit Stipulations | | | | | | | | | | | |
| | | 2 Outfalls | 002 and 003 | | | | | | | | | | | |
| Sediment Pond Discharge | Deer Creek | 1 Outfall | As Needed Basis According to UPDES Permit Stipulations | | | | | | | | | | | |

** After Portal Sealing (Deer Creek Canyon and Rilda Canyon), PacifiCorp Will Monitor Down Dip For Development Of Groundwater Seeps/Springs Until Bond Release

POST MINE CLOSURE SAMPLING - (Table 2)

| | | | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|---|-------------------|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Mine Water Rilda Canyon Pipeline | Deer Creek | DCDRCP | Operational |
| | | Meters ^{See Note} | Flow |

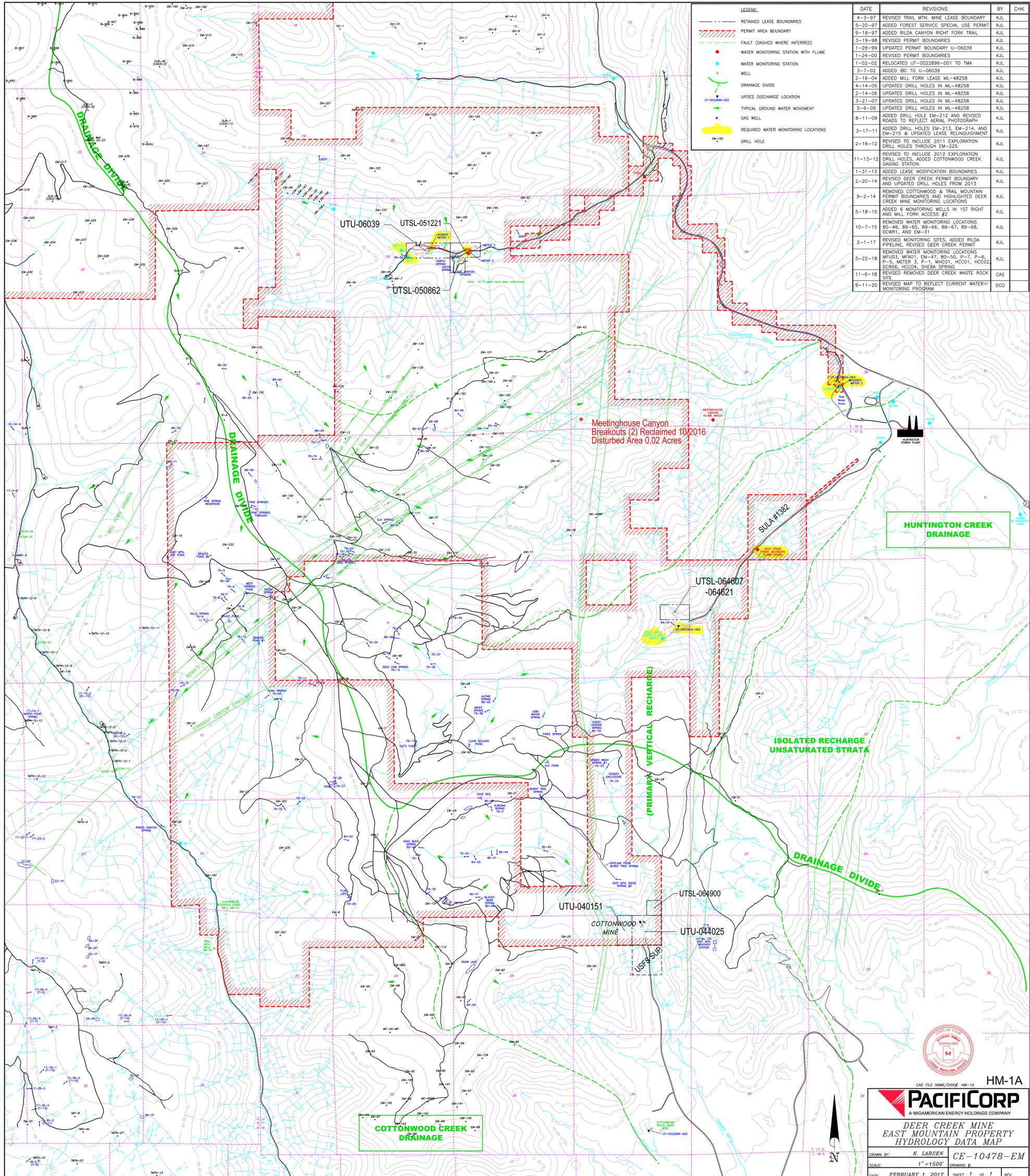
Note:
 DCDRCP - Meter 1: located near Rilda Canyon Portals
 DCDRCP - Meter 2: located near Huntington Plant Raw Water Pond

Rilda Canyon Pipeline and Meter (s) monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.

PacifiCorp
Deer Creek Mine
C/015/0018

**Amendment to Update the Water Monitoring
Program for the Deer Creek Mine**

Volume 1, Part 2
Replace Map HM-1A



LEGEND

- RETAINED LEASE BOUNDARIES
- - - PERMIT AREA BOUNDARY
- - - FAULT (DASHED WHERE INFERRED)
- WATER MONITORING STATION WITH FLUME
- WATER MONITORING STATION
- WELL
- DRAINAGE DIVIDE
- UPDES DISCHARGE LOCATION
- TYPICAL GROUND WATER MOVEMENT
- GAS WELL
- REQUIRED WATER MONITORING LOCATIONS
- DRILL HOLE

| DATE | REVISIONS | BY | CHK |
|----------|---|-----|-----|
| 4-3-97 | REVISED TRAIL MTN. MINE LEASE BOUNDARY | KJL | |
| 5-20-97 | ADDED FOREST SERVICE SPECIAL USE PERMIT | KJL | |
| 9-18-97 | ADDED RILDA CANYON RIGHT FORK TRAIL | KJL | |
| 3-19-98 | REVISED PERMIT BOUNDARIES | KJL | |
| 1-28-99 | UPDATED PERMIT BOUNDARY U-06039 | KJL | |
| 1-24-00 | REVISED PERMIT BOUNDARIES | KJL | |
| 1-02-02 | RELOCATED UT-0022896-001 TO TMA | KJL | |
| 3-7-02 | ADDED IBC TO U-06039 | KJL | |
| 2-16-04 | ADDED MILL FORK LEASE ML-48258 | KJL | |
| 4-14-05 | UPDATED DRILL HOLES IN ML-48258 | KJL | |
| 2-14-06 | UPDATED DRILL HOLES IN ML-48258 | KJL | |
| 3-21-07 | UPDATED DRILL HOLES IN ML-48258 | KJL | |
| 5-6-09 | UPDATED DRILL HOLES IN ML-48258 | KJL | |
| 8-11-09 | ADDED DRILL HOLE EM-212 AND REVISED ROADS TO REFLECT AERIAL PHOTOGRAPH | KJL | |
| 3-17-11 | ADDED DRILL HOLES EM-213, EM-214, AND EM-215 & UPDATED LEASE RELINQUISHMENT | KJL | |
| 2-16-12 | REVISED TO INCLUDE 2011 EXPLORATION DRILL HOLES THROUGH EM-225 | KJL | |
| 11-13-12 | REVISED TO INCLUDE 2012 EXPLORATION DRILL HOLES, ADDED COTTONWOOD CREEK GAGING STATION | KJL | |
| 1-31-13 | ADDED LEASE MODIFICATION BOUNDARIES | KJL | |
| 2-20-14 | REVISED DEER CREEK PERMIT BOUNDARY AND UPDATED DRILL HOLES FROM 2013 | KJL | |
| 9-2-14 | REMOVED COTTONWOOD & TRAIL MOUNTAIN PERMIT BOUNDARIES AND HIGHLIGHTED DEER CREEK MINE MONITORING LOCATIONS | KJL | |
| 5-18-15 | ADDED 6 MONITORING WELLS IN 1ST RIGHT AND MILL FORK ACCESS #2 | KJL | |
| 10-7-15 | REMOVED WATER MONITORING LOCATIONS 80-48, 89-65, 89-66, 89-67, 89-88, DCWR1, AND EM-31 | KJL | |
| 2-1-17 | REVISED MONITORING SITES, ADDED RILDA PIPELINE, REVISED DEER CREEK PERMIT | KJL | |
| 5-22-18 | REMOVED WATER MONITORING LOCATIONS MFU03, MFAD1, EM-47, 80-50, P-7, P-6, P-5, METER 3, P-11, HCC01, HCC01, HCC02, HCC04, SHEBA SPRING | KJL | |
| 11-6-18 | REVISED DEER CREEK WASTE ROCK SITE | CAS | |
| 9-11-20 | REVISED MAP TO REFLECT CURRENT WATER MONITORING PROGRAM | DCO | |

Meetinghouse Canyon Breakouts (2) Reclaimed 10/2016 Disturbed Area 0.02 Acres

HUNTINGTON CREEK DRAINAGE

ISOLATED RECHARGE UNSATURATED STRATA

DRAINAGE DIVIDE

COTTONWOOD CREEK DRAINAGE

HM-1A

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

DEER CREEK MINE
EAST MOUNTAIN PROPERTY
HYDROLOGY DATA MAP

DRAWN BY: K. LARSEN
SCALE: 1"=1500'
DATE: FEBRUARY 1, 2017

CE-10478-EM
DRAWING #
SHEET 1 OF 1