



Interwest Mining Company
Huntington Office
P. O. Box 310
15 North Main Street
Huntington, UT 84528

January 7, 2016

Electronically Submitted

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

C/015/0018
Received 1/7/2016
Task ID #5064

Subj: Amendment to Reduce the Hydrologic Monitoring Program for Sites Within the Mine Permit Boundaries, PacifiCorp, Deer Creek Mine C/015/0018, Emery County, Utah.

PacifiCorp, by and through its wholly-owned subsidiary, Interwest Mining Company as mine manager, hereby submits an amendment to amend Volume 9, Hydrologic Volume, Appendix A and Deer Creek Mine Volume 1, to reduce the water monitoring responsibilities as outlined in the hydrologic monitoring program.

In 2013, Energy West Mining Company (the mines past operator) submitted an amendment to reduce its monitoring responsibilities for sites within the Deer Creek, Cottonwood/Wilberg, and Trail Mountain mines. The Division agreed with PacifiCorp when they gave conditional approval for this amendment (Task ID #4443) on November 10, 2014 that its underground mining operations did not impact quantity or quality of spring flow of the over-lying springs.

Interwest is now proposing to remove five springs and two wells from its monitoring program. The springs and one well were retained in the monitoring program in 2013 since they were considered at the time to be strategic monitoring sites as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were being discussed. PacifiCorp is no longer the holder of the Cottonwood Tract and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015 and monitoring these springs and well is no longer relevant. A map is provided to show the general location of the sites and how they relate to the Cottonwood and Deer Creek mines and the mine workings. A second map is provided to detail exactly where the springs are located relative to the mine workings below and projected fault zones.

Subsidence surveys have been conducted from the time of development and extraction operations of the underground mine. No subsidence has been recorded for the area where the springs and well are located. Subsidence surveys of this area were terminated in 2008 as subsidence was determined to be substantially complete (refer to attached subsidence

PacifiCorp has conducted extensive research regarding the interrelationships between the surface and groundwater hydrologic systems and the potential impacts associated with its underground mining operations. Analysis has included; seep and spring surveys, drainage surveys, baseline data collection, in-house and consultant hydrologic studies and government and non-government research project. The June 5, 2014 submittal, appendices A – D contains some of these research projects. Please review the documentation in the June 5, 2014 submittal (Task ID #4443).

The second well is associated with the Deer Creek waste rock site. This site was sold under a purchase agreement with Bowie Refined Coals LLC in August 2015. PacifiCorp feels that no other justification is needed to remove this site from the monitoring program since it no longer retains jurisdiction over the site.

This submittal includes the amended Volume 9, Appendix A and Deer Creek Volume 1, Part 2. Sites that are proposed for removal are "~~struck out~~". A justification document for removal of the five springs and one well is also included. This document includes an outline of the spring location, lease association, water quality, a graph showing flow versus the Palmer Drought Index, and photos of the sites. With this document, PacifiCorp is claiming that there has been no impact to the springs or well due to its underground mining operations.

The required C1/C2 forms are included. If you have any questions concerning this action, please contact Dennis Oakley at 435-687-4825.

Sincerely,



Kenneth Fleck
Geology and Environmental Affairs Manager

Cc: file

APPLICATION FOR COAL PERMIT PROCESSING

Permit Change New Permit Renewal Exploration Bond Release Transfer

Permittee: PacifiCorp

Mine: Deer Creek Mine

Permit Number: C/015/0018

Title: Amendment to Reduce the Hydrologic Monitoring Program for Sites Within the Mine Permit Boundaries, PacifiCorp, Deer Creek Mine C/015/0018, Emery County, Utah.

Description, Include reason for application and timing required to implement:

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

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

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

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.

Kenneth Fleck
Print Name

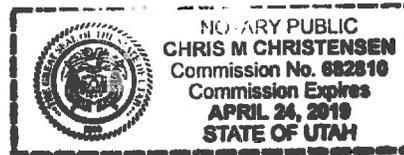
Kenneth S. Fleck
Sign Name, Position, Date

Manager of Environmental Affairs JANUARY 7, 2016

Subscribed and sworn to before me this 7th day of January, 2016

Chris M Christensen
Notary Public

My commission Expires: April 24, 2019
Attest: State of Utah } ss:
County of Emery



For Office Use Only:	Assigned Tracking Number:	Received by Oil, Gas & Mining

Location: Section 33, Township 16 South, Range 7 East, SLB&M. This site is located within the Deer Creek mine permit boundary.

Lease Association: Springs 80-48 is associated with federal coal lease U-024319. PacifiCorp is the leaseholder of this Federal Coal Lease. The springs are located above the 3rd North B Mains at the entrance to the 2nd West longwall panel. The mains were developed in 1977. The panels in this area have been completely extracted from the Hiawatha Seam.

Subsidence: No subsidence is reported in the vicinity of the spring. Refer to the 2008 Annual Subsidence Report data which are included herein.

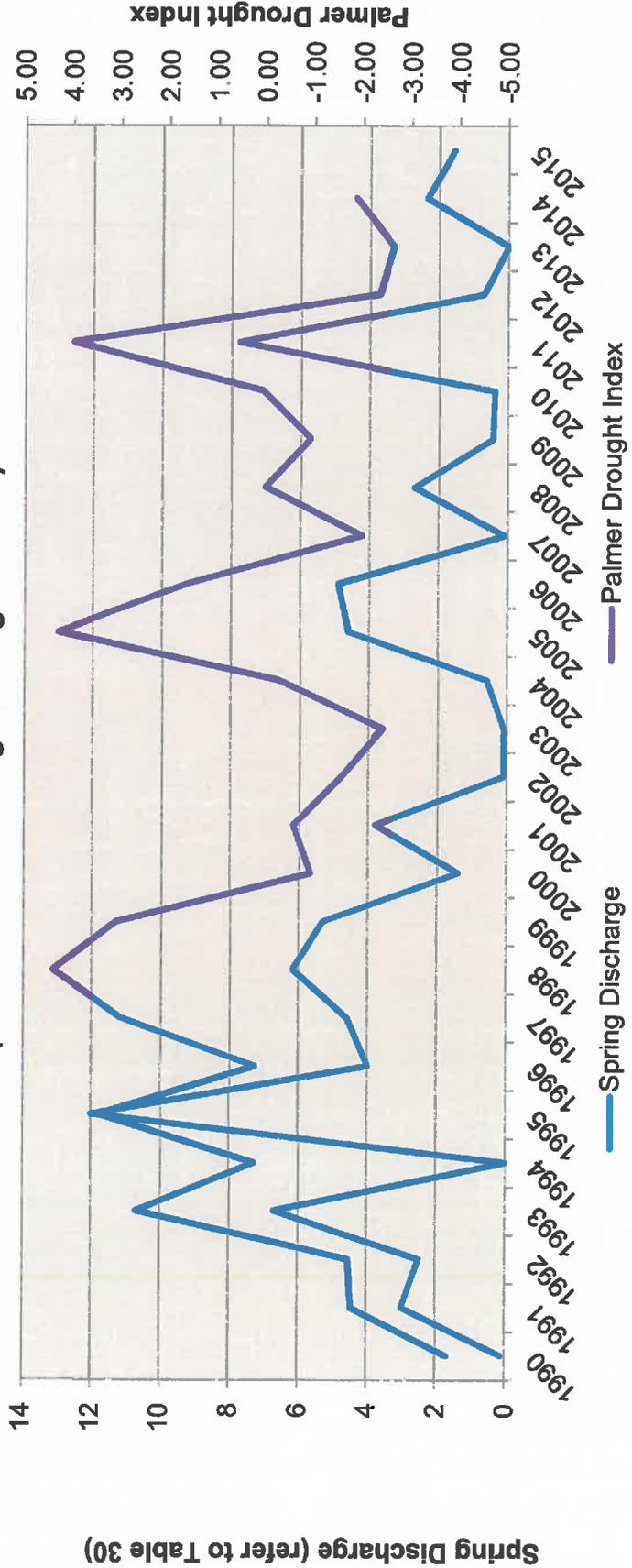
Water Data: Pre- and Post-water quality data is included for spring 80-48. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected for years 1990 through 2015 (25 years) although sampling has been conducted since 1980. This information is found on the following page where July spring flow is plotted against the Palmer Drought Index for regions 4 and 5. Spring flow shows a positive correlation with the Palmer Drought Indices. The mode of occurrence for Spring 80-48 is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation.

Justification for removal from monitoring: Site 80-48 has been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1980. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the sites.

This spring was considered a strategic monitoring site as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were discussed. PacifiCorp is no longer the holder of the Cottonwood Lease and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015. Although this site is located within a current federal coal lease and within the mine permit boundaries, its location is in the southern extents of the Deer Creek and Wilberg/Cottonwood permit boundaries where no mining has been conducted for at least 10 years.

This site is also located where it requires access through a certain surface private property owners land. This property owner has expressed his disliking of PacifiCorp accessing his land and has restricted access by locking gates. This owner is not always available to give access through his property. During the big game hunting seasons within September and October, the property owner does not allow any other access except for his paid hunting clients. October is a scheduled monitoring time period. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

**Spring 80-48
EAST MOUNTAIN
SPRING DISCHARGE vs. PALMER DROUGHT INDEX**
(Palmer Data - Average of Region 4 & 5)



East Mountain Spring: 80-48
Water Quality Data: July Operational Data
Mine Association: Deer Creek Mine
Date of Development: Blind Canyon Seam: May 1997
Date of Second Mining: First Mining Only

Historical Data: 1990-2014			
	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	437	272	324.65
CALCIUM	147.7	44.8	69.41
CARBONATE	5	0	1.2
CHLORIDE	15	2	4.455
CONDUCTIVITY	595	380	529.15
DISSOLVED OXYGEN	9.9	5	7.09
FLOW	12	0.13	3.71
HARDNESS	501	261	302.25
TOTAL IRON	2.6	0.05	0.44
DISSOLVED IRON	2	0	0.26
MAGNESIUM	41.4	24.1	31.29
DISSOLVED MANGANESE	0.1	0.002	0.026
MANGANESE	0.5	0	0.059
OIL AND GREASE	0	0	
PH	8.27	7.3	7.78
POTASSIUM	1	0.29	0.58
SET SOLIDS	0	0	
SODIUM	5.92	2.61	4.79
SULFATE	150	4	14.15
SUSPENDED SOLIDS	124	5	38.6
TEMPERATURE	52.8	6.4	15.1
TOTAL DISSOLVED SOLIDS	327	190	293.15



Spring: 80-48

Note: Spring was developed in 2009 as part of a cattlemen's mitigation plan associated with the Elk Spring culinary development project.



Location: T16S, R7E, Section 33
Associated Formation: North Horn
GPS: N 39°22'55.7"
W 111°09'13.8"

Note: Access to spring requires travel through private property in which owner does not allow.

Location: Section 31, Township 16 South, Range 7 East, SLB&M. This site is located outside the Deer Creek mine permit boundary. The spring is located above a block of unmined coal south of the 3rd West longwall panel.

Lease Association: Springs 89-65 was associated with federal coal lease U-7653. This lease was terminated in March 2002. PacifiCorp was the sublessee of this lease. PacifiCorp notified the Lessee (Lincoln Reavis, Trustee of the Louisiana D. Brown 1992 Irrevocable Trust) in December 2001 that it was terminating its sublease agreement of this Federal Coal Lease.

Subsidence: No subsidence is reported in the vicinity of the spring. Refer to the 2008 Annual Subsidence Report data which are included herein.

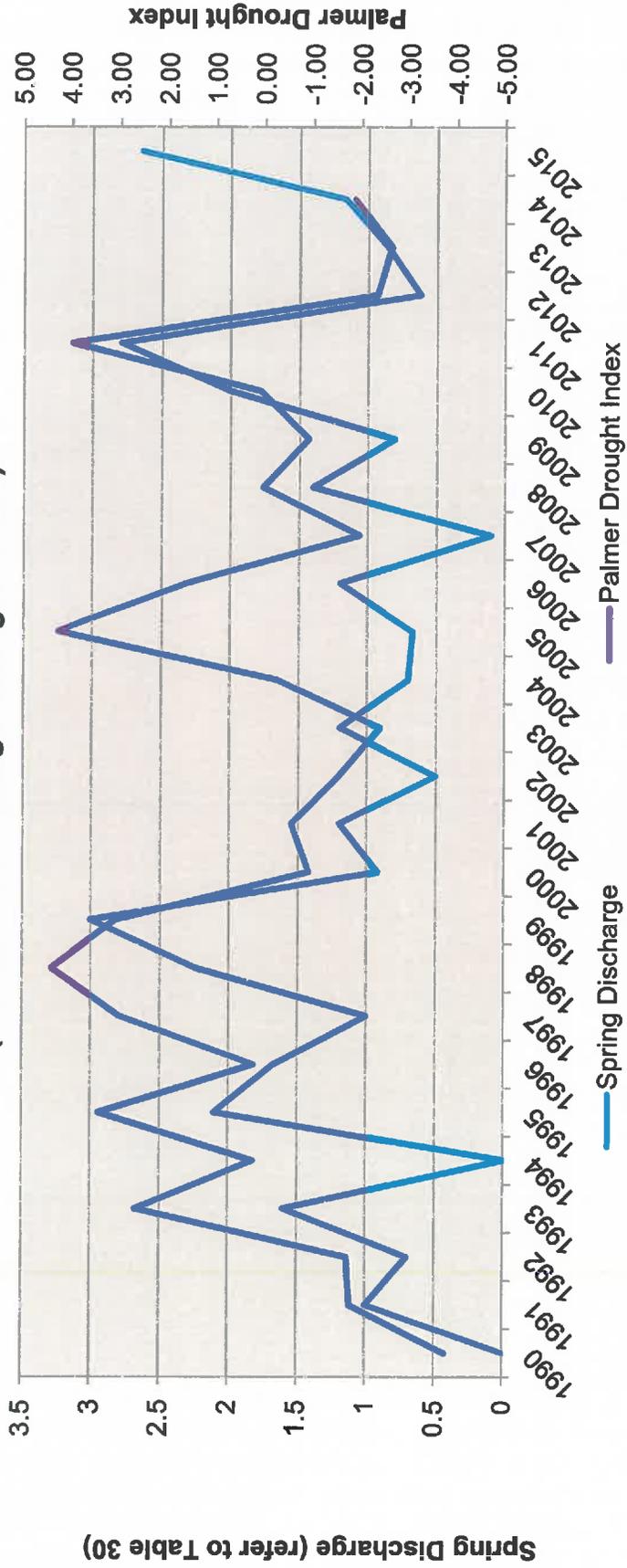
Water Data: Pre- and Post-water quality data is included for spring 89-65. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected for years 1990 through 2015 (25 years) although sampling has been conducted since 1989. This information is found on the following page where July spring flow is plotted against the Palmer Drought Index for regions 4 and 5. Spring flow shows a positive correlation with the Palmer Drought Indices. The mode of occurrence for Spring 89-65 is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation.

Justification for removal from monitoring: Site 89-65 has been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1989. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

This spring was considered a strategic monitoring site as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were discussed. PacifiCorp is no longer the holder of the Cottonwood Lease and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015.

This site is also located where it requires access through a certain surface private property owners land. This property owner has expressed his disliking of PacifiCorp accessing his land and has restricted access by locking gates. This owner is not always available to gives access through his property. During the big game hunting seasons within September and October, the property owner does not allow any other access except for his paid hunting clients. October is a scheduled monitoring time period. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

Spring 89-65
EAST MOUNTAIN
SPRING DISCHARGE vs. PALMER DROUGHT INDEX
 (Palmer Data - Average of Region 4 & 5)



East Mountain Spring: 89-65
Water Quality Data: July Operational Data
Mine Association: Deer Creek Mine
Date of Development: N/A
Date of Second Mining: N/A

Historical Data: 1990-2014			
	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	375	270	325.80
CALCIUM	170	68.3	81.77
CARBONATE	5	0	0.625
CHLORIDE	10	1.5	3.02
CONDUCTIVITY	633	488	560.65
DISSOLVED OXYGEN	9.6	4.5	7.52
FLOW	3	0.62	1.39
HARDNESS	570	262	307
TOTAL IRON	3.8	0	0.81
DISSOLVED IRON	0.1	0	0.02
MAGNESIUM	34	17.8	24.92
DISSOLVED MANGANESE	0.071	0	0.02
MANGANESE	0.1	0	0.012
OIL AND GREASE	0	0	
PH	7.86	7.35	7.56
POTASSIUM	10	0.53	1.33
SET SOLIDS	0	0	
SODIUM	10	1.82	6.87
SULFATE	20	2	13.45
SUSPENDED SOLIDS	225	2	113.50
TEMPERATURE	45.5	4.8	12.24
TOTAL DISSOLVED SOLIDS	353	248	309.30

Spring: 89-65

Location: T16S, R7E, Section 31
Associated Formation: North Horn
GPS: N 39°22'53.3"
W 111°09'26"

Note: Access to spring
requires travel through
private property in which
owner does not allow.



Location: Section 5, Township 17 South, Range 7 East, SLB&M. This site is located within the Deer Creek mine permit boundary.

Lease Association: Spring 89-66 is associated with federal coal lease U-084923. PacifiCorp is the sublease holder of this Federal Coal Lease. The spring is located above the extraction face of the 2nd West longwall panel in the Hiawatha Seam. The headgate and tailgate sections of this panel were started in June and July of 2004. The 2nd West panel was completed in June 2005.

Subsidence: No subsidence is reported in the vicinity of the spring. Refer to the 2008 Annual Subsidence Report data which are included herein.

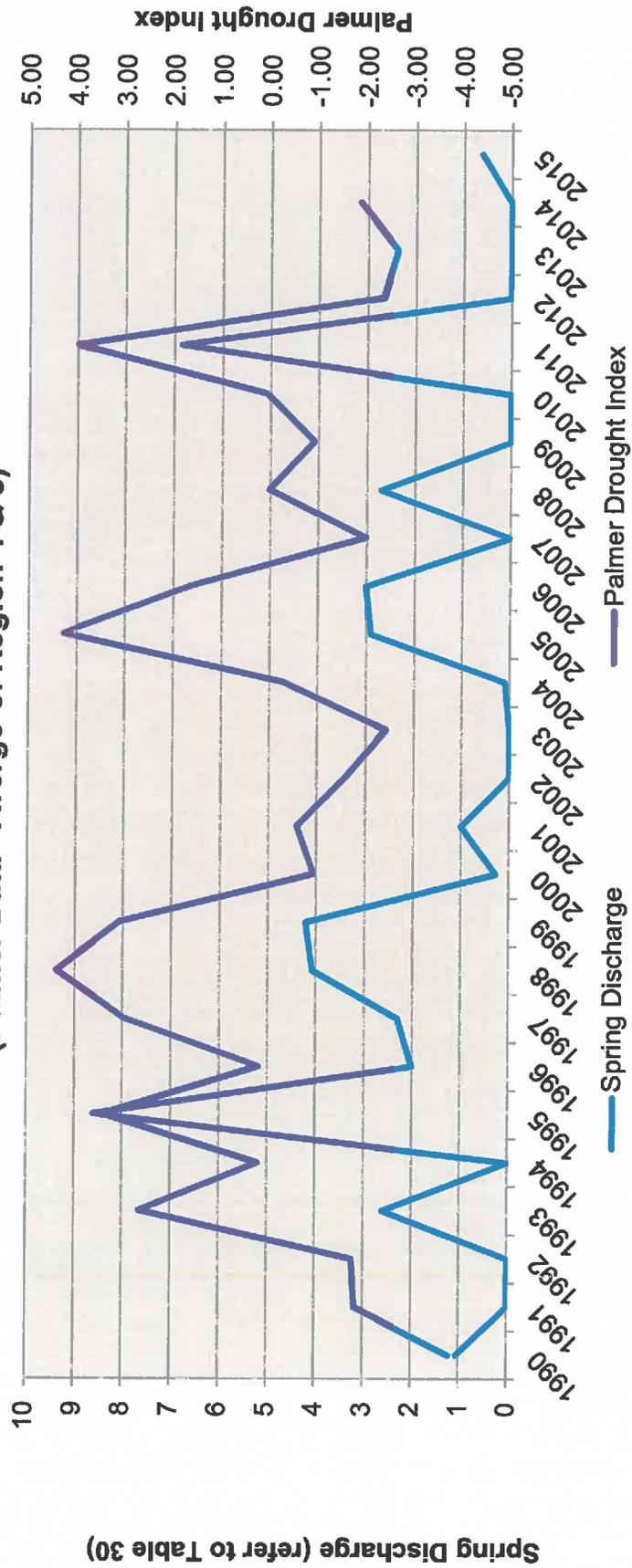
Water Data: Pre- and Post-water quality data is included for spring 89-66. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected for years 1990 through 2015 (25 years) although sampling has been conducted since 1989. This information is found on the following page where July spring flow is plotted against the Palmer Drought Index for regions 4 and 5. Spring flow shows a positive correlation with the Palmer Drought Indices. The mode of occurrence for spring 89-66 is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation.

Justification for removal from monitoring: Site 89-66 has been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1989. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

This spring was considered a strategic monitoring site as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were discussed. PacifiCorp is no longer the holder of the Cottonwood Lease and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015.

This site is also located within a certain surface private property owners land. This property owner has expressed his disliking of PacifiCorp accessing his land and has restricted access by locking gates. This owner is not always available to gives access through his property. During the big game hunting seasons within September and October, the property owner does not allow any other access except for his paid hunting clients. October is a scheduled monitoring time period. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

**Spring 89-66
EAST MOUNTAIN
SPRING DISCHARGE vs. PALMER DROUGHT INDEX**
(Palmer Data - Average of Region 4 & 5)



East Mountain Spring: 89-66
Water Quality Data: July Operational Data
Mine Association: Deer Creek Mine
Date of Development: Blind Canyon Seam: 2nd West Tailgate developed June 2004
Date of Second Mining: June 2005

Historical Data: 1990-2014			
	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	397	234	292.29
CALCIUM	110.4	41.9	51.44
CARBONATE	5	0	1.20
CHLORIDE	10	4	5.25
CONDUCTIVITY	554	438	494.57
DISSOLVED OXYGEN	10.3	4.7	7.58
FLOW	8.6	0.27	3.01
HARDNESS	370	227	263.64
TOTAL IRON	1.89	0	0.55
DISSOLVED IRON	0.28	0	0.072
MAGNESIUM	36.67	23	32.74
DISSOLVED MANGANESE	0.14	0	0.039
MANGANESE	0.1	0	0.023
OIL AND GREASE	0	0	
PH	8.13	7.22	7.62
POTASSIUM	1.4	0.67	0.87
SET SOLIDS	0	0	
SODIUM	6.7	3.56	5.33
SULFATE	35	0.9	12.85
SUSPENDED SOLIDS	10	1	6.33
TEMPERATURE	45	4.7	12.18
TOTAL DISSOLVED SOLIDS	294	202	253.21



Spring: 89-66

Location: T17S, R7E, Section 5
Associated Formation: North Horn
GPS: N 39°22'44.5"
W 111°09'26.2"

Note: Spring is located within the boundaries of private property in which owner does not allow access.

Location: Section 32, Township 16 South, Range 7 East, SLB&M. This site is located within the Deer Creek mine permit boundary.

Lease Association: ; Springs 89-67 and 89-68 are associated with federal coal lease U-47977. PacifiCorp is the lease holder of this Federal Coal Lease. The spring is located above the unmined coal barrier between 2nd West longwall panel to the south and the 3rd West longwall panel to the north. The coal reserve is situated in the Hiawatha Seam. The two entry system of the 2nd West section began development in December 1997. Longwall extraction of the 3rd West panel was completed in April 1999. The 2nd West panel was completed in June 2005.

Subsidence: No subsidence is reported in the vicinity of the spring. Refer to the 2008 Annual Subsidence Report data which are included herein.

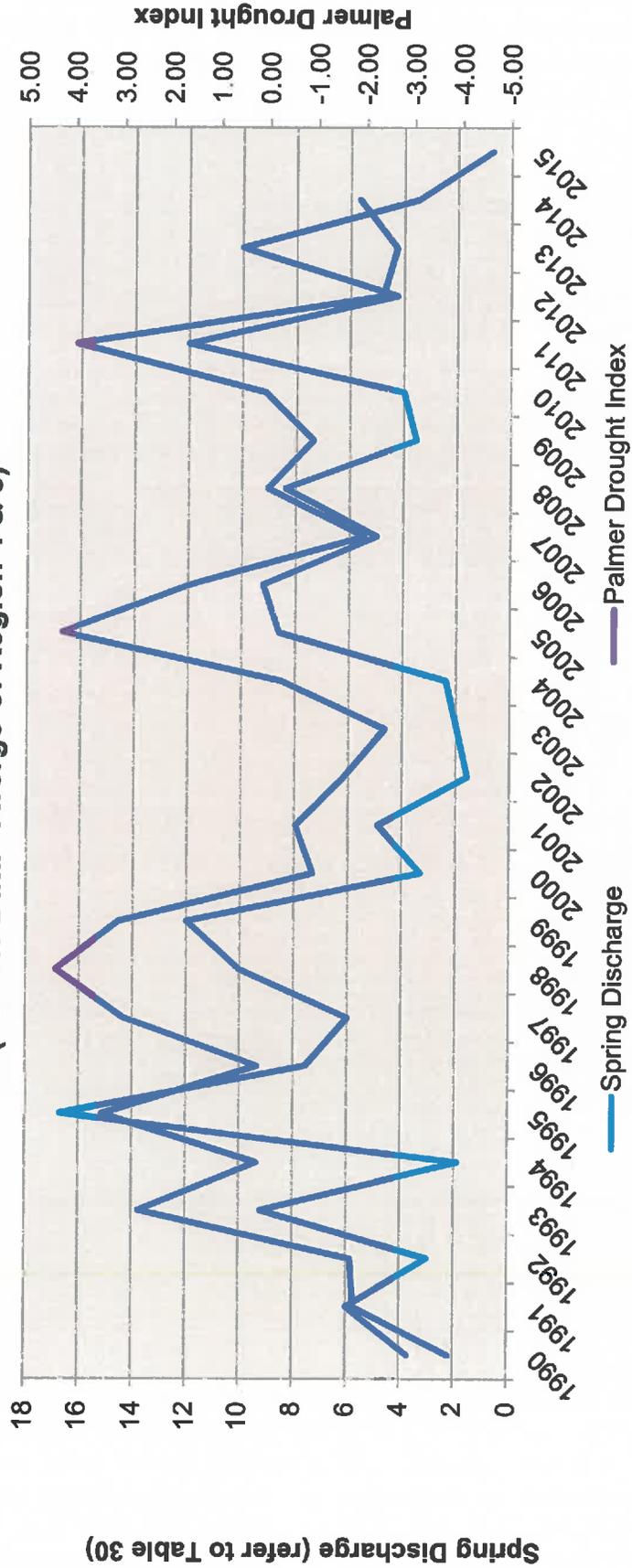
Water Data: Pre- and Post-water quality data is included for springs 89-67 and 89-68. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected for years 1990 through 2015 (25 years) although sampling has been conducted since 1989. This information is found on the following page where July spring flow is plotted against the Palmer Drought Index for regions 4 and 5. Spring flow shows a positive correlation with the Palmer Drought Indices. The mode of occurrence for springs 89-67 and 89-68 is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation.

Justification for removal from monitoring: Sites 89-67 and 89-68 have been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1989. There have been no reported occurrences in which mining has impacted these sites. Historic quality and quantity data has not indicated such impacts to the sites.

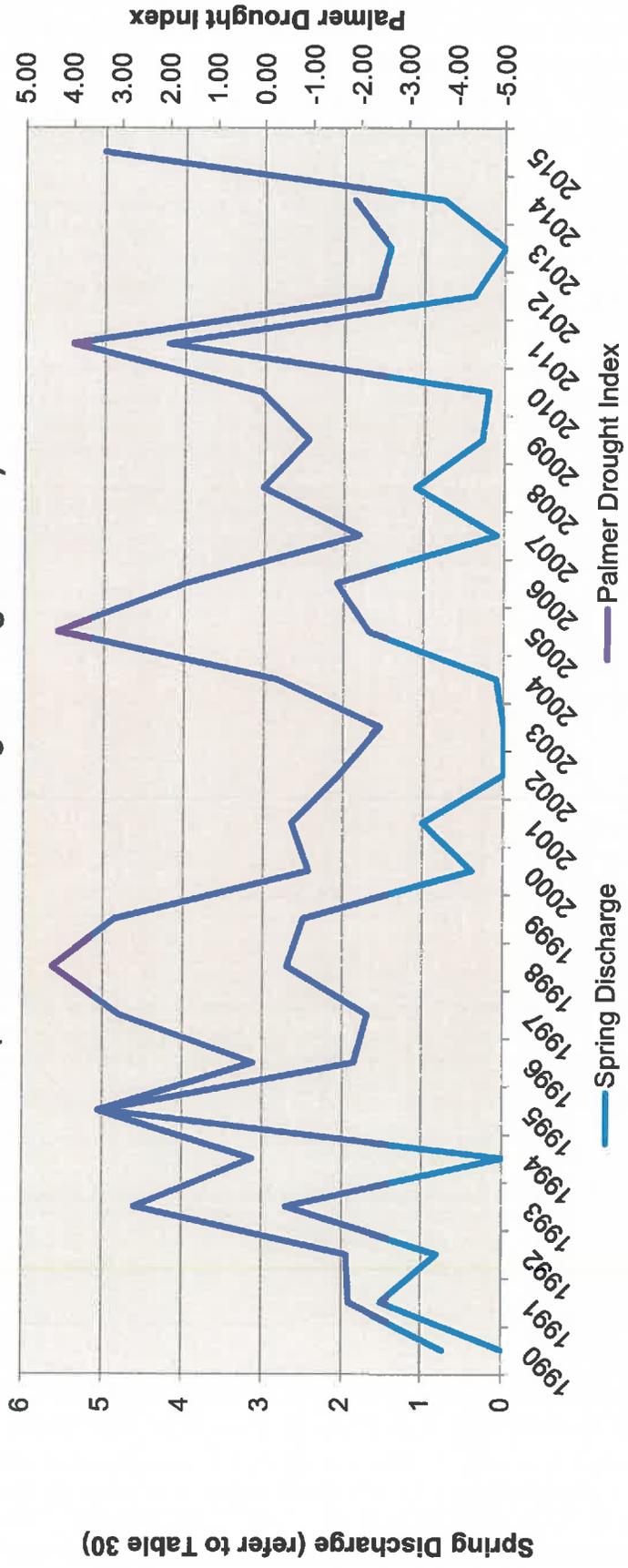
These springs were considered strategic monitoring sites as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were discussed. PacifiCorp is no longer the holder of the Cottonwood Lease and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015.

These sites are also located where it requires access through a certain surface private property owners land. This property owner has expressed his disliking of PacifiCorp accessing his land and has restricted access by locking gates. This owner is not always available to gives access through his property. During the big game hunting seasons within September and October, the property owner does not allow any other access except for his paid hunting clients. October is a scheduled monitoring time period. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

Spring 89-67
EAST MOUNTAIN
SPRING DISCHARGE vs. PALMER DROUGHT INDEX
(Palmer Data - Average of Region 4 & 5)



Spring 89-68 EAST MOUNTAIN SPRING DISCHARGE vs. PALMER DROUGHT INDEX (Palmer Data - Average of Region 4 & 5)



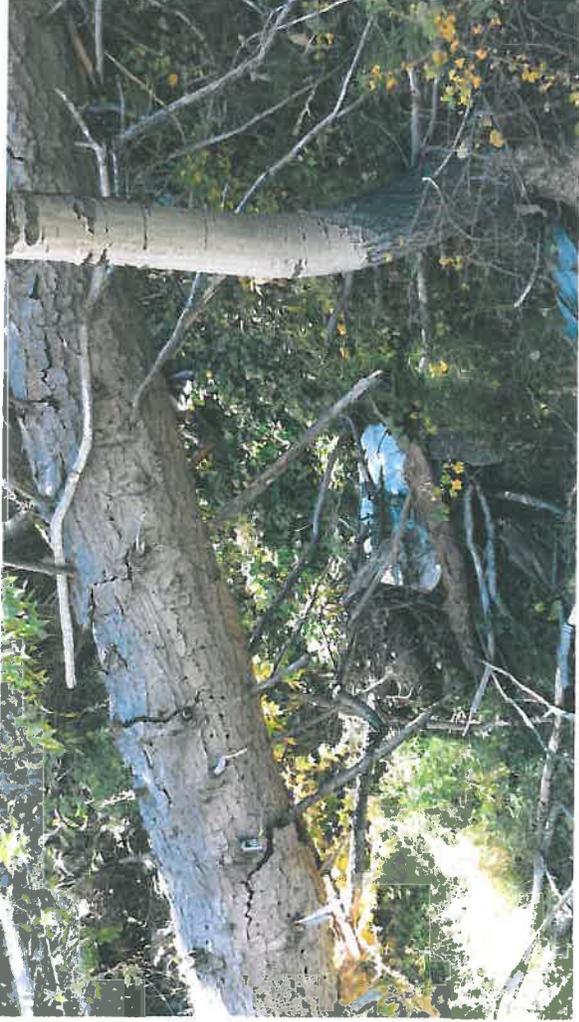
East Mountain Spring: 89-67
Water Quality Data: July Operational Data
Mine Association: Deer Creek Mine
Date of Development: N/A
Date of Second Mining: N/A

Historical Data: 1990-2014			
	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	368	232	295.71
CALCIUM	76.8	33.9	52.13
CARBONATE	5	0	0.70
CHLORIDE	10	3.5	5.26
CONDUCTIVITY	583	473	534.75
DISSOLVED OXYGEN	10.4	5	7.37
FLOW	16.7	1.6	6.36
HARDNESS	342	211	268.83
TOTAL IRON	1	0	0.29
DISSOLVED IRON	0.2	0	0.044
MAGNESIUM	36.5	30.6	33.62
DISSOLVED MANGANESE	0.038	0	0.011
MANGANESE	0.2	0	0.031
OIL AND GREASE	0	0	
PH	8.26	7.21	7.64
POTASSIUM	5	0.4	1.26
SET SOLIDS	0	0	
SODIUM	17	8.2	11.89
SULFATE	65	9	18.83
SUSPENDED SOLIDS	8	2	4.60
TEMPERATURE	40.8	3.6	11.48
TOTAL DISSOLVED SOLIDS	313	190	282.67

East Mountain Spring: 89-68
Water Quality Data: July Operational Data
Mine Association: Deer Creek Mine
Date of Development: N/A
Date of Second Mining: N/A

Historical Data: 1990-2014

	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	368	232	295.71
CALCIUM	76.8	33.9	52.13
CARBONATE	5	0	0.70
CHLORIDE	10	3.5	5.26
CONDUCTIVITY	583	473	534.75
DISSOLVED OXYGEN	10.4	5	7.37
FLOW	16.7	1.6	6.36
HARDNESS	342	211	268.83
TOTAL IRON	1	0	0.29
DISSOLVED IRON	0.2	0	0.044
MAGNESIUM	36.5	30.6	33.62
DISSOLVED MANGANESE	0.038	0	0.011
MANGANESE	0.2	0	0.031
OIL AND GREASE	0	0	
PH	8.26	7.21	7.64
POTASSIUM	5	0.4	1.26
SET SOLIDS	0	0	
SODIUM	17	8.2	11.89
SULFATE	65	9	18.83
SUSPENDED SOLIDS	8	2	4.60
TEMPERATURE	40.8	3.6	11.48
TOTAL DISSOLVED SOLIDS	313	190	282.67



Spring: 89-67

Location: T16S, R7E, Section 32
Associated Formation: North Horn
GPS: N 39°22'44.5"
W 111°09'26.2"

Note: Access to spring requires travel through private property in which owner does not allow.



Note: Spring was developed in 2009 as part of a cattlemen's mitigation plan associated with the Elk Spring culinary development project.



Spring: 89-68

Location: T16S, R7E, Section 32
Associated Formation: North Horn
GPS: N 39°22'53.6"
W 111°09'21.4"

Note: Access to spring requires travel through private property in which owner does not allow.

Note: Spring was developed in 2009 as part of a cattlemen's mitigation plan associated with the Elk Spring culinary development project.

Location: Section 24, Township 17 South, Range 6 East, SLB&M. This site is located within the Deer Creek mine permit boundary. The well head is located on alluvial deposits just above the Trail Mountain Mine portals.

Lease Association: ; Well EM-31 is associated with federal coal lease U-083066. PacifiCorp is the sublease holder of this Federal Coal Lease. The well is located within unmined coal managed by the BLM and was developed on surface lands managed by the USFS.

Subsidence: No subsidence is reported in the vicinity of the well. Refer to the 2008 Annual Subsidence Report data which are included herein. No mining has occurred with 1000 feet of this site.

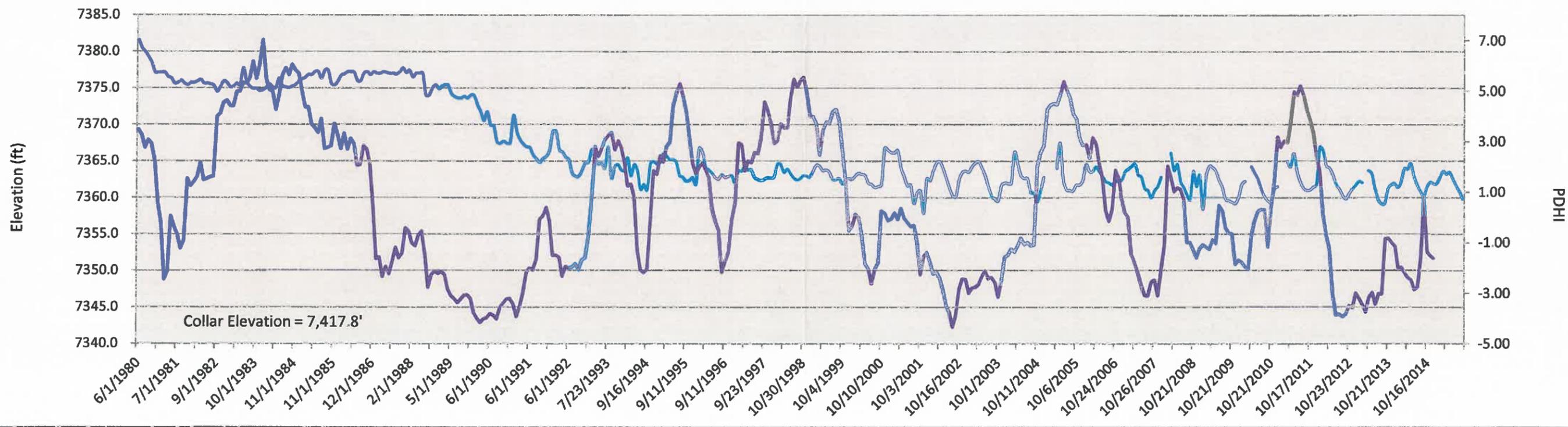
Water Data: Level data is included for well EM-31. Data show insignificant fluctuations of water level. Historic data has been collected for years 1980 through 2015 (35 years) although the well was developed in 1978. The total depth of the well is 280 feet. The elevation at the collar is 7417.8 feet. The drill hole diameter is 9.75 inches and fitted with a 4 inch (ID) casing and packed with gravel to within 50 feet of surface. Perforations were set between 180 feet and 250 feet. The annular is cemented from 0-50 feet. The lithologic well log is attached.

Justification for removal from monitoring: Well EM-31 has been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1980. There have been no reported occurrences in which mining has impacted this site. Historic level data has not indicated such impacts to the site.

Originally, the site was developed to assess the pieziometric gradient of the western reserves of the Wilberg Mine. Water elevation of the well was the only parameter ever monitored. The hydrograph of EM-31 shows that the well responds subtly to annual precipitation and long-term climatic cycles. We believe that these hydraulic responses are due in large part to hydraulic communication between the gravel-pack zone and shallow, overlying groundwater systems. The Star Point Sandstone, in other locations, does not respond to annual precipitation or climatic trends.

Since there is no longer mining in Cottonwood/Wilberg or Deer Creek mines, PacifiCorp see's no reason to retain this site as a required monitoring location. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

**WELL EM-31
EAST MOUNTAIN**
(Well Elevation vs. Palmer Drought Index)



COAL LITHOLOGIC LOG
UTAH POWER & LIGHT COMPANY
DEPT. OF MINING & EXPLORATION

Detailed log
 PAGE 1 OF 3

PROJECT: East Mountain DRILL HOLE: EM-31

LOCATION: <u>155' N, 1680' W, SE 16</u> COLLAR ELEV.: <u>7478'</u> HOLE TYPE: <u>WATER MONITORING</u> PLUG INTERVAL: <u>0-280'</u> CORE INTERVAL: <u>-</u> TOTAL DEPTH: <u>280'</u> DATE: <u>August 26, 1978</u> SCALE: <u>1" = 10'</u> GEOLOGIST: <u>Rodger C. Fry</u>	GEOPHYSICAL DATA LOG FROM TO DENSITY: <u>46</u> <u>250</u> H.R.D.: <u>10</u> <u>250</u> E. LOG: <u>42</u> <u>250</u> GAMMA: <u>10</u> <u>250</u> CALIPER: S.P.: <u>42</u> <u>250</u>	COAL SUMMARY: SEAM THICKNESS INT. Blind C <u>1.8+</u> <u>81.3</u> Hiawatha <u>1.8</u> Hiawatha <u>0.5</u> <u>0.7</u> Hiawatha <u>1.6</u> <u>3.3</u> Hiawatha <u>0.6</u> <u>0.4</u> Hiawatha <u>2.4</u> <u>2.2</u> Hiawatha <u>3.7</u> <u>0.2</u>
---	--	---

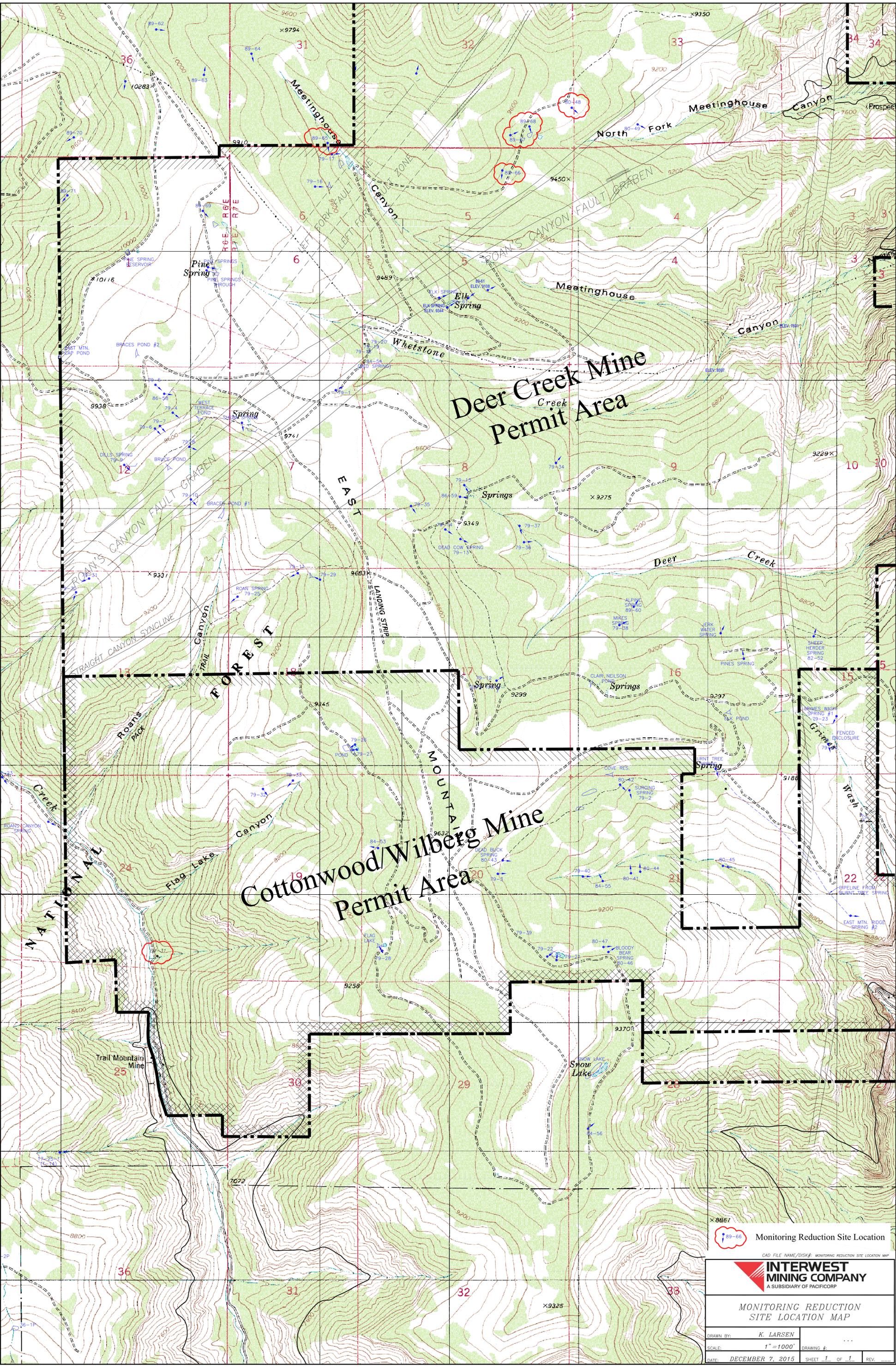
DEPTH	PLUG	CORE	GRAPHIC LOG	FORMATION NAME	LITHOLOGIC DESCRIPTION	R. Q. D.	BOX NO.	RUN NO.	% REC.	SAMPLE
+10										
0					+1.8-0 Coal (Exposed at Drill site) 1.8+ Blind Canyon outcrop					
					0-20 Alluvium Collar ↗					
20				BLACKHAWK FORMATION	20-40 Sandstone; Light-gray; very fine-grained; Silty					
40			40-50 Interbeds; Siltstone; Light-gray; sandy Carbmadstone; Black; fissile							
50			50-81.3 Sandstone; Light-gray; medium-grained; moderately sorted;							

COAL LITHOLOGIC LOG
 UTAH POWER & LIGHT COMPANY
 DEPT. OF MINING & EXPLORATION

Detailed log
 PROJECT: East Mountain
 DRILL HOLE: EM-31
 PAGE 3 OF 3

DEPTH	PLUG	CORE	GRAPHIC LOG	FORMATION NAME	LITHOLOGIC DESCRIPTION	R. Q. D.	BOX NO.	RUN NO.	% REC.	SAMPLE	
150				STARPOINT SANDSTONE	99.4-190 Sandstone; Light-gray; fine-grained; well-sorted; quartzose						
160											
170											
180											
190					190-220 Interbeds; Sandstone: Light-gray; fine-grained Carb. Mudstone; Black; fissile						
200											
210											
220					220-280 Sandstone; Light-gray; medium-grained; well-sorted; quartzose						
230											
280					T.D. 280						

MAPS



**Deer Creek Mine
Permit Area**

**Cottonwood/Wilberg Mine
Permit Area**

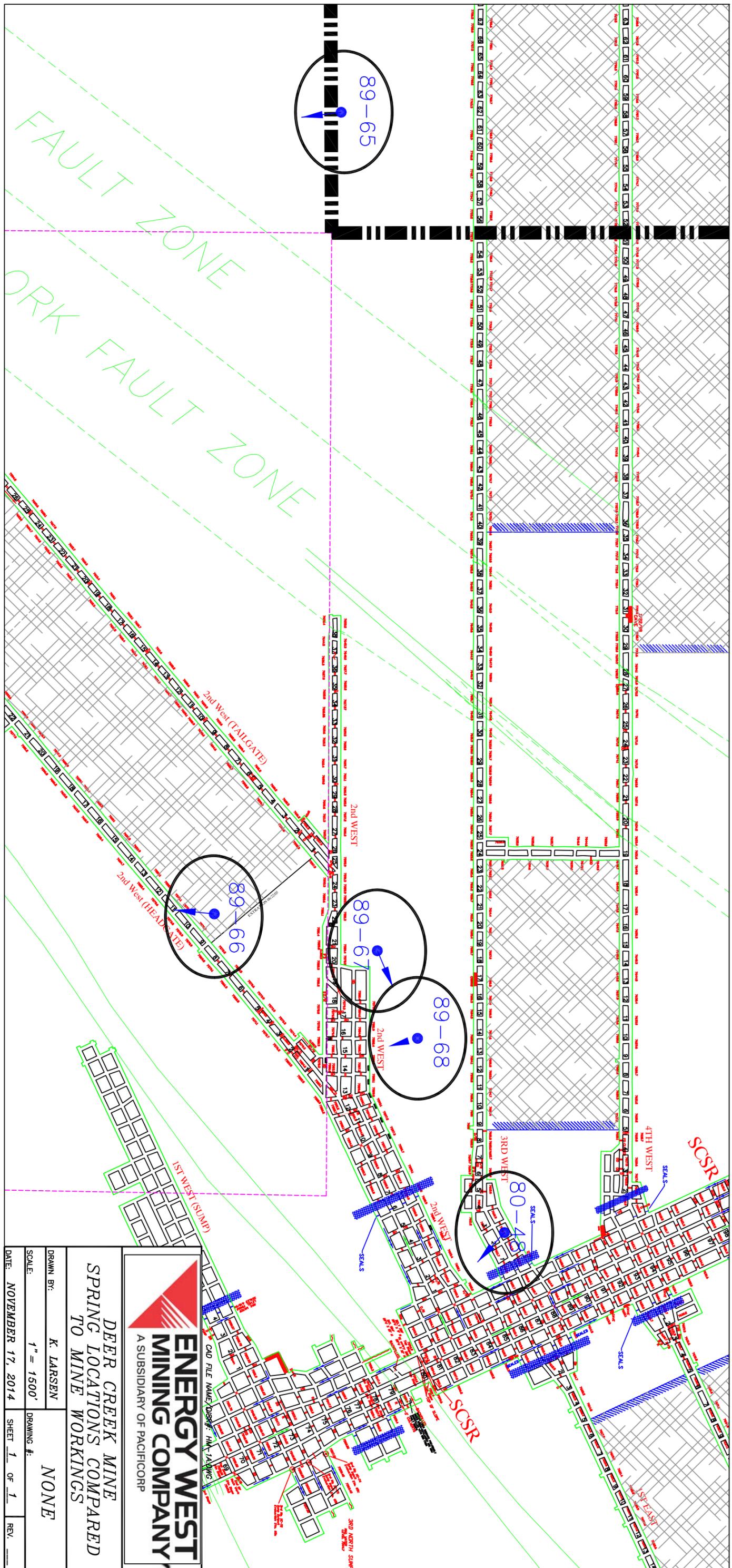
NATIONAL FOREST

Monitoring Reduction Site Location
CAD FILE NAME/DISK# MONITORING REDUCTION SITE LOCATION MAP



**MONITORING REDUCTION
SITE LOCATION MAP**

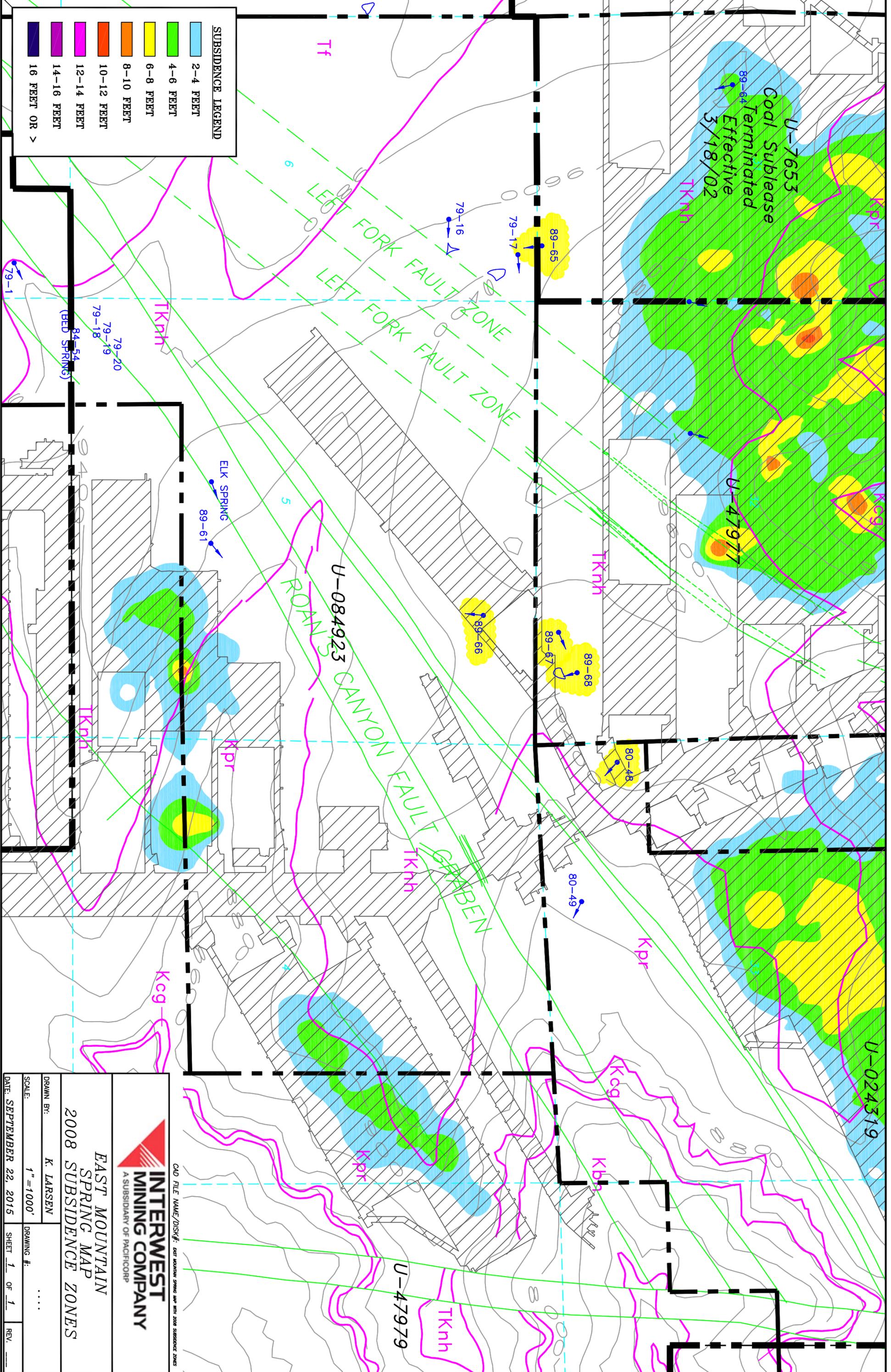
DRAWN BY:	K. LARSEN	DRAWING #:	...
SCALE:	1" = 1000'	SHEET #:	1 OF 1
DATE:	DECEMBER 7, 2015	REV.:	



 <p>ENERGY WEST MINING COMPANY A SUBSIDIARY OF PACIFICORP</p>		<p>DEER CREEK MINE SPRING LOCATIONS COMPARED TO MINE WORKINGS</p>	
		<p>DRAWN BY: K. LARSEN</p>	<p>DRAWING #: NONE</p>
<p>SCALE: 1" = 1500'</p>	<p>DATE: NOVEMBER 17, 2014</p>	<p>SHEET 1 OF 1</p>	<p>REV. _____</p>

SUBSIDENCE LEGEND

Light Blue	2-4 FEET
Green	4-6 FEET
Yellow	6-8 FEET
Orange	8-10 FEET
Red	10-12 FEET
Pink	12-14 FEET
Purple	14-16 FEET
Dark Purple	16 FEET OR >



**EAST MOUNTAIN
SPRING MAP
2008 SUBSIDENCE ZONES**

DRAWN BY:	K. LARSEN	DRAWING #:
SCALE:	1" = 1000'	SHEET	1 OF 1
DATE:	SEPTEMBER 22, 2015	REV.	---

CAD FILE NAME/DISK#: EAST MOUNTAIN SPRING MAP 2008 SUBSIDENCE ZONES

Amendment

PacifiCorp

Interwest Mining Company

Amendment to Reduce the Hydrologic Monitoring Program

Replace Volume 1, Part 2, Pages 220 - 225

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, Deer Creek Mine, and the reclaimed Des Bee Dove Mine (Phase III Bond Released 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. 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.

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

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

Cottonwood Creek Drainage System

Indian Creek (refer to Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)

- 1) ICA
- 2) ICF
- 3) ICD
- 4) ICB

Huntington Creek Drainage System

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

- 1) HCC01
- 2) HCC02
- 3) HCC04

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

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

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

- 1) MHC01

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

- | | |
|----------|---------|
| 1) RCF1 | 5) RCF3 |
| 2) RCLF1 | 6) RCW4 |
| 3) RCLF2 | |
| 4) RCF2 | |

Mill Fork Canyon (refer to Deer Creek Volume 12 R645-
301-700: Hydrologic Monitoring Map MFS1851D)

- 1) MFA01
- 2) MFB02
- 3) MFU03

Ground Water Hydrology (for detailed information for the Deer
Creek Mine see Volumes 9 and 9A: Hydrologic Section,
Cottonwood/Wilberg and Deer Creek Mines)

East Mountain Springs (refer to Volume 9, Hydrologic
Section, Cottonwood/Wilberg and Deer Creek Mines,
Map HM-4)

- | | |
|---------------------|------------------------|
| 1) Sheba Springs | 6) 89-67 |
| 2) 80-48 | 7) 89-68 |
| 3) 80-50 | 8) Rilda Canyon Meters |
| 4) 89-65 | (Meters 2 & 3)* |
| 5) 89-66 | |

* NEWUSSD controls Rilda Canyon meters. Monitoring will be
conducted when meters are functioning.

East Mountain Springs - Mill Fork Area (refer to Deer
Creek Permit Volume 12 R645-301-700: Hydrologic
Monitoring Map MFS1851D)

- | | |
|------------|------------------------|
| 1) EM-216 | 11) MF-213 |
| 2) MFR-30 | 12) MF-219 |
| 3) JV-9 | 13) SP1-26 |
| 4) JV-34 | 14) SP1-29 |
| 5) RR-5 | 15) MFR-10 |
| 6) RR-15 | 16) UJV 101 |
| 7) RR-23A | 17) UJV-206 |
| 8) MF-7 | 18) UJV-213 |
| 9) MF-10 | 19) EM Pond |
| 10) MF-19B | 20) Little Bear Spring |
| | 21) Grants Spring |

Piezometric Data - Surface

Rilda Canyon

- | | |
|-------|----------|
| 1) P1 | 4) P7 |
| 2) P5 | 5) EM-47 |
| 3) P6 | |

~~———— Cottonwood Creek Canyon~~

- ~~———— 1) EM 31~~

~~———— Piezometric Data — Underground~~

- ~~———— 1) Refer to Annual Hydrologic Reports for Locations:
Map HM-2~~

~~———— Waste Rock Wells~~

- ~~———— 1) DCWR1~~

UPDES Monitoring Locations - UPDES Permit #UT0023604

- 1) 001 - Sediment Pond
- 2) 002 - Mine Discharge

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

Laboratory Measurements cont.

- 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
- # Construction * Operational - Baseline

*UPDES & surface waters above & below mine sites

Monitoring Schedule

Surface monitoring sites shall be field monitored quarterly for all field parameters except for Indian Creek Sites - monitoring to be conducted during base flow only. Surface sites shall also be analyzed for quality for all quality parameters listed except for Indian Creek sites - monitoring to be conducted during base flow only.

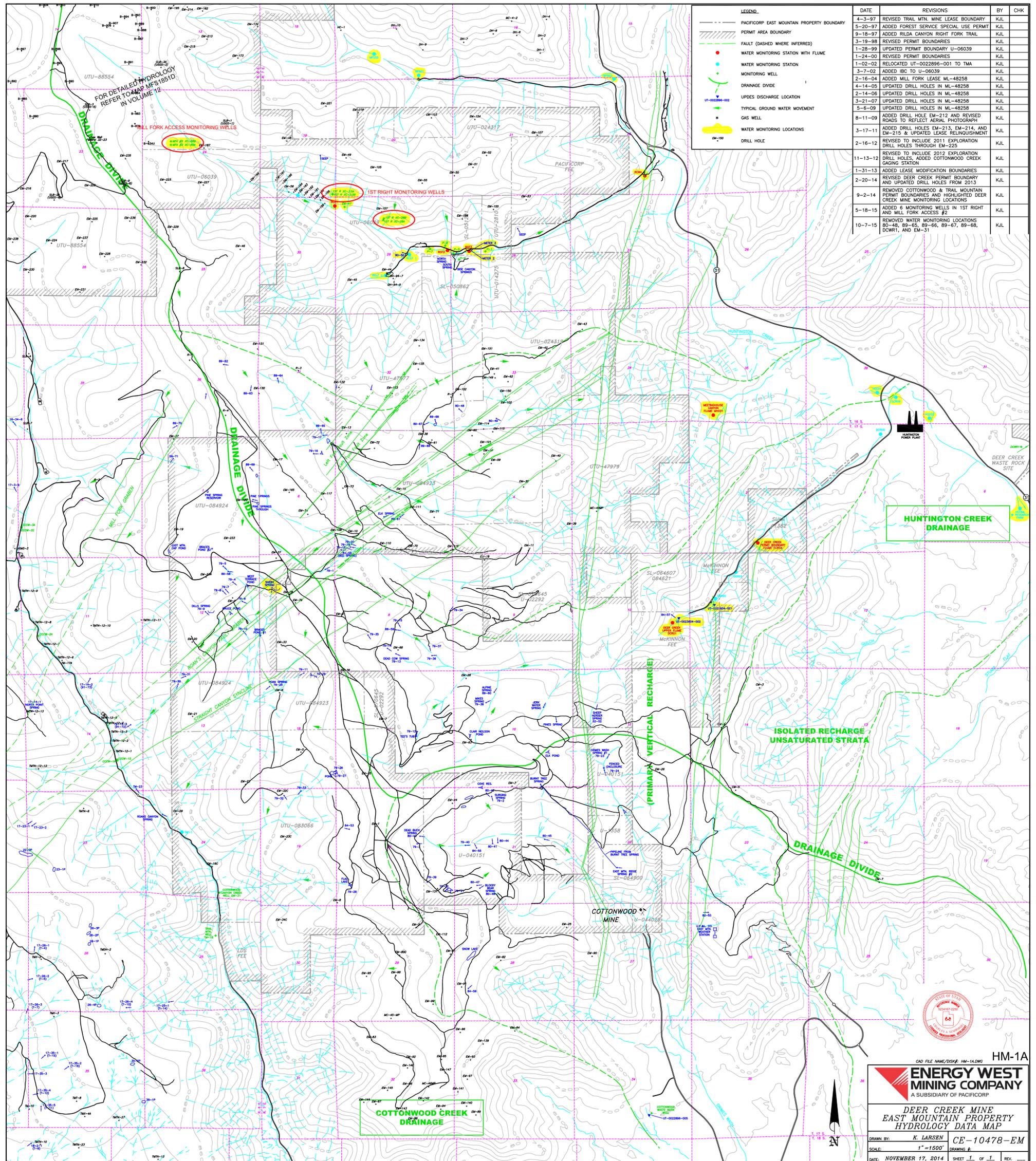
East Mountain Springs (including the Mill Fork Area) shall be field monitored during the months of July and October. Rilda Canyon Springs - NEWUSSD: Meters 2 & 3 shall be field monitored monthly depending on access. East Mountain Springs (including the Mill Fork Area) shall also be analyzed for quality during the months of July and October. Rilda Canyon Springs - NEWUSSD: Meters 2 & 3 shall be monitored for quality monthly depending on access. All surface and ground water monitoring requirements for the Mill Fork Area are found in Volume 12, Deer Creek Mine, Mill Fork Lease, Section R645-301-700.

PacifiCorp

Interwest Mining Company

Amendment to Reduce the Hydrologic Monitoring Program

Replace Volume 1, Part 2, Map HM-1A



FOR DETAILED HYDROLOGY
REFER TO MAP MF'S 1851D
IN VOLUME 12

MILL FORK ACCESS MONITORING WELLS

1ST RIGHT MONITORING WELLS

COTTONWOOD CREEK DRAINAGE

HUNTINGTON CREEK DRAINAGE

ISOLATED RECHARGE UNSATURATED STRATA

(PRIMARY VERTICAL RECHARGE)

DRAINAGE DIVIDE

COTTONWOOD MINE

LEGEND

- PACIFICORP EAST MOUNTAIN PROPERTY BOUNDARY
- PERMIT AREA BOUNDARY
- - - FAULT (DASHED WHERE INFERRED)
- WATER MONITORING STATION WITH FLUME
- WATER MONITORING STATION
- MONITORING WELL
- - - DRAINAGE DIVIDE
- UPDES DISCHARGE LOCATION
- TYPICAL GROUND WATER MOVEMENT
- GAS WELL
- 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	
2-7-02	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	
3-6-09	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	
9-18-15	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, 89-68, DOWN1, AND EM-31	KJL	



CAD FILE NAME/DWG#: HM-1A.DWG

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

DEER CREEK MINE
EAST MOUNTAIN PROPERTY
HYDROLOGY DATA MAP

DRAWN BY: K. LARSEN
SCALE: 1" = 1500'
DATE: NOVEMBER 17, 2014

CE-10478-EM
DRAWING #:
SHEET 1 OF 1

HM-1A

PacifiCorp

Interwest Mining Company

Amendment to Reduce the Hydrologic Monitoring Program

Replace Volume 9, Appendix A-1, Water Monitoring Program 1-14 pages

**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. Cottonwood Creek Drainage System

a. ***Indian Creek*** (refer to Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)

- (1) ICA - Indian Creek Above
(Approximately 2500 feet northwest of the Mill Fork permit boundary) 400 feet North, 2350 feet West of the Southwest corner of Section 3, Township 16 South, Range 6 East.
- (2) ICF - Indian Creek Flume
(Approximately 2100 feet west of the Mill Fork permit boundary) 300 feet North, 3400 feet West of the Southwest corner of Section 10, Township 16 South, Range 6 East.
- (3) ICD - Indian Creek Ditch
(Approximately 1600 feet west of the Mill Fork permit boundary, irrigation ditch for Upper Joes Valley) 240 feet North, 2850 feet West of the Southwest corner of Section 15, Township 16 South, Range 6 East.
- (4) ICB - Indian Creek Below
(Approximately 3700 feet west of the Mill Fork permit boundary, junction of Indian Creek and FDR040) 70 feet North, 120 feet West of the Southwest corner of Section 16, Township 16 South, Range 6 East.

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE

2. Huntington Creek Drainage System

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

- (1) HCC01 - Above Deer Creek Confluence:
1400 feet north, 2200 feet west of the southeast corner of Section 36, Township 16 South, Range 7 East.
- (2) HCC02 - Below Deer Creek Confluence:
300 feet north, 300 feet west of the southwest corner of Section 31, Township 16 South, Range 8 East.
- (3) HCC04 - @ Research Farm*
800 feet north, 200 feet east of the southwest corner of Section 5, Township 17 South, Range 8 East.
*Not listed on map due to scale.

b. ***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.

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE

- c. ***Meetinghouse Canyon - South Fork*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)
 - (1) MHC01 - Meetinghouse Canyon South Fork
(Approximately 200 feet upstream from the north and south convergence.) 800 feet North, 1500 feet East of the Southwest corner of Section 35, Township 16 South, Range 7 East.

- d. ***Rilda Canyon*** (refer to Deer Creek and Wilberg/Cottonwood Mines: Volume 9 Map HM-1A)
 - (1) RCF-1 - Rilda Canyon - Right Fork:
(Approximately 4000 feet upstream from the Right and Left fork convergence.) 400 feet South, 200 feet West of the Northeast corner of Section 30, Township 16 South, Range 7 East.

 - (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.

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE

- (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.

- e. **Mill Fork Canyon** (refer to Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)
 - (1) MFA01 - Mill Fork Canyon - Above Old Mine: (Approximately 2000 feet above old mine portals @ end of USFS development road.) 100 feet North, 1500 feet West of the Southeast corner of Section 17, Township 16 South, Range 7 East.

 - (2) MFB02 - Mill Fork Canyon - Above Huntington Creek Confluence: (Approximately 200 feet above confluence with Huntington Creek @ culvert outfall.) 100 feet South, 1900 feet East of the Northwest corner of Section 22, Township 16 South, Range 7 East.

 - (3) MFU03 - Mill Fork Canyon - Above Mill Fork Fault Crossing: (Approximately 700 feet upstream of projected Mill Fork Fault crossing) 1150 feet North, 1700 feet East of the Southwest corner of Section 17, Township 16 South, Range 7 East.

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

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

B. Groundwater Hydrology – Deer Creek Mine

- 1. East Mountain Springs** (refer to Deer Creek and Wilberg/Cottonwood Mines:
Volume 9 maps HM-4)

Sheba Springs	80-48
80-50	
89-65	
89-66	
89-67	
89-68	
Rilda Canyon-(Meters 2&3) ¹	

¹-NEWUSSD controls Rilda Canyon meters. Monitoring will be conducted when meters are functioning.

- 2. East Mountain Springs - Mill Fork Area** (refer to Deer Creek Permit
Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)

EM-216	MFR-30
JV-9	RR-5
JV-34	RR-15
MF-7	RR-23A
MF-10	SP1-26
MF-19B	SP1-29
MF-213	UJV-101
MF-219	UJV-206
MFR-10	UJV-213
EMPOND	Grants Spring
Little Bear Spring	

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

3. Piezometric Data

a. Surface

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

P1
P5
P6
P7
EM-47

~~(2) Cottonwood Canyon Creek~~

~~East Mountain (refer to Deer Creek and Wilberg/Cottonwood Mines: Volume 9 Map HM-1a)~~

~~EM 31~~

b. Underground: Deer Creek In-Mine

- (1) (Refer to Annual Hydrologic Reports for Locations : Map HM-2)

4. Deer Creek In-Mine Water Locations

- a. Refer to Annual Hydrologic Reports for Locations: Map HM-2

~~5. Waste Rock Wells (refer to Deer Creek Mine: Volume 10 Map CM-10778-WB)~~

- ~~a. DCWR1~~

C. UPDES Monitoring Locations – Deer Creek Mine

- a. *Deer Creek Mine*
UPDES UT0023604
001- Sediment Pond
002- Mine Discharge

**PACIFICORP
ENERGY WEST
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, except Indian Creek - monitoring to be conducted during base flow only.

1. Cottonwood Canyon Creek

- a. Indian Creek
 - (1) ICA
 - (2) ICF
 - (3) ICD
 - (4) ICB

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

2. Huntington Canyon Drainage

a. Deer Creek

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

b. Huntington Creek

- (1) HCC01
- (2) HCC02
- (3) HCC04

Flow in Huntington Creek is measured only at HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report.

c. Meetinghouse Canyon - South Fork:

- (1) MCH01

d. Rilda Canyon

- (1) RCF1*
- (2) RCLF 1
- (3) RCLF 2
- (4) RCF2
- (5) RCF3
- (6) RCW4

* Baseline flow will be measured adjacent to EM-163

e. Mill Fork Canyon

- (1) MFA01
- (2) MFB02
- (3) MFU03

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

Groundwater Monitoring

1. East Mountain Springs (see monitoring location list I.B.1)
2. East Mountain Springs - Mill Fork Area (see monitoring location list I.B.3)

East Mountain Springs will be field monitored during the months of July and October. Rilda Canyon Springs - (NEWUSSD: Meters 2 & 3; when functioning) will be field monitored monthly depending upon access.

3. In-Mine
 - a. Deer Creek

In-mine locations will be field monitored quarterly for all field parameters except pH, conductivity, and dissolved oxygen.

4. Piezometric Wells
 - a. Surface

Piezometric surface wells will be field monitored for level only on a monthly basis depending upon access.

- (1) Rilda Canyon (see Map HM-1 for locations)

P1
P5
P6
P7
EM-47

- ~~(2) Cottonwood Canyon Creek (see Map HM-1 for locations)~~

~~EM-31~~

- ~~5. Waste Rock Wells~~
 - ~~a. Deer Creek~~

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

UPDES Monitoring

1. Deer Creek

UPDES sites 001 and 002 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.

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

Springs East Mountain Springs will be field monitored during the months of July and October.

Rilda Canyon Springs (NEWUSSD: Meters 2 & 3; when functioning) will be field monitored monthly for flow depending upon access. East Mountain Springs (including Rilda Springs) monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.

Wells: Piezometric surface wells (Rilda Canyon and Cottonwood Canyon): will be field monitored for level only on a monthly basis depending upon access. Piezometric surface well monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.

~~Waste Rock Well: will be field monitored for level only on a quarterly basis. Monitoring will be conducted until sealing during final reclamation.~~

UPDES: Sites will be monitored as specified in the individual permits

**PACIFICORP
ENERGY WEST
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, except for Indian Creek - quality samples will be collected during baseflow only. 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 2011 and will be repeated every five years there-after.

a. Cottonwood Creek Drainage

(1) Indian Creek

- (a) ICA
- (b) ICD
- (c) ICB

b. Huntington Creek Drainage

(1) Deer Creek

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

(2) Huntington Creek

- (a) HCC01
- (b) HCC02
- (c) HCC04

(3) Meetinghouse Canyon - South Fork:

- (a) MCH01

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK MINE

- (4) Rilda Canyon
 - (a) RCF1
 - (b) RCF3
 - (c) RCW4

- (5) Mill Fork Canyon
 - (a) MFA01
 - (b) MFB02
 - (c) MFU03

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.

2. Groundwater Hydrology

- a. East Mountain Springs: Water samples will be collected and analyzed during the months of July and October. Rilda Canyon Springs (NEWUSSD: Meters 2 & 3; when functioning) will be monitored for quarterly for quality. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).
- b. In-Mine: Two water samples will be collected and analyzed per mine quarterly until mine is sealed or access is discontinued. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).
- c. Wells: No analysis required.
- ~~d. Waste Rock Wells: One water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM~~

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

~~Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).~~

Baseline analysis was performed in 2011 and will be repeated every five years thereafter.

Reclamation Monitoring - Groundwater Hydrology:

- a. East Mountain Springs: Water samples will be collected and analyzed during the months of July and October. Rilda Canyon Springs (NEWUSSD: Meters 2 & 3; when functioning) will be monitored quarterly for quality. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List). East Mountain Springs (including Rilda Springs) monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.
- b. In-Mine: Two water samples will be collected and analyzed per mine quarterly until the mine is sealed or the sites become inaccessible. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).
- c. Wells: Rilda and Cottonwood Canyon wells will be sealed during final reclamation. Quarterly sampling will continue until sealing. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).
- ~~d. Waste Rock Wells: Waste rock wells will be sealed during final reclamation. One water sample will be collected and analyzed per location quarterly until well sealing. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).~~

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

- e. Post Reclamation Monitoring: PacifiCorp commits to conduct annual surveys 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 (see Table 2-Ground Water Quality Parameter List). Baseline analysis will be performed on the 5th and 9th year.

3. UPDES Monitoring Sites

- a. Deer Creek Mine

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

III. ANNUAL REPORTS

All data collected regarding the hydrology of East Mountain will be summarized by the applicant in an annual Hydrologic Monitoring Report. Copies of the report will be submitted to the Utah State Division of Oil, Gas and Mining. In addition, any raw data collected will be submitted to the Utah State Division of Oil, Gas and Mining on a quarterly basis.

PacifiCorp

Interwest Mining Company

Amendment to Reduce the Hydrologic Monitoring Program

Replace Volume 9, Appendix A-1, Water Monitoring Schedule, 6 pages

PACIFICORP
ENERGY WEST MINING COMPANY
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>Cottonwood Creek Drainage System</i>	<i>Joels Valley</i>	ICA	Based Flow Monitoring Only (October or November)									Operational			
	<i>Indian Creek</i>	ICD	Based Flow Monitoring Only (October or November)									Operational			
		ICB	Based Flow Monitoring Only (October or November)									Operational			
<i>Huntington Drainage System</i>	<i>Deer Creek</i>	DCR01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	
		DCR04	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	
		DCR06	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	
	<i>Huntington Creek</i>	HCC01	Flow *	Flow *	Operational*	Flow *	Flow *	Operational*	Flow *	Flow *	Operational*	Flow *	Flow *	Operational*	
		HCC02			Operational*			Operational*			Operational*			Operational*	
		HCC04			Operational*			Operational*			Operational*			Operational*	
	* Flow in Huntington Creek is measured @ HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report														
	<i>Meetinghouse Canyon</i>	MCH01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	
	<i>Rilda Canyon</i>	RCF1*	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	
		RCLF1	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	
		RCLF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	
		RCF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	
		RCF3	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	
RCW4		Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational		
* Baseline flow will be measured adjacent to EM-163															
<i>Mill Fork Canyon</i>	MFA01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational		
	MFB02	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational		
	MFU03	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational		

PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING SCHEDULE
DEER CREEK MINE

GROUNDWATER HYDROLOGY - OPERATIONAL SAMPLING (Table 2)

Groundwater Type

		<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>Springs</i>	<i>East Mountain (Includes Mill Fork Springs)</i>							Operational	Flow *	Flow *	Operational		
	<i>East Mountain-Rilda Canyon</i>	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
<i>In-Mine</i>	<i>Deer-Creek</i>			Operational			Operational			Operational			Operational
<i>Wells</i>	<i>Cottonwood Canyon Wells</i>	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	<i>Deer-Creek Waste-Rock Well</i>			Operational			Operational			Operational			Operational
	<i>Deer-Creek In-Mine Well</i>			Level			Level			Level			Level
	<i>Rilda Canyon Wells</i>	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level

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>	<i>DCD</i>	Operational											
<i>Sediment Pond Discharge</i>	<i>Deer Creek</i>	<i>1 Outfall</i>	Operational											

PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING SCHEDULE
DEER CREEK MINE

SURFACE HYDROLOGY - BASELINE SAMPLING (Table 1) - 2011

<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>Cottonwood Creek Drainage System</i>	<i>Joes Valley</i>	ICA	Based Flow Monitoring Only (October or November)										Baseline		
	<i>Indian Creek</i>	ICD	Based Flow Monitoring Only (October or November)										Baseline		
		ICB	Based Flow Monitoring Only (October or November)										Baseline		
<i>Huntington Drainage System</i>	<i>Deer Creek</i>	DCR01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	
		DCR04	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	
		DCR06	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	
	<i>Huntington Creek</i>	HCC01	Flow *	Flow *	Baseline*	Flow *	Flow *	Baseline*	Flow *	Flow *	Baseline*	Flow *	Flow *	Baseline*	
		HCC02			Baseline*			Baseline*			Baseline*			Baseline*	
		HCC04			Baseline*			Baseline*			Baseline*			Baseline*	
	* Flow in Huntington Creek is measured @ HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report														
	<i>Meetinghouse Canyon</i>	MCH01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	
	<i>Rilda Canyon</i>	RCF1*	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	
		RCLF1	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	
		RCLF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	
		RCF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	
RCF3		Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline		
	RCW4	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline		
* Baseline flow will be measured adjacent to EM-163															
<i>Mill Fork Canyon</i>	MFA01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline		
	MFB02	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline		
	MFU03	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline		

PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING SCHEDULE
DEER CREEK MINE

GROUNDWATER HYDROLOGY - BASELINE SAMPLING (Table 2) - 2011

Groundwater Type

			<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>Springs</i>	<i>East Mountain (Includes Mill Fork Springs)</i>								Baseline	Flow *	Flow *	Baseline		
	<i>East Mountain-Rilda Canyon</i>		Flow	Flow	Baseline									
<i>In-Mine</i>	<i>Deer-Creek</i>				Baseline			Baseline			Baseline			Baseline
<i>Wells</i>	<i>Cottonwood-Canyon-Wells</i>		Level											
	<i>Deer-Creek-Waste-Rock-Well</i>				Baseline			Baseline			Baseline			Baseline
	<i>Deer-Creek-In-Mine-Well</i>				Level			Level			Level			Level
	<i>Rilda Canyon Wells</i>		Level											

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	Operational											
<i>Sediment Pond Discharge</i>	<i>Deer Creek</i>	1 Outfall	Operational											

PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING SCHEDULE
DEER CREEK MINE

SURFACE HYDROLOGY - RECLAMATION 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>Cottonwood Creek Drainage System*</i>	<i>Joels Valley</i>	ICA	Based Flow Monitoring Only (October or November)										Operational		
	<i>Indian Creek</i>	ICD	Based Flow Monitoring Only (October or November)										Operational		
		ICB	Based Flow Monitoring Only (October or November)										Operational		
<i>Huntington Drainage System*</i>	<i>Deer Creek</i>	DCR01			Operational			Operational			Operational		Operational		
		DCR04			Operational			Operational			Operational		Operational		
		DCR06			Operational			Operational			Operational		Operational		
	<i>Huntington Creek</i>	HCC01			Operational**			Operational**			Operational**		Operational**		
		HCC02			Operational**			Operational**			Operational**		Operational**		
		HCC04			Operational**			Operational**			Operational**		Operational**		
	<i>** Flow in Huntington Creek is measured @ HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report</i>														
	<i>Meetinghouse Canyon</i>	MCH01			Operational			Operational			Operational		Operational		
	<i>Rilda Canyon</i>	RCF1***			Operational			Operational			Operational		Operational		
		RCLF1			Field			Field			Field		Field		
RCLF2				Field			Field			Field		Field			
RCF2				Field			Field			Field		Field			
RCF3				Operational			Operational			Operational		Operational			
RCW4				Operational			Operational			Operational		Operational			
<i>*** Baseline flow will be measured adjacent to EM-163</i>															
<i>Mill Fork Canyon</i>	MFA01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational		
	MFB02	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational		
	MFU03	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	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.

PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING SCHEDULE
DEER CREEK MINE

GROUNDWATER HYDROLOGY - RECLAMATION SAMPLING (Table 2)

Groundwater Type

Springs

	<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>
East Mountain (Includes Mill Fork Springs)							Operational			Operational		
<i>Spring monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.</i>												
East Mountain-Rilda Canyon	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
<i>Rilda Spring monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.</i>												
<i>Spring monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.</i>												

In-Mine

Deer-Creek samples will be collected and analyzed quarterly until the mine is sealed or the sites become inaccessible

Wells

Cottonwood Canyon Wells*	Level	Level	Level									
<i>Cottonwood Canyon well monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.</i>												
Deer-Creek Waste Rock Well			Operational			Operational			Operational			Operational
<i>Deer-Creek Waste Rock Well will sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing</i>												
Rilda Canyon Wells*	Level	Level	Level									
<i>Rilda Canyon well monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.</i>												
<i>* Monitored monthly subject of access</i>												

UPDES SAMPLING - (Table 1)

Mine Water

Discharge**

	<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	DCD											
<i>As Needed Basis According to UPDES Permit Stipulations</i>												
** After Portal Sealing, PacifiCorp Will Monitor Down Dip For Development Of Groundwater Seeps/Springs Until Bond Release												

Sediment Pond

Discharge

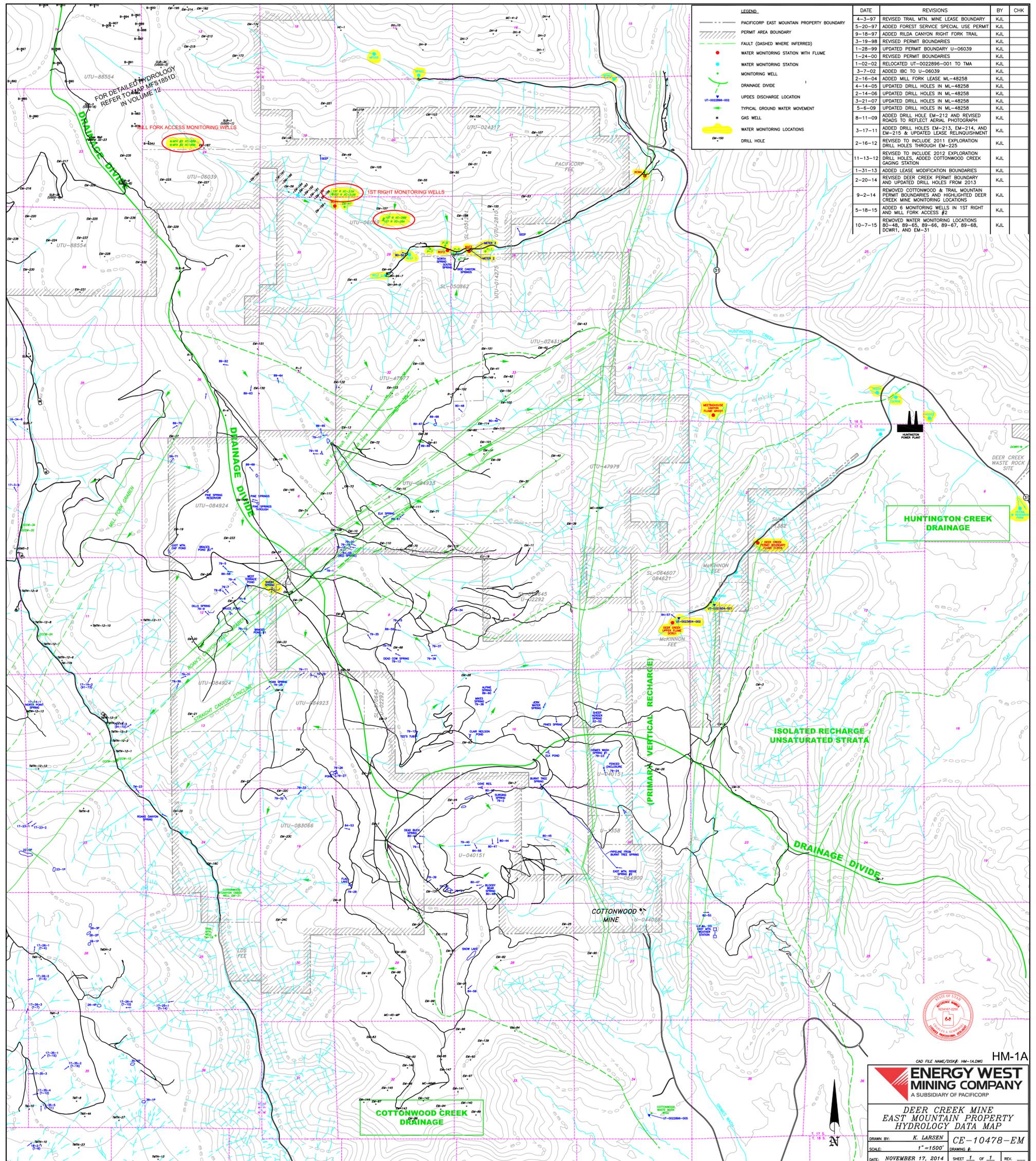
Deer Creek	1 Outfall											
<i>As Needed Basis According to UPDES Permit Stipulations</i>												

PacifiCorp

Interwest Mining Company

Amendment to Reduce the Hydrologic Monitoring Program

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



FOR DETAILED HYDROLOGY
REFER TO MAP MF'S 1851D
IN VOLUME 12

MILL FORK ACCESS MONITORING WELLS

1ST RIGHT MONITORING WELLS

COTTONWOOD CREEK DRAINAGE

HUNTINGTON CREEK DRAINAGE

ISOLATED RECHARGE UNSATURATED STRATA

(PRIMARY VERTICAL RECHARGE)

DRAINAGE DIVIDE

COTTONWOOD MINE

LEGEND

- PACIFICORP EAST MOUNTAIN PROPERTY BOUNDARY
- PERMIT AREA BOUNDARY
- - - FAULT (DASHED WHERE INFERRED)
- WATER MONITORING STATION WITH FLUME
- WATER MONITORING STATION
- MONITORING WELL
- DRAINAGE DIVIDE
- UPDES DISCHARGE LOCATION
- TYPICAL GROUND WATER MOVEMENT
- GAS WELL
- 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	
2-7-02	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	
3-6-09	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	
9-18-15	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, 89-68, DOWN1, AND EM-31	KJL	



CAD FILE NAME/DISK# HM-1A.DWG

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

DEER CREEK MINE
EAST MOUNTAIN PROPERTY
HYDROLOGY DATA MAP

DRAWN BY: K. LARSEN
SCALE: 1" = 1500'
DATE: NOVEMBER 17, 2014

CE-10478-EM
DRAWING #
SHEET 1 OF 1

HM-1A