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LOST CREEK ISR, LLC

December 12, 2008

Mr. Ronald Burrows
U.S. Nuclear Regulatory Commission
Two White Flint North
11545 Rockville Pike
Mail Stop T8F5
Rockville, MD 20852-2738

Re: Response to NRC Request for Additional Information (RAI), Dated November 6, 2008
Technical Report for the Lost Creek Project, Great Basin, Wyoming
Docket No. 40-9068
TAC No. LU0142

Dear Mr. Burrows,

Please find behind this cover an original and a copy of our responses to the RAI issued by NRC on November 6, 2008 for the Technical Report of the Lost Creek Application. This submittal addresses a majority of the questions posed in the RAI but additional time will be required in order to complete responses for the remaining questions. Lost Creek ISR, LLC plans on submitting responses to the remaining RAI questions during the week of January 12th, 2009.

This submittal consists of three volumes. The first includes the responses and various supporting materials, and the second and third are copies of pump test reports. Currently, the responses to the RAI are presented as a 'stand alone' document. If NRC prefers, Lost Creek ISR, LLC can also prepare 'replacement pages' for the Technical Report, along with an 'index sheet' which explains how to update the Technical Report with the new or amended pages. The corresponding portions of the Environmental Report will be updated when the RAI for the Technical Report has been accepted by NRC and as part of the responses to any NRC RAI for the ER.

If you have any questions regarding this submittal please contact me at (307) 265-2373, ext. 303.

Sincerely,
Lost Creek ISR, LLC
By: Ur-Energy USA Inc., Manager

John W Cash

John W. Cash
Manager EHS and Regulatory Affairs

Cc: Mrs. Melissa Bautz, WDEQ Lander Field Office
Mr. Bill Boberg, Ur-Energy USA Inc.
Mr. Hal Demuth, Petrotek
Mr. Mark Newman, BLM Rawlins Field Office
Dr. Ping Wang, AATA International

LOST CREEK ISR, LLC

December 2008 Responses
to the
NRC November 2008 Comments on the
Lost Creek Techncial Report

Volume 1 of 3

Responses and Supporting Materials

RESPONSES TO NRC COMMENTS
of 11/6/2008 on

SECTION 2.0
Site Characterization

in the Technical Report for the
LOST CREEK PROJECT
Wyoming

Section 2.5 Meteorology, Climatology and Air Quality

LCI has not provided sufficient information regarding the meteorological characteristics of the site to enable the staff to fully understand this topic and to support other reviews dependent on that understanding, such as dose to members of the public. Specifically, please provide the following information:

1. ***Section 2.5.5.2***

   a. ***Section 2.5.4 ("Winds") and Figure 2.5-3 indicate that the most prevalent winds are from the west-northwest. Section 7.2.1.2 ("Exposures from Air Pathways") indicates that the SEB1 boundary location has the highest calculated total effective dose equivalent. In addition, the proposed mine unit abuts the permit boundary in the SEB1 area. However, there has been no preoperational radon sampling in this area. Identify and provide justification for using the downwind radon monitoring location that excludes these areas.***

   As recommended in Regulatory Guide 4.14, passive radon samplers were installed at three boundary locations (URPA-8, URPA-13, and URPA-10 at the downwind eastern boundaries), and at a site that would represent background conditions (URPA-7 at the upwind western boundary). A radon sampler was also installed at the geographic center of the Permit Area (URPA-9). The closest residence is greater than 10 kilometers from the site. Because of the distance, radon sampling is not recommended by Regulatory Guide 4.14; however this location was also instrumented (URPA-1). Regulatory Guide 4.14 recommends at least four radon gas sampling locations in a remote setting, and LC ISR, LLC provided six, strategically placed to represent conditions across the site and at the nearest receptor.

   Because the radon gas monitoring effort represents baseline conditions, the locations were selected prior to delineation drilling, mine unit delineation, and plant siting. At the time baseline monitoring began, LC ISR, LLC had no way to predict where the calculated total effective dose equivalent would be the greatest. Although radon gas was not measured at the SEB1 location, there were three radon gas sampling locations within 1.5 miles of SEB1. Since LCI installed 50% more radon samplers than suggested by RG4.14, LCI believes that baseline radon concentrations across the site have been adequately characterized. Based on MILDOS modeling results, a radon detector will be added to the SEB1 location as a component of ongoing environmental monitoring that will precede the initiation of operations. Operations with the potential for radon release associated with the Lost Creek Project will not occur until facilities are constructed. Therefore, four quarters of background data from SEB1 will be available for comparison to any facility impact on environmental radon concentrations, well prior to commencement of operations.

b. Information regarding instrumentation used to collect radon gas measurements.

Radon gas measurements were made using Landauer Radtrak® long-term radon monitors equipped with a thoron-proof filter in order to measure radon-222, only. The radiosensitive element in these detectors is a CR-39 (allyl-diglycol carbonate) based passive alpha-track detector, sensitive to levels as low as 6 picoCuries per liter (pCi/l) days (0.07 pCi/l), and the detectors are designed for outdoor use. The detectors are suspended three feet above the ground in inverted cups, which shield the monitors from the elements but allow for a continuous free flow of air. The detectors are delivered in a film-foil bag that prevents exposure prior to deployment, and a metallic label is affixed to the detectors during retrieval to prevent ongoing exposure during return shipping.

c. Information regarding instrumentation used for gamma air sampling.

X9 Environmental/Low Level Dosimetry badges manufactured by Landauer, Inc. were used to measure gamma levels in the air. These detectors are specifically designed for outdoor applications, and have a linear response between 0.1 millirem (mrem) and 1000 rem using an aluminum oxide (Al_2O_3:C) thermoluminescent element read by optically stimulated luminescence technology. X9 badges are protected from the elements by a polypropylene holder sealed within a vinyl pouch, and deployed at a height of three feet. Net dosage is calculated by subtracting gamma levels measured by transit and deployment/retrieval control badges from the gross dosage measured by each badge deployed on site.

d. Information obtained regarding radon equilibrium ratios as a result of environmental sampling.

The equilibrium fraction for baseline measurements at the site would represent the global equilibrium fraction and will vary significantly from season to season. It is not useful to measure the equilibrium fraction for radon originating from the site operations for the purpose of assessing potential doses to members of the public. MILDOS estimates the equilibrium fraction based on residence time in the air for the site radon effluent. The residence time for any particular receptor location is a function of the distance from the source and the wind speed. Regulatory Guide 4.14 does not require either pre-operational or operational radon decay product measurements for environmental assessments. Occupational doses due to radon decay products will be assessed using routine radon decay product measurements in occupied areas of the plant as per Regulatory Guide 8.30.

2. *A description of onsite meteorological instrumentation.*

Meteorological instrumentation used to represent the site consists of the following sensors mounted on a 10 m tower and connected to a Campbell Scientific CR10X data logger:

- Vaisala Temperature and Relative Humidity Probe: temperature range of -40 to 60°C; accurate to ±2% at 10-90% relative humidity and to ±3% at greater than 90% humidity; shielded by RM Young 10-Plate Gill Solar Radiation Shield and mounted at 2 m.
- Dual Met One Model 062 Temperature Probes: used for measurement of differential temperature (ΔT) for dispersion and inversion modeling; temperature range of -50 to 50° C; sensors accurate to ±0.05° C; sensors co-calibrated for a maximum error per degree of differential temperature of 0.02° C; shielded by Met One Model 077 Aspirated Shields and mounted at 2 m and 10 m.
- Met One 3-Cup Anemometer and Wind Vane: range of 0 to 50 m/s (0 to 110 mph); anemometer accurate to ±0.11 m/s when less than 10.1 m/s or ±1.1% of true when greater than 10.1 m/s; vane accurate to ±4°; mounted at 10 m.
- Texas Electronics Tipping Bucket Rain Gage with 8" Orifice: accurate to ±1% at rain fall rates up to 1 inch/hour; resolution of 0.01 inches; mounted on freestanding post approximately 1 m high, and 5 m from tower.
- LI-COR Silicon Pyranometer: measures incoming radiation with wavelengths in the daylight spectrum; measures wavelengths between 400 and 1100 nm; accurate to within 3-5%; mounted at 10 m.

3. ***Any effects of nearby water bodies identified in Figure 2.5-1 on meteorological measurements.***

As noted in TR Section 2.5.2, the nearest water bodies of any size are Pathfinder and Seminoe Reservoirs, which are on the order of 50 miles downwind of the Lost Creek site and on the other side of the Continental Divide. It is unlikely these water bodies have any impact on meteorological measurements at Lost Creek. All other water bodies shown on Figure 2.5-1 are seasonal, at best, and unlikely to have any impact on the measurements.

4. ***Information regarding total evaporation by month.***

Information on total evaporation by month is included in Section 3.7.1.5 and Table 3.7-4 of the Lost Creek Environmental Report (ER).

5. ***Information regarding annual average mixing layer heights.***

Data collected for Lander/Riverton Wyoming indicated that the average annual mixing height is 348 meters in the morning and 2,300 meters in the afternoon. These can also be considered the inversion heights.

Reference: Holzworth, G.C., 1972, "Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States", U.S. EPA, Office of Air Programs, AP-101, 1972.

6. ***Information regarding average inversion height.***

Please see Response to Comment 2.5 #5 above.

7. ***Wind stability class in tabular format.***

The monthly wind stability class distribution is shown in the following table:

Percent Monthly Distribution of Pasquill Stability Class (2007)

Month	Percent					
	A	B	C	D	E	F
Jan	0.0	6.7	5.9	9.0	6.5	7.3
Feb	0.0	1.6	1.2	8.9	10.0	3.6
Mar	0.0	2.7	3.2	9.8	6.9	4.2
Apr	0.0	6.0	11.2	7.9	9.6	9.8
May	60.0	17.1	13.5	7.2	8.8	11.1
Jun	0.0	12.5	18.1	6.9	12.3	7.5
Jul	20.0	29.4	20.0	5.3	16.2	14.3
Aug	20.0	14.3	11.1	7.4	9.2	14.3
Sep	0.0	4.9	6.2	8.8	8.1	6.7
Oct	0.0	1.8	3.9	9.4	3.8	10.1
Nov	0.0	1.8	4.1	9.2	3.5	8.6
Dec	0.0	1.3	1.5	10.2	5.0	2.5

where the Pasquill Stability Classes are: A = very unstable; B = unstable; C = slightly unstable; D = neutral; E = slightly stable; and F = stable.

The time period covered by the data set in the above table (January 2007 through December 2007) is slightly different from that in Table 3.7-5 of the Lost Creek ER, which is a 12-month summary for April 2006 through April 2007. For comparison, the 12-month summary for January 2007 through December 2007, which is not that different from the April 2006 through April 2007 summary is:

Air Stability Class (Jan – Dec 2007)

Stability Class	%
A	0.1
B	5.1
C	7.5
D	78.4
E	3.0
F	6.0

2.6 Geology and Soils

The analysis of the geology in the proposed license areas is currently insufficient to determine the relationship and isolation of the extraction layer from the overlying and underlying aquifers especially across the fault. Please provide:

1. ***The land surface elevation in mean sea level (msl) on all of the cross sections and the distance in feet between wells.***

   The requested information is being incorporated onto the cross-sections, and LC ISR, LLC anticipates submitting the updated cross-sections during the week of January 12, 2009.

2. ***Maps of the top elevation in msl for the following layers: The FG horizon, the Lost Creek Shale (LCS), the HJ horizon, the Sage Brush Shale (SBS), and the KM horizon. Include the location of the fault on all maps to enable reviewers to assess the change in elevation of these layers across the fault.***

   The requested maps are in preparation and LC ISR, LLC anticipates submitting the updated cross-sections during the week of January 12, 2009.

3. ***A discussion of the true thickness of the overlying and underlying shales where isopach maps indicate they are less than ten feet thick, especially within the mine units. Large sections exist of less than 10 foot thickness in the SBS and several areas in the LCS in the proposed mine units.***

In response to a similar comment from WDEQ, LC ISR, LLC has updated TR Plates 2.6-2a and 2.6-2c to include the actual shale thicknesses measured in the drill holes in those areas where the isopach maps indicate a shale thickness less than 10 feet.

Aquifers in the Battle Spring Formation typically consist of thick sequences of multiple, medium to coarse-grained, fluvial channel-fill sands. Mapable "sand" units (for example: the UHJ Sand) may range from five to 50 feet in composite thickness and typically consist of multiple stacked "channel-fills'. "Aquifers", in turn, typically consist of multiple stacked sand units. Sand units are commonly separated vertically by locally thick beds of mudstone, claystone, siltstone or fine-grained sands. These interbeds represent local aquitards and aquicludes which can be considered internal to the regional aquifer. Total composite thickness of an aquifer (for example: the HJ horizon) is commonly in excess of 100 feet.

Aquiclides and aquitards (for example: the LCS or SBS Shales) represent quiescent floodplain and overbank sedimentary environments between channel fill sequences. Generally referred to as 'shales' they are, in essence, sedimentary sequences dominated by mudstone and claystone lithology; but also may include substantial amounts of siltstone and fine-grained sands. These lithologies can exhibit considerable interfingering, and are often transitional to the aquifers above or below. As a result, dramatic thickening and thinning of the aquicludes can occur locally. In addition their upper and lower boundaries are often gradational. Aquicludes may even exhibit localized occurrences of mineralization.

4. ***Evidence or further explanation of why LCI has confidence that the 560 abandoned exploration holes drilled prior to 2000, shown in Attachment 2.6.2, were sealed and surface plugged in compliance with the State of Wyoming Regulations in effect at the time of drilling.***

LC ISR, LLC has made a concerted effort to ensure both historic and new drill holes and wells are properly abandoned. At the end of the Responses for TR Section 2.0, please find attached a Table entitled "Pre-2008 Drill Hole Abandonment Status" detailing how drill holes and wells were abandoned historically; before year 2008. As noted in the table, some holes do not have abandonment information which is just an indication of lack of historic data and does not necessarily indicate that they were improperly abandoned. Since LC ISR, LLC has held the property, every drill hole has been properly abandoned in accordance with WDEQ regulations. Many of these holes have been inspected by WDEQ/LQD to ensure proper plugging. LC ISR, LLC understands that some historic holes may not have been properly abandoned when compared to today's standards and has therefore been proactive in attempting to locate and properly abandon any questionable holes. The right hand portion of the table shows LC ISR LLC's efforts to locate and abandon any such holes. Any hole with surface subsidence or near a pump test well was re-entered, when it could be located, and re-plugged. Additionally, in 1983-1984, Texas Gulf completed a program of locating historic drill holes on the property and re-plugging any holes with questionable plugging. The results of the Texas Gulf program are also included in the table. Finally, the results of hydrologic pumping tests will be analyzed to determine the degree of confinement.

5. ***Please provide an analysis of the short term stability of the storage ponds. Guidance regarding this type of analysis can be found in Regulatory Guide 3.11, "Design, Construction, and Inspection of Embankment Retention Systems for Uranium Recovery Facilities."***

   The analysis is in progress, and LC ISR, LLC anticipates submitting a response during the week of January 12, 2009.

<u>Section 2.7.1 Surface Water</u>

The analysis of the surface water hydrology and quality in the proposed license areas is currently insufficient to determine the potential for floods to disrupt the operation of the facility. Provide the following:

1. ***Maps showing areas inundated during major flood events within each proposed license area.***

   The surface areas contributing to the drainages which cross the Lost Creek Permit Area are small, e.g., less than 10 square miles, and the drainages are correspondingly small, as would be expected considering the aridity of the site. Therefore, none of the Permit Area would be inundated, per the classic definition of the term, by a major flood event. More problematic is the prevalence of wet, muddy conditions during snowmelt and during summer thunderstorms, which may create sheetflow, and the difficulties of winter travel. The EHS Department will develop protocols and procedures to be followed in case of adverse weather conditions that could disrupt operations.

2. ***A discussion of the potential for flooding of the area around the central processing plant and the provisions to protect critical equipment and components.***

   As noted in the Response to Comment 2.7.1 #1, the potential for flooding is minimal throughout the site and at the Plant, and other weather conditions may create problematic situations. As a precaution, there will be a berm that extends about six inches above grade around the Plant.

3. ***Peak flow estimates at recurrence intervals for all drainages within the license area near or crossing the planned wellfields noted on topographic maps.***

   Peak flow estimates were provided for Battle Spring Draw (TR Table 2.2-2), which is the largest drainage crossing the Permit Area. Therefore, even though this draw is in the easternmost portion of the Permit Area, and east of most of the proposed mine units, LC ISR, LLC considers these estimates as 'worst case' for the Permit Area. The relative sizes of the drainages crossing the Permit Area are most easily seen on TR Figure 2.7-1.

4. ***Provisions for erosion and wellhead protection against the effects of flooding from all drainages in the license area which pass near or through planned wellfields, or explain why protection is not necessary. All berms, culverts, rock riprap, drainage, or diversion channels are suggested to follow a design which meets the requirements of 10 CFR Part 40, Appendix A.***

   The drainages which cross the projected mine unit locations are quite small, e.g, less that five feet wide; therefore, it is unlikely that any wells will need to be located within or near those drainages. If LC ISR, LLC finds it necessary to locate a well within or near enough to a drainage that erosion or flooding are of concern, LC ISR, LLC will install additional wellhead protection such as large corrugated pipe, significantly larger in diameter than the well itself, for wellhead protection. This approach has been used successfully at other ISR facilities. LC ISR, LLC also commits to designing any necessary berms, culverts, rock riprap, drainage, or diversion channels in accordance with the requirements of 10 CFR Part 40, Appendix A as appropriate.

<u>*Section 2.7.2 Groundwater Occurrence*</u>

The analysis of the groundwater hydrology and water quality in the proposed license area is currently insufficient to interpret the impact of operations on groundwater flow and quality in and around the license area. Please provide the following:

1. ***Potentiometric contours in msl and groundwater flow direction and gradient for the FG horizon, HJ horizon, and KM horizon across the entire license area, in addition to the fault region provided previously.***

   Additional monitor wells have been installed across the permit area in the DE, FG, HJ and KM horizons. Water level data have been collected from these new locations and from previously existing monitor wells in order to provide a more complete potentiometric surface representation for the DE, FG, HJ and KM horizons. Once the data have been compiled, reviewed and interpreted, potentiometric surface maps for each of the horizons will be generated and hydraulic gradients will be calculated.

Submittal of the revised potentiometric surface maps and recalculated hydraulic gradients is anticipated during the week of January 12, 2009.

2. ***Cross-sections showing water levels in msl for the overlying (DE and FG horizon), ore zone (HJ horizon) and underlying aquifers (KM horizon) in the proposed permit area (Figures 2.6-1b-e).***

   Revised potentiometric surface maps are being generated that will incorporate additional monitor well locations for the DE, FG, HJ and KM horizons across the Permit Area. Those revised potentiometric surfaces will be projected onto the appropriate cross sections. Submittal of the revised cross sections is anticipated during the week of January 12, 2009.

3. ***A surface map showing the names and locations of the sands that act as the surficial aquifer (highest occurrence of groundwater) and contours of their water levels in feet below ground surface (bgs) across the proposed permit area.***

   The shallowest occurrence of groundwater within the permit area is in the DE Horizon. Data from monitor wells completed across the DE horizon indicate that the saturated thickness of that unit ranges from approximately 5 feet in the northeastern portion of the permit area to over 40 feet in the southwest. A map showing the water level contours of the DE Horizon is in preparation, and submittal of that map is anticipated during the week of January 12, 2009.

4. ***Tables identifying the existing or planned locations, rates and total withdrawal of any domestic or stock wells within a five mile radius of the license area. This distance was selected based on predicted drawdowns of 146 ft at 2 miles and 114 ft at 3 miles (page 3-14). Provide a notation for the type of water use for all wells.***

   The predicted drawdown has been recalculated based on the "true" estimated aquifer transmissivity and accounting for the fault as a no-flow boundary. Additional description of the calculations is provided in Responses to Comments 2.7.2 #12 and 3.2 #8. Based on those calculations, the predicted drawdown at 2 miles and 5 miles from the centroid of the production area will be 177 and 148 ft, respectively. However, those predictions are based on the assumption that the fault has an infinite extent and that all production and restoration activities occur on the same side of the fault. Data from site borings indicate that the fault in question probably only extends less than 1 mile on either side of the centroid and that projected mineable ore zones are located on both sides of the fault. Both of these factors will greatly reduce the total drawdown at the 2 and 3 mile radius from the project area.

Even though the predicted drawdown is considered a 'worst case' scenario given the conservative assumptions used for the prediction, a table and map have been created to identify domestic or stock wells within five miles of the Lost Creek Permit Area. Fifteen potentially active domestic or stock wells were identified, 14 utilizing the Wyoming State Engineer's Office Online Water Rights Database and one from correspondence with the United States Bureau of Land Management (WSEO, 2006). Three other wells were included in the table but are not considered potentially active due to a status of abandoned, cancelled, or rejected.

Additionally, Table 2.2-2 (Groundwater Use Permits) and Table 2.2-3 (Abandoned and Cancelled Wells) were updated to reflect the current status of wells within two miles of the Lost Creek Permit Area. New information has been acquired since the previous revision to the tables (e.g., more applications have been filed, temporary permit application numbers have been changed to permit numbers, status has changed, etc.).

The formatting of the tables was also modified to distinguish between a well and a point of use. All of the wells have at least one associated point of use. According to W.S. 41-3-930.(a), "Any person who intends to acquire the right to beneficial use of any underground water in the state of Wyoming, shall," . . . "file with the state engineer an application for a permit to make the appropriation" . . . "The application shall contain" . . . "the location by legal subdivision of the proposed well or other means of obtaining the underground water" and "the location by legal subdivision of the area or point of use". Therefore, WSEO maintains records of permitted wells with associated point(s) of use.

Table 2.2-2 (Groundwater Use Permits) and Table 2.2-3 (Abandoned and Cancelled Wells) present wells *and* the points of use associated with the wells, which may be difficult to observe with the previous formatting. During this modification, it was notable that certain points of use were within the two-mile buffer area but their associated wells were outside of the two-mile buffer area. To accommodate any questions that may arise, these wells *not* within the two-mile buffer were included in the table and highlighted to differentiate them from the wells within the two-mile buffer area.

To its knowledge, LC ISR, LLC has provided all publicly available well information in these aforementioned tables. These data were generated from the WSEO on-line database, conversations with WSEO personnel, copy and review of WSEO files, correspondence with the BLM, and new detailed data from ongoing Lost Creek Project well development.

Reference: Wyoming State Engineer's Office (WSEO). 2006. Water rights database. Available from: http://seo.state.wy.us/wrdb/index.aspx. Accessed on 11 December 2008.

5. ***A correction for the location of monitoring well HJMP 110 on Figure 2.7-9 and clarify other well locations on this map for readability. Also a correction for the township/range numbers on cross section 2.6-1b and c in the small inset maps.***

   The location of well HJMP-110 was correct on the figure. However, the labeling may have been confusing. The notations for all the wells on the figure have been made more readable. A revised copy of Figure 2.7-9 is provided at the end of the Responses for TR Section 2.0.

6. ***A column indicating the dates for the 1982 pumping tests and the 2006 pumping tests in Table 2.7-9.***

   A column for the dates of the 1982 and 2006 pump tests has been added to Table 2.7-9. A revised copy of the table is provided at the end of the Responses for TR Section 2.0.

7. ***All pumping test data and the drawdown/recovery plots for the three 2006 long term tests in the HJ horizon and information on screens and well completion for the pumping well and observation wells used for each test.***

   A copy of the Lost Creek Aquifer Test Analyses by Hydro Engineering, LLC dated March 2007 that contains this information is included under separate cover as part of this submittal. The well completion and screen interval data are included in the table titled "Well Completion Data-2006 Long Term Pump Tests" at the end of the Responses for TR Section 2.0.

8. ***Redraw the axes in Figures 6-2, 6-6, 6-8 and 6-10 in Attachment 2-7 as they are switched.***

   The figures have been corrected and revised copies are provided with this submittal.

9. ***In Table 3-1 in the pumping test report (Attachment 2.7), please provide the top of screen and bottom of screen in msl and indicate if each well was completed across the entire aquifer (FG. HJ, KM) horizon or one or more particular sands of each horizon (e.g., UHJ, MHJ, etc). Also provide the perpendicular distance of each well from the fault. For example:***

WELL NAME	FAULT LOCATION	FAULT DISTANCE	TOS	BOS	AQUIFER
LC19M	North	200 ft	6700ft	6800 ft	All 25 ft of LHJ, bottom 10 ft MHJ, 0 ft of UHJ

Table 3-1 in the pumping test report has been revised to include the following information for each well: top and bottom of screen (in msl), additional designation as to the completion zone, and the perpendicular distance to the fault. A revised copy of the table is provided at the end of the responses for TR Section 2.0.

10. ***An explanation of how a pumping test conducted on specific layers of the heterogeneous HJ horizon can be used to determine a representative transmissivity of the entire HJ horizon which is about 120 ft thick. According to an analysis of Table 3-1 in Attachment 2.7, the completion intervals of the pumping and observation wells in the LC19M pumping test were of different lengths (20-57 ft) and across different sands (UHJ, MHJ, LHJ).***

The pumping well, LC19M, is completed across the LHJ at depths of 412 to 463 ft below ground surface (bgs) or 6537 to 6486 ft msl (below mean sea level). Several of the observation wells included in the pumping test are completed across the MHJ sand (see revised Table 3-1). However, the transmissivity calculated for each of the observation wells completed in the HJ Horizon and located on the same side of the fault as the pumping well (north side) were all very similar, regardless of which HJ sand the wells were completed in. The only exception was well HJT-104 which had a transmissivity about half as large as the other wells. Well HJT104 is completed in the same sand as the pumping well but may be influenced by its proximity to the fault. If significant hydraulic boundaries existed between the various sands within the HJ Horizon, analysis of the pumping test data would indicate substantially lower transmissivity for those locations. The similarity in transmissivity between the HJ observation wells located on the same side of the fault as the pumping well is a good indication that the entire HJ Horizon on the north side of the fault is hydraulically connected and responds as a single aquifer system.

Similar results were found on the south side of the fault. Pumping from a well completed in the UHJ Sand (LC16M) resulted in significant drawdown response in the UHJ and MHJ observation wells on the south side of the fault and analysis of the data indicated similar transmissivity for each of those wells. The pump test conducted on the south side of the fault also resulted in minor responses in HJ completions on the north side of the fault. A copy of the LC16M pumping test report is included under separate cover as part of this submittal.

11. ***The manner in which LCI has and will account for the difference in the well completion locations in the HJ horizon across the fault on the pumping test analysis for the determination of connectivity in the DE, FG, HJ and KM horizons. For example, please explain how an observation well located in the HJ horizon on the south side of the fault was used to determine connectivity from the pumping well in a much higher HJ horizon on the north side of the fault. As shown in cross section HH, if the pumping well is screened in MHJ and UHJ on the north side and the observation well is screened in the entire HJ horizon on the south side, the observation well may not fully respond since the HJ horizon is thrown down on the south side and separated by the LCS from the MHJ and UHJ on the north side. In this particular case the adjacent aquifer across the fault from the MHJ and UHJ is the overlying FG, and this appears to be where the observation response was detected in LC 25M south of the fault for the LC19M test.***

First it should be stated that the LC19M pump test was designed to provide general aquifer characteristics of the production zone aquifer, to identify if hydraulic communication exists between the overlying and underlying aquifers, and to identify hydraulic boundaries to groundwater flow, if any. This pump test was not intended to be a mine unit hydrologic test. The presence of the fault was known prior to the test and monitoring was designed to observe if pumping stress would translate across the fault within the HJ Horizon. The LC19M pump test results showed that the fault, while not impermeable, is at least a partial barrier to groundwater flow, as demonstrated by the large head differential that was created across the fault during pumping of LC19M.

LC19M is completed in the LHJ at an elevation of 6537 to 6486 ft msl. Observation wells across the fault were included in the monitoring of the test. These wells were completed in stratigraphically shallower sands than the LHJ (UHJ and MHJ). However, because the wells on the south side of the fault are downthrown relative to well LC19M, the msl elevations of the completion zones were similar. For instance well HJT-105 is completed in the UHJ sand across an elevation of 6533 to 6502 msl. Well HJMP-107 is completed from 6494 to 6477 msl in the MHJ Sand. LC16M is completed from 6525 to 6468 in the UHJ Sand. In other words, these south side observation wells are completed in shallower HJ sands that are juxtaposed to the HJ sand that was being pumped on the north side of the fault. If direct hydraulic communication exists across the fault, a well completed in the UHJ or MHJ on the south side of the fault would provide the highest probability of showing a response. And the results of the pumping test indicate that some hydraulic communication does exist across the fault, although the responses in wells south of the fault are an order of magnitude less than the responses observed in wells on the north side of the fault during the LC19M pump test.

Additional testing and evaluation will be conducted as part of the Mine Unit 1 Hydrologic Test. Data and results of that testing will be reported in the Mine Unit 1 Well Data Package.

12. ***An assurance that the analysis of the long term pumping test data at LC19M was performed to provide a transmissivity which was not affected by the influence of the fault. This information is important because the drawdown curves provided for the test do not clearly show the time and impact of intercepting a sealing fault. The sealing nature of the fault is evident on the recovery plots.***

The fault impacted the drawdown response in all of the wells. The impact of the fault occurred within the first hour or less in most of the wells that were monitored during the test. The reason that the barrier effect is not easily detected in the observation wells is because of the rapid and far reaching response during the test.

In order to facilitate the large amount of data that was collected during the course of the test, the transducers were setup to record water levels every 10 minutes. Wells HJMP-110 and HJMP-111 are located 338 and 470 feet, respectively, from the pumping well. The first response to the pump test at wells HJMP-110 and HJMP-111 occurred within 20 and 30 minutes respectively, after the test startup. The pumping well is located approximately 480 feet from the fault. Because HJMP-111 is located about the same distance from the pumping well as the pumping well is from the fault, one can surmise that the radius of influence from the pumping well reached the fault within 30 minutes or less. Accounting for the rebound of the pressure wave off the fault results in response to the barrier at the pumping well is an hour or less. That means that the influence of the fault occurs after the first 5 to 6 recorded data points (data collection is at 10 minute intervals, as previously stated). Well HJMP-104 is located 638 feet from the pumping well. The initial response to pumping at HJMP-104 was observed approximately 60 minutes into the test. By the time the pumping response is seen at HJMP-104, the fault had already impacted the data.

Because of the influence of the fault, the transmissivity determined from this pumping test is viewed as an 'effective" transmissivity. The fault will impact all production and restoration operations for this mine unit, therefore the "effective" transmissivity is more suitable for estimating hydraulic impacts of the in situ operation. A hydraulic conductivity calculated from this effective transmissivity will be lower than the actual or intrinsic hydraulic conductivity of the aquifer. The hydraulic conductivity of the production zone aquifer will have to be reevaluated when considering normal, non-pumping steady state flow conditions because the determination of groundwater flow velocity is directly proportional to hydraulic conductivity. Additional testing with a greater number of distant observation wells will be conducted under the Mine Unit 1 Hydrologic Testing and will be reported in the Mine Unit 1 Well Data Package.

A value of transmissivity that is not influenced by the fault can be estimated using the principle of superposition and image well theory (Stallman 1952). The principle of superposition simply states that the total effect resulting from pumping multiple wells simultaneously is equal to the sum of the individual effect caused by each of the wells acting separately. The principle of superposition is commonly used to evaluate well interference problems by summing the drawdown determined using the Theis equation for a homogeneous, isotropic, infinite extent aquifer. Image well theory is used to address hydraulic impacts of a bounded (non infinite extent) aquifer for either no flow or recharge boundaries (Domenico and Schwartz (1990)). In the application of image well theory for a no flow barrier, an imaginary well is placed directly across the no flow boundary at an equal distance from the boundary as the pumping well. The image well is assigned a pumping rate equal to that of the real pumping well. Then the drawdown can be calculated at any point within the aquifer (on the side with the real well) by summing the impacts from both the real and image well, using a modification of the Theis equation:

$$s = -s_p + s_i = Q/(4\Pi T) \times [W(u)_p + W(u)_t]$$

where:
s is the observed drawdown at any point;
s_p - drawdown resulting from pumping the real well;
s_i - drawdown resulting from pumping the image well;
Q - the pumping rate;
T - aquifer transmissivity;
$W(u)_p$ - well function for the real well;
$W(u)_t$ - well function for the image well;
and:
$(u)_p$ - $r_p^2S/4Tt$
$(u)_t$ - $r_t^2S/4Tt$
where:
r_p is the distance from the pumping well to the observation point;
r_i is the distance from the image well to the observation point; and
S - aquifer storativity.

In the case of the Lost Creek Project, image well theory was applied using the drawdown resulting from the LC19M pump test. The pumping well LC19M is located 482 feet from the fault, based on mapped data. An image well was assumed at a distance of 964 from the pumping well, on the other side of the fault. The drawdown at the end of the pump test at three wells were used to back calculate the transmissivity and storativity of the aquifer. The LC19M pump test was run for a period of 8,251.5 minutes at an average rate of 42.9 gpm. The wells and respective drawdown used to solve the Theis equation for transmissivity and drawdown were LC19M (93.32 ft), HJMP111 (35.56 ft) and HJMP104 (36.44 ft). The distance from LC19M to HJMP-111 is 473 ft and from LC19M to HJMP104 is 637 ft. The distances from the image well to HJMP-111 and HJMP-104 are 1,043 and 847 feet, respectively. A series of calculations were performed varying the transmissivity and storativity to find the best fit to the observed drawdown at the end of the test. Results of the effort indicate that a transmissivity of 144 ft^2/d and a storativity of 7e-05 provide a very good fit to the data with residuals (difference between the observed and calculated drawdown) of 0.06 ft at LC19M, -1.04 ft at HJMP-111 and 1.00 ft at HJMP-104. Although this calculation does not account for the partial penetration effects of the pumping and observation wells or the minor leakage from overlying and underlying aquifers (as evidenced by the slight drawdown response in overlying and underlying observation wells during the test), it does provide a reasonable estimate of the aquifer properties within the vicinity of Mine Unit 1.

13. ***An explanation of how the range of 60-70 ft2/day transmissivity for the HJ horizon was determined as a value which does not reflect the impact of the fault (page 2.7-26).***

    This range of transmissivity does indeed reflect the impact of the fault, as described in the previous response. This transmissivity is an 'effective' transmissivity for the production zone aquifer. The true transmissivity for the production zone aquifer is higher than the range that was identified in the permit application. However, the effective transmissivity accurately represents how the production zone aquifer will respond during in situ mining and restoration. Although the transmissivity and hydraulic conductivity determined from the pump test are lower than actual values, they will be representative of conditions that will be observed during mining within the vicinity of the fault. The actual transmissivity is in the range of 120 to 150 ft/d based on the principle of superposition and image well theory applied to the drawdown data as described in the previous comment response.

14. ***An explanation of how LCI will evaluate and address the drawdown response of the overlying and underlying wells on pumping tests which indicate there is a connection between these aquifers and the mining zone through the confining shales. The drawdowns at LC 18M (FG sand above the pumping well) and at UKMP-102 (KM sand very far from the pumping well) are of concern as the shales may be poorly confining.***

A more detailed evaluation of potential causes of hydraulic communication between the production zone and overlying and underlying aquifers will be conducted during the Mine Unit 1 Hydrologic Test. The Mine Unit 1 Hydrologic Test will employ a greater density of monitoring wells within the production zone aquifer and overlying and underlying aquifers on both sides of the fault. The additional hydrologic testing for Mine Unit 1 will provide better information regarding the cause of the drawdown response in overlying and underlying wells. The results and interpretation of that hydrologic test will be provided in the Mine Unit 1 Data Package.

Regardless of the cause of the hydraulic connection between the production zone and the overlying and underlying aquifers, URE will maintain a net bleed within any areas being mined during production. The net bleed will result in groundwater flow into the production zone aquifer from the surrounding aquifer. Furthermore, URE will conduct adequate monitoring during production and restoration operations to detect impacts to the overlying and underlying aquifers. Any detected excursion will be addressed immediately using overproduction, selective shutin of well patterns, rebalancing of well patterns or whatever other methods are deemed suitable for recovering fluids and restoring the impacted aquifer.

15. A calculation of potential leakage across the LCS and SBS to the HJ horizon during operations since they are thin (less than 10 ft) in many portions of the license area and the pumping tests showed they were not sufficiently confining to prevent a drawdown response in the overlying and underlying aquifers.

The HJ pumping tests conducted in 2007 did show a response, albeit minor, in the overlying and underlying aquifers. However, the cause of the response has not been determined. The response during the pumping test may have been the result of juxtaposed sands across the fault, improperly abandoned boreholes from previous exploration and investigation, damaged casing from currently installed monitor wells, or leakage through the overlying and underlying confining units. It is premature at this point to assume that the LCS and SBS are insufficiently confining, even if they are thin in certain locations. As previously described, additional hydrologic testing will be conducted to further assess the cause and extent of hydraulic communication between the production zone aquifer and the overlying and underlying aquifer. Results of the additional testing and will be reported as part of the Mine Unit 1 Data Package.

<u>Section 2.7.3 Groundwater Quality</u>

The analysis of the groundwater quality in the proposed license area is currently insufficient to interpret the impact of ISR recovery operations on water quality in and around the license area. Please provide an explanation of why the number, location,

and completion intervals of wells selected for preoperational groundwater quality monitoring in all the horizons provide adequate coverage and are representative of the license area. Most wells are concentrated in and near the ore body and are not completely penetrating of each targeted horizon.

LC ISR, LLC has installed several new wells throughout the property and is in the process of sampling these wells. Additional discussion of the selection of locations and completion intervals, is anticipated for submittal the week of January 12, 2009.

2.9 Background Radiological Characteristics

The analysis of background radiological characteristics is currently insufficient. Background radiological characterization is necessary to determine whether LCI's future operations will affect human health and the environment. Please provide the following information:

1. ***On page 2.9-1 of the Technical Report, LCI states: "Passive air samplers were used to measure natural gamma and Rn-222 at multiple locations within and outside of the Permit Area; and these results are presented in Section 2.5.2 of this report." However, Section 2.5.2 describes precipitation for the permit area. Provide the appropriate reference for these results.***

   The correct reference should be to TR Section 2.5.5.2. LC ISR, LLC will provide a replacement page if requested by NRC.

2. ***Radon flux measurements consistent with Regulatory Guide 4.14 or justification for not submitting them.***

   There will be no tailings impoundments. The planned storage ponds are small and will be lined. Any residues that may accumulate in these ponds will be disposed of off site in compliance with all regulatory requirements. Upon site decommissioning, soils in the vicinity of the former pond locations will be remediated if necessary as part of site closure plans, and will subsequently be surveyed according to applicable regulatory guidance to demonstrate compliance with all applicable soil cleanup standards.

   In addition, the national emission standard for radon flux from the disposal of uranium ore byproduct materials in onsite impoundments (40 CFR 61, Subpart T) appears to be a prescriptive gross value (20 pCi/m^2-sec). Baseline radon flux is not considered in this standard and as such, the related protocol from Regulatory Guide 4.14 appears to be inconsistent with the corresponding federal standard. Baseline radon flux measurements are not planned at this time.

3. ***Regarding preoperational vegetation sampling for radionuclides, LCI states: "The Project will not produce particulate emissions because the end-product is yellowcake slurry. Therefore, there will be no radiological impact on vegetation; and baseline characterization of vegetation radiological characteristics was not conducted." LCI has not sufficiently demonstrated compliance with 10 CFR 40.31(h) regarding the requirements and objectives in 10 CFR 40, Appendix A. Criterion 7 of Appendix A states: "At least one full year prior to any major site construction, a preoperational monitoring program must be conducted to provide complete baseline data on a milling site and its environs." Baseline data is used not only to measure the effectiveness of effluent control systems and procedures during normal milling operations, but also to assess the impacts of unusual releases due to spills, accidents, etc. In addition, LCI recognizes in its pathway analysis (Section 7.2.1.2 and Figure 7.2-1) that radon-222 releases can lead to radionuclide foliar deposition and uptakes by vegetation. LCI has not provided sufficient regulatory or technical justification to relieve them from the requirement of 10 CFR 40, Appendix A, Criterion 7. Please submit vegetation sampling in accordance with 10 CFR 40, Appendix A, Criterion 7, for NRC review prior to any major site construction.***

   This application does not include information on installation of a yellowcake drying facility. Therefore, the collection of vegetation samples was not considered necessary. LC ISR, LLC also believed that there was an established precedent, based on sampling programs at other facilities, to not conduct vegetation samples in cases when the proposed project did not include a yellowcake dryer. Discussion of proposed baseline sampling programs with NRC personnel also did not indicate the need for vegetation sampling. However, in anticipation of a possible license amendment request for installation of a dryer at Lost Creek, LC ISR, LLC collected vegetation samples in 2008. LC ISR, ISR anticipates submitting the sampling results and evaluation of those results during the week of January 12, 2009.

4. ***Preoperational radionuclide air particulate samples are not discussed. LCI has not provided sufficient regulatory or technical justification to relieve them from the requirement of 10 CFR 40 Appendix A, Criterion 7. Please submit radionuclide air particulate sampling in accordance with 10 CFR 40, Appendix A, Criterion 7, for NRC review prior to any major site construction.***

   This application does not include information on installation of a yellowcake drying facility. Therefore, the collection of air particulate samples was not considered necessary. LC ISR, LLC also believed that there was an established precedent, based on sampling programs at other facilities, to not conduct air particulate sampling for radionuclides in cases when the proposed project did not include a yellowcake dryer. Discussion of proposed baseline sampling programs with NRC personnel also did not indicate the need for radionuclide air particulate sampling. However, in anticipation of a possible license amendment request for installation of a dryer at Lost Creek, LC ISR, LLC began collection of air particulate samples in late 2007. The final sampling quarter has just been completed, and the samples are at the laboratory for analysis. Therefore, LC ISR, ISR anticipates submitting the sampling results and evaluation of those results during the week of January 12, 2009.

5. ***Preoperational surface water sampling is not discussed. However, in Section 7.3.2 of its Technical Report, LCI identifies "drainages within and downstream of the Permit Area." Regarding preoperational sediment sampling for radionuclides, LCI states, "Because there is no perennial surface water in the Permit Area, sediment sampling was not conducted." The Lost Creek site contains drainages that may periodically contain surface water. Furthermore, spills could impact sediments, and consequently, surface water or runoff quality exiting the site.***

Surface Water: The preoperational surface water sampling is discussed in Section 2.7 of the application (cross-reference on Page 2.9-1). The radiometric parameters included uranium, radium-226, radium-228, gross alpha, gross beta, lead-210, polonium-210, and thorium-230. The sampling results are presented in Table 2.7-4. All of the concentrations were below detection limits, except for uranium and gross alpha. All of the uranium concentrations were less than 0.001 milligrams per liter, and all of the gross alpha concentrations were less than 5 picoCuries per liter.

Sediment: Due to the arid nature of the site and the poor drainage development, the background gamma radiation survey was completed throughout the site, i.e., the survey equipment did not detour around drainages as a matter of course. The survey results and associated soil sampling were considered to provide definitive information on the distribution of radionuclides. In addition, based on NRC approval of other applications which did not include sediment sampling, LCI believed that there was an established precedent to not conduct pre-operational sediment sampling for radionuclides in cases when the proposed project does not include a yellowcake dryer, and the drainages in the project area have no perennial surface water flow, or flow only in short and isolated reaches.

Despite this precedent, LCI is willing to conduct sediment sampling in 2009. Regulatory Guide 4.14 recommends sampling sediment from each stream above and below areas of possible contamination, once following spring runoff and once in late summer following a period of extended low flow. LCI commits to sampling sediment at two locations in each of the three primary drainages in May 2009 and analyzing these samples for the parameters recommended in Regulatory Guide 4.14. In the unlikely event that these drainages have surface flow after the first sampling event and before January 2010, a second set of samples will be collected from the same locations and analyzed.

Regulatory Guide 4.14 also recommends sampling sediment from any onsite impoundments that could receive contaminated surface waters. The only onsite impoundment, Crooked Well Reservoir, is located upstream of any project activities therefore no sediment sampling will be conducted at this location.

6. ***The application does not discuss preoperational food and fish samples. Please provide a justification for not addressing this data.***

   This application does not include information on installation of a yellowcake drying facility. Also, as discussed in TR Section 2.2.1 and ER Section 3.1.1.1, there is no crop production in or near the Permit Area, and though numbers of grazing cattle are discussed in ER Section 3.1.1.1, the actual use of the Permit Area for grazing is very limited. Therefore, the collection of biologic tissue samples was not originally performed. However, after additional discussions with NRC staff, LCI agrees to perform tissue bioassays of a beef during 2008 and a second beef before commencing operations, with the results submitted to the NRC Project Manager. The beef tissue will be sampled for the analytes listed in Regulatory Guide 4.14 Section 1.2. There are no fish within several miles of the proposed facility so no fish sampling will be performed.

7. ***Background gamma radiation survey and soils sampling:***

   a. ***Considering that LCI has stated "There is an unexpected degree of variability in gamma exposure rates in the Permit Area" and that increased exposure rates were detected over ore bodies and at Permit Area boundaries, it is not clear why only ten correlation grids were chosen and how these ten correlation grids accurately represent the Permit Area as a whole. Demonstrate and provide justification that the ten correlation grid samples are representative of the Permit Area as a whole.***

      LC ISR, LLC is preparing an expanded discussion of the background gamma radiation survey and soils sampling to address NRC's questions about the procedures and results. It is anticipated that this discussion will be submitted the week of January 12, 2009.

   b. ***Estimates in the literature (e.g., Faw and Shultis, 1993) indicate that the average concentration of K-40 in soils is 12 pCi/g. Considering that the method proposed to characterize Lost Creek depends on exposure rate correlated to radium*** *concentrations, how is the presence and variation of K-40 and other naturally occurring radionuclides taken into consideration in the proposed methodology?*

Please see Response to Comment 2.9 #7a.

c. *Considering that the main product from Lost Creek is uranium in slurry form, and that uranium is not well correlated to radium on the Lost Creek site, demonstrate that the proposed preoperational soil sampling methodology is sufficient to allow LCI to clean up land as a result of spills and accidents, including on proposed transport routes, and meet the requirements of 10 CFR 40, Appendix A, Criterion 6(6), for decommissioning for radionuclides other than radium.*

Please see Response to Comment 2.9 #7a.

d. *LCI states: "Within each grid, ten soil sub-samples were collected to a depth of six inches (15 centimeters) then composited into a single sample." Demonstrate that the subsurface (greater than 15 cm below the surface) is properly characterized so as to be able to comply with 10 CFR 40 Appendix A, Criteria 6 (6).*

Please see Response to Comment 2.9 #7a.

e. *In discussing the cross-calibration of the sodium iodide (NaI) detector with a High-Pressure Ionization Chamber (HPIC), LCI states: "NaI detectors were crosscalibrated in the field at each site against an HPIC. Results were consistent with cross-calibrations at other uranium sites as well as with the literature in terms of the energy dependence of NaI detectors (Ludlum, 2006; Schiager, 1972)." Regarding the Schiager reference, please address the following: The Schiager paper describes a process where the NaI detector was calibrated with a radium point source which was then used to measure exposure from radium. The NaI detectors used in the Lost Creek evaluation were calibrated with cesium-137 (Cs-137) then used to measure exposure from radium. Explain why Cs-137 was chosen as the calibration source and the relevance of the Schiager paper to the Lost Creek survey cross-calibration.*

Please see Response to Comment 2.9 #7a.

f. *The intent of the Schiager paper is to demonstrate that the exposure rate over a uranium mill tailings pile can be estimated if there is a known uniform concentration of radium in the tailings. The technique proposed in the Lost Creek analysis attempts to correlate known exposure rates with unknown radium*

concentrations that may or may not be uniform outside of the correlation grids. Aside from the references noted, are there other outside references that establish this type of relationship?

Please see Response to Comment 2.9 #7a.

g. ***LCI states: "Each 1,076-square-foot (100m2) soil sampling grid was also, scanned to determine the average gamma exposure rate over the same area, following methods described in Johnson et al. (2006)." The Johnson reference indicates that the site was scanned with a "shielded sodium iodide detector." Verify if a shielded sodium iodide detector was used to survey Lost Creek and if so provide details on the shielding, including its purpose and how it alters the unshielded energy response.***

Please see Response to Comment 2.9 #7a.

h. ***For all linear regression analyses presented (Figures 2.9-7 – 2.9-9, 2.9-11 and 2.9-14), provide calculations and results of testing the null hypothesis (i.e., that no correlation exists).***

Please see Response to Comment 2.9 #7a.

i. ***For Figures 2.9-7 – 2.9-9, 2.9-11 and 2.9-14, provide the paired X and Y coordinate data points and where these are located in the application.***

Please see Response to Comment 2.9 #7a.

j. ***For the relevant dates that data was used for correlation, provide the quality control charts titled "Lost Creek: Check Source QC chart for ATV Instruments" or indicate where these can be found in the application.***

Please see Response to Comment 2.9 #7a.

List of Information Included with the Responses to NRC Comments on Lost Creek TR Section 2.0 December 12 2008

For Comment 2.6 #3:
  Updated TR Plate 2.6-2a - Isopach Map of the Lost Creek Shale
  Updated TR Plate 2.6-2c - Isopach Map of the Sagebrush Shale

For Comment 2.6 #4:
  New Table - Pre-2008 Drill Hole Abandonment Status

For Comment 2.7.2 #4:
  New Figure - Domestic and Stock Wells within Five Miles of the Project Area
  New Table - Domestic and Stock Wells within Five Miles of the Project Area
  Updated TR Table 2.2-2 - Groundwater Use Permits
  Updated TR Table 2.2-3 - Abandoned and Cancelled Wells

For Comment 2.7.2 #5:
  Revised TR Figure 2.7-9 - Location Map, Lost Creek Monitor Wells

For Comment 2.7.2 #6:
  Revised TR Table 2.7-9 - 1982 and 2006 Pump Test Results

For Comment 2.7.2 #7:
  Lost Creek Aquifer Test Analyses by Hydro Engineering, LLC - March 2007
  (The March 2007 Report is submitted in a separate binder.)
  New Table - Well Completion Data - 2006 Long Term Pump Tests

For Comment 2.7.2 #8:
  From TR Attachment 2.7-1 (Lost Creek Regional Hydrologic Testing Report #1):
  Revised Figure 6-2 - Water Level Elevations - Wells HJMP-104 and LC19M;
  6-6 - Water Level Elevations - Wells UKMO-102 & LC19M;
  6-8 - Water Level Elevations - Wells HJT-105 and LC19M; and
  6-10 - Water Level Elevations - Wells UKMO-101 and LC19M.

For Comment 2.7.2 #8:
  From TR Attachment 2.7-1 (Evaluation of Pumping Test):
  Revised Table 3-1 - Lost Creek Regional Aquifer Test Well Information

For Comment 2.7.2 #10:
  Lost Creek Regional Hydrologic Testing Report #2
  (Submitted in a separate binder.)

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED: DRAWING NO. PLATE 2.6-2A, "ISOPACH MAP OF THE LOST CREEK SHALE LOST CREEK PERMIT AREA"

WITHIN THIS PACKAGE... OR BY SEARCHING USING THE DOCUMENT/REPORT NO. PLATE 2.6-2A

D-01

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED:
DRAWING NO. PLATE 2.6-2C,
"ISOPACH MAP OF THE SAGEBRUSH SHALE LOST CREEK PERMIT AREA"

WITHIN THIS PACKAGE... OR
BY SEARCHING USING THE
DOCUMENT/REPORT NO.
PLATE 2.6-2C

D-02

Pre-2008 Drill Hole Abandonment Status

HoleID	Location					TD	Year	Exploration Co	Original Plug Material	Original Plug Cap	1983-1984 TG Reopening, Probing & Re-Plugging Program			URE Replugging Program		
	N_nad83	E_nad83	S	T	R						Water Level (ft.)	Mud Depth (ft.)	Resealing Material	Date	Plug Depth (ft)	Replug Material
1-13	595656.1	2201396.15	13	25	93	1000	1971	Conoco								
1D-17	596927.03	2214157.19	17	25	92	502	1982	TG	Concrete							
1D-18	596222.05	2210916.18	18	25	92	590	1982	TG	Concrete							
1D-20	595224.02	2213368.16	20	25	92	530	1982	TG	Concrete							
1M-17	596928.02	2214133.19	17	25	92	467	1982	TG	Concrete							
1M-18	596220.05	2210943.16	18	25	92	450	1982	TG	Concrete							
1M-19	595179.06	2210943.16	19	25	92	450	1982	TG	Concrete							
1M-20	595225.03	2213343.16	20	25	92	440	1982	TG	Concrete							
1S-17	596929.03	2214105.21	17	25	92	200	1982	TG	Concrete							
1S-18	596218.05	2210968.16	18	25	92	357	1982	TG	Concrete							
1S-20	595226.02	2213318.18	20	25	92	300	1982	TG	Concrete							
2M-19	595205.05	2210943.16	19	25	92	680	1982	TG	Concrete							
3M-19	595229.07	2210942.16	19	25	92	461	1982	TG	Concrete							
4-1	595685.1	2203263.13	13	25	93	800										
13-1	597151.11	2202677.14	13	25	93	800										
13-2	597126.11	2203274.14	13	25	93	800										
13-3	597154.09	2203861.15	13	25	93	800										
13-4	597110.09	2204605.15	13	25	93	800										
19-1	594384.04	2206739.15	19	25	92	800										
24-1	594952.1	2204119.14	24	25	93	800										
24-2	594958.1	2204565.15	24	25	93	800										
24-3	594950.1	2204989.16	24	25	93	800										
24-4	594172.07	2202752.13	24	25	93	800										
24-5	594173.09	2203324.12	24	25	93	802										
24-6	594157.08	2203881.15	24	25	93	800										
24-7	594389.06	2205338.13	24	25	93	805										
24-8	594394.05	2206079.16	24	25	93	802										
24-9	594961.09	2204468.16	24	25	93	640										
24-10	594957.09	2204661.14	24	25	93	671										
59-1	598920.08	2208938.19	18	25	92	300										
72-1	595290.07	2209052.15	19	25	92	800										
77-1	593497.05	2209014.15	19	25	92	790										
81-1	595513.1	2204371.14	24	25	93	800										
81-2	594196.09	2204301.13	24	25	93	795										
82-1	593038.07	2204412.11	24	25	93	731										
82-2	593032.09	2204357.12	24	25	93	795										
82-3	593243.08	2204408.13	24	25	93	1214										
83-1	594198.09	2204502.15	24	25	93	800										
83-2	594320.09	2204551.13	24	25	93	600										
83-3	595286.1	2204563.15	24	25	93	650										
83-4	595521.1	2204570.13	24	25	93	1200										
83-5	594510.08	2204496.14	24	25	93	800										
84-1	593998.07	2204508.16	24	25	93	800										
86-1	595611.08	2204417.15	13	25	93	703										
86-2	595612.09	2204466.16	13	25	93	800										
86-3	595613.08	2204371.14	13	25	93	800										
86-4	597087.09	2204169.15	13	25	93	800										
86-5	595719.1	2204365.16	13	25	93	960										
88-1	595729.1	2204769.15	13	25	93	600										
88-2	595725.1	2204565.15	13	25	93	800										
131-1	595892.05	2205988.14	13	25	93	800										
131-2	595620.1	2204668.15	13	25	93	760										
131-3	595619.08	2204758.13	13	25	93	600										
131-4	595730.09	2204769.15	13	25	93	1200										
131-5	595524.09	2204770.15	24	25	93	800										
135-1	594204.1	2204701.14	24	25	93	1200										
139-1	593471.06	2205237.14	24	25	93	780										
139-2	593493.05	2205525.13	24	25	93	1200										
139-3	593493.05	2205777.14	24	24	93	800										
140-1	593492.06	2206063.13	19	25	92	760										
140-2	593491.05	2207525.15	19	25	92	800										
140-3	593485.04	2207223.14	19	25	92	1200										
557	598507.06	2211827.2	17	25	92	650										
558	595807.03	2211804.17	18	25	92	650										
844	591721	2212210.16	20	25	92	560	1969									
A23	596854.02	2213320.18	17	25	92	700	1970	Conoco								
A66	597490.06	2210635.19	18	25	92	360	1970	Conoco								
A67	599898.06	2210516.19	18	25	92	740	1970	Conoco								
A176	598445.08	2210978.18	18	25	92	500	1970	Conoco								
A177	598464.04	2212691.2	17	25	92	500	1970	Conoco								
A178	596051.03	2213327.16	17	25	92	500	1970	Conoco								
A179	596451.02	2213324.16	17	25	92	500	1970	Conoco								
A180	598481.99	2217895.21	16	25	92	620	1970	Conoco								
A181	596250.04	2213328.16	17	25	92	520	1970	Conoco								
A185	595260.01	2213348.16	20	25	92	500/600	1970?	Conoco								
A186	598324.03	2217169.21	16	25	92	620	1970	Conoco								
A187	594860.03	2213350.17	20	25	92	500	1970	Conoco								
A188	595061.04	2213350.17	20	25	92	500	1970	Conoco								
A189	598408.03	2216378.2	17	25	92	620	1970	Conoco								
A190	595445.01	2213345.16	20	25	92	500	1970	Conoco								
A191	598352.02	2215596.21	17	25	92	690	1970	Conoco								
A196	598399.04	2214795.19	17	25	92	640	1970	Conoco								
A228	598495.05	2213839.18	17	25	92	700	1970	Conoco								
A399	598369.05	2215159.18	17	25	92	520	1970	Conoco								
A400	598506.04	2212209.19	17	25	92	580	1970	Conoco								
A426	598471.07	2211382.19	18	25	92	600	1970	Conoco								
A442	598409.05	2213041.17	17	25	92	600	1970	Conoco								
A443	598364.03	2214974.21	17	25	92	520	1970	Conoco								
CG2-1	600404	2218314.22	16	25	92	660										
D19	599857.04	2216739.21	17	25	92	600										
D20	598325.08	2209390.16	18	25	92	616										
D21	597485.04	2214405.19	17	25	92	700										
D22	596360.06	2210438.15	18	25	92	640										
D23	593865.04	2210460.15	19	25	92	560										
D49	595115.01	2212805.16	20	25	92	660	1970									
D50	595060.05	2210459.15	19	25	92	600										
D51	592887.06	2210468.16	19	25	92	780										
D52	593851.03	2211615.17	19	25	92	540										
D53	599885.03	2213098.22	17	25	92	600										
D54	599885.03	2215547.2	17	25	92	600										
D55	597485.04	2215579.21	17	25	92	780										
D75	597485.04	2213182.16	17	25	92	600	1977									
D76	595083.02	2215205.18	20	25	92	600	1977									
D96	595113.01	2214010.16	20	25	92	540	1970									
D131	595100.02	2214398.18	20	25	92	520	1977									
D132	596555.07	2210458.15	18	25	92	640	1977									
D144	596455.05	2210449.16	18	25	92	540										
D149	595117.01	2213688.18	20	25	92	540	1970									
D150	595105.04	2214195.16	20	25	92	540	1970									
D156	595125.02	2213586.18	20	25	92	540	1970									
LC1W	595463.09	2203585.14	24	25	93	380	2005	LCI	Cased Well							
LC2	595407.05	2210065.17	19	25	92	800	2005	LCI	Plug Gel	2-4' Cement						
LC3	595332.07	2210396.17	19	25	92	800	2005	LCI	Plug Gel	2-4' Cement						
LC4	595610.03	2211913.15	20	25	92	800	2005	LCI	Plug Gel	2-4' Cement				2006	600	Grout
LC5C	595526.03	2211704.18	19	25	92	800	2005	LCI	Plug Gel	2-4' Cement				2006	600	Grout
LC6C	595505.06	2210926.16	19	25	92	800	2005	LCI	Plug Gel	2-4' Cement						
LC7C	595458.07	2210254.18	19	25	92	800	2005	LCI	Plug Gel	2-4' Cement				2006	600	Grout
LC8C	596104.02	2211716.17	18	25	92	800	2005	LCI	Plug Gel	2-4' Cement				2006	600	Grout
LC9C	595911.02	2211321.19	18	25	92	800	2005	LCI	Plug Gel	2-4' Cement						
LC10A	596002.04	2211702.18	18	25	92	240	2005	LCI	Plug Gel	2-4' Cement				2006	250	Grout
LC10C	596006.01	2211706.18	18	25	92	800	2005	LCI	Plug Gel	2-4' Cement				2006	600	Grout
LC11C	595510.01	2213320.18	20	25	92	820	2005	LCI	Plug Gel	2-4' Cement						
LC12C	595515.03	2212907.18	20	25	92	800	2005	LCI	Plug Gel	2-4' Cement				2006	800	Grout
LC13C	596105.04	2212030.2	17	25	92	800	2005	LCI	Plug Gel	2-4' Cement						
LC14A	595510.01	2212420.17	20	25	92	200	2005	LCI	Plug Gel	2-4' Cement						

Pre-2008 Drill Hole Abandonment Status

HoleID	Location					TD	Year	Exploration Co	Original Plug Material	Original Plug Cap	1983-1984 TG Reopening, Probing & Re-Plugging Program			URE Replugging Program		
	N_nad83	E_nad83	S	T	R						Water Level (ft.)	Mud Depth (ft.)	Resealing Material	Date	Plug Depth (ft)	Replug Material
LC15M	595526.03	2212853.19	20	25	92	350	2006	LCI	Cased Well							
LC16M	595523.04	2212869.19	20	25	92	472	2006	LCI	Cased Well							
LC17M	595542.04	2212869.19	20	25	92	575	2006	LCI	Cased Well							
LC18M	596021.04	2211668.16	18	25	92	350	2006	LCI	Cased Well							
LC19M	596020.02	2211685.18	18	25	92	463	2006	LCI	Cased Well							
LC20M	596034.03	2211684.18	18	25	92	543	2006	LCI	Cased Well							
LC21M	593553.09	2204584.15	24	25	93	410	2006	LCI	Cased Well							
LC22M	593553.09	2204598.14	24	25	93	592	2006	LCI	Cased Well							
LC23M	593538.07	2204599.14	24	25	93	620	2006	LCI	Cased Well							
LC24M	595906.03	2212886.18	17	25	92	535	2006	LCI	Cased Well							
LC25M	595323.01	2211713.16	19	25	92	380	2006	LCI	Cased Well							
LC26M	595535.02	2216510.19	20	25	92	436	2006	LCI	Cased Well							
LC27M	599720.02	2221566.22	16	25	92	477	2006	LCI	Cased Well							
LC28M	585139.06	2201671.07	25	25	92	1000	2006	LCI	Cased Well							
LC29M	595540.04	2212854.19	20	25	92	171	2006	LCI	Cased Well							
LC30M	593538.07	2204584.15	24	25	92	236	2006	LCI	Cased Well							
LC31M	585136.04	2201686.09	25	25	92	191	2006	LCI	Cased Well							
LC32W	597511.03	2215385.18	0	0	0	800	2007	LCI	Cased Well							
LC33W	595018.02	2216487.18	0	0	0	995	2007	LCI	Cased Well							
LC34	596403.04	2212711.2	0	0	0	866	2007	LCI	Grout	10-25' Cement						
LC35	596399.04	2212907.18	0	0	0	650	2007	LCI	Grout	10-25' Cement						
LC36	596255.03	2213182.16	0	0	0	866	2007	LCI	Grout	10-25' Cement						
LC37	595314.68	2211712.62	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC38	594985.7	2213914.96	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC39	596200.23	2212707.16	0	0	0	818	2007	LCI	Grout	10-25' Cement						
LC40	596251.02	2212607.17	0	0	0	866	2007	LCI	Grout	10-25' Cement						
LC41	596102.02	2212607.17	0	0	0	866	2007	LCI	Grout	10-25' Cement						
LC42	596201.02	2212404.17	0	0	0	864	2007	LCI	Grout	10-25' Cement						
LC43	596104.02	2212409.18	0	0	0	862	2007	LCI	Grout	10-25' Cement						
LC44	596000.04	2212307.18	0	0	0	703	2007	LCI	Grout	10-25' Cement						
LC45	596002.04	2212206.19	0	0	0	860	2007	LCI	Grout	10-25' Cement						
LC46	595899.04	2212206.19	0	0	0	865	2007	LCI	Grout	10-25' Cement						
LC47	595799.03	2212108.19	0	0	0	860	2007	LCI	Grout	10-25' Cement						
LC48	595730.02	2212036.15	0	0	0	763	2007	LCI	Grout	10-25' Cement						
LC49	595707.02	2212208.19	0	0	0	766	2007	LCI	Grout	10-25' Cement						
LC50	595805.03	2212313.16	0	0	0	784	2007	LCI	Grout	10-25' Cement						
LC51	595599.03	2212309.18	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC52	595453.18	2212203.21	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC53	595451.02	2212306.18	0	0	0	804	2007	LCI	Grout	10-25' Cement						
LC54	595536.03	2212404.17	0	0	0	583	2007	LCI	Grout	10-25' Cement						
LC55	595605.01	2212500.08	0	0	0	603	2007	LCI	Grout	10-25' Cement						
LC56	595705.12	2212620.27	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC57	595804.01	2212610.17	0	0	0	765	2007	LCI	Grout	10-25' Cement						
LC58	595402.72	2211724.07	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC59	595707.64	2213018.9	0	0	0	603	2007	LCI	Grout	10-25' Cement						
LC60	595202.3	2214124.12	0	0	0	603	2007	LCI	Grout	10-25' Cement						
LC61	595109.89	2214119.12	0	0	0	603	2007	LCI	Grout	10-25' Cement						
LC62	595502.33	2211019.42	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC63	595538.03	2212229.19	0	0	0	585	2007	LCI	Grout	10-25' Cement						
LC64	596262.61	2212824.05	0	0	0	530	2007	LCI	Grout	10-25' Cement						
LC65	595811.07	2210964.48	0	0	0	430	2007	LCI	Grout	10-25' Cement						
LC66	595975.66	2211489.76	0	0	0	480	2007	LCI	Grout	10-25' Cement						
LC67	596765.03	2215413.19	0	0	0	865	2007	LCI	Grout	10-25' Cement						
LC68	595602.25	2211020.34	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC69	597125.02	2215399.17	0	0	0	845	2007	LCI	Grout	10-25' Cement						
LC70	595239.01	2216467.18	0	0	0	858	2007	LCI	Grout	10-25' Cement						
LC71	595127.02	2216478.2	0	0	0	860	2007	LCI	Grout	10-25' Cement						
LC72	594907.01	2216500.2	0	0	0	860	2007	LCI	Grout	10-25' Cement						
LC73	595229.04	2216673.18	0	0	0	860	2007	LCI	Grout	10-25' Cement						
LC74	595335.88	2210619.98	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC75	592203.01	2210806.14	0	0	0	850	2007	LCI	Grout	10-25' Cement						
LC76	592388.01	2210687.15	0	0	0	850	2007	LCI	Grout	10-25' Cement						
LC77	592388.01	2210929.14	0	0	0	850	2007	LCI	Grout	10-25' Cement						
LC78	595382.7	2210543.07	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC79	595903.7	2211022.26	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC80	598302.08	2208204.17	0	0	0	920	2007	LCI	Grout	10-25' Cement						
LC81	598307.07	2208356.18	0	0	0	1000	2007	LCI	Grout	10-25' Cement						
LC82	598171.06	2208046.16	0	0	0	850	2007	LCI	Grout	10-25' Cement						
LC83	596001.55	2211022.29	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC84	595204.79	2214213.59	0	0	0	603	2007	LCI	Grout	10-25' Cement						
LC85	595305.1	2213320.21	0	0	0	845	2007	LCI	Grout	10-25' Cement						
LC86	595107.37	2213321.29	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC87	595003.65	2213323.13	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC88	595391.43	2214009.84	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC89	595307.98	2214010.05	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC90	595211.61	2214045.56	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC91	595402.75	2213916.37	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC92	595209.51	2213914.28	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC93	595109.01	2213919.88	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC94	595405.11	2213823.08	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC95	595302.83	2213816.96	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC96	595205.28	2213820	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC97	595104.87	2213820.16	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC98	595003.22	2213823.35	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC99	595401.63	2213724.06	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC100	595213.78	2213719.41	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC101	595003.12	2213722.33	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC102	595505.06	2213620.17	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC103	595403.34	2213619.11	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC104	595305.26	2213622.47	0	0	0	598	2007	LCI	Grout	10-25' Cement						
LC105	595206.33	2213619.6	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC106	595105.5	2213618.57	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC107	595001.05	2213622.79	0	0	0	589	2007	LCI	Grout	10-25' Cement						
LC108	595607.4	2213515.95	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC109	595403.04	2213523.61	0	0	0	607	2007	LCI	Grout	10-25' Cement						
LC110	595200.13	2213511.78	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC111	595104.97	2213520.12	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC112	594993.7	2213514.16	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC113	595606.12	2213421.23	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC114	595503.91	2213418.82	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC115	595405.18	2213420.2	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC116	595305.13	2213420.01	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC117	595205.02	2213419.99	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC118	595105.07	2213420.18	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC119	595004.93	2213420.18	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC120	595602.32	2213310.47	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC121	595603.89	2213222	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC122	595505.12	2213220.21	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC123	595405.01	2213220.16	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC124	595304.15	2213219.56	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC125	595215.19	2213201.76	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC126	595110.62	2213206.9	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC127	595003.22	2213220.27	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC128	595605.07	2213120.05	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC129	595405.14	2213120.14	0	0	0	603	2007	LCI	Grout	10-25' Cement						
LC130	595237.93	2213092.88	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC131	594905.04	2213720.19	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC132	594892.18	2213520.2	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC133	595332.82	2213015.89	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC134	595237.31	2212995.32	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC135	595403.96	2212802.64	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC136	595264.21	2212831.54	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC137	595400.84	2212621.65	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC138	595302.01	2212625.17	0	0	0	603	2007	LCI	Grout	10-25' Cement						
LC139	595189.1	2212624.76	0	0	0	604	2007	LCI	Grout	10-25' Cement						

Pre-2008 Drill Hole Abandonment Status

HoleID	Location					TD	Year	Exploration Co	Original Plug Material	Original Plug Cap	1983-1984 TG Reopening, Probing & Re-Plugging Program			URE Replugging Program		
	N_nad83	E_nad83	S	T	R						Water Level (ft.)	Mud Depth (ft.)	Resealing Material	Date	Plug Depth (ft)	Replug Material
LC140	595403.14	2212421.01	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC141	595320.03	2212438.76	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC142	595189.76	2212551.39	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC143	595405.44	2212220.04	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC144	595305.95	2212220.28	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC145	595405.01	2212020.16	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC146	595305.03	2212020.16	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC147	595505.91	2211825.09	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC148	595406.32	2211821.55	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC149	595304.15	2211823.98	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC150	595198.88	2212207.81	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC151	595405.01	2211616.98	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC152	595319.01	2211610.62	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC153	595506.76	2211621.29	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC154	595607.4	2211636.93	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC155	595601.36	2211519.42	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC156	595402.72	2211524.16	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC157	595502.56	2211421.97	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC158	595406.46	2211421.11	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC159	595304.34	2211422.92	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC160	595202.82	2211422.11	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC161	595303.95	2211222.6	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC162	595311.28	2211024.71	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC163	595383.39	2211023.64	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC164	595388.54	2211122.69	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC165	595401.93	2211318.32	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC166	595203.77	2211218.76	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC167	595204.46	2211118.58	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC168	595204.89	2211022.69	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC169	595803.75	2213521.96	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC170	595200.79	2212102.75	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC171	595101.3	2212203.59	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC172	595206.59	2212319.28	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC173	595205.28	2211824.61	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC174	595206.82	2211321.19	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC175	595102.54	2212104.13	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC176	595204.85	2210916.61	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC177	595202.89	2210817.37	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC178	595206.95	2210718.21	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC179	595221.16	2211616.47	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC180	595301.06	2211926.36	0	0	0	599	2007	LCI	Grout	10-25' Cement						
LC181	595407.18	2212119.94	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC182	595201.15	2212439.03	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC183	595154.82	2212832.14	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC184	595602.28	2213020.82	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC185	595505.06	2213022.74	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC186	595406.16	2213022.93	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC187	595705.08	2212822.42	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC188	595604.87	2212820.04	0	0	0	607	2007	LCI	Grout	10-25' Cement						
LC189	595602.91	2212719.23	0	0	0	603	2007	LCI	Grout	10-25' Cement						
LC190	595605.2	2212620.1	0	0	0	606	2007	LCI	Grout	10-25' Cement						
LC191	595403.63	2211925.33	0	0	0	600	2007	LCI	Grout	10-25' Cement						
LC192	595190.91	2212696.69	0	0	0	604	2007	LCI	Grout	10-25' Cement						
LC193	595240.72	2212915.06	0	0	0	602	2007	LCI	Grout	10-25' Cement						
LC194	595583.78	2212093.04	0	0	0	599	2007	LCI	Grout	10-25' Cement						
LC195	595607.01	2212222.29	0	0	0	605	2007	LCI	Grout	10-25' Cement						
LC196	595205.22	2210620.25	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC197	595303.19	2210822.57	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC198	595404.55	2210823.7	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC199	595503.02	2210820.08	0	0	0	601	2007	LCI	Grout	10-25' Cement						
LC200	595574.23	2210826.65	0	0	0	601	2007	LCI	Grout							
LC201	595717.78	2210812.64	0	0	0	601	2007	LCI	Grout							
LC202	595801.09	2210820.75	0	0	0	601	2007	LCI	Grout							
LC203	595783.57	2210749.96	0	0	0	600	2007	LCI	Grout							
LC204	595406.09	2210720.87	0	0	0	590	2007	LCI	Grout							
LC205	595403.4	2210621.49	0	0	0	585	2007	LCI	Grout							
LC206	595503.88	2211224.28	0	0	0	588	2007	LCI	Grout							
LC207	595580.53	2213419.69	0	0	0	600	2007	LCI	Grout							
LC208	595604.87	2211322.33	0	0	0	601	2007	LCI	Grout							
LC209	595603.76	2211423.43	0	0	0	601	2007	LCI	Grout							
LC210	595705.77	2211422.03	0	0	0	600	2007	LCI	Grout							
LC211	595558.15	2213419.55	0	0	0	600	2007	LCI	Grout							
LC212	596192.45	2211633.6	0	0	0	600	2007	LCI	Grout							
LC213	596245.12	2211500.89	0	0	0	600	2007	LCI	Grout							
LC214	596116.46	2211404.16	0	0	0	600	2007	LCI	Grout							
LC215	596013.43	2211432.72	0	0	0	600	2007	LCI	Grout							
LC216	595608.16	2211827.58	0	0	0	600	2007	LCI	Grout							
LC217	595607.99	2211733.22	0	0	0	600	2007	LCI	Grout							
LC218	595445.08	2212717.29	0	0	0	580	2007	LCI	Grout							
LC219	595550.27	2212818.99	0	0	0	604	2007	LCI	Grout							
LC220	595165.25	2214124.45	0	0	0	605	2007	LCI	Grout							
LC221	595199.11	2214312.04	0	0	0	606	2007	LCI	Grout							
LC222	595354.32	2214520.64	0	0	0	605	2007	LCI	Grout							
LC223	595510.51	2214808.53	0	0	0	606	2007	LCI	Grout							
LC224	595567.53	2214908.72	0	0	0	604	2007	LCI	Grout							
LC225	595503.71	2215021.43	0	0	0	600	2007	LCI	Grout							
LC226	595530.55	2213418.09	0	0	0	600	2007	LCI	Grout							
LC227	595478.94	2213421.45	0	0	0	600	2007	LCI	Grout							
LC228	595257.88	2214317.27	0	0	0	600	2007	LCI	Grout							
HJT-107A	595520	2213550	0	0	0	163	2007	LCI	Cased Well	Cement						
UKMU-102A	595848	2212461	0	0	0	814	2007	LCI	Cased Well	Cement						
OH1	598115.02	2218381.22	16	25	92	323	1968									
P1-16	595944.98	2217700.17	16	25	92	680	1988	PNC	PlugGel							
P1-17	596669.02	2213891.17	17	25	92	500	1987	PNC	PlugGel							
P1-18	595993.02	2211572.17	18	25	92	560	1987	PNC	PlugGel						Could not Locate	
P1-19	594450.06	2206714.15	19	25	92	560	1987	PNC	PlugGel							
P1-20	595263.03	2212905.18	20	25	92	560	1987	PNC	PlugGel							
P1-24	593705.05	2205770.13	24	25	93	600	1987	PNC	PlugGel							
P2-16	596359.99	2217708.18	16	25	92	600	1988	PNC	PlugGel							
P2-17	596435.04	2213125.17	17	25	92	660	1988	PNC	PlugGel							
P2-18	595955.02	2211702.18	18	25	92	500	1990	PNC	PlugGel						Could not Locate	
P2-19	593945.04	2206898.14	19	25	92	720	1988	PNC	PlugGel							
P2-20	595325.01	2213920.18	20	25	92	560	1987	PNC	PlugGel							
P2-24	593578.1	2204250.12	24	25	93	560	1987	PNC	PlugGel							
P3-17	595903.01	2214910.2	17	25	92	640	1988	PNC	PlugGel							
P3-18	596042.04	2211702.18	18	25	92	500	1990	PNC	PlugGel							
P3-19	595757.06	2210925.16	19	25	92	500	1992	PNC	PlugGel							
P3-20	595415.02	2212912.19	20	25	92	520	1990	PNC	PlugGel							
P3-24	593083.08	2202706.13	24	25	93	730	1988	PNC	PlugGel							
P4-17	596705.02	2214320.19	17	25	92	633	1988	PNC	PlugGel							
P4-18	596141.03	2211693.16	18	25	92	500	1990	PNC	PlugGel							
P4-19	595632.04	2210922.16	19	25	92	500	1992	PNC	PlugGel							
P4-20	595465.03	2212912.19	20	25	92	520	1990	PNC	PlugGel							
P5-17	596255.03	2212964.18	17	25	92	650	1988	PNC	PlugGel							
P5-18	596192.03	2211689.16	18	25	92	500	1990	PNC	PlugGel							
P5-19	595456.07	2210913.17	19	25	92	500	1992	PNC	PlugGel							
P5-20	595565.04	2212915.19	20	25	92	520	1990	PNC	PlugGel							
P6-17	596009.03	2212119.18	17	25	92	500	1990	PNC	PlugGel							
P6-18	595856.06	2210922.16	18	25	92	500	1992	PNC	PlugGel							
P6-19	595359.04	2210916.18	19	25	92	500	1992	PNC	PlugGel							
P6-20	595615.01	2212916.19	20	25	92	520	1990	PNC	PlugGel							
P7-17	596059.04	2212118.18	17	25	92	500	1990	PNC	PlugGel							
P7-19	595801.06	2211125.15	19	25	92	500	1992	PNC	PlugGel							
P7-20	595652.03	2212925.18	20	25	92	520	1990	PNC	PlugGel							
P8-17	596208.04	2212115.17	17	25	92	500	1990	PNC	PlugGel							

Pre-2008 Drill Hole Abandonment Status

HoleID	Location					TD	Year	Exploration Co	Original Plug Material	Original Plug Cap	1983-1984 TG Reopening, Probing & Re-Plugging Program			URE Replugging Program		
	N_nad83	E_nad83	S	T	R						Water Level (ft.)	Mud Depth (ft.)	Resealing Material	Date	Plug Depth (ft)	Replug Material
P8-19	595602.05	2211118.17	19	25	92	500	1992	PNC	PlugGel							
P9-17	596005.03	2211912.15	17	25	92	500	1990	PNC	PlugGel							
P10-17	596207.02	2211923.17	17	25	92	500	1990	PNC	PlugGel							
RD34	598491.02	2219625.2	16	25	92	840										
RD125	595904.98	2219820.18	21	25	92	480	1968									
RD131	599905.02	2219820.21	16	25	92	850	1968									
RD188	596037.02	2215568.17	17	25	92	800	1968									
RD189	597429.98	2217545.19	16	25	92	800	1968									
RD210	596401.99	2221870.21	16	25	92	600	1968									
RD301	596485.01	2218820.2	16	25	92	600	1968									
RD343	594646.02	2214392.18	20	25	92	650	1968									
RD345	596004.04	2214099.17	17	25	92	650	1968									
RD392	595876.99	2218386.18	16	25	92	600	1968									
RD393	596515	2221500.22	16	25	92	200	1968									
RD404	598240	2218465.2	16	25	92	550	1968									
RD412	598755.03	2214360.19	17	25	92	700	1968									
RD436	595141.03	2211158.17	19	25	92	670	1968									
RD445	598456.01	2221499.22	16	25	92	600	1968									
RD446	599729.04	2217176.19	16	25	92	800	1968									
RE6	585415.01	2207290.12	30	25	92	800										
TE1	593316.09	2204335.12	24	25	93	720	1976	TG		None	Dry					
TE2	593169.09	2204479.15	24	25	93	700	1976	TG		Octoplug	188	191				
TE3	594956.1	2204613.13	24	25	93	680	1976	TG		? Too Deep						
TE4	595053.1	2204676.13	24	25	93	680	1976	TG		Octoplug	205	401	ShurGel & QuickGel			
TE5	594853.1	2204660.14	24	25	93	680	1976	TG		Sagebrush	Dry					
TE6	595558.08	2204518.14	24	25	93	700	1976	TG		Octoplug	Dry					
TE7	595409.08	2204391.14	24	25	93	700	1976	TG		Octoplug	Dry					
TE8	595511.1	2204170.12	24	25	93	720	1976	TG		Octoplug	Dry					
TE9	594133.09	2202533.15	24	25	93	820	1976	TG		Octoplug	210	276				
TE10	594052.08	2202729.13	24	25	93	820	1977	TG		Octoplug	210	221				
TE11	594240.09	2203252.14	24	25	93	720	1977	TG		Octoplug	Dry					
TE12	594097.1	2203400.14	24	25	93	720	1977	TG		Octoplug	215	227				
TE17	595168.1	2204405.16	24	25	93	1200	1977	TG		? Too Deep						
TE18	593478.08	2204245.14	24	25	93	775	1977	TG		None	Dry					
TE19	593073.08	2204571.13	24	25	93	700	1977	TG		Octoplug	Dry					
TE20	593051.09	2204215.13	24	25	93	800	1977	TG		Octoplug	Dry					
TE21	593969.09	2202348.15	24	25	93	1200	1977	TG		Octoplug	207	238				
TE22	594260.08	2203457.14	24	25	93	800	1977	TG		Octoplug	215	235				
TE23	593929.1	2203500.14	24	25	93	800	1977	TG		Octoplug	210	228				
TE26	595582.1	2203010.15	24	25	93	600	1977	TG		Octoplug	221	225				
TE27	595359.07	2203343.12	24	25	93	600	1977	TG				*Drill Hole Not Located*				
TE28	595146.09	2203764.13	24	25	93	640	1977	TG		Octoplug	224	444	ShurGel & QuickGel			
TE29	594657.08	2204119.14	24	25	93	620	1977	TG		None	Dry					
TE30	595096.08	2204232.12	24	25	93	620	1977	TG		Octoplug	Dry					
TE31	595563.1	2203635.15	24	25	93	620	1977	TG				*Drill Hole Not Located*				
TE32	595969.1	2203437.16	13	25	93	700	1977	TG				*Drill Hole Not Located*				
TE33	596029.08	2203969.13	13	25	93	800	1977	TG		? Down Hole						
TE34	595508.04	2205700.15	24	25	93	620	1977	TG		Octoplug	223	228				
TE35	595544.11	2202972.15	24	25	93	620	1977	TG		Octoplug	223	235				
TE36	595398.09	2203423.12	24	25	93	620	1977	TG		Octoplug	Dry					
TE37	595327.08	2203351.13	24	25	93	620	1977	TG		Octoplug	219	277				
TE38	595462.07	2203643.14	24	25	93	380	1977	TG								
TE39	595123.09	2204273.15	24	25	93	620	1977	TG		None	216	220				
TE40	595054.08	2204202.14	24	25	93	620	1977	TG				*Drill Hole Not Located*				
TE41	595721.1	2202859.14	31	25	93	620	1977	TG				*Drill Hole Not Located*				
TE42	595433.1	2203177.15	24	25	93	620	1977	TG		Permaplug	219	228				
TE43	595201.08	2203537.16	24	25	93	620	1977	TG		Permaplug	218	226				
TE44	595234.09	2204071.13	24	25	93	620	1977	TG		? Down Hole						
TE45	594991.08	2204357.15	24	25	93	620	1977	TG		Octoplug	211	221				
TE46	594499.09	2204304.13	24	25	93	1200	1977	TG		None	Dry					
TE47	594209.09	2204194.13	24	25	93	760	1977	TG		Octoplug	204	248				
TE48	594349.1	2203883.15	24	25	93	600	1977	TG		None	212	225				
TE49	594361.08	2203138.12	24	25	93	600	1977	TG				*Drill Hole Not Located*				
TE50	594311.1	2202895.13	24	25	93	800	1977	TG		Octoplug	209	234				
TE51	594282.09	2202540.13	24	25	93	700	1977	TG		Octoplug		Blockage at about 100 ft.				
TE52	594068.09	2201824.14	24	25	93	1200	1977	TG		Octoplug	209	247				
TE53	593827.08	2201824.14	24	25	93	800	1977	TG		Octoplug	210	238				
TE56	593541.08	2202141.12	24	25	93	700	1977	TG		None	203	230				
TE57	593908.1	2202619.12	24	25	93	1200	1977	TG		Octoplug	210	235				
TE58	593183.07	2202195.11	24	25	93	1200	1977	TG				*Drill Hole Not Located*				
TE59	593222.08	2202557.12	24	25	93	700	1977	TG				*Drill Hole Not Located*				
TE60	593526.09	2203012.15	24	25	93	700	1977	TG				*Drill Hole Not Located*				
TE61	593722.08	2203363.12	24	25	93	1200	1977	TG		Octoplug	209	225				
TE62	593126.07	2202936.13	24	25	93	700	1977	TG				*Drill Hole Not Located*				
TE63	593804.08	2203657.13	24	25	93	700	1977	TG		Octoplug	Dry					
TE64	593698.09	2203836.14	24	25	93	680	1977	TG		None	195	224				
TE65	593638.08	2203697.13	24	25	93	1203	1977	TG		Octoplug	Dry					
TE66	593619.08	2204003.15	24	25	93	700	1977	TG		Octoplug	Dry					
TE67	593312.08	2204125.14	24	25	93	719	1977	TG		Octoplug	191	389	ShurGel & QuickGel			
TE68	593833.09	2204381.13	24	25	93	1202	1977	TG				*Drill Hole Not Located*				
TE69	593486.09	2204515.14	24	25	93	793	1977	TG		Octoplug	191	209		2006	650	Grout
TE70	593246.07	2204209.12	24	25	93	1202	1977	TG		Octoplug	189	252				
TE71	593393.07	2204517.14	24	25	93	700	1977	TG		Octoplug	Dry			2006	650	Grout
TE72	593494.1	2204411.11	24	25	93	700	1977	TG		Octoplug	192	211		2006	650	Grout
TE73	593604.09	2204522.15	24	25	93	700	1977	TG		Octoplug	Dry			2006	650	Grout
TE74	595632.08	2202770.16	24	25	93	600	1977	TG		Octoplug	227	249				
TE75	595532.1	2202655.12	24	25	93	600	1977	TG		Octoplug	229	270				
TE77	593783.08	2201859.13	24	25	93	640	1977	TG		None	Dry					
TE79	594306.08	2201716.13	23	25	93	700	1977	TG		None	214	308				
TE80	594169.09	2201859.13	24	25	93	680	1977	TG		Octoplug	Dry					
TE81	595311.1	2202715.11	24	25	93	700	1977	TG		Octoplug	?	250				
TE83	593457.08	2201861.13	23	25	93	640	1977	TG		Octoplug	207	326				
TE84	594536.1	2202965.14	24	25	93	600	1977	TG		Octoplug	212	241				
TE87	595530.09	2202265.15	23	25	93	700	1977	TG		Octoplug	233	238				
TE88	594716.08	2202856.11	23	25	93	700	1977	TG		Octoplug	216	219				
TE89	593597.1	2204508.16	24	25	93	660	1977	TG		Octoplug	194	230		2006	650	Grout
TE90	593905.08	2202120.12	24	25	93	700	1978	TG		Permaplug	209	243				
TE91	593304.08	2203117.15	24	25	93	700	1978	TG		? Too Deep						
TE92	593305.1	2202719.12	24	25	93	700	1978	TG		Permaplug	204	252				
TE93	593507.09	2202516.12	24	25	93	600	1978	TG		Permaplug	205	225				
TE94	593704.1	2202120.12	24	25	93	700	1978	TG		Permaplug	205	227				
TE96	593505.09	2203320.12	24	25	93	700	1978	TG		Permaplug	203	207				
TE97	593505.09	2203120.13	24	25	93	700	1978	TG		? Down Hole						
TE101	593305.1	2202920.11	24	25	93	720	1978	TG		Permaplug	195	199				
TG1-17	595905.01	2211920.16	17	25	92	500	1978	TG		Permaplug	160	238				
TG1-18	595705.05	2210720.16	18	25	92	600	1978	TG		Permaplug	151	156				
TG1-19	593105	2210720.14	19	25	92	600	1978	TG		Permaplug	145	223				
TG1-20	595505.03	2211920.16	20	25	92	500	1978	TG								
TG1A-19(60deg)	595427.03	2211712.16	19	25	92	200	1980	TG								
TG1A-19(75deg)	595427.03	2211712.16	19	25	92	380	1980	TG		? Angle Hole						
TG1A-20(60deg)	595607.04	2212520.16	20	25	92	200	1980	TG		? Angle Hole						
TG1A-20(75deg)	595605.04	2212520.16	20	25	92	380	1980	TG								
TG2-18	595905.05	2210720.16	18	25	92	600	1978	TG		Permaplug	156	242				
TG2-19	593505.02	2210720.14	19	25	92	600	1978	TG		Permaplug	143	144				
TG2-20	595705.02	2211920.16	20	25	92	500	1978	TG								
TG3-17	596105.04	2213720.19	17	25	92	600	1978	TG		Permaplug	155	160				
TG3-18	596105.07	2210720.16	18	25	92	600	1978	TG		? Too Deep						
TG3-19	593905.04	2210720.14	19	25	92	600	1978	TG		Permaplug	129	139				
TG3-20	595705.02	2212320.17	20	25	92	500	1978	TG								
TG4-18	596305.07	2210720.16	18	25	92	600	1978	TG		Permaplug	164	176				
TG4-19	594305.06	2210720.14	19	25	92	600	1978	TG		Permaplug	138	>450	ShurGel & QuickGel			
TG4-20	595505.03	2212320.17	20	25	92	600	1978	TG								
TG5-17	595905.01	2212320.17	17	25	92	500	1978	TG		Permaplug	151	368	ShurGel & QuickGel			
TG5-18	596505.06	2210720.16	18	25	92	660	1978	TG		Permaplug	159	168				
TG5-19	594705.05	2210720.16	19	25	92	600	1978	TG		Permaplug	145	215				

Pre-2008 Drill Hole Abandonment Status

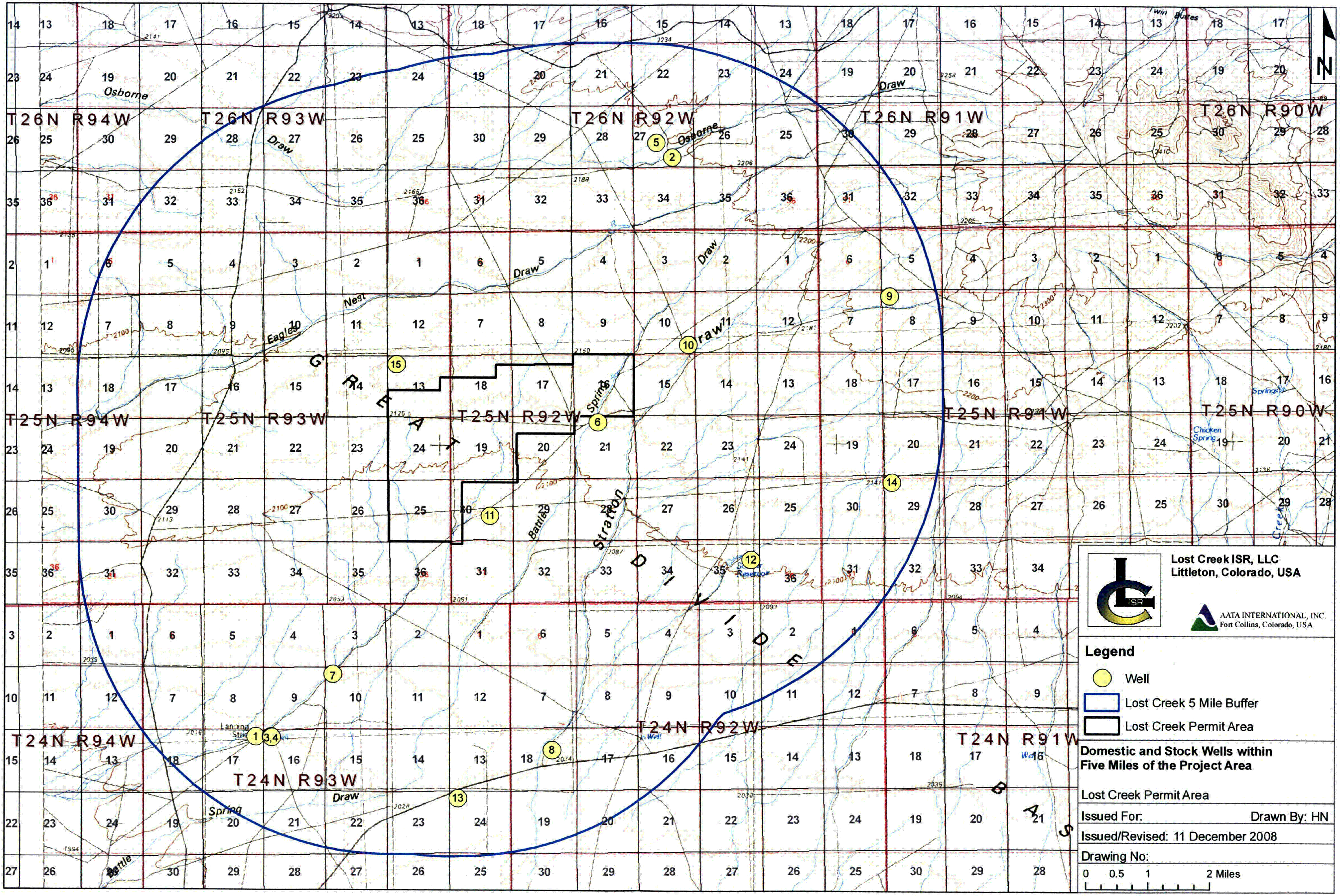
HoleID	Location					TD	Year	Exploration Co	Original Plug Material	Original Plug Cap	1983-1984 TG Reopening, Probing & Re-Plugging Program			URE Replugging Program		
	N_nad83	E_nad83	S	T	R						Water Level (ft.)	Mud Depth (ft.)	Resealing Material	Date	Plug Depth (ft)	Replug Material
TG5-20	595705.02	2212720.15	20	25	92	600	1978	TG								
TG6-17	596105.04	2211920.16	17	25	92	600	1978	TG		Permaplug	166	395	ShurGel & QuickGel			
TG6-18	596705.05	2210720.16	18	25	92	660	1978	TG		Permaplug	166	306				
TG6-19	595105.07	2210720.16	19	25	92	600	1978	TG		? Too Deep						
TG6-20	595505.03	2212720.15	20	25	92	600	1978	TG								
TG7-17	596105.04	2212320.17	17	25	92	540	1978	TG		Permaplug	157	239				
TG7-18	596905.08	2210720.16	18	25	92	660	1978	TG		Permaplug	167	224				
TG7-19	595305.06	2210720.16	19	25	92	600	1978	TG		? Down Hole						
TG7-20	595105.04	2213120.16	20	25	92	520	1978	TG								
TG8-17	596305.03	2212320.17	17	25	92	560	1978	TG		? Down Hole						
TG8-18	595914.04	2211508.17	18	25	92	600	1978	TG		Permaplug	157	341				
TG8-19	595505.06	2210720.16	19	25	92	600	1978	TG		Yes						
TG8-20	595505.03	2213120.16	20	25	92	600	1978	TG								
TG9-17	595828.03	2212707.16	17	25	92	560	1978	TG		Permaplug	151	163				
TG9-18	595905.05	2211120.17	18	25	92	600	1978	TG				*Drill Hole Not Located*				
TG9-19	595505.06	2211120.17	19	25	92	600	1978	TG		Permaplug	158	>450	ShurGel & QuickGel			
TG9-20	595305.03	2213120.16	20	25	92	600	1978	TG								
TG10-17	596105.04	2212720.15	17	25	92	600	1978	TG		Permaplug	153	313				
TG10-18	596305.07	2211120.17	18	25	92	600	1978	TG		Permaplug	166	298				
TG10-19	595305.03	2211120.17	19	25	92	500	1978	TG		Permaplug	154	283				
TG10-20	595305.03	2212720.15	20	25	92	600	1978	TG								
TG11-17	596305.03	2212720.18	17	25	92	600	1978	TG		Permaplug	159	186				
TG11-18	596711.06	2211120.17	18	25	92	660	1978	TG				*Drill Hole Not Located*				
TG11-19	595705.05	2211120.17	19	25	92	500	1978	TG		Permaplug	Dry					
TG11-20	595305.03	2212320.17	20	25	92	600	1978	TG								
TG12-17	595826.03	2213108.17	17	25	92	560	1978	TG		Permaplug	152	154				
TG12-18	597105.07	2211120.17	18	25	92	660	1978	TG		Permaplug	173	206				
TG12-19	595705.02	2211520.18	19	25	92	500	1978	TG		Permaplug	160	331				
TG12-20	595705.02	2213320.18	20	25	92	600	1978	TG								
TG13-17	596105.04	2213120.16	17	25	92	600	1978	TG		Permaplug	158	288				
TG13-18	595905.05	2211220.17	18	25	92	500	1979	TG		Permaplug	154	379	ShurGel & QuickGel			
TG13-19	595305.03	2211520.18	19	25	92	540	1978	TG		? Down Hole						
TG13-20	595705.02	2213720.19	20	25	92	600	1978	TG								
TG14-18	597105.04	2211520.18	18	25	92	600	1978	TG				*Drill Hole Not Located*				
TG14-19	595505.03	2211520.18	19	25	92	500	1978	TG		Permaplug	159	175				
TG14-20	595505.03	2213720.19	20	25	92	540	1978	TG								
TG15-17	596505.03	2213720.19	17	25	92	600	1978	TG		Permaplug	167	341				
TG15-18	596116.03	2211511.17	18	25	92	500	1978	TG		Permaplug	156	238				
TG15-19	595305.06	2210920.18	19	25	92	580	1980	TG		? Too Deep						
TG15-20	595305.03	2213720.19	20	25	92	540	1978	TG								
TG16-17	596505.03	2214120.17	17	25	92	600	1978	TG		Permaplug	167	241				
TG16-19	595505.06	2210920.18	19	25	92	580	1980	TG				*Drill Hole Not Located*				
TG16-20	595305.03	2214120.17	20	25	92	600	1978	TG								
TG17-17	596105.04	2214520.18	17	25	92	600	1978	TG		Permaplug	160	205				
TG17-19	595705.05	2210920.18	19	25	92	580	1980	TG		? Too Deep						
TG17-20	595505.03	2214120.17	20	25	92	540	1978	TG								
TG18-17	596505.03	2214520.18	17	25	92	600	1978	TG		Permaplug	167	190				
TG18-19	595305.03	2211320.16	19	25	92	580	1980	TG		Yes						
TG18-20	595705.02	2214120.17	20	25	92	600	1978	TG								
TG19-17	596105.04	2214920.19	17	25	92	600	1978	TG		Permaplug	156	203				
TG19-19	595505.03	2211320.16	19	25	92	580	1980	TG		? Too Deep						
TG19-20	595715.03	2214516.18	20	25	92	600	1978	TG								
TG20-17	596505.03	2214920.19	17	25	92	600	1978	TG		Permaplug	161	294				
TG20-18	595905.05	2210920.18	18	25	92	580	1980	TG		? Too Deep						
TG20-19	595705.02	2211320.16	19	25	92	580	1980	TG		? Too Deep						
TG20-20	595505.03	2214520.18	20	25	92	540	1978	TG								
TG21-17	596305.03	2214120.17	17	25	92	600	1978	TG		Permaplug	163	357	ShurGel & QuickGel			
TG21-18	595905.01	2211320.19	18	25	92	580	1980	TG		? Too Deep						
TG21-19	595505.03	2211720.17	19	25	92	580	1980	TG		? Down Hole						
TG21-20	595305.03	2214520.18	20	25	92	516	1978	TG								
TG22-17	596705.02	2214120.2	17	25	92	600	1978	TG		Permaplug	171	248				
TG22-18	596105.04	2211320.19	18	25	92	580	1980	TG		? Down Hole						
TG22-19	595705.02	2211720.17	19	25	92	580	1980	TG		? Too Deep						
TG22-20	595305.03	2214920.16	20	25	92	540	1978	TG								
TG23-17	595905.01	2215320.17	17	25	92	600	1978	TG		Permaplug.	155	186				
TG23-18	595905.01	2211720.17	18	25	92	580	1980	TG		None	Dry				Could Not Locate	
TG23-19	595705.05	2210520.15	19	25	92	580	1980	TG		? Too Deep						
TG23-20	595505.03	2214920.16	20	25	92	540	1978	TG								
TG24-17	596105.04	2215320.17	20	25	92	600	1978	TG		Permaplug	157	201				
TG24-18	596119.02	2211707.18	18	25	92	580	1980	TG		? Too Deep						
TG24-19	595505.06	2210520.15	19	25	92	580	1980	TG								
TG24-20	595705.02	2214920.19	17	25	92	600	1978	TG								
TG25-17	595905.01	2215720.21	17	25	92	600	1978	TG		Permaplug	159	221				
TG25-18	596305.03	2211720.17	18	25	92	580	1980	TG		? Too Deep						
TG25-19	595305.06	2210520.15	19	25	92	580	1980	TG		? Too Deep						
TG25-20	595705.02	2215320.17	20	25	92	600	1978	TG								
TG26-17	596105.04	2215720.21	17	25	92	600	1978	TG		Permaplug	158	166				
TG26-20	595505.03	2215320.17	20	25	92	540	1978	TG								
TG27-17	596505.03	2215720.21	17	25	92	600	1978	TG		Permaplug	163	271				
TG27-18	596005.03	2211699.17	18	25	92	580	1980	TG		None	Dry					
TG27-20	595305.03	2215320.17	20	25	92	540	1978	TG								
TG28-17	596505.03	2215320.17	17	25	92	600	1978	TG		Permaplug	162	225				
TG28-20	595305.03	2215720.21	20	25	92	540	1978	TG								
TG29-17	596305.03	2213720.19	17	25	92	600	1978	TG		Permaplug	161	238				
TG29-20	595505.03	2215720.21	20	25	92	540	1978	TG								
TG30-17	596705.02	2214520.18	17	25	92	600	1978	TG		Permaplug	168	243				
TG30-20	595705.02	2215720.21	20	25	92	600	1978	TG								
TG31-20	595705.02	2216120.19	20	25	92	600	1978	TG								
TG32-17	595905.01	2216120.19	17	25	92	600	1978	TG		Permaplug	160	196				
TG32-20	595505.03	2216120.19	20	25	92	540	1978	TG								
TG33-17	596105.04	2216120.19	17	25	92	600	1978	TG		Permaplug	161	200				
TG33-20	595305.03	2216120.19	20	25	92	540	1978	TG								
TG34-17	595905.01	2216520.2	17	25	92	600	1978	TG		Permaplug	158	275				
TG34-20	595705.02	2216520.2	20	25	92	600	1978	TG								
TG35-17	595905.01	2216920.18	17	25	92	600	1978	TG		Permaplug	152	333				
TG35-20	595505.03	2216520.2	20	25	92	540	1978	TG					Resealed 1983?			
TG36-17	595905.01	2212120.18	17	25	92	580	1980	TG		? Too Deep						
TG36-20	595305.03	2216520.2	20	25	92	540	1978	TG								
TG37-17	596105.04	2212120.18	17	25	92	580	1980	TG		Permaplug	161	317				
TG38-17	595905.01	2212520.16	17	25	92	580	1980	TG		Permaplug	151	176				
TG39-17	596105.04	2212520.16	17	25	92	580	1980	TG		? Too Deep						
TG39-20	595704.99	2216920.18	20	25	92	600	1978	TG								
TG40-17	596305.03	2212520.16	17	25	92	580	1980	TG		? Too Deep						
TG41-17	595905.01	2212920.17	17	25	92	580	1980	TG		? Too Deep						
TG41-20	595504.99	2216920.18	20	25	92	540	1978	TG								
TG42-17	596145.04	2212920.17	17	25	92	580	1980	TG		? Too Deep						
TG42-20	595305	2216920.18	20	25	92	540	1978	TG								
TG43-17	596305.03	2213120.16	17	25	92	580	1980	TG		Permaplug	161	438	ShurGel & QuickGel			
TG43-20	595105.01	2216920.18	20	25	92	540	1978	TG								
TG44-17	596505.03	2213520.2	17	25	92	580	1980	TG		Permaplug	166	286				
TG44-20	592105	2212120.15	20	25	92	460	1979	TG								
TG45-17	596505.03	2213920.18	17	25	92	580	1980	TG		? Too Deep						
TG46-17	596705.02	2213920.18	17	25	92	580	1980	TG		? Down Hole						
TG47-17	596505.03	2214320.19	17	25	92	580	1980	TG		? Too Deep						
TG48-17	596305.03	2212120.18	17	25	92	580	1980	TG		? Too Deep						
TG49-17	596005.03	2212520.16	17	25	92	580	1980	TG		Permaplug	151	159				
TG50-17	596205.02	2212520.16	17	25	92	580	1980	TG		? Too Deep						
TG51-17	597105.04	2214720.17	17	25	92	600	1981	TG		Concrete	Did Not Open					
TG52-17	599105.04	2215520.19	17	25	92	600	1981	TG		Concrete	Did Not Open					
TG52-20	595305.03	2212120.18	20	25	92	580	1980	TG								
TG53-20	595505.03	2212120.18	20	25	92	580	1980	TG								
TG54-20	595705.02	2212120.18	20	25	92	580	1980	TG								
TG55-20	595105.04	2212520.16	20	25	92	580	1980	TG								
TG56-20	595305.03	2212520.16	20	25	92	580	1980	TG								
TG57-20	595505.03	2212520.16	20	25	92	580	1980	TG								

Pre-2008 Drill Hole Abandonment Status

HoleID	Location					TD	Year	Exploration Co	Original Plug Material	Original Plug Cap	1983-1984 TG Reopening, Probing & Re-Plugging Program			URE Replugging Program		
	N_nad83	E_nad83	S	T	R						Water Level (ft.)	Mud Depth (ft.)	Resealing Material	Date	Plug Depth (ft)	Replug Material
TG58-20	595705.02	2212520.16	20	25	92	580	1980	TG								
TG59-20	595305.03	2212920.17	20	25	92	580	1980	TG								
TG60-20	595505.03	2212920.17	20	25	92	580	1980	TG								
TG61-20	595717.03	2212910.19	20	25	92	580	1980	TG								
TG62-20	595505.03	2213320.18	20	25	92	580	1980	TG								
TG63-20	595305.03	2213520.17	20	25	92	580	1980	TG								
TG64-20	595505.03	2213520.2	20	25	92	580	1980	TG								
TG65-20	595705.02	2213520.2	20	25	92	580	1980	TG								
TG66-20	595305.03	2213920.18	20	25	92	580	1980	TG								
TG67-20	595505.03	2213920.18	20	25	92	580	1980	TG								
TG68-20	595705.02	2213920.18	20	25	92	580	1980	TG								
TG69-20	595305.03	2214320.19	20	25	92	580	1980	TG								
TG70-20	595505.03	2214320.19	20	25	92	580	1980	TG								
TG71-20	595705.02	2213120.16	20	25	92	580	1980	TG								
TG72-20	595405.01	2212520.16	20	25	92	580	1980	TG								
TG73-20	595805.03	2212520.16	20	25	92	580	1980	TG								
TGC1-19	595405.04	2210920.18	19	25	92	500	1980	TG		Permaplug	154	180				
TGC1A(45deg)	595207.05	2210920.18	19	25	92	140	1980	TG		? Angle Hole						
TGC1A(60deg)	595205.05	2210920.18	19	25	92	200	1980	TG		? Angle Hole						
TGC2-19	595565.07	2210920.18	19	25	92	480	1980	TG		Yes						
TGC16	595905.05	2211170.16	18	25	92	475	1979	TG								
TGC17	595905.05	2211160.17	18	25	92	423	1979	TG		? Too Deep						
TGC18	595905.05	2211150.16	18	25	92	442	1979	TG		Permaplug	155	369	ShurGel & QuickGel			
TGC19	595905.05	2211130.16	18	25	92	465	1979	TG		Permaplug	155	389				
TGC20	596005.06	2210920.18	18	25	92	460	1980	TG		? Too Deep						
TGC21	595805.06	2210920.18	18	25	92	477	1980	TG		? Down Hole						
TT1	594953.08	2204825.14	24	25	93	680	1976	TG		None	Dry					
TT2	595475.1	2204952.17	24	25	93	700	1976	TG		Octoplug	Dry					
TT3	595420.11	2204780.13	24	25	93	720	1976	TG				*Drill Hole Not Located*				
TT4	593417.05	2205460.13	24	25	93	600	1976	TG		Octoplug	Dry					
TT5	593395.04	2207708.15	19	25	92	580	1976	TG		Sagebrush	174	356	ShurGel & QuickGel			
TT6	593412.03	2209201.15	19	25	92	600	1976	TG		Sagebrush	Dry					
TT7	594288.07	2205245.15	24	25	93	820	1976	TG		Octoplug	Dry					
TT8	594331.05	2206907.16	19	25	92	740	1976	TG		Sagebrush	Dry					
TT9	595215.06	2209136.15	19	25	92	600	1976	TG				*Drill Hole Not Located*				
TT13	593270.05	2205464.14	24	25	92	500	1976	TG		Octoplug	Dry					
TT14	593468.04	2207633.16	19	25	92	500	1976	TG		? Too Deep						
TT15	593316.06	2207796.13	19	25	92	540	1976	TG		? Down Hole						
TT16	593275.04	2209357.14	19	25	92	600	1976	TG		Octoplug	165	175				
TT17	594039.08	2204966.13	24	25	93	1140	1976	TG		Octoplug	Dry					
TT18	593906.06	2208235.16	19	25	92	1000	1976	TG		Octoplug	163	169				
TT19	595115.05	2209294.17	19	25	92	600	1976	TG		None	Dry					
TT20	599133.06	2209282.18	18	25	92	1160	1977	TG		Permaplug	210	270				
TT22	596083.09	2204681.14	13	25	93	700	1977	TG		Octoplug	223	270				
TT23	596043.09	2205075.14	13	25	93	600	1977	TG		Octoplug	226	261				
TT24	596008.08	2205501.13	13	25	93	600	1977	TG		Octoplug	Dry					
TT25	593708.04	2205143.15	13	25	93	700	1977	TG		Octoplug	184	196				
TT26	593470.05	2204871.15	24	25	93	700	1977	TG		Octoplug	Dry					
TT27	593695.08	2204686.15	24	25	93	700	1977	TG		Octoplug	Dry			2006	650	Grout
TT28	593844.08	2204869.14	24	25	93	700	1977	TG		None	Dry					
TT29	593677.06	2206284.13	24	25	93	700	1977	TG		Octoplug	Dry					
TT30	595509.06	2205700.15	19	25	92	780	1977	TG		Octoplug	187	202				
TT31	594159.05	2207422.15	19	25	92	600	1977	TG				*Drill Hole Not Located*				
TT32	594439.04	2208146.15	19	25	92	600	1977	TG		Octoplug	180	233				
TT33	593680.05	2209018.16	23	25	93	600	1977	TG		Octoplug	177	208				
TT34	594905.04	2209306.18	19	25	92	600	1977	TG		None	Dry					
TT35	593362.06	2209532.15	19	25	92	600	1977	TG		Octoplug	163	183				
TT36	593543.05	2209921.15	19	25	92	600	1977	TG		Octoplug	164	187				
TT37	595908.06	2209670.17	19	25	92	800	1977	TG				*Drill Hole Not Located*				
TT38	593926.04	2210194.18	19	25	92	600	1977	TG		None	115	120				
TT39	595302.05	2209531.15	19	25	92	600	1977	TG		Octoplug	Dry					
TT40	594804.05	2208920.16	19	25	92	800	1977	TG		Octoplug	Dry					
TT41	594695.04	2209407.18	19	25	92	600	1977	TG		Octoplug	151	174				
TT42	595128.04	2209429.18	19	25	92	600	1977	TG				*Drill Hole Not Located*				
TT43	594180.05	2209901.15	19	25	92	1000	1977	TG				*Drill Hole Not Located*				
TT44	593427.06	2209722.16	19	25	92	600	1977	TG		Octoplug	Dry					
TT45	593611.04	2208653.14	19	25	92	1000	1977	TG		Sagebrush	Dry					
TT46	593714.04	2208317.16	19	25	92	1000	1977	TG		Octoplug	177	189				
TT47	594087.06	2208151.16	19	25	92	700	1977	TG		None	156	234				
TT48	593984.06	2207672.16	19	25	92	1000	1977	TG		Octoplug	Dry					
TT49	593968.04	2207319.15	19	25	92	1000	1977	TG		None	Dry					
TT50	594069.04	2206895.14	19	25	92	900	1977	TG		Octoplug	Dry					
TT51	593748.03	2206819.15	19	25	92	1000	1977	TG		? Too Deep						
TT52	593825.05	2206062.13	24	25	93	1000	1977	TG		Octoplug	179	376	ShurGel & QuickGel			
TT53	593280.06	2206263.15	24	25	93	1000	1977	TG		None	Dry					
TT54	593634.04	2205782.12	24	25	93	700	1977	TG				*Drill Hole Not Located*				
TT55	593362.06	2205643.13	24	25	93	700	1977	TG		Octoplug	182	210				
TT56	593488.06	2205036.12	24	25	93	700	1977	TG		Octoplug	Dry					
TT57	593065.04	2204994.12	24	25	93	700	1977	TG		Octoplug	184	194				
TT58	593252.07	2204765.14	24	25	93	700	1977	TG				*Drill Hole Not Located*				
TT59	593969.09	2204722.14	24	25	93	1060	1977	TG		? Too Deep						
TT60	594406.09	2204986.13	24	25	93	900	1977	TG		Octoplug	189	210				
TT61	593485.07	2204631.13	24	25	93	700	1977	TG		? Too Deep				2006	650	Grout
TT62	595246.1	2205278.14	24	25	93	820	1977	TG		? Down Hole						
TT63	595435.07	2209681.16	19	25	92	600	1977	TG		Octoplug	Dry					
TT64	594910.06	2209108.14	19	25	92	600	1977	TG		Octoplug	155	193				
TT65	594425.06	2208538.15	19	25	92	600	1977	TG		? Too Deep						
TT66	595025.04	2208968.15	19	25	92	600	1977	TG				*Drill Hole Not Located*				
TT67	594095.06	2207861.13	19	25	92	700	1977	TG				*Drill Hole Not Located*				
TT68	593868.06	2207115.13	19	25	92	700	1977	TG		Octoplug	Dry					
TT69	593676.08	2204875.12	24	25	93	700	1977	TG				*Drill Hole Not Located*				
TT70	595144.09	2205263.14	24	25	93	760	1977	TG		Octoplug	198	199				
TT71	595268.08	2205177.14	24	25	93	760	1977	TG		Octoplug	201	204				
TT72	595357.11	2205291.15	24	25	93	760	1977	TG		Octoplug	199	203				
TT73	595218.05	2205380.13	24	25	93	760	1977	TG		Octoplug	195	234				
TT74	595224.05	2209765.16	19	25	92	600	1977	TG		Octoplug	156	170				
TT75	595342.04	2210066.17	19	25	92	600	1977	TG				*Drill Hole Not Located*				
TT76	593612.06	2209426.18	19	25	92	600	1977	TG		Sagebrush	Dry					
TT77	593343.06	2208992.15	19	25	92	600	1977	TG		Octoplug	167	180				
TT78	595072.06	2209155.15	19	25	92	600	1977	TG		Sagebrush	159	184				
TT79	594757.06	2208708.16	19	25	92	600	1977	TG		Sagebrush	Dry					
TT80	594528.06	2208397.16	19	25	92	600	1977	TG		Octoplug	180	222				
TT81	594292.04	2208019.15	19	25	92	700	1977	TG		Octoplug	175	232				
TT82	594140.05	2207810.15	19	25	92	700	1977	TG		Octoplug	176	214				
TT83	593627.05	2206946.15	19	25	92	700	1977	TG		None	Dry					
TT84	593492.06	2206483.14	24	25	93	700	1977	TG		None	Dry					
TT85	594997.05	2209563.17	19	25	92	600	1977	TG		Octoplug	153	320				
TT86	595136.05	2210060.17	19	25	92	600	1977	TG				*Drill Hole Not Located*				
TT87	595404.06	2209864.15	19	25	92	600	1977	TG		Octoplug	161	190				
TT88	595437.07	2210272.17	19	25	92	600	1977	TG				*Drill Hole Not Located*				
TT89	594598.05	2210127.17	19	25	92	600	1977	TG		Octoplug	Dry					
TT90	595901.07	2210184.17	19	25	92	600	1977	TG		Octoplug	Dry					
TT94	596605.07	2210420.15	18	25	92	660	1978	TG		? Down Hole						
TT95	596205.05	2210420.15	18	25	92	660	1978	TG		? Too Deep						
TT96	595805.06	2210420.15	18	25	92	660	1978	TG		Sagebrush	Dry					
TT97	595425.06	2210413.17	19	25	93	600	1978	TG		? Down Hole						
TT98	595105.07	2208720.17	19	25	92	700	1978	TG		? Down Hole						
TT99	594805.06	2208420.16	19	25	92	700	1978	TG		Permaplug	Dry					
TT100	594605.04	2207820.13	19	25	92	700	1978	TG		Permaplug	187	202				
TT101	594405.04	2207420.15	19	25	92	700	1978	TG				*Drill Hole Not Located*				
TT102	593705.05	2207120.14	19	25	92	660	1978	TG		Permaplug	177	203				
TT103	593705.05	2207520.15	19	25	92	700	1978	TG		? Too Deep						
TT104	593705.05	2207920.13	19	25	92	600	1978	TG		? Too Deep						
TT105	594305.06	2206520.16	24	25	93	660	1978	TG		Permaplug	180	247				
TT106	594090.04	2206536.16	24	25	93	700	1978	TG		Octoplug	178	200				

Pre-2008 Drill Hole Abandonment Status

HoleID	Location					TD	Year	Exploration Co	Original Plug Material	Original Plug Cap	1983-1984 TG Reopening, Probing & Re-Plugging Program			URE Replugging Program		
	N_nad83	E_nad83	S	T	R						Water Level (ft.)	Mud Depth (ft.)	Resealing Material	Date	Plug Depth (ft)	Replug Material
TT107	593624.04	2205535.15	24	25	93	700	1978	TG		Octoplug	Dry					
TT108	594318.06	2205590.14	24	25	93	700	1978	TG		Octoplug	176	182				
TT109	594105.04	2206720.15	19	25	92	700	1978	TG		? Down Hole						
TT110	594768.05	2208715.17	19	25	92	560	1978	TG		Octoplug	176	229				
TT111	595446.06	2210267.17	19	25	92	500	1978	TG		Octoplug	155	170				
TT112	593905.04	2206520.14	24	25	93	660	1978	TG		? Too Deep						
TT113	594105.04	2206320.15	24	25	93	660	1978	TG		Permaplug	176	214				
TT114	593705.05	2205520.13	24	25	93	660	1978	TG		Permaplug	186	197				
TT120	593905.04	2208120.15	19	25	92	600	1978	TG		? Too Deep						
TT121	593905.04	2207920.13	19	25	92	600	1978	TG		Permaplug	172	243				
TT122	593905.04	2207720.14	19	25	92	600	1978	TG		Permaplug	Dry					
TT123	593905.04	2207520.15	19	25	92	600	1978	TG		Permaplug	Dry					
TT124	594305.06	2207520.15	19	25	92	620	1978	TG		? Too Deep						
TT125	593705.05	2207720.14	19	25	92	600	1978	TG		Permaplug	178	251				
TT126	594305.06	2207720.14	19	25	92	600	1978	TG		Permaplug	179	382	ShurGel & QuickGel			
TT127	594305.06	2207920.15	19	25	92	600	1978	TG		Permaplug	176	228				
TT128	593505.06	2207720.14	19	25	92	600	1978	TG		? Too Deep						
TT129	594305.06	2208120.15	19	25	92	600	1978	TG		Permaplug	176	197				
TT130	593905.04	2205120.15	24	25	93	700	1978	TG		Permaplug	Dry					
TT131	593905.04	2205320.14	24	25	93	700	1978	TG		Permaplug	180	218				
TT132	593705.05	2205320.14	24	25	93	700	1978	TG		Permaplug	184	203				
TT133	593905.08	2204920.13	24	25	93	700	1978	TG		Permaplug	183	191				
TT134	593905.04	2205520.13	24	25	93	700	1978	TG		? Down Hole						
TT135	593505.06	2205320.14	24	25	93	700	1978	TG		Permaplug	Dry					
TT136	593505.06	2205120.12	24	25	93	700	1978	TG		Permaplug	187	394	ShurGel & QuickGel			
TT137	593305.06	2205320.14	24	25	93	700	1978	TG		? Too Deep						
TT138	593305.06	2205120.12	24	25	93	700	1978	TG		Permaplug	Dry					
TT139	593305.06	2204920.13	24	25	93	630	1978	TG		? Too Deep						
TT140	594505.06	2208120.15	19	25	92	600	1978	TG		? Too Deep						
TT141	594505.06	2207920.15	19	25	92	600	1978	TG			*Drill Hole Not Located*					
TT142	594505.06	2207720.14	19	25	92	620	1978	TG		Permaplug	184	243				
TT143	594505.06	2207520.15	19	25	92	620	1978	TG		Permaplug	185	204				
TT144	594105.04	2207720.14	19	25	92	620	1978	TG		Permaplug	Dry					
TT145	593905.04	2207520.15	19	25	92	620	1978	TG		None	Dry					
TT146	593669.09	2204615.14	24	25	93	700	1978	TG		Permaplug	191	207		2006	650	Grout
TT147	593620.1	2204614.13	24	25	93	560	1978	TG		Permaplug	195	236		2006	650	Grout
TT148	593620.1	2204604.15	24	25	93	560	1978	TG		Permaplug	195	236		2006	650	Grout
TT149	593568.09	2204613.13	24	25	93	700	1978	TG		Permaplug	193	239		2006	650	Grout
TT150	594105.04	2207420.15	19	25	92	650	1978	TG		Permaplug	176	249				
TT151	594405.04	2208020.15	19	25	92	660	1978	TG		Permaplug	179	294				
TT152	594400.06	2208121.15	19	25	92	520	1978	TG		Permaplug	179	236				
TT153	594005.06	2207420.15	19	25	92	650	1978	TG		Permaplug	175	210				
TT154	594005.06	2207520.15	19	25	92	700	1978	TG		? Down Hole						
TT155	594405.04	2208110.16	19	25	92	490	1978	TG		Permaplug	179	272				
TT156	593620.1	2204594.13	24	25	93	600	1978	TG		Permaplug	195	396	ShurGel & QuickGel	2006	650	Grout
LCI - Lost Creek ISR LLC																
TG - Texas Gulf																


Lost Creek ISR, LLC
Littleton, Colorado, USA
AATA INTERNATIONAL, INC.
Fort Collins, Colorado, USA
Legend
Well
Lost Creek 5 Mile Buffer
Lost Creek Permit Area
Domestic and Stock Wells within Five Miles of the Project Area
Lost Creek Permit Area
Issued For:
Drawn By: HN
Issued/Revised: 11 December 2008
Drawing No:
0 0.5 1 2 Miles
T26N R94W
T26N R93W
T26N R92W
T26N R91W
T26N R90W
T25N R94W
T25N R93W
T25N R92W
T25N R91W
T25N R90W
T24N R94W
T24N R93W
T24N R92W
T24N R91W
GREAT DIVIDE BAS
Osborne
Draw
Eagles Nest
Battle
Stratton
Spring
Chicken Spring
Creek

Potentially Active Domestic and Stock Wells within a Five-Mile Radius of the Lost Creek Permit Area

Last Revised December 2008

Map ID	Permit Number	Applicant	Town-ship	Range	Section	¼ of the ¼	Uses	Priority	Status	Permit Facility Name	Yield (gpm)	Well Depth (feet)	Static Depth (feet)	Top of Main Water-Bearing Zone	Bottom of Main Water-Bearing Zone	Well Log	Chemical Analysis
1	P6572W	Kennecott Uranium Company	24 N	93 W	17	NENE	Domestic	9/17/1970	Good Standing	DB No. 1	9	216	60	140	216	Yes	Yes
2	P8444P	Sun Land/Cattle Co.	26 N	92 W	27	SWSE	Stock	12/31/1946	Good Standing	Osborne No. 1	10	280	250	Unknown	Unknown	No	No
3	P8461P	Sun Land/Cattle Co. and Wyoming Board of Land Commissioners	24 N	93 W	16	NWNW	Stock	12/31/1919	Good Standing	Jawbone School Sec No. 1	25	600	-1	Unknown	Unknown	No	No
4	P8462P	Sun Land/Cattle Co. and Wyoming Board of Land Commissioners	24 N	93 W	16	NWNW	Stock	6/25/1919	Good Standing	Jamborn S Sec No. 2	30	600	60	Unknown	Unknown	No	No
5	P10696P	BLM - Rawlins District	26 N	92 W	27	NESW	Stock	1/10/1942	Good Standing	Osbourne Draw Well No. 123	5	237	-1	Unknown	Unknown	No	No
6	P13834P	BLM - Rawlins District	25 N	92 W	21	NENW	Stock	9/21/1968	Good Standing	Battle Spring Draw Well No. 4451	19	900	104	Unknown	Unknown	No	No
7	P47137W	Kennecott Uranium Company	24 N	93 W	10	NWNW	Reservoir Supply, Stock, Miscellaneous	12/7/1977	Unadjudicated	Blue No. 5						No	
8	P55108W	BLM - Rawlins District	24 N	92 W	18	SWNE	Stock	12/24/1980	Good Standing	Stratton Draw	5	220	138	150	200	Yes	No
9	P55111W	BLM - Rawlins District	25 N	91 W	8	NWNW	Stock	12/24/1980	Good Standing	Road Crossing	5	300	199	220	300	Yes	No
10	P55112W	BLM - Rawlins District	25 N	92 W	10	SESE	Stock	12/24/1980	Good Standing	Boundary	5	280	155	220	280	Yes	No
11	P55113W	BLM - Rawlins District	25 N	92 W	30	NWSE	Stock	12/24/1980	Good Standing	Battle Springs	5	220	109	184	220	Yes	No
12	P55114W	BLM - Rawlins District	25 N	92 W	35	SENE	Stock	12/24/1980	Good Standing	Sooner	5	320	237	250	320	Yes	No
13	P63765W	BLM - Rawlins District	24 N	93 W	24	NWNW	Stock	4/1/1983	Good Standing	Mineral X Pipeline	20	380	140	100	380	Yes	No
14	P183470W	BLM - Rawlins District and Ur-Energy USA, Inc.	25 N	91 W	29	NWNW	Stock	8/27/2007	Good Standing Incomplete	Driller's Well						No	
15	[1]	BLM - Rawlins District	25 N	93 W	13	NWNW	Stock			East Eagle Nest Draw Well	5	370	269				
	P35721W	BLM and Texasgulf Inc.	25 N	93 W	14	SWSE	Stock, Miscellaneous	12/8/1976	Abandoned	TE 24						No	
	P37663W	BLM - Rawlins District	24 N	93 W	24	NWNW	Stock	5/4/1977	Cancelled	24 93 24 1W						No	
	37/9/261W	Stratton Sheep Co. and Wyoming Board of Land Commissioners	24 N	93 W	16	NWNW	Stock	1/27/2005	Rejected	DW 31 Water Well						No	

* WSEO, 2006

[1] This well does not currently have an associated WSEO permit number.

= Abandoned, Cancelled, or Rejected Status

Potentially Active Domestic and Stock Wells within a Five-Mile Radius of the Lost Creek Permit Area **General Disclaimer**

The data contained herein are provided AS IS and IN NO EVENT SHALL the State of Wyoming, its agencies or representatives, be LIABLE for any DAMAGES including, without limitation, damages resulting from lost data or profits or revenue the costs of recovering such data, the cost of substitute data, computer repair or replacement costs, claims by third parties for similar costs, or any special, direct or indirect, incidental, punitive or consequential damages of any kind whatsoever, arising out of the use of these data. The accuracy or reliability of the data IS NOT GUARANTEED or WARRANTED in ay way and the State of Wyoming, its agencies or representatives, EXPRESSLY DISCLAIM LIABILITY, whether expressed or implied, or of any kind whatsoever, including, without limitation, liability for QUALITY, PERFORMANCE, MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE arising from the use of the data, NEITHER the State of Wyoming, NOR its agencies or representatives, including the State Engineer's Office, REPRESENT or ENDORSE the ACCURACY or RELIABILITY OF ANY INFORMATION contained in the database, as some of the data are provided by permit applicants and may not have been verified by the State of Wyoming, its agencies or representatives. The State of Wyoming, its agencies and representatives RESERVE THE RIGHT, at their sole discretion, WITHOUT OBLIGATION, to MODIFY, ADD OR REMOVE all or portions of the data , at any time, WITH OR WITHOUT NOTICE. This includes the correction of errors or omissions within the database. All data or information provided by the Wyoming State Engineer's Office shall be used and relied upon only at the USER'S SOLE RISK, and the user agrees to indemnify and hold harmless the State of Wyoming, its agencies or representatives, including the Wyoming State Engineer's Office, and its officials, officers, and employees, from any liability arising out of the use or distribution of these data.

Definitions

- **Abandoned:** The loss of a water right based on the non-use of that water right when water was available for a period of five consecutive years, or the voluntary relinquishment of an adjudicated water right.
- **Cancelled:**
    - A temporary use permit issued for a limited time, after which the permit is cancelled; or
    - A permit or certificate that has been issued by the state engineer or the board of control, in which the provisions of the permit or certificate were found willfully violated.
- **Good Standing Incomplete:** All legally required notices have not been received and the permit has not expired.
- **Unadjudicated:** A water right permit before it has been publicly recognized by proof of inspection and advertisement.

* Wyoming State Engineer's Office (WSEO). 2006. Documents. Available from: http://seo.state.wy.us/docs.aspx. Accessed on 11 December 2008.

Table 2.2-2 Groundwater Use Permits (Page 1 of 8)

Last Revised December 2008

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼ [3]	Uses	Priority	Status	Permit Facility Name	Yield [4]	Well Depth (ft)	Static Well Depth (ft)
1	Well	P9742W	Kennecott Uranium Company	24 N	94 W	34	NENE	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1	25 gpm	170	104
1a	Use Point	P9742W	Kennecott Uranium Company	24 N	92 W	5	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1b	Use Point	P9742W	Kennecott Uranium Company	24 N	92 W	6	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1c	Use Point	P9742W	Kennecott Uranium Company	24 N	92 W	7	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1d	Use Point	P9742W	Kennecott Uranium Company	24 N	93 W	1	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1e	Use Point	P9742W	Kennecott Uranium Company	24 N	93 W	2	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1f	Use Point	P9742W	Kennecott Uranium Company	24 N	93 W	3	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1g	Use Point	P9742W	Kennecott Uranium Company	24 N	93 W	11	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1h	Use Point	P9742W	Kennecott Uranium Company	24 N	93 W	12	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1i	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	1	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1j	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	2	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1k	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	3	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1l	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	10	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1m	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	11	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1n	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	12	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1o	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	13	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1p	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	14	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1q	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	15	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1r	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	22	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1s	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	23	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1t	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	24	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1u	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	25	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1v	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	26	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1w	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	27	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1x	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	34	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1y	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	35	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
1z	Use Point	P9742W	Kennecott Uranium Company	25 N	93 W	36	INP	Stock, Industrial	7/15/1971	Adjudicated	J E S No. 1			
2	Well	P13834P	USDI BLM, Rawlins District	25 N	92 W	21	NENW	Stock	9/21/1968	Good Standing	Battle Spring Draw Well No. 4451	19 gpm	900	104
2a	Use Point	P13834P	USDI BLM, Rawlins District	25 N	92 W	21	NENW	Stock	9/21/1968	Good Standing	Battle Spring Draw Well No. 4451			
3	Well	P47137W	Kennecott Uranium Company	24 N	93 W	10	NWNW	Reservoir Supply, Stock, Miscellaneous	12/7/1977	Unadjudicated	Blue No. 5	INP	INP	INP
3a	Use Point	P47137W	Kennecott Uranium Company	24 N	93 W	3	SWSW	Reservoir Supply, Stock, Miscellaneous	12/7/1977	Unadjudicated	Blue No. 5			
3b	Use Point	P47137W	Kennecott Uranium Company	24 N	93 W	3	SESW	Reservoir Supply, Stock, Miscellaneous	12/7/1977	Unadjudicated	Blue No. 5			
4	Well	P48386W	Kennecott Uranium Company	24 N	93 W	3	SWNE	Monitoring, Dewatering, Miscellaneous	5/31/1979	Unadjudicated	24-93W-3AC-M-1	0 gpm	450	135.8
5	Well	P54883W	Kennecott Uranium Company -- WSBLC	24 N	93 W	16	NWNE	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW31	190 gpm	600	152
5a	Use Point	P54883W	Kennecott Uranium Company -- WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 31			
5b	Use Point	P54883W	Kennecott Uranium Company -- WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 31			
6	Well	P54884W	Kennecott Uranium Company -- WSBLC	24 N	93 W	16	NENE	Dewatering, Industrial, Miscellaneous	11/24/1980	Unadjudicated	DW 32	200 gpm	600	147

Table 2.2-2 Groundwater Use Permits (Page 2 of 8)

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼ [3]	Uses	Priority	Status	Permit Facility Name	Yield [4]	Well Depth (ft)	Static Well Depth (ft)
6a	Use Point	P54884W	Kennecott Uranium Company – WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Unadjudicated	DW 32			
6b	Use Point	P54884W	Kennecott Uranium Company – WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Unadjudicated	DW 32			
7	Well	P54885W	Kennecott Uranium Company – WSBLC	24 N	93 W	16	NENE	Dewatering, Industrial, Miscellaneous	11/24/1980	Unadjudicated	DW 33	190 gpm	560	141
7a	Use Point	P54885W	Kennecott Uranium Company – WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Unadjudicated	DW 33			
7b	Use Point	P54885W	Kennecott Uranium Company – WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Unadjudicated	DW 33			
8	Well	P54886W	Kennecott Uranium Company – WSBLC	24 N	93 W	16	NENE	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 34	200 gpm	450	140
8a	Use Point	P54886W	Kennecott Uranium Company – WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 34			
8b	Use Point	P54886W	Kennecott Uranium Company – WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 34			
9	Well	P54891W	USDI BLM – Kennecott Uranium Company	24 N	93 W	15	NWNW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 39	200 gpm	600	169
9a	Use Point	P54891W	USDI BLM – Kennecott Uranium Company	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 39			
9b	Use Point	P54891W	USDI BLM – Kennecott Uranium Company	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 39			
10	Well	P54892W	USDI BLM – Kennecott Uranium Company	24 N	93 W	15	NWNW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 40	200 gpm	600	155
10a	Use Point	P54892W	USDI BLM – Kennecott Uranium Company	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 40			
10b	Use Point	P54892W	USDI BLM – Kennecott Uranium Company	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 40			
11	Well	P54893W	Kennecott Uranium Company – WSBLC	24 N	93 W	16	NENE	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 41	190 gpm	600	157
11a	Use Point	P54893W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 41			
11b	Use Point	P54893W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 41			
12	Well	P54894W	Kennecott Uranium Company – WSBLC	24 N	93 W	16	NENE	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 42	200 gpm	600	166
12a	Use Point	P54894W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 42			
12b	Use Point	P54894W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Good Standing	DW 42			
13	Well	P55112W	USDI BLM, Rawlins District	25 N	92 W	10	SESE	Stock	12/24/1980	Good Standing	Boundary	5 gpm	280	155
13a	Use Point	P55112W	USDI BLM, Rawlins District	25 N	92 W	10	SESE	Stock	12/24/1980	Good Standing	Boundary			
14	Well	P55113W	USDI BLM, Rawlins District	25 N	92 W	30	NWSE	Stock	12/24/1980	Good Standing	Battle Springs	5 gpm	220	109
14a	Use Point	P55113W	USDI BLM, Rawlins District	25 N	92 W	30	NWSE	Stock	12/24/1980	Good Standing	Battle Springs			
15	Well	P63128W	USDI, BLM – Kennecott Uranium Company	24 N	93 W	11	SWSW	Monitoring	1/28/1983	Good Standing	TMW-14	0 gpm	INP	INP
15a	Use Point	P63128W	USDI, BLM – Kennecott Uranium Company	24 N	93 W	11	SWSW	Monitoring	1/28/1983	Good Standing	TMW-14			

Table 2.2-2 Groundwater Use Permits (Page 3 of 8)

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼ [3]	Uses	Priority	Status	Permit Facility Name	Yield [4]	Well Depth (ft)	Static Well Depth (ft)
16	Well	P147594W	Kennecott Uranium Company	24 N	93 W	1	SWNE	Monitoring	10/22/2002	Good Standing	TMW-90	INP	55	36.13
17	Well	P147595W	Kennecott Uranium Company	24 N	93 W	1	SENW	Monitoring	10/22/2002	Good Standing	TMW-91	INP	110	100.17
18	Well	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW	LCS	LCS	LCS
18a	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	NENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18b	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	NWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18c	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	SWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18d	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	SENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18e	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18f	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18g	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	SWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18h	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	SENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18i	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	NESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18j	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	NWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18k	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	SWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18l	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	SESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18m	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	NESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18n	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	NWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18o	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	SWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18p	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	16	SESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18q	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	NENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18r	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	NWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18s	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	SWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18t	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	SENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18u	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18v	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18w	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	SWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18x	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	SENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18y	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	NESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18z	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	NWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18aa	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	SWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ab	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	SESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ac	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	NESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ad	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	NWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ae	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	SWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18af	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	17	SESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ag	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	NENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ah	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	NWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ai	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	SWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18aj	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	SENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ak	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18al	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18am	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	SWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18an	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	SENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ao	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	NESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ap	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	NWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18aq	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	SWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ar	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	SESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18as	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	NESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			

Table 2.2-2 Groundwater Use Permits (Page 4 of 8)

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼ [3]	Uses	Priority	Status	Permit Facility Name	Yield [4]	Well Depth (ft)	Static Well Depth (ft)
18at	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	NWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18au	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	SWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18av	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	18	SESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18aw	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	NENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ax	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	NWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ay	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	SWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18az	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	SENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ba	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bb	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bc	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	SWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bd	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	SENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18be	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	NESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bf	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	NWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bg	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	SWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bh	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	19	SESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bi	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	20	NENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bj	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	20	NWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bk	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	20	SWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bl	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	20	SENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bm	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	20	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bn	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	20	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bo	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	20	SWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bp	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	20	SENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bq	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	30	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18br	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	30	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bs	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	30	SWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bt	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	30	SENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bu	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	30	NESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bv	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	30	NWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bw	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	30	SWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bx	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	92 W	30	SESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18by	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	NWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18bz	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	SWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ca	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	SESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cb	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	SWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cc	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	SESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cd	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	NESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ce	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	SENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cf	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	NESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cg	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	NWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ch	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ci	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cj	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	SWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ck	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	NWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cl	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	SWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cm	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	SENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cn	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	13	NENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18co	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	SESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			

Table 2.2-2 Groundwater Use Permits (Page 5 of 8)

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼ [3]	Uses	Priority	Status	Permit Facility Name	Yield [4]	Well Depth (ft)	Static Well Depth (ft)
18cp	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	NESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cq	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	NWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cr	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	SWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cs	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	NWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ct	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	SWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cu	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	SESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cv	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	SWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cw	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	SENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cx	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	NESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cy	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	SENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18cz	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18da	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18db	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	NENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dc	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	NWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dd	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	24	SWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18de	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	SWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18df	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	SESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dg	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	SESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dh	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	NESE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18di	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	NWSE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dj	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	NESW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dk	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	NWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dl	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	SWSW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dm	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dn	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	SWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18do	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	SENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dp	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	SWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dq	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	SENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dr	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18ds	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	NENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dt	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	25	NWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18du	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	36	NWNW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dv	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	36	NENW	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dw	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	36	NWNE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
18dx	Use Point	P169906W	Ur-Energy USA Inc. -- WSBLC	25 N	93 W	36	NENE	Miscellaneous	9/12/2005	Good Standing Incomplete	LCIW			
19	Well	P175260W	NFU Wyoming LLC and BLM	25 N	92 W	20	NWNW	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC15M	LCS	350	160.8
20	Well	P175260W	NFU Wyoming LLC and BLM	25 N	92 W	20	NWNW	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC16M	LCS	472	178.14
21	Well	P175260W	NFU Wyoming LLC and BLM	25 N	92 W	20	NWNW	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC17M	LCS	575	185.26
22	Well	P175260W	NFU Wyoming LLC and BLM	25 N	92 W	20	NWNW	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC29M	LCS	171	153.95
23	Well	P175261W	NFU Wyoming LLC and BLM	25 N	92 W	18	SESE	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC18M	LCS	350	168.04
24	Well	P175261W	NFU Wyoming LLC and BLM	25 N	92 W	18	SESE	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC19M	LCS	463	180.08
25	Well	P175261W	NFU Wyoming LLC and BLM	25 N	92 W	18	SESE	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC20M	LCS	543	202.36
26	Well	P175262W	NFU Wyoming LLC and BLM	25 N	93 W	24	SWNE	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC21M	LCS	410	198.2
27	Well	P175262W	NFU Wyoming LLC and BLM	25 N	93 W	24	SWNE	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC22M	LCS	592	206.73
28	Well	P175262W	NFU Wyoming LLC and BLM	25 N	93 W	24	SWNE	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC23M	LCS	634	220.75
29	Well	P175262W	NFU Wyoming LLC and BLM	25 N	93 W	24	SWNE	Monitoring, Test Well	6/9/2006	Good Standing Incomplete	LC30M	LCS	236	198.91
30	Well	P175263W	NFU Wyoming LLC and BLM	25 N	92 W	17	SWSW	Monitoring	6/9/2006	Good Standing Incomplete	LC24M	LCS	542	192.11
31	Well	P175264W	NFU Wyoming LLC and BLM	25 N	92 W	19	NENE	Monitoring	6/9/2006	Good Standing Incomplete	LC25M	LCS	380	167.05

Table 2.2-2 Groundwater Use Permits (Page 6 of 8)

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼ [3]	Uses	Priority	Status	Permit Facility Name	Yield [4]	Well Depth (ft)	Static Well Depth (ft)
32	Well	P175265W	NFU Wyoming LLC and BLM	25 N	92 W	20	NENE	Monitoring	6/9/2006	Good Standing Incomplete	LC26M	LCS	436	171.1
33	Well	P175266W	NFU Wyoming LLC and BLM	25 N	92 W	16	SENE	Monitoring	6/9/2006	Good Standing Incomplete	LC27M	LCS	477	189.8
34	Well	P175267W	NFU Wyoming LLC and BLM	25 N	93 W	25	SWSW	Monitoring	6/9/2006	Good Standing Incomplete	LC28M	LCS	563	154.45
35	Well	P175268W	NFU Wyoming LLC and BLM	25 N	93 W	25	SWSW	Monitoring	6/9/2006	Good Standing Incomplete	LC31M	LCS	191	144.01
36	Well	P179826W	Lost Creek ISR LLC	25 N	92 W	17	NWSE	Miscellaneous	2/28/2007	Good Standing Incomplete	LC 32W	LCS	LCS	LCS
37	Well	P179827W	Lost Creek ISR LLC	25 N	92 W	20	NENE	Miscellaneous	2/28/2007	Good Standing Incomplete	LC 33W	LCS	LCS	LCS
38	Well	P179856W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJT 101	LCS	LCS	LCS
39	Well	P179857W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJT 102	LCS	LCS	LCS
40	Well	P179858W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJT 103	LCS	LCS	LCS
41	Well	P179859W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJT 104	LCS	460	169.51
42	Well	P179860W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJT 105	LCS	LCS	LCS
43	Well	P179861W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJT 106	LCS	LCS	LCS
44	Well	P179862W	NFU Wyoming LLC	25 N	92 W	20	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJT 107	LCS	LCS	LCS
45	Well	P179863W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-101	LCS	LCS	LCS
46	Well	P179864W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-101	LCS	LCS	LCS
47	Well	P179865W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-101	LCS	LCS	LCS
48	Well	P179866W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-102	LCS	LCS	LCS
49	Well	P179867W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-102	LCS	LCS	LCS
50	Well	P179868W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-102	LCS	LCS	LCS
51	Well	P179869W	NFU Wyoming LLC	25 N	92 W	18	SESE	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-103	LCS	LCS	LCS
52	Well	P179870W	NFU Wyoming LLC	25 N	92 W	18	SESE	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-103	LCS	LCS	LCS
53	Well	P179871W	NFU Wyoming LLC	25 N	92 W	18	SESE	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-103	LCS	LCS	LCS
54	Well	P179872W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-104	LCS	LCS	LCS
55	Well	P179873W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-104	LCS	430	171.81
56	Well	P179874W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-104	LCS	LCS	LCS
57	Well	P179875W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-105	LCS	LCS	LCS
58	Well	P179876W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-105	LCS	LCS	LCS
59	Well	P179877W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-105	LCS	LCS	LCS
60	Well	P179878W	NFU Wyoming LLC	25 N	92 W	18	SESE	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-106	LCS	LCS	LCS
61	Well	P179879W	NFU Wyoming LLC	25 N	92 W	18	SESE	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-106	LCS	LCS	LCS
62	Well	P179880W	NFU Wyoming LLC	25 N	92 W	18	SESE	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-106	LCS	LCS	LCS
63	Well	P179881W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-107	LCS	LCS	LCS
64	Well	P179882W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-107	LCS	464	183.61
65	Well	P179883W	NFU Wyoming LLC	25 N	92 W	19	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-107	LCS	LCS	LCS
66	Well	P179884W	NFU Wyoming LLC	25 N	92 W	18	SESE	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-108	LCS	LCS	LCS
67	Well	P179885W	NFU Wyoming LLC	25 N	92 W	18	SESE	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-108	LCS	LCS	LCS
68	Well	P179886W	NFU Wyoming LLC	25 N	92 W	18	SESE	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-108	LCS	LCS	LCS
69	Well	P179887W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-109	LCS	LCS	LCS
70	Well	P179888W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-109	LCS	LCS	LCS
71	Well	P179889W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-109	LCS	LCS	LCS
72	Well	P179890W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-110	LCS	LCS	LCS
73	Well	P179891W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-110	LCS	476	174.89
74	Well	P179892W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-110	LCS	LCS	LCS
75	Well	P179893W	NFU Wyoming LLC	25 N	92 W	17	SWSW	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-111	LCS	LCS	LCS
76	Well	P179894W	NFU Wyoming LLC	25 N	92 W	17	SWSW	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-111	LCS	440	176.94
77	Well	P179895W	NFU Wyoming LLC	25 N	92 W	17	SWSW	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-111	LCS	LCS	LCS
78	Well	P179896W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-112	LCS	LCS	LCS
79	Well	P179897W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-112	LCS	LCS	LCS

Table 2.2-2 Groundwater Use Permits (Page 7 of 8)

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼ [3]	Uses	Priority	Status	Permit Facility Name	Yield [4]	Well Depth (ft)	Static Well Depth (ft)
80	Well	P179898W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-112	LCS	LCS	LCS
81	Well	P179899W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-113	LCS	LCS	LCS
82	Well	P179900W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-113	LCS	LCS	LCS
83	Well	P179901W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-113	LCS	LCS	LCS
84	Well	P179902W	NFU Wyoming LLC	25 N	92 W	20	NENW	Monitoring	3/1/2007	Good Standing Incomplete	HJMV-114	LCS	LCS	LCS
85	Well	P179903W	NFU Wyoming LLC	25 N	92 W	20	NENE	Monitoring	3/1/2007	Good Standing Incomplete	HJMP-114	LCS	LCS	LCS
86	Well	P179904W	NFU Wyoming LLC	25 N	92 W	20	NENW	Monitoring	3/1/2007	Good Standing Incomplete	HJMO-114	LCS	LCS	LCS
87	Well	P179905W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	UKMU-101	LCS	LCS	LCS
88	Well	P179906W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	UKMP-101	LCS	575	192.13
89	Well	P179907W	NFU Wyoming LLC	25 N	92 W	20	NWNW	Monitoring	3/1/2007	Good Standing Incomplete	UKMO-101	LCS	LCS	LCS
90	Well	P179908W	NFU Wyoming LLC	25 N	92 W	17	SWSW	Monitoring	3/1/2007	Good Standing Incomplete	UKMU-102	LCS	LCS	LCS
91	Well	P179909W	NFU Wyoming LLC	25 N	92 W	17	SWSW	Monitoring	3/1/2007	Good Standing Incomplete	UKMP-102	LCS	498	190.68
92	Well	P179910W	NFU Wyoming LLC	25 N	92 W	17	SWSW	Monitoring	3/1/2007	Good Standing Incomplete	UKMO-102	LCS	LCS	LCS
93	Well	P179911W	NFU Wyoming LLC	25 N	92 W	17	SWSW	Monitoring	3/1/2007	Good Standing Incomplete	UKMU-103	LCS	LCS	LCS
94	Well	P179912W	NFU Wyoming LLC	25 N	92 W	17	SWSW	Monitoring	3/1/2007	Good Standing Incomplete	UKMP-103	LCS	LCS	LCS
95	Well	P179913W	NFU Wyoming LLC	25 N	92 W	17	SWSW	Monitoring	3/1/2007	Good Standing Incomplete	UKMP-103	LCS	LCS	LCS
96	Well	41/1/163W	Ur-Energy USA Inc.	25 N	92 W	19	SWNE	Monitoring	7/3/2008	Unadjucated	SWNE19M	LCS	LCS	LCS
97	Well	41/1/284W	Lost Creek ISR LLC	25 N	93 W	13	NWSE	Monitoring	9/26/2008	Unadjucated	MB-03	LCS	LCS	LCS
98	Well	41/10/162W	Ur-Energy USA Inc.	25 N	92 W	19	NWNE	Monitoring	7/3/2008	Unadjucated	NWNE19M	LCS	LCS	LCS
99	Well	41/10/163W	Ur-Energy USA Inc.	25 N	92 W	20	NWNW	Monitoring	7/3/2008	Unadjucated	NWNW20PW	LCS	LCS	LCS
100	Well	41/10/283W	Lost Creek ISR LLC	25 N	93 W	13	NWSE	Monitoring	9/26/2008	Unadjucated	MB-02	LCS	LCS	LCS
101	Well	41/2/162W	Ur-Energy USA Inc.	25 N	92 W	18	SESW	Monitoring	7/3/2008	Unadjucated	SESW18M	LCS	LCS	LCS
102	Well	41/2/163W	Ur-Energy USA Inc.	25 N	92 W	19	NENW	Monitoring	7/3/2008	Unadjucated	NENW19M	LCS	LCS	LCS
103	Well	41/2/284W	Lost Creek ISR LLC	25 N	93 W	13	NWSE	Monitoring	9/26/2008	Unadjucated	MB-04	LCS	LCS	LCS
104	Well	41/3/162W	Ur-Energy USA Inc.	25 N	92 W	18	SWSE	Monitoring	7/3/2008	Unadjucated	SWSE18M	LCS	LCS	LCS
105	Well	41/3/163W	Ur-Energy USA Inc.	25 N	92 W	19	NWNE	Monitoring	7/3/2008	Unadjucated	NWNE19MU	LCS	LCS	LCS
106	Well	41/3/213W	NFU Wyoming LLC	25 N	93 W	25	SWSW	Miscellaneous	7/29/2008	Unadjucated	LC 28M	LCS	LCS	LCS
107	Well	41/3/284W	Lost Creek ISR LLC	25 N	93 W	25	SWSW	Monitoring	9/26/2008	Unadjucated	MB-05	LCS	LCS	LCS
108	Well	41/4/162W	Ur-Energy USA Inc.	25 N	92 W	18	SESE	Monitoring	7/3/2008	Unadjucated	SESE18M	LCS	LCS	LCS
109	Well	41/4/163W	Ur-Energy USA Inc.	25 N	92 W	19	NWNE	Monitoring	7/3/2008	Unadjucated	NWNE19MO	LCS	LCS	LCS
110	Well	41/4/284W	Lost Creek ISR LLC	25 N	93 W	25	SWSW	Monitoring	9/26/2008	Unadjucated	MB-06	LCS	LCS	LCS
111	Well	41/5/162W	Ur-Energy USA Inc.	25 N	92 W	17	SWSW	Monitoring	7/3/2008	Unadjucated	SWSW17M	LCS	LCS	LCS
112	Well	41/5/163W	Ur-Energy USA Inc.	25 N	92 W	19	NWNE	Monitoring	7/3/2008	Unadjucated	NWNE19MP	LCS	LCS	LCS
113	Well	41/5/284W	Lost Creek ISR LLC	25 N	92 W	16	SENE	Monitoring	9/26/2008	Unadjucated	MB-07	LCS	LCS	LCS
114	Well	41/5/294W	Lost Creek ISR LLC	25 N	93 W	25	SWSW	Monitoring	10/9/2008	Unadjucated	Deep Well No. 1	LCS	LCS	LCS
115	Well	41/5/35W	Lost Creek ISR LLC	25 N	92 W	17	NWSE	Miscellaneous	4/8/2008	Unadjucated	ENL. LC 32W	LCS	LCS	LCS
116	Well	41/6/162W	Ur-Energy USA Inc.	25 N	92 W	17	SESW	Monitoring	7/3/2008	Unadjucated	SESW17M	LCS	LCS	LCS
117	Well	41/6/163W	Ur-Energy USA Inc.	25 N	92 W	20	NENW	Monitoring	7/3/2008	Unadjucated	NENW20MU	LCS	LCS	LCS
118	Well	41/6/284W	Lost Creek ISR LLC	25 N	92 W	16	SENE	Monitoring	9/26/2008	Unadjucated	MB-08	LCS	LCS	LCS
119	Well	41/6/35W	Lost Creek ISR LLC	25 N	92 W	20	NENE	Miscellaneous	4/8/2008	Unadjucated	ENL. LC 33W	LCS	LCS	LCS
120	Well	41/7/162W	Ur-Energy USA Inc.	25 N	92 W	20	NENW	Monitoring	7/3/2008	Unadjucated	NENW20M	LCS	LCS	LCS
121	Well	41/7/163W	Ur-Energy USA Inc.	25 N	92 W	20	NENW	Monitoring	7/3/2008	Unadjucated	NENW20MO	LCS	LCS	LCS
122	Well	41/7/284W	Lost Creek ISR LLC	25 N	92 W	16	SENE	Monitoring	9/26/2008	Unadjucated	MB-09	LCS	LCS	LCS
123	Well	41/7/2W	Lost Creek ISR LLC	25 N	93 W	24	NENW	Miscellaneous	3/19/2008	Unadjucated	ENL. LCIW	LCS	LCS	LCS
124	Well	41/8/162W	Ur-Energy USA Inc.	25 N	92 W	20	NWNW	Monitoring	7/3/2008	Unadjucated	NWNW20M	LCS	LCS	LCS
125	Well	41/8/163W	Ur-Energy USA Inc.	25 N	92 W	20	NENW	Monitoring	7/3/2008	Unadjucated	NENW20MP	LCS	LCS	LCS
126	Well	41/8/284W	Lost Creek ISR LLC	25 N	92 W	18	SESE	Monitoring	9/26/2008	Unadjucated	MB-10	LCS	LCS	LCS
127	Well	41/8/2W	Lost Creek ISR LLC	25 N	92 W	18	SWNE	Miscellaneous	3/19/2008	Unadjucated	LC229W	LCS	LCS	LCS

Table 2.2-2 Groundwater Use Permits (Page 8 of 8)

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼ [3]	Uses	Priority	Status	Permit Facility Name	Yield [4]	Well Depth (ft)	Static Well Depth (ft)
128	Well	41/9/162W	Ur-Energy USA Inc.	25 N	92 W	19	NENE	Monitoring	7/3/2008	Unadjucated	NENE19M	LCS	LCS	LCS
129	Well	41/9/163W	Ur-Energy USA Inc.	25 N	92 W	18	SESE	Monitoring	7/3/2008	Unadjucated	SESE18PW	LCS	LCS	LCS
130	Well	41/9/283W	Lost Creek ISR LLC	25 N	93 W	13	NWSE	Monitoring	9/26/2008	Unadjucated	MB-01	LCS	LCS	LCS
131	Well	[5]	USDI BLM, Rawlins District	25 N	93 W	13	NWNW	Stock			East Eagle Nest Draw Well	5 gpm	370	269

* WSEO, 2006

[1] Each number represents a well. A number followed by a letter(s) is a point of use related to the well.

= Well within two miles of the Permit Area.

= Well more than two miles from the Permit Area. However, points of use related to the well are within two miles of the Permit Area.B309

= Point of use within two miles of the Permit Area.

[2] USDI BLM = United States Department of Interior's Bureau of Land Management; WSBLC = Wyoming State Board of Land Commissioners

[3] INP = Information not provided by the online WSEO database.

[4] LCS = Part of the on-going Lost Creek Project study. Information will be provided when it becomes available.

Table 2.2-2 Groundwater Use Permits General Disclaimer

The data contained herein are provided AS IS and IN NO EVENT SHALL the State of Wyoming, its agencies or representatives, be LIABLE for any DAMAGES including, without limitation, damages resulting from lost data or profits or revenue the costs of recovering such data, the cost of substitute data, computer repair or replacement costs, claims by third parties for similar costs, or any special, direct or indirect, incidental, punitive or consequential damages of any kind whatsoever, arising out of the use of these data. The accuracy or reliability of the data IS NOT GUARANTEED or WARRANTED in ay way and the State of Wyoming, its agencies or representatives, EXPRESSLY DISCLAIM LIABILITY, whether expressed or implied, or of any kind whatsoever, including, without limitation, liability for QUALITY, PERFORMANCE, MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE arising from the use of the data, NEITHER the State of Wyoming, NOR its agencies or representatives, including the State Engineer's Office, REPRESENT or ENDORSE the ACCURACY or RELIABILITY OF ANY INFORMATION contained in the database, as some of the data are provided by permit applicants and may not have been verified by the State of Wyoming, its agencies or representatives. The State of Wyoming, its agencies and representatives RESERVE THE RIGHT, at their sole discretion, WITHOUT OBLIGATION, to MODIFY, ADD OR REMOVE all or portions of the data , at any time, WITH OR WITHOUT NOTICE. This includes the correction of errors or omissions within the database. All data or information provided by the Wyoming State Engineer's Office shall be used and relied upon only at the USER'S SOLE RISK, and the user agrees to indemnify and hold harmless the State of Wyoming, its agencies or representatives, including the Wyoming State Engineer's Office, and its officials, officers, and employees, from any liability arising out of the use or distribution of these data.

Definitions

- **Adjudicated:** A priority assigned to an appropriation and a decree or certificate issued publicly recognizing the defined water right and conveying property-right status on the appropriation.
- **Good Standing Incomplete:** All legally required notices have not been received and the permit has not expired.
- **Unadjudicated:** A water right permit before it has been publicly recognized by proof of inspection and advertisement.

* Wyoming State Engineer's Office (WSEO). 2006. Documents. Available from: http://seo.state.wy.us/docs.aspx. Accessed on 11 December 2008.

Table 2.2-3 Abandoned and Cancelled Wells (Page 1 of 4)

Last Revised December 2008

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼	Uses	Priority	Status	Permit Facility Name	Yield [3]	Well Depth (ft)	Static Well Depth (ft)
1	Well	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SWSE	Stock, Miscellaneous	28102	Abandoned	TE 24	25 gpm		
1a	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	SESE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1b	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	NESE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1c	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	NWSE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1d	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	SWSE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1e	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SWSE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1f	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SESE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1g	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SESW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1h	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NESE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1i	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NWSE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1j	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NESW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1k	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NWSW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1l	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SWSW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1m	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NWNE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1n	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SWNE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1o	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SENE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1p	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NENE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1q	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SWSE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1r	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SESE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1s	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SESW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1t	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NESE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1u	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NWSE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1v	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NESW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1w	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NWSW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1x	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SWSW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1y	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SWNW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1z	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SENW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1aa	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SENE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1ab	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NENW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1ac	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NWNW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1ad	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NENE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1ae	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NWNE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1af	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SWNE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1ag	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NWNW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1ah	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SWNW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1ai	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SENW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1aj	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SWNE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1ak	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SENE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1al	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NENW	Stock, Miscellaneous	28102	Abandoned	TE 24			
1am	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NENE	Stock, Miscellaneous	28102	Abandoned	TE 24			
1an	Use Point	P35721W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NWNE	Stock, Miscellaneous	28102	Abandoned	TE 24			
2	Well	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NENW	Miscellaneous	28250	Cancelled	TE 38	25 gpm	380	220
2a	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	SWSE	Miscellaneous	28250	Cancelled	TE 38			
2b	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	SESE	Miscellaneous	28250	Cancelled	TE 38			
2c	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	NESE	Miscellaneous	28250	Cancelled	TE 38			

Table 2.2-3 Abandoned and Cancelled Wells (Page 2 of 4)

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼	Uses	Priority	Status	Permit Facility Name	Yield [3]	Well Depth (ft)	Static Well Depth (ft)
2d	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	NWSE	Miscellaneous	28250	Cancelled	TE 38			
2e	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NWSE	Miscellaneous	28250	Cancelled	TE 38			
2f	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SWSE	Miscellaneous	28250	Cancelled	TE 38			
2g	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SESE	Miscellaneous	28250	Cancelled	TE 38			
2h	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SWSW	Miscellaneous	28250	Cancelled	TE 38			
2i	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SESW	Miscellaneous	28250	Cancelled	TE 38			
2j	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NESE	Miscellaneous	28250	Cancelled	TE 38			
2k	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SENE	Miscellaneous	28250	Cancelled	TE 38			
2l	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NESW	Miscellaneous	28250	Cancelled	TE 38			
2m	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NWSW	Miscellaneous	28250	Cancelled	TE 38			
2n	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NENE	Miscellaneous	28250	Cancelled	TE 38			
2o	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NWNE	Miscellaneous	28250	Cancelled	TE 38			
2p	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SWNE	Miscellaneous	28250	Cancelled	TE 38			
2q	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NWSE	Miscellaneous	28250	Cancelled	TE 38			
2r	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SWSE	Miscellaneous	28250	Cancelled	TE 38			
2s	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SESE	Miscellaneous	28250	Cancelled	TE 38			
2t	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SWSW	Miscellaneous	28250	Cancelled	TE 38			
2u	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SESW	Miscellaneous	28250	Cancelled	TE 38			
2v	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NESE	Miscellaneous	28250	Cancelled	TE 38			
2w	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NESW	Miscellaneous	28250	Cancelled	TE 38			
2x	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NWSW	Miscellaneous	28250	Cancelled	TE 38			
2y	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SENW	Miscellaneous	28250	Cancelled	TE 38			
2z	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NENW	Miscellaneous	28250	Cancelled	TE 38			
2aa	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NWNW	Miscellaneous	28250	Cancelled	TE 38			
2ab	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SWNW	Miscellaneous	28250	Cancelled	TE 38			
2ac	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NWNE	Miscellaneous	28250	Cancelled	TE 38			
2ad	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SWNE	Miscellaneous	28250	Cancelled	TE 38			
2ae	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SENE	Miscellaneous	28250	Cancelled	TE 38			
2af	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NENE	Miscellaneous	28250	Cancelled	TE 38			
2ag	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SENW	Miscellaneous	28250	Cancelled	TE 38			
2ah	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NWNW	Miscellaneous	28250	Cancelled	TE 38			
2ai	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SWNW	Miscellaneous	28250	Cancelled	TE 38			
2aj	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SWNE	Miscellaneous	28250	Cancelled	TE 38			
2ak	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SENE	Miscellaneous	28250	Cancelled	TE 38			
2al	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NENW	Miscellaneous	28250	Cancelled	TE 38			
2am	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NENE	Miscellaneous	28250	Cancelled	TE 38			
2an	Use Point	P37637W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NWNE	Miscellaneous	28250	Cancelled	TE 38			
3	Well	P39744W	USDI, BLM – Apexco Inc.	25 N	93 W	22	SWNE	Miscellaneous	8/26/1977	Cancelled	Battle Springs No. 1	25 gpm	640	60
3a	Use Point	P39744W	USDI, BLM – Apexco Inc.	25 N	93 W	22	SWNE	Miscellaneous	8/26/1977	Cancelled	Battle Springs No. 1			
4	Well	P54887W	Minerals Exploration Company – WSBLC	24 N	93 W	15	SWNW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 35	INP	INP	INP
4a	Use Point	P54887W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 35			
4b	Use Point	P54887W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 35			

Table 2.2-3 Abandoned and Cancelled Wells (Page 3 of 4)

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼	Uses	Priority	Status	Permit Facility Name	Yield [3]	Well Depth (ft)	Static Well Depth (ft)
5	Well	P54888W	Minerals Exploration Company – WSBLC	24 N	93 W	15	SWNW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 36	INP	INP	INP
5a	Use Point	P54888W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 36			
5b	Use Point	P54888W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 36			
6	Well	P54889W	Minerals Exploration Company – WSBLC	24 N	93 W	15	NWNW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 37	INP	INP	INP
6a	Use Point	P54889W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 37			
6b	Use Point	P54889W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 37			
7	Well	P54890W	Minerals Exploration Company – WSBLC	24 N	93 W	15	NWNW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 38	INP	INP	INP
7a	Use Point	P54890W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SWSW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 38			
7b	Use Point	P54890W	Minerals Exploration Company – WSBLC	24 N	93 W	11	SESW	Dewatering, Industrial, Miscellaneous	11/24/1980	Cancelled	DW 38			
8	Well	P61528W	Texasgulf Inc.	25 N	92 W	20	NWNW	Monitoring	30113	Abandoned	M25 92 20 1S	0 gpm	355	155.8
8a	Use Point	P61528W	Texasgulf Inc.	25 N	92 W	20	NWNW	Monitoring	30113	Abandoned	M25 92 20 1S			
9	Well	P61529W	Texasgulf Inc.	25 N	92 W	20	NWNW	Monitoring	30113	Abandoned	M25 92 20 1M	0 gpm	440	173.8
9a	Use Point	P61529W	Texasgulf Inc.	25 N	92 W	20	NWNW	Monitoring	30113	Abandoned	M25 92 20 1M			
10	Well	P61530W	Texasgulf Inc.	25 N	92 W	20	NWNW	Monitoring	30113	Abandoned	M25 92 20 1D	0 gpm	534	181.2
10a	Use Point	P61530W	Texasgulf Inc.	25 N	92 W	20	NWNW	Monitoring	30113	Abandoned	M25 92 20 1D			
11	Well	P61531W	Texasgulf Inc.	25 N	92 W	19	NENE	Monitoring	30113	Abandoned	M25 92 19 3M	0 gpm	460	176.5
11a	Use Point	P61531W	Texasgulf Inc.	25 N	92 W	19	NENE	Monitoring	30113	Abandoned	M25 92 19 3M			
12	Well	P61532W	Texasgulf Inc.	25 N	92 W	19	NENE	Monitoring	30113	Abandoned	M25 92 19 2M	0 gpm	460	175.9
12a	Use Point	P61532W	Texasgulf Inc.	25 N	92 W	19	NENE	Monitoring	30113	Abandoned	M25 92 19 2M			
13	Well	P61533W	Texasgulf Inc.	25 N	92 W	19	NENE	Monitoring	30113	Abandoned	M25 92 19 1M	0 gpm	460	174.4
13a	Use Point	P61533W	Texasgulf Inc.	25 N	92 W	19	NENE	Monitoring	30113	Abandoned	M25 92 19 1M			
14	Well	P61534W	Texasgulf Inc.	25 N	92 W	18	SESE	Monitoring	30113	Abandoned	M25 19 18 1M	0 gpm	465	166.7
14a	Use Point	P61534W	Texasgulf Inc.	25 N	92 W	18	SWSE	Monitoring	30113	Abandoned	M25 19 18 1M			
15	Well	P61535W	Texasgulf Inc.	25 N	92 W	18	SESE	Monitoring	30113	Abandoned	M25 19 18 1S	0 gpm	355	159.5
15a	Use Point	P61535W	Texasgulf Inc.	25 N	92 W	18	SESE	Monitoring	30113	Abandoned	M25 19 18 1S			
16	Well	P61536W	Texasgulf Inc.	25 N	92 W	18	SESE	Monitoring	30113	Abandoned	M25 92 18 1D	0 gpm	615	195.7
16a	Use Point	P61536W	Texasgulf Inc.	25 N	92 W	18	SESE	Monitoring	30113	Abandoned	M25 92 18 1D			
17	Well	P61537W	Texasgulf Inc.	25 N	92 W	17	SESW	Monitoring	30113	Abandoned	M25 92 17 1S	0 gpm	340	170.53
17a	Use Point	P61537W	Texasgulf Inc.	25 N	92 W	17	SESW	Monitoring	30113	Abandoned	M25 92 17 1S			
18	Well	P61538W	Texasgulf Inc.	25 N	92 W	17	SESW	Monitoring	30113	Abandoned	M25 92 17 1M	0 gpm	480	182.7
18a	Use Point	P61538W	Texasgulf Inc.	25 N	92 W	17	SESW	Monitoring	30113	Abandoned	M25 92 17 1M			
19	Well	P61539W	Texasgulf Inc.	25 N	92 W	17	SESW	Monitoring	30113	Abandoned	M25 92 17 1D	0 gpm	529	204.5
19a	Use Point	P61539W	Texasgulf Inc.	25 N	92 W	17	SESW	Monitoring	30113	Abandoned	M25 92 17 1D			
20	Well	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NENW	Miscellaneous	30904	Cancelled	TE 38	25 gpm	380	220
20a	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	SESE	Miscellaneous	30904	Cancelled	TE 38			
20b	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	NESE	Miscellaneous	30904	Cancelled	TE 38			
20c	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	NWSE	Miscellaneous	30904	Cancelled	TE 38			

Table 2.2-3 **Abandoned and Cancelled Wells (Page 4 of 4)**

ID [1]	Well or Use Point	Permit Number	Applicant [2]	Township	Range	Section	¼ of the ¼	Uses	Priority	Status	Permit Facility Name	Yield [3]	Well Depth (ft)	Static Well Depth (ft)
20d	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	12	SWSE	Miscellaneous	30904	Cancelled	TE 38			
20e	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SWSE	Miscellaneous	30904	Cancelled	TE 38			
20f	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SESE	Miscellaneous	30904	Cancelled	TE 38			
20g	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SESW	Miscellaneous	30904	Cancelled	TE 38			
20h	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NESE	Miscellaneous	30904	Cancelled	TE 38			
20i	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NWSE	Miscellaneous	30904	Cancelled	TE 38			
20j	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NESW	Miscellaneous	30904	Cancelled	TE 38			
20k	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NWSW	Miscellaneous	30904	Cancelled	TE 38			
20l	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SWSW	Miscellaneous	30904	Cancelled	TE 38			
20m	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NWNE	Miscellaneous	30904	Cancelled	TE 38			
20n	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SWNE	Miscellaneous	30904	Cancelled	TE 38			
20o	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	SENE	Miscellaneous	30904	Cancelled	TE 38			
20p	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	13	NENE	Miscellaneous	30904	Cancelled	TE 38			
20q	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NWSE	Miscellaneous	30904	Cancelled	TE 38			
20r	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SWSE	Miscellaneous	30904	Cancelled	TE 38			
20s	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SESE	Miscellaneous	30904	Cancelled	TE 38			
20t	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SWSW	Miscellaneous	30904	Cancelled	TE 38			
20u	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	SESW	Miscellaneous	30904	Cancelled	TE 38			
20v	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NESE	Miscellaneous	30904	Cancelled	TE 38			
20w	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NESW	Miscellaneous	30904	Cancelled	TE 38			
20x	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	14	NWSW	Miscellaneous	30904	Cancelled	TE 38			
20y	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SWNW	Miscellaneous	30904	Cancelled	TE 38			
20z	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SENW	Miscellaneous	30904	Cancelled	TE 38			
20aa	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SENE	Miscellaneous	30904	Cancelled	TE 38			
20ab	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NENW	Miscellaneous	30904	Cancelled	TE 38			
20ac	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NWNW	Miscellaneous	30904	Cancelled	TE 38			
20ad	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NENE	Miscellaneous	30904	Cancelled	TE 38			
20ae	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	NWNE	Miscellaneous	30904	Cancelled	TE 38			
20af	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	23	SWNE	Miscellaneous	30904	Cancelled	TE 38			
20ag	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NWNW	Miscellaneous	30904	Cancelled	TE 38			
20ah	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SWNW	Miscellaneous	30904	Cancelled	TE 38			
20ai	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SENW	Miscellaneous	30904	Cancelled	TE 38			
20aj	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SENE	Miscellaneous	30904	Cancelled	TE 38			
20ak	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NENW	Miscellaneous	30904	Cancelled	TE 38			
20al	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NENE	Miscellaneous	30904	Cancelled	TE 38			
20am	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	NWNE	Miscellaneous	30904	Cancelled	TE 38			
20an	Use Point	P68449W	USDI, BLM – Texasgulf Inc.	25 N	93 W	24	SWNE	Miscellaneous	30904	Cancelled	TE 38			

* WSEO, 2006

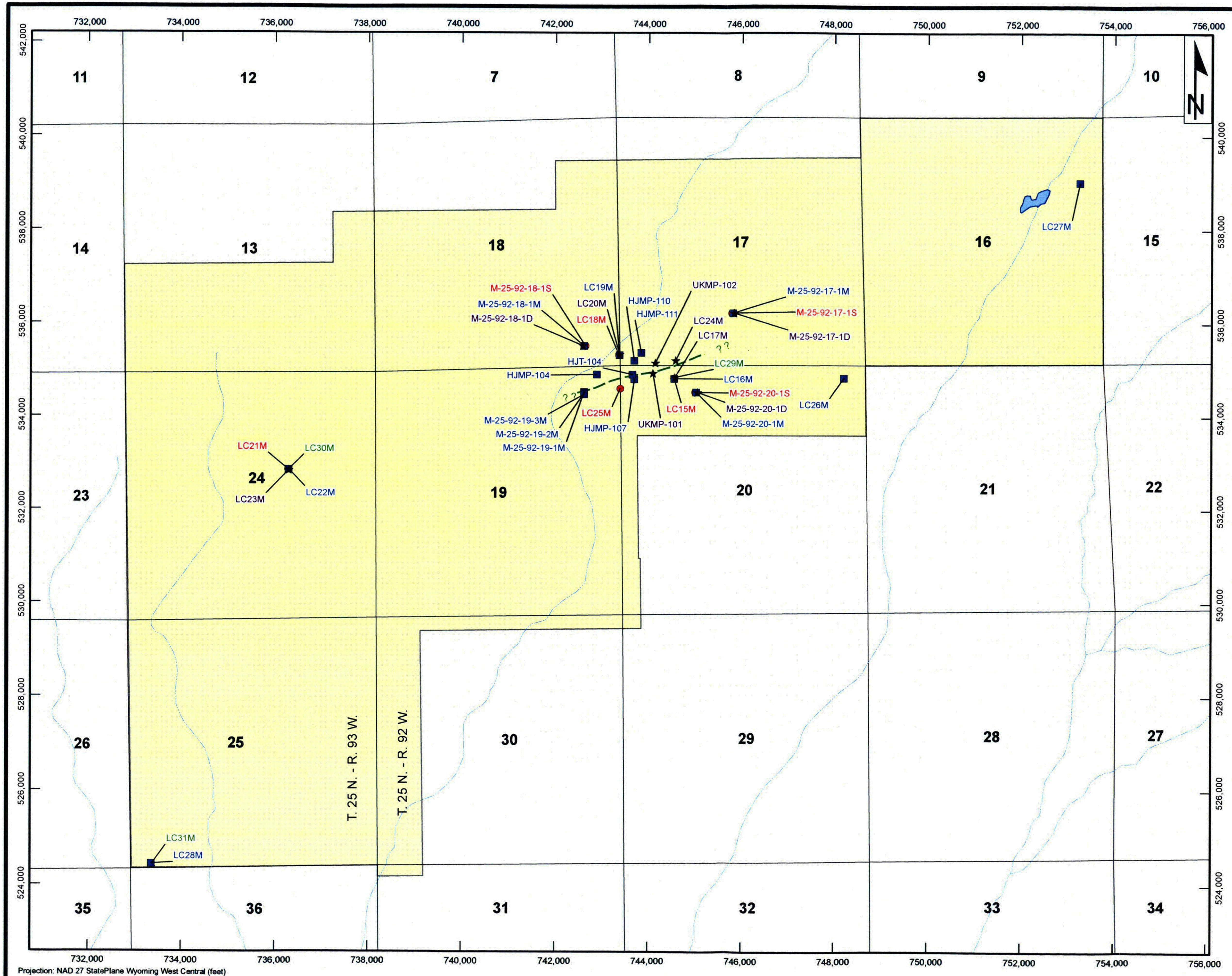
[1] Each number represents a well. A number followed by a letter(s) is a point of use related to the well.

= Well within two miles of the Permit Area.

= Point of use within two miles of the Permit Area.

[2] USDI BLM = United States Department of Interior's Bureau of Land Management; WSBLC = Wyoming State Board of Land Commissioners

[3] INP = Information not provided by the online WSEO database.



Lost Creek ISR, LLC
Littleton, Colorado, USA

Petrotek www.petrotek.com Littleton, CO USA

FIGURE 2.7-9
Location Map, Lost Creek Monitor Wells

Lost Creek Permit Area

Issued For: NRC TR | Drawn By: JM

Issued/ Revised: 12.08.08

Drawing No.: LC-TR Figure 2.7-9.mxd

0 2,000 4,000 Feet

Table 2.7-9 1982 and 2006 Pump Test Results

Well ID	Completion Zone	Date of Test Startup	Pumping Well	Underreamed interval[6]	Pumping Rate	Length of Test	Max Drawdown	Transmissivity/Analytical Method								
								Cooper Jacobs[7]		Hantush		Jacob Recovery		Average	Average Hydraulic Conductivity	Storativity
				(feet)	(gpm)	(hr:min)	(feet)	(gpd/ft)	(ft2/d)	(gpd/ft)	(ft2/d)	(gpd/ft)	(ft2/d)	(ft2/d)	(ft/d)	
Multi-Well Tests																
LC16M[1]	HJ	11/8/2006	LC16M	57	15	19:50	21.8	818	109.4			769	102.8	106.1	1.9	
LC19M[2] 1st	HJ	10/26/2006	LC19M	51	17.6-18.8	10:42	26.4	553	73.9			719	96.1	85.0	1.7	
LC19M[2] 2nd	HJ	11/2/2006	LC19M	51	17.6-18.8	25:30	29.1	590	78.9			773	103.3	91.1	1.8	
LC22M[3]	HJ	11/15/2006	LC22M	81	11.75	45:00	36.3	3007	402.0			1605	214.6	308.3	3.8	
M-25-92-19-1M	HJ	8/17/1982	M-25-92-19-2M	~50	30	25:10	28.5	700	93.6	730	97.6	760	101.6	97.6	2.0	8.40E-04
M-25-92-19-2M	HJ	8/17/1982	M-25-92-19-2M	~50	30	25:10	49	730	97.6	580	77.5	620	82.9	86.0	1.7	
M-25-92-19-3M	HJ	8/17/1982	M-25-92-19-2M	~50	30	25:10	31.7	680	90.9	610	81.6	730	97.6	90.0	1.8	3.30E-04
M-25-92-20-1M[4]	HJ	8/19/1982	M-25-92-20-1M	~50	30	25:00	25	2000	267.4			1300	173.8	220.6	4.4	
Single Well Tests																
LC26M	HJ	11/17/2006		55	13.6-14.3	1:09	9.7	1821	243.4						4.4	
LC27M 1st	HJ	10/24/2006		23	12.8-13.0	2:05	12.5	1659	221.8						9.6	
LC27M 2nd[5]	HJ	11/16/2006		23	8.8	2:13	8.2	2013	269.1						11.7	
LC15M	LFG	11/26/2006		54	14.2	1:50	32.1	302	40.4						0.7	
LC18M 1st	LFG	9/20/2006		42	8.8-13.0	3:25	94	33	4.4						0.1	
LC18M 2nd	LFG	11/22/2006		42	'7.5 to 10	2:17	50.5	62	8.3						0.2	
LC21M	LFG	11/26/2006		23	13.1	3:45	50.2	303	40.5						1.8	
LC25M	LFG	11/17/2006		33	9.4-12.2	2:01	75	212	28.3						0.9	
LC17M	UKM	11/26/2006		36	13	2:15	26	195	26.1						0.7	
LC20M	UKM	11/22/2006		32	12-12.5	2:21	23.5	520	69.5						2.2	
LC23M	UKM	11/26/2006		35	9.9	3:56	25	583	77.9						2.2	
LC24M	UKM	11/26/2006		53	12.1	1:12	24	561	75.0						1.4	
LC29M	DE	9/20/2006		40	0.67	0:31	10.3	10	1.3						0.0	
LC30M 1st	DE	9/20/2006		40	2.7-3.3	5:02	13	231	30.9						0.8	
LC30M 2nd	DE	11/26/2006		40	7	2:55	24	573	76.6						1.9	
LC31M	DE	11/26/2006		40	7	1:34	14	1098	146.8						3.7	

[1] -No significant response from HJ observation wells LC19M (across fault 1,284 ft), LC22M (8,500 ft) or LC26M (3,640 ft) during the test

[2] -No significant response from HJ observation wells LC16M (1,284 ft), LC22M (7,500 ft) or LC26M (4,850 ft) (all located across the fault) during the test.

[3] -No significant response from HJ observation wells LC16M (8,502 ft) or LC28M (8908 ft) or from LFG well LC21M (15 ft) or UKM well LC23M (15 ft) during the test

[4] -No response from overlying (M-25-92-20S) or underlying (M25-92-20-D) observation wells during the test

[5] - Pump was shut off after 59 minutes for 10 minutes, then test was resumed

[6] - The underreamed interval in the M-25-92 series wells is estimated. These data not provided in Hydro-Search, Inc report (1982)

[7]- Hydro Engineering (2007) reported early and late time values for Cooper Jacobs analytical methods. Only late time data results are shown here. Late time data provides better representation as much of the early time data is impacted by casing storage and later time date shows effects of fault

Well Completion Data-2006 Long Term Pump Tests

Well ID	Easting	Northing	Completion Zone	Measure Point Elevation	Top Underreamed Interval	Bottom Underreamed Interval	Top Underreamed Interval	Bottom Underreamed Interval
	(feet)	(feet)		(ft amsl)	(ft bgs)	(ft bgs)	(ft amsl)	(ft amsl)
LC19M Test								
LC19M	743,383	535,317	HJ	6,950.52	412	463	6,539	6488
LC16M	744,562	534,820	HJ	6,936.38	410	467	6,526	6469
LC22M	736,292	532,850	HJ	6,926.06	504	585	6,422	6341
LC26M	748,203	534,832	HJ	6,955.67	376	431	6,580	6525
LCM15	744,546	534,823	LFG	6,936.57	286	340	6,651	6597
LC18M	743,368	535,316	LFG	6,949.03	290	332	6,659	6617
LCM25M	743,397	534,601	LFG	6,936.40	316	349	6,620	6587
LCM17	744,562	534,840	UKM	6,936.87	529	565	6,408	6372
LC20M	743,383	535,331	UKM	6,950.64	511	543	6,440	6408
LC24M	744,580	535,203	UKM	6,944.63	478	531	6,467	6414
LC16M Test								
LC16M	744,562	534,820	HJ	6,936.38	410	467	6,526	6469
LC19M	743,383	535,317	HJ	6,950.52	412	463	6,539	6488
LC22M	736,292	532,850	HJ	6,926.06	504	585	6,422	6341
LC26M	748,203	534,832	HJ	6,955.67	376	431	6,580	6525
LCM15	744,546	534,823	LFG	6,936.57	286	340	6,651	6597
LC18M	743,368	535,316	LFG	6,949.03	290	332	6,659	6617
LCM25M	743,397	534,601	LFG	6,936.40	316	349	6,620	6587
LCM17	744,562	534,840	UKM	6,936.87	529	565	6,408	6372
LC20M	743,383	535,331	UKM	6,950.64	511	543	6,440	6408
LC24M	744,580	535,203	UKM	6,944.63	478	531	6,467	6414
LC22M Test								
LC22M	736,292	532,850	HJ	6,926.06	504	585	6,422	6341
LC16M	744,562	534,820	HJ	6,936.38	410	467	6,526	6469
LC28M	733,364	524,437	HJ	6,805.19	502	557	6,303	6248
LCM15	744,546	534,823	LFG	6,936.57	286	340	6,651	6597
LC21M	736,277	532,850	LFG	6,927.13	375	398	6,552	6529
LCM17	744,562	534,840	UKM	6,936.87	529	565	6,408	6372
LC20M	743,383	535,331	UKM	6,950.64	511	543	6,440	6408
LC23M	736,292	532,835	UKM	6,926.80	595	630	6,332	6297

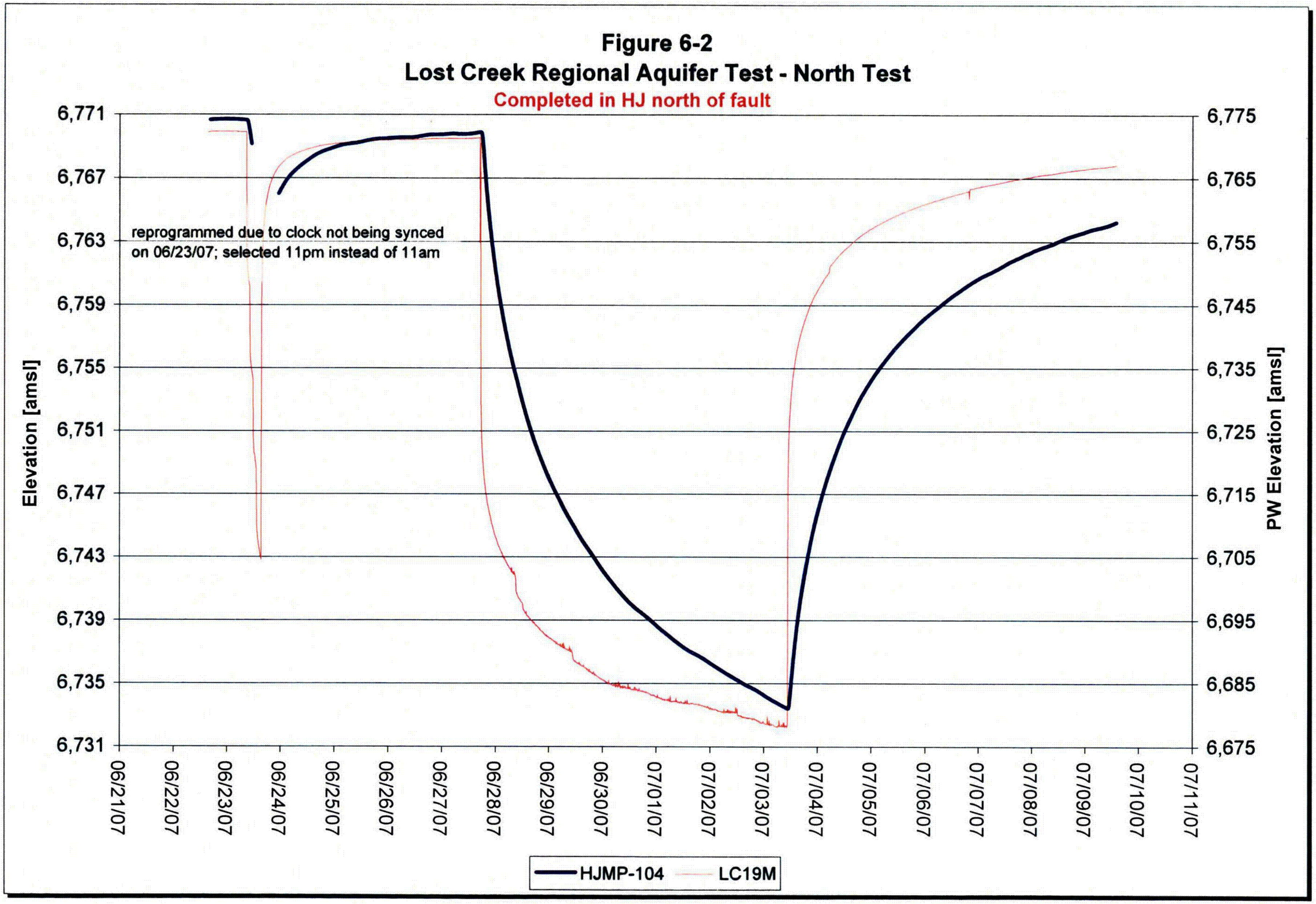


Figure 6-2
Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
reprogrammed due to clock not being synced on 06/23/07; selected 11pm instead of 11am
Elevation [amsl]
PW Elevation [amsl]
6,771
6,767
6,763
6,759
6,755
6,751
6,747
6,743
6,739
6,735
6,731
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
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07/11/07
HJMP-104
LC19M

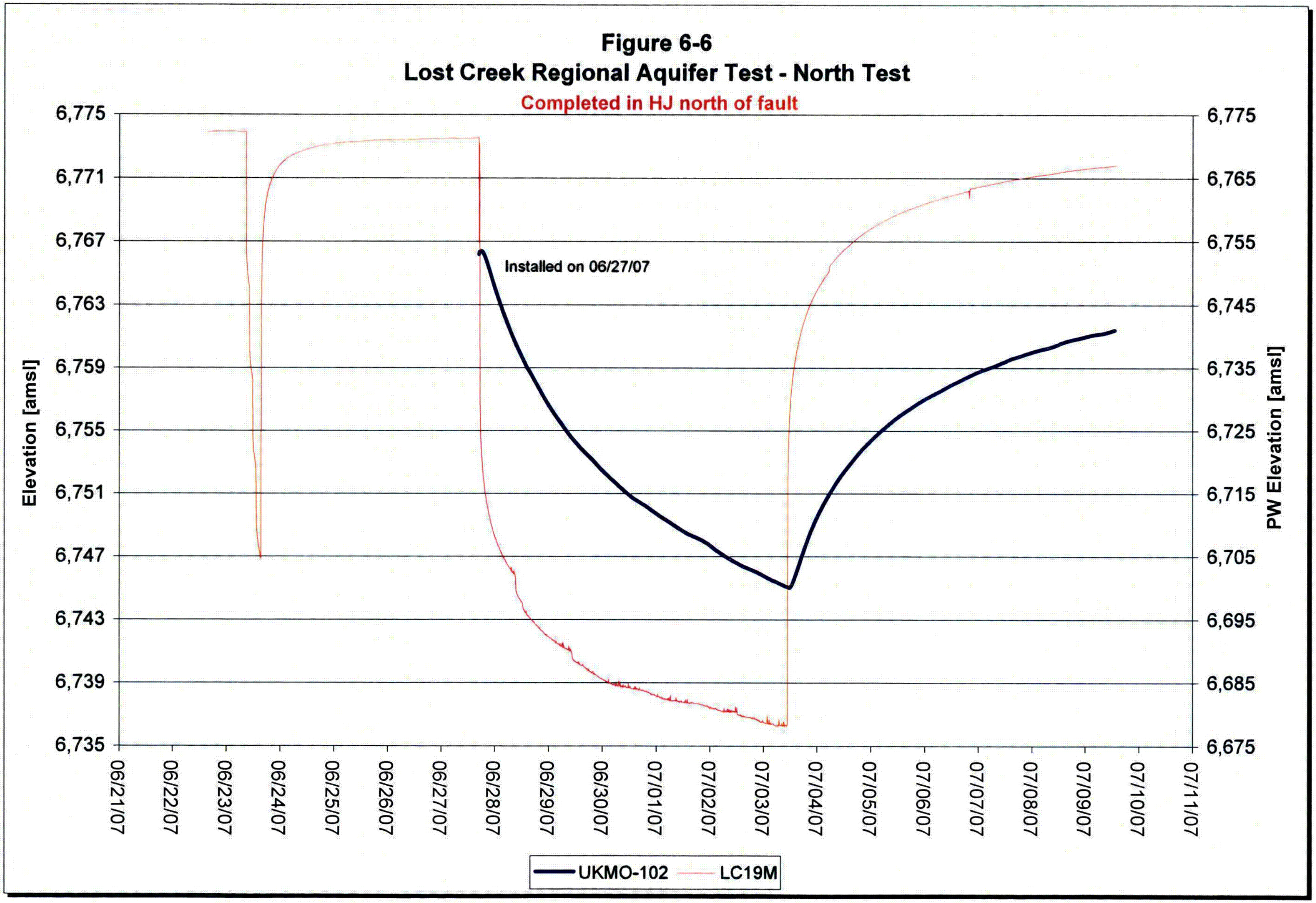

Figure 6-6
Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
Elevation [amsl]
PW Elevation [amsl]
6,775
6,771
6,767
6,763
6,759
6,755
6,751
6,747
6,743
6,739
6,735
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
Installed on 06/27/07
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
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07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
UKMO-102
LC19M

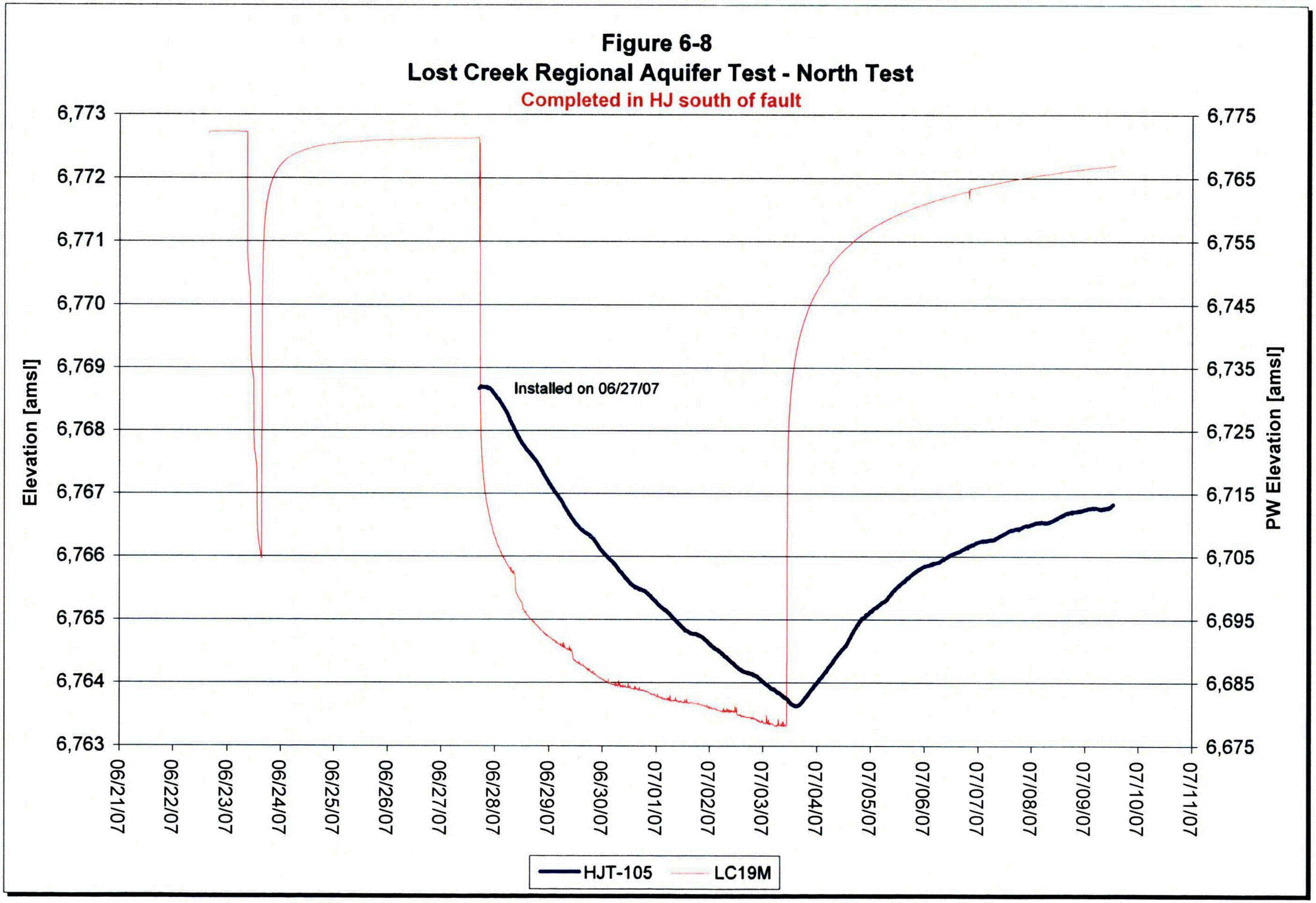

Figure 6-8
Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault
Elevation [amsl]
PW Elevation [amsl]
6,773
6,772
6,771
6,770
6,769
6,768
6,767
6,766
6,765
6,764
6,763
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
Installed on 06/27/07
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
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07/09/07
07/10/07
07/11/07
HJT-105
LC19M

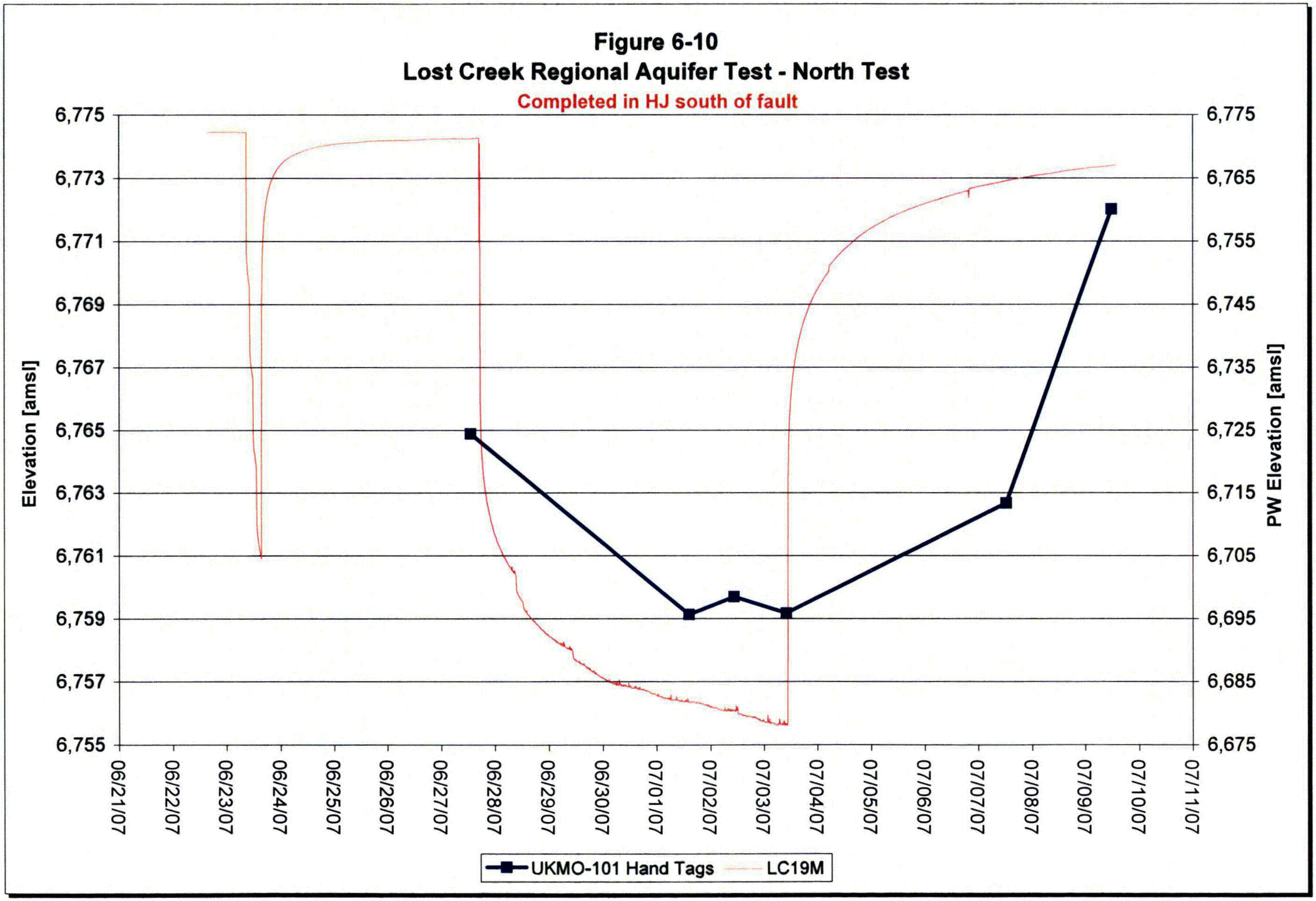

Figure 6-10
Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault
Elevation [amsl]
PW Elevation [amsl]
6,775
6,773
6,771
6,769
6,767
6,765
6,763
6,761
6,759
6,757
6,755
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
UKMO-101 Hand Tags
LC19M

Revised Table 3-1
LC ISR, LLC
Lost Creek Regional Aquifer Test
Well Information

LC19M Test																				
LocId	Test	Type Well	Completion Horizon	Completion Sand	GS Elevation	TOC Elevation	Easting (feet)	Northing (feet)	Top Underreamed Zone (ft bgs)	Bottom Underreamed Zone (ft bgs)	Top Underreamed Zone (ft msl)	Bottom Underreamed Zone (ft msl)	Distance from pumping well (feet)	Same side of fault as pumping well?	Distance from Fault (feet)	Casing I.D. (inches)	06/27/07 DTW	06/27/07 Elevation	DTW at End of Test	Water Elevation at End of Test
LC19M	North Test	PZ Pumping Well	HJ	LHJ	6,949.32	6,950.52	743,383	535,317	412	463	6,537.32	6,486.32	0	-----	480	4.5	180.08	6,770.44	273.40	6,677.12
HJMP-104	North Test	Prod. Zone Monitor	HJ	MHJ	6,939.76	6,941.01	742,900	534,900	405	430	6,534.76	6,509.76	638	Yes	245	4.5	171.81	6,769.20	208.25	6,732.76
HJMP-110	North Test	Prod. Zone Monitor	HJ	LHJ	6,945.95	6,947.14	743,700	535,200	430	475	6,515.95	6,470.95	338	Yes	310	4.5	174.89	6,772.25	215.37	6,731.77
HJMP-111	North Test	Prod. Zone Monitor	HJ	MHJ	6,948.98	6,950.32	743,850	535,370	395	440	6,553.98	6,508.98	470	Yes	460	4.5	176.94	6,773.38	212.50	6,737.82
HJT-104	North Test	Prod. Zone Monitor	HJ	LHJ	6,938.78	6,940.11	743,660	534,900	413	463	6,525.78	6,475.78	501	Yes	15	4.5	169.51	6,770.60	209.95	6,730.16
UKMO-102	North Test	Prod. Zone Monitor	HJ	MHJ	6,940.33	6,940.79	744,150	535,160	377	408	6,563.33	6,532.33	783	Yes	190	4.5	165.15	6,775.64	186.69	6,754.10
HJMP-107	North Test	Prod. Zone Monitor	HJ	MHJ	6,937.13	6,938.40	743,700	534,800	443	460	6,494.13	6,477.13	606	No	85	4.5	183.61	6,754.79	184.95	6,753.45
HJT-105	North Test	Prod. Zone Monitor	HJ	UHJ	6,938.12	6,938.78	744,450	535,030	405	436	6,533.12	6,502.12	242	No	20	4.5	170.09	6,768.69	175.02	6,763.76
LC16M	North Test	Prod. Zone Monitor	HJ	UHJ	6,934.76	6,936.38	744,553	534,811	410	467	6,524.76	6,467.76	1284	No	545	4.5	178.14	6,758.24	179.61	6,756.77
UKMO-101	North Test	Prod. Zone Monitor	HJ	MHJ	6,940.57	6,942.48	744,100	534,940	465	485	6,475.57	6,455.57	810	No	5	4.5	177.59	6,764.89	183.30	6,759.18
LC20M	North Test	Underlying Monitor	KM	UKM	6,949.27	6,950.64	743,383	535,331	511	543	6,438.27	6,406.27	14	Yes	496	4.5	202.36	6,748.28	203.23	6,747.41
UKMP-102	North Test	Underlying Monitor	KM	UKM	6,940.87	6,942.03	744,150	535,150	485	505	6,455.87	6,435.87	785	Yes	190	4.5	190.68	6,751.35	191.83	6,750.20
UKMP-101	North Test	Underlying Monitor	KM	UKM	6,940.26	6,941.75	744,100	534,930	540	572	6,400.26	6,368.26	815	No	20	4.5	192.13	6,749.62	192.66	6,749.09
LC18M	North Test	Overlying Monitor	FG	LFG	6,948.43	6,949.03	743,368	535,316	290	332	6,658.43	6,616.43	15	Yes	480	4.5	168.04	6,780.99	169.14	6,779.89
LC25M	North Test	Overlying Monitor	FG	LFG	6,935.00	6,936.52	743,397	534,601	316	349	6,619.00	6,586.00	697	No	215	4.5	167.05	6,769.47	168.60	6,767.92

RESPONSES TO NRC COMMENTS
of 11/6/2008 on

SECTION 3.0
Description of the Proposed Facility

in the Technical Report for the
LOST CREEK PROJECT
Wyoming

Section 3.2 Mine Unit Process, Instrumentation and Control)

LCI has not provided sufficient information regarding the ISR mine unit operation and instrumentation and control to enable the staff to fully understand this topic and to support other reviews dependent on that understanding. Specifically, the following information should be provided:

1. ***A clarification and explanation for how selective completion of the mine unit monitoring well ring in specific sands in the HJ horizon will be sufficient to capture horizontal excursions outside the extraction zone. For example, if the monitoring ring well is only completed in the MHJ sand in the belief it is the only sand present at the location, an excursion may migrate through the LHJ or UHJ without detection. Furthermore, please justify the use of 500 feet for the monitoring well ring spacing.***

   The selective completion of the mine unit monitoring well ring is a Wyoming Department of Environmental Quality (WDEQ) requirement. The WDEQ has clearly stated this request at planning meetings with LC ISR, LLC. Results of site pumping tests indicate that the various sand units within the HJ Horizon are hydraulically well connected and respond as a single hydrostratigraphic unit. A mine unit hydrologic test will be completed to demonstrate connection of the monitor ring wells to the production zone. Furthermore, it is unlikely that a horizontal excursion would selectively migrate within a specific sand in the HJ Horizon and not be present within the sand that was being produced. Completion across the entire HJ Horizon would most likely result in collection of samples that are more diluted with respect to any production fluids and would potentially decrease the likelihood of detection of an excursion.

   Based on the pumping test results, it is apparent that the radius of influence of a single pumping well greatly exceeds 500 feet. In fact, the LC19M pump test indicated a response in the HJ Horizon at a distance exceeding 1000 feet within 5 days. Therefore, an excursion detected at the monitoring ring placed 500 feet from the wellfield could be readily recovered by adjusting extraction and injection rates in nearby well patterns. As noted in TR Section 3.2.2.2, the distance for the monitor well spacing (as well as the projection and injection well spacing) will be specific for each mine unit, depending on the aquifer characteristics of that mine unit. Based on available information, a spacing of 500 feet is anticipated to be appropriate.

2. ***A monitoring strategy (number, location of wells) for detecting excursions into the FG sand when it is juxtaposed across the fault from the HJ extraction zone (figures 2.6-1 c-e).***

This information will be provided in the Mine Unit 1 Well Data Package.

3. ***A monitoring strategy (number, location of wells) for detecting excursions into the KM sand when it is juxtaposed across the fault from the HJ extraction zone (figures 2.6-1 c-e).***

   This information will be provided in the Mine Unit 1 Well Data Package.

4. ***A description of which sands will be used to provide water for well drilling and completions and the total volume anticipated to be withdrawn. An evaluation of whether the water use in these sands will impact water levels in the overlying extraction or underlying aquifers.***

   Increasingly detailed information on the geohydrologic conditions at the Lost Creek site is becoming available (TR Section 2.7), and LC ISR, LLC is in the process of updating the geohydrologic information and associated information on drawdowns, pore volumes, and other aspects of mining and restoration. LC ISR, LLC anticipates submitting the updated information during the week of January 12, 2009.

5. ***Standard industry practice for MIT tests requires less than a 10 percent pressure drop of 20 minutes. Please justify the use of the standard of less than 5 percent pressure drop over 10 minutes.***

   The alternate mechanical integrity test method of a 5% pressure drop over 10 minutes is in use at other in-situ uranium facilities in Wyoming and is accepted by the WDEQ.

6. ***Methods for timely detection and cleanup of leaks in the wellfield at wellheads and in surface and buried lines in the wellfield.***

   Several methods will be used for timely detection of leaks in the wellfield, including 'on-the-ground' inspections, flow and pressure instrumentation, and fluid detection systems. Cleanup methods will include measures to stop the leak and reconnaissance to determine the extent of cleanup and required safety measures, as well as treatment, removal, and/or disposal needs.

   'ON-THE-GROUND' INSPECTIONS. The first and foremost method for timely detection of leaks is a regular presence of Operators in the wellfields. The Operators will be responsible for taking measurements (i.e., double checking instrument readings) and looking for leaks and problems at the header houses. In addition, their regular routine will include checking each of the wellheads for fluids or salts from evaporated fluids and repairing them as needed. They will also be required to drive the pipeline rights-of-way and check the valve stations for fluids or salts.

INSTRUMENTATION. Several types of instruments, described in more detail in the response to Comment 7 below, will be used in several ways to detect leaks. Flow and pressure data will be continuously transmitted to the Operations Center in the Plant for review by Operators. In addition, algorithms are being developed to alarm in the event of changes against previous data and set points. In the event that an alarm sounds, Operators will be notified and the well/line will be checked for an upset condition.

FLUID DETECTION SYSTEMS. These systems will also be used in the header houses and at the wellheads to alarm the Operators of potential upset conditions (see the response to Comment 7 below). The first component of these systems is typically based on the leaking fluid completing an electrical circuit which initiates an audible/visible alarm locally and/or transmits an alarm to the Operations Center. The second component of these systems is typically a shutdown switch, which is triggered if there is an accumulation of fluids in a header house sump, and an alarm transmitted to the Operations Center.

CLEANUP. If an alarm occurs or an Operator has an indication of a leak, the affected system will immediately be shut down and repaired. Prior to repair, the leak or spill will be reported internally (as required) and to the appropriate agency (if required). The Site RSO or HPT will evaluate the nature of the leak/spill, obtain soil samples as necessary, and determine the appropriate method of remediation. If fluid or salts are present when the event is noted, the Operator and/or designated personnel will collect and dispose of the material properly.

7. ***Descriptions of the process and wellfield instrumentation, controls and radiation safety monitoring instrumentation, including their minimum specifications and operating characteristics. LCI provides only a general commitment to have instrumentation and controls to monitor production, injection, and waste flows, and to have instrumentation to alarm for system failures. The descriptions of the process and wellfield instrumentation and controls and radiation safety monitoring instrumentation need to be more detailed and specific, including their minimum specifications and operating characteristics (alarms, interlocks, etc.). The descriptions should focus on how the instrumentation and controls are adequate to identify quickly and remedy all potential processing problems that can increase exposures to radiological and chemical hazards.***

PROCESS INSTRUMENTATION

There will be three layers of protection associated with the process instrumentation:

I) Automated Monitoring and Data Output;
II) Alarm; and
III) Control.

I) Automated Monitoring and Data Output

a) Piping: Piping will typically be monitored for flow and pressure. Some of the readings will normally be taken to the operator's computer for continuous monitoring and data recording. The others will typically be local readouts to give the operator an idea of what is going on in the plant. For example, the total flow rates on the IC and PC lines may be monitored and recorded by the computer. The individual flow rates for each column may be local readouts so the operator can monitor the system's effectiveness.
b) Tanks: All process tanks will typically be monitored for fluid level. The level readout will typically be brought back to the plant operator's computer for continuous monitoring. Some tanks (precipitation) may be monitored for pH. In that case, pH data will also be brought back to the computer for continuous monitoring. Additional data monitoring will normally be brought back to the operator's computer as well.
c) Processes: Processes that are set to run automatically after the operator turns them on will typically be monitored continuously by the computer. These processes will monitor the flow, pressure, pH, level and all necessary indicators to ensure proper operation. In the event of an upset condition (operating parameters outside preset levels), alarms will typically occur to notify the operator.

II) Alarm

a) Piping: High and low set points will typically be set for plant piping with continuous monitoring. If the pressures or flow rates fall outside the set points, alarms will typically notify the operator.
b) Tanks: High and low set points will typically be set for the key tank process indicators such as level, pH, and temperature. If the indicators fall outside the set points, alarms will typically notify the operator.
c) Processes: If programmed processes are not operating as within the preset operating conditions, the operator will typically be notified audibly and on the control screen.

III) Control

a) Piping: Control valves will typically be utilized where applicable to shut down flow in the event of a piping failure or over pressurization.
b) Tanks: Control valves will typically be utilized for level control. As the levels change, valves will normally be used to maintain normal tank operating conditions.
c) Processes: Control valves may be used in automating and controlling some of the processes. They will turn open and close as needed to keep the process moving.

WELLFIELD INSTRUMENTATION

There will be three layers of protection associated with the wellfield instrumentation on the pipelines and header houses (The same three layers of protection associated with the wellfield instrumentation will also be associated with the plant instrumentation.):

IV) Automated Monitoring and Data Output;
V) Alarm; and
VI) Control.

I) Automated Monitoring and Data Output

a) Pipelines: Pressures will be monitored and sent to the Plant for Operator review. Flow algorithms may be used to review differential flow status to determine if there is a potential problem. Monitoring points will be at pump discharges and at header house entrances. Also, if booster stations are used, the inlet and outlet pressures at those stations will also be monitored.
b) Header Houses:
   1) Oxygen: Oxygen pressures will be monitored for abnormal operating conditions.
   2) Production Systems: The main header pressure and flow rate will be monitored as well as the flow rate of each of the production wells for abnormal operating conditions. The On/Off status of each of the pumps will also be monitored.
   3) Injection Systems: The main header pressure and flow rate will be monitored as well as the flow rate of each of the injection wells for abnormal operating conditions.

4) Header House Sumps: Sump levels and the operating status of the sump pumps in the header house basements will be monitored and transmitted to the Plant for review/alarm.

II) Alarm

a) Pipelines: High and low set points will be set for pipeline data. If pressures are outside the set points, Operators will be notified via alarm and Wellfield Operators will address the upset condition.
b) Header Houses:
   1) Oxygen: High and low data points will be set for oxygen injection piping within the header houses. If pressures are outside the set points, Operators will be notified via alarm and Wellfield Operators will address the upset condition.
   2) Production Systems: The main header pressure and flow rate will have high and low set points. If there is an upset condition, Operators will be notified via alarm and Wellfield Operators will address the upset condition. The same is true for individual production well flow rates as well as the On/Off status of the pumps. Flow algorithms may be utilized to review differential flow status to determine if there is a potential problem. Production wellheads will have fluid detection systems to alarm of the presence of a leak. The fluid will close a circuit that will generate an alarm either locally, at the plant, or both.
   3) Injection Systems: The main header pressure and flow rate will have high and low set points. If there is an upset condition, Operators will be notified via alarm and Wellfield Operators will address the upset condition. The same is true for individual injection well flow rates. Flow algorithms may be utilized to review differential flow status to determine if there is a potential problem. Injection wellheads will have fluid detection systems to alarm of the presence of a leak. The fluid will close a circuit that will generate an alarm either locally, at the plant, or both.
   4) Header House Sumps: If sumps have fluid in them, the sumps will be activated and the fluid pumped into the production header. Anytime the sumps are activated, the Plant Operator will receive an indication. If a high level in the sump is received, the Operator will receive an alarm and the Wellfield Operator will address the upset condition.

III) Control

a) Pipelines: Where applicable, control valves will be used to moderate flow and pressure.

b) Header Houses:
   1) Oxygen: Pressure switches and interlocks with the injection system will be utilized to insure that oxygen injection cannot occur without adequate flow and pressure in the injection header. The concept being that if oxygen is only allowed to enter the injection header when water is present, then dangerous concentrations cannot build up in the piping.
   2) Production Systems: There are several levels of control and shutdown within the production system. The PLC will be connected to the Plant and will allow for shutdown/startup of all production wells in upset conditions. The main valve will be capable of being shut based on operating conditions, i.e., sump overflow, ruptured flowline, etc. The motor control center (MCC) will typically be interlocked with the sump high level shutoff to shut down operating pumps. The wellheads will typically utilize any leaking fluid to complete a circuit and initiate an alarm in the form of either an audible/visible alarm locally or by transmitting an alarm to the operations center. Simple systems included in the piping include check valves to insure that pipeline production fluid cannot enter shutdown sections of pipe.
   3) Injection Systems: Control of this system begins with the control valve where the injection fluid enters the header house. This valve will maintain the appropriate pressure and flow for the local operating conditions as well as allow for complete shutdown of injection. Data from the main flow line and the individual injection wells will be transmitted to the Plant for review. If there is an upset condition, operators will be notified and the suspect area will be shut down for maintenance. The wellheads will typically utilize any leaking fluid to complete a circuit and initiate an alarm in the form of either an audible/visible alarm locally or by transmitting an alarm to the operations center.
   4) Header House Sumps: High sump levels will initiate a shutdown in the production wells and alarm the Operators.

8. ***Revised drawdown calculations for the extraction zone which include the impact of the fault as opposed to the infinite aquifer assumption during full capacity operation (6000 gpm) with groundwater sweep (original no-fault calculations on page 3-14 estimate 146 ft and 114 ft drawdown at 2 and 3 miles respectively). Please account for the fact that the fault, if it is sealing as described, will separate the extraction area into two zones. The consumptive use will exacerbate the drawdown in the presence of a sealing fault and change the impact of the drawdown on both sides of the fault. One may use an analytical model and account for the influence of the fault through superposition of image wells across the fault to estimate the drawdown.***

Revised drawdown calculations have been performed. Although the original calculations did not directly account for the impact of the fault, the transmissivity used in the calculations was an "effective" transmissivity, which was impacted by the fault, as described in the Response to Comment 2.7.2 #12. It should also be noted that the aquifer thickness assumed in those calculations was only 50 feet instead of 120 feet. Pump tests at the site indicate that the entire HJ Horizon will most likely respond to pumping and therefore a thickness of 120 feet is more appropriate for determining long-term and distant impacts of pumping. The unimpacted transmissivity and storativity were estimated to be 144 ft^2/d and 7×10^{-5}, respectively, using the principle of superposition and image well theory as described in Response to Comment 2.7.2 #12. Image well theory was used to predict drawdown at distances of 2 and 3 miles from the centroid of production after 8 years of production and restoration activities, assuming a no flow boundary condition at the fault. This calculation assumes that the fault is of infinite extent (which it is not) and all of the production will occur on the same side of the fault (which it will not because the projected mine units are on both sides of the fault). The predicted drawdown at the end of production/restoration operations at an average pumping rate of 175 gpm will be 177 ft at 2 miles from the centroid of production and 147 ft at 3 miles. However, as noted, the fault is not of infinite extent, probably extending no more than a mile in either direction from the centroid of the production area. In addition, production will be occurring on both sides of the fault, effectively reducing the long term average pumping rate that should be used in the calculation. Therefore, the drawdown should be less than the calculated value. While the fault will have substantial impacts on localized drawdown in the vicinity of the mine units, the effect at great distance will be noticeably reduced. For a lower bounding limit, the drawdown was calculated at the end of production and restoration at distances of 2 and 3 miles from the centroid of production using the unimpacted transmissivity and storativity values without consideration of the fault (i.e., assuming an infinite acting aquifer). The calculated drawdown for that case at 2 and 3 miles, respectively, is 89 and 74 ft. These two calculations provide a reasonable bounding limit to the drawdown that can be expected as a result of ISR activities at the projected rates. The drawdown at the 2 mile radius should be between 89 and 177 ft, and the drawdown at the 3 mile radius should be between 74 and 147 ft.

9. ***A potentiometric contour map showing the calculated drawdown for full capacity consumptive water use over a five mile radius and the wells within this radius which may be impacted.***

Increasingly detailed information on the geohydrologic conditions at the Lost Creek site is becoming available (TR Section 2.7), and LC ISR, LLC is in the process of updating the geohydrologic information and associated information on drawdowns, pore volumes, and other aspects of mining and restoration. This includes a contour map showing the calculated drawdown for full capacity consumptive water use over a five mile radius, which LC ISR, LLC anticipates submitting during the week of January 12, 2009.

10. ***A comprehensive explanation of how LCI will operate the mine units in the HJ horizon to address the potentially large drawdowns that will occur near the fault when the operation is up to full capacity.***

Increasingly detailed information on the geohydrologic conditions at the Lost Creek site is becoming available (TR Section 2.7), and LC ISR, LLC is in the process of updating the geohydrologic information and associated information on drawdowns, pore volumes, and other aspects of mining and restoration. LC ISR, LLC anticipates submitting this information during the week of January 12, 2009.

11. ***A statement that LCI will submit all wellfield hydrologic packages to NRC for review and approval before extraction begins, as LCI does not have a record of performance with NRC.***

LC ISR, LLC will submit wellfield hydrologic packages to NRC for review and approval until such time as the NRC is comfortable with LC ISR, LLC's management experience and SERP process.

12. ***Section 4.1.2 of the application discusses the ventilation systems that are planned for the facility. Please provide details on the type, size, and location of the ventilation systems.***

Preliminary HVAC designs are attached at the end of the responses for TR Section 3, and show the location of all of the planned ventilation systems.

The calculated air space is approximately 470,240 cubic feet. The fans, located at the center of the plant on floor level, are sized to remove air from the building at a rate of 50,000 cfm (25,000 cfm each). This is enough to ensure 6 air changes per hour.

For the tank specific ventilation, each area will typically be equipped with a utility set fan to remove the air. Each system will typically also have a redundant exhaust fan to allow for maintenance on the primary fan while maintaining ventilation. A summary of the preliminary fan specifications are in the following table.

Quantity	Name	Area Served	Use	Flow Rate
2	EF-7 (A/B)	IX Columns and Guard Columns	On/Off as needed	300 cfm
2	EF-8 (A/B)	Waste Water Tanks and Area Sumps	Always On	300 cfm
2	EF-9 (A/B)	Elution Tanks and Permeate Tank	On/Off as needed	300 cfm
2	EF-10 (A/B)	Resin Shaker Screens and Elution Columns	On/Off as needed	6,000 cfm
2	EF-11 (A/B)	Resin Water Tanks and Area Sumps	Always On	400 cfm
2	EF-12 (A/B)	Precipitation Tanks	Interlocked with PLC to be on during a precipitation cycle	200 cfm
2	EF-13 (A/B)	Restoration Columns	On/Off as needed	300 cfm
1	EF-14	Transfer Bay	On/Off as needed	7,000 cfm

All of the utility set fans will typically vent through a "knock-out" pot. The purpose of the "knock-out" pot is to ensure the fans are only venting air. The ducting from the tank and columns will go into a tank partially filled with fresh water. Any particulates or moisture will be trapped in the water in the "knock-out" pot, and the fans will just vent the air.

13. ***Please discuss radiation safety monitoring devices and other process safety controls that will be used within the central processing plant. The discussion should focus on the availability and reliability of these systems. This should include a discussion of controls that are used to minimize or eliminate the hazards presented by radioactive materials or chemicals that may impact radiological safety.***

The initial risk assessment is complete, but is still under review by management. LC ISR, LLC anticipates submitting a response during the week of January 12, 2009.

14. ***Please provide details regarding the quantities and storage locations of chemicals that will be used at the facility. This should include a list of federal, state, and local regulations that LCI intends to use to ensure that chemicals that have the potential to impact radiological safety are handled in a safe and appropriate manner. Also, please provide a discussion of the operating conditions (temperature, pressures, and flow rates) that will exist during operation of the central processing plant for both radioactive and non-radioactive materials that may have an impact on radiological safety.***

The plans for chemical storage are under review by management. LC ISR, LLC anticipates submitting a response during the week of January 12, 2009.

3.3 Plant Processes, Instrumentation and Control

LCI did not provide sufficient information to assess the plant processes, instrumentation, and controls of the proposed facility. Such information is necessary to determine if LCI will be operating its central plant safely. Please provide the following information requested below.

1. ***Section 3.3 indicates that LCI plans to accept loaded ion exchange resins from other satellite facilities operated by LCI and/or other third party facilities. Please provide a discussion related to shipping and handling of third party resins, including potential impacts of shipping and transportation. Furthermore, such third parties must be identified in the license. Therefore, the parties must be identified in this license application or subsequent license amendment applications.***

   LC ISR, LLC believes that the responsibility for transporting loaded resin in accordance with applicable requirements is that of the company shipping the resin. Furthermore, NRC's request to list third party companies supplying loaded resin to a licensee is unprecedented, and the regulatory basis for this request is not clear. In addition, LC ISR, LLC does not know at this time who may be supplying loaded resins for processing at Lost Creek. However, LC ISR, LLC commits to informing NRC of any contracts with third party loaded resin suppliers, when those contracts are in place, and to listing those third parties in the license if NRC deems necessary.

2. ***Section 3.2.7.1 provides information on the operation and shutdown mechanisms that will be used if a piping failure occurs. Please provide similar discussion related to backup systems or other controls within the central processing plant. The discussion should also address the actions that will occur at the facility (central processing plant, wellfields, and header houses) in the event of a power failure or other potential disruptions in operations.***

   Please see Responses to Comments 3.2 #6 and 3.2 #7 also.

   The plant will typically be equipped with the appropriate instrumentation to monitor flow, pressure, level, pH, and temperature where needed. This instrumentation will normally alert the operator to possible problems both on the Plant computer and audibly. If necessary, the instrumentation may shut the process down depending on the nature of the problem.

The main injection/production lines coming from the field will typically have automated valves. If there is a loss of power, pressure or flow, the change will alarm the operator on the computer and audibly in the Plant. In the case of power loss or problems in the Plant, the automated valves are designed to open a by-pass loop and the fluids will return to the field. This will keep the wellfields operational while isolating the Plant to complete repairs.

In the case of an upset condition in the chemical area, the operator will normally be alerted on the computer and audibly to the problem. Instrumentation will shut down the process if it is resulting in a release (piping break or tank overfill). Also, there will be a chemical area emergency stop. If failures occur in the chemical area during operation (or loading), the operator (or chemical delivery driver) could hit the emergency stop button. This action will stop all pumps and close all valves in the chemical area. Instrumentation will stay active, but there will be no movement of chemical until the area is restarted.

In the case of an upset condition in the other systems (elution, precipitation, and restoration), the instrumentation will normally alert the operator on the computer screen and audibly. If necessary, the instrumentation will shut the process down.

An additional safety aspect/control point will be the installation of two plant emergency stops located outside the building. One will be located outside the office main entrance door and one outside the rear plant entrance door. If either of these buttons is pushed, the entire plant will shut down and valves will close; only instrumentation will remain operational.

In the event of a total power failure, wellfields and header houses will shut down until power is restored. Only the emergency and critical systems in the plant will remain operational.

3. Please provide the following information regarding the deep disposal wells:

a. Maximum number of disposal wells to be installed at the Lost Creek facility.

A minimum of two disposal wells will be constructed, regardless of the injection acceptance rate for each well, to allow for routine testing and maintenance. The maximum number of disposal wells that will be constructed depends upon:

- The injection acceptance rate of each well, which can only be estimated at this time, and

- The calculated maximum disposal rate, based on total plant capacity of 6,000 gpm, which is the output from the Stage Two RO as outlined in Figure 3.2-5):

Restoration RO:	640 gpm x 25%	=	160 gpm
Restoration GWS:	160 gpm x 25%	=	40 gpm
Total Input to Stage One RO:			200 gpm
Production Bleed:	6,000 gpm x 1%	=	60 gpm
Total Input to Stage Two RO:			260 gpm
Output from Stage Two RO:	260 gpm x 50%	=	130 gpm

Based on the above calculation, if each injection well sustains an injection acceptance rate of 100 gpm, then two wells will be installed to accommodate the needed disposal capacity of 130 gpm, with the potential for installation of a third well to allow for significant down time.

b. Information regarding the instrumentation and controls that are planned for the deep disposal wells.

The disposal well injection system will typically be controlled by the Plant Operators. The transfer pump and the injection pump will be interlocked to insure that one cannot operate without the other. Pressure and flow rates will be measured and compared at each of the pumps. If there is a discrepancy outside allowable tolerances, the system will alarm the Operator and shut down the pumps. The transfer pump is planned to be located in the Plant building while the injection pump is planned for the wellhead building at the disposal well.

c. Basis for reaching a conclusion on the number of deep wells that will be needed for liquid waste disposal

Please see Response to Comment 3.3 #3(a).

List of Information Included with the Responses
to
NRC Comments on Lost Creek TR Section 3.0
December 12 2008

For Comment 3.2 #12:
Preliminary HVAC Designs (Plates M1 through M4)

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SHEET M1

D-03

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D-06

RESPONSES TO NRC COMMENTS
of 11/6/2008 on

SECTION 4.0
Effluent Control Systems

in the Technical Report for the
LOST CREEK PROJECT
Wyoming

Section 4.0 Effluent Control Systems

LCI did not provide sufficient information to assess the effluent control systems for the proposed facility. Information regarding the workplace ventilation, radiation monitoring, effluent composition, liquid and solid wastes is necessary to allow the staff to assess the manner in which LCI is protecting public health and the environment. Please provide the following information requested below.

Section 4.1 Gaseous Emissions and Airborne Particulates

1. ***Details regarding the Continuous Working Level (CWL) monitor system regarding calibration frequency and methods.***

   A unit such as an Alpha Nuclear PRISM working level system will be used to monitor facility working level (WL). Information on the instrument function, output, error check, limitations, and calibration are outlined below, along with LC ISR, LLC's commitment for system use.

   WL measurement involves drawing ambient air through a filter and close-counting the alpha particle radiation from radon progeny trapped on the filter. The Alpha Nuclear monitors run continuously; alpha counts are integrated into 10 minute periods and stored in nonvolatile memory with the capacity to store 55 days of data. Software performs WL calculations and generates reports that include: average WL; maximum WL; periodic WL; and graphical WL plots.

   These CWL monitors use mass airflow measurement, providing the system microprocessor with data for feedback-based flow control. If the filter becomes clogged with dust and the pump cannot maintain flow rate, it provides an error message. The flow rate should be checked at least weekly to make sure the system is operating properly.

   The PRISM will be used as a warning device, not for calculating dose. It will be calibrated according to the manufacturer's instructions and checked regularly according to the manufacturer's instructions. Alpha Nuclear will annually recalibrate the units at their Saskatchewan facility. The units are calibrated in a specially designed chamber. Radon gas is injected into the chamber, with particulates. The units run for 48 hours; readings are checked against other permanently mounted instruments and grab samples from the chamber. The units will be "source checked" at the facility on a regular basis. An alpha source placed in the counting area, counted for 10 minutes, checks system reproducibility. Instrument background can be checked periodically as well, by inserting a clean filter and turning off the pump.

LC ISR, LLC commits to compliance with the manufacturer's instructions and recommendations concerning use of the PRISM system, and to training by Alpha Nuclear staff at the time of initial use of the instrument at the Lost Creek facility. If LC ISR, LLC decides to use a system other than the PRISM, LC ISR, LLC will inform NRC.

2. ***LCI has established an administrative action level for radon-222 at 25% of the derived air concentration (DAC) limit, per regulatory guides 8.30 and 8.31. However, LCI has not established the equivalent for uranium. Provide information regarding the administrative action level for uranium based on its DAC.***

LCI plans to use a value of 25% of the 10 CFR 20 non-stochastic Derived Air Concentration (DAC) for soluble uranium as the facility action level for uranium in air: 1.25 x 10^{-10} microCuries per milliliter (µCi/ml). Dose calculations will be made on the basis of the stochastic DAC of 8 x 10^{-10} µCi/ml.

3. ***On page 4-2 of the Technical Report LCI states: "Airborne particulates may also include minor amounts of salt and soda ash releases during deliveries to the Plant…" However, NUREG/CR-6733, A Baseline Risk-Informed, Performance-Based Approach for In Situ Leach Uranium Extraction Licensees, estimates that soda ash releases from facilities using baghouse dust collection systems that are over 99 percent efficient are typically 2 tons/yr. Provide an analysis of soda ash release during operations.***

An analysis of soda ash emissions shows that approximately 13.5 pounds of particulate will be released per year. The analysis assumes that: 5.2 pounds of particulate is created per ton delivered. There will be 17.5 tons of soda ash per delivery; and 521.1 tons of soda ash is used each year. Although 1.35 tons of particulate is created each year, a standard passive bag house filter will capture 99.5% of the material (using emission factors from EPA's AP-42 (Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition) resulting in a total emission of 13.5 pounds. A similar analysis of salt emissions, utilizing a passive bag house filter, concludes that approximately 17.5 pounds of salt will be emitted per year.

4. ***Regarding accident scenarios involving yellowcake slurry, LCI states: "Given that the slurry storage tanks will be positioned a considerable distance from exterior walls and within a bermed area it is highly unlikely that a ruptured vessel of yellowcake slurry could reach the outdoor environment." Provide an analysis of the volume of bermed area compared to the largest yellowcake slurry vessel.***

Two slurry storage tanks are planned (TR Plate 3.1-1). The total containment volume of the bermed area is enough to hold the contents of both slurry vessels if they were both ruptured. The following numbers are approximate because they are rounded to work in whole numbers):

Volume of one yellowcake slurry vessel: ~ 1722 ft^3

Volume of containment:

Area of precipitation/yellowcake slurry room: 39 ft x 178.5 ft = ~6961 ft^2

Area taken up by tanks/filter presses/pumps/ramps: ~700 ft^2

Total useable area: 6961 ft – 700 ft = 6261 ft^2

Volume of sloping foundation: (0.5) x (6261 ft^2) x (.396 ft) = ~1240 ft^3

Minimum height of berm: 0.5 ft

Volume of bermed area: 0.5 ft x 6261 ft^2 = ~3130 ft^3

Volume of sumps (2 at 18 ft^3 each) = 36 ft^3

Total containment volume: 3130 ft^3 + 1240 ft^3 + 36 ft^3 = 4406 ft^3

5. ***Regarding potential accident scenarios involving yellowcake slurry on site, LCI refers to analyses of accidents discussed in NUREG/CR-6733. The discussion in NUREG/CR-6733 is focused on uranium oxide, U3O8. According to Section 3.3.3 of the Technical Report, "Hydrogen peroxide will then be added to the eluate to effect precipitation of the uranium as uranyl peroxide. Caustic soda solution will then be added to elevate the pH, which promotes growth of uranyl peroxide crystals and makes the slurry safer to handle in the subsequent process steps." Various references (e.g., R.F. Leininger, J.P. Hunt, and D.E. Koshland, Jr., "Composition and Thermal Decomposition of Uranyl Peroxide," Chemistry of Uranium, USAEC, TID-5290, Book 2 (1958)) describe this precipitate as UO4*nH2O, where the typical value of n is 2. Since the values of density, solubility class (thus dose) and other physical parameters depend on the molecular formula, provide a justification for utilizing an accident scenario for uranium oxide and applying it to uranyl peroxide.***

The term U3O8 has historically been used by both the industry and the NRC to refer to uranyl peroxide and various uranium oxides. Technically, U_3O_8 does not exist but the term is commonly used in marketing the end product. When LC ISR, LLC refers to U_3O_8 it is referring to uranyl peroxide in solution, slurry, or dried yellowcake. This usage of the term is consistent with the analysis performed in NUREG/CR-6733. A further review of other portions of NUREG/CR-6733 reveals that the terms uranyl peroxide and U_3O_8 are used interchangeably.

6. ***Redundant Exhaust Fans:***

   a. ***Provide a comparison of the capacity of the redundant exhaust fans to the primary exhaust fans.***

The redundant exhaust fans will be the same size and model as the primary exhaust fans.

b. ***Will redundant exhaust fans be connected to the same power supply as the primary exhaust fans?***

Yes, the redundant exhaust fans will be connected to the same power supply. The redundant fans are in place to ensure ventilation when the primary fan goes down for mechanical or maintenance reasons. In the event of a power loss, the emergency and critical processes will continue to run on the backup generator. Ventilation, including the primary and redundant exhaust fans, is considered a critical process and will be tied into the backup generator.

__Section 4.2 Liquid Wastes__

LCI needs to provide the following additional information related to the liquid effluents at the proposed facility:

1. ***Provide information on the expected chemical and radiological composition of the liquid waste stream to be disposed of in the deep wells.***

   LC ISR, LLC is evaluating historic and recent information in relation to the anticipated composition of this liquid waste stream and anticipates providing a response the week of January 12, 2009.

2. ***Provide additional information related to releases on site. The discussion should address the following issues: the health and safety impacts of a spill, inspection practices, inspection frequencies, measures planned to contain spills on or below the ground surface within wellfields or near evaporation ponds, details of the planned fluid detection system, procedures for determining if a radiation work permit will be needed to address a release, notification, and recordkeeping efforts related to spills.***

   Given the anticipated low concentration of radionuclides in injection and production fluids and the fact that spilled solutions are not likely to become airborne until they dry, it is unlikely that an employee will receive a significant radiation dose while responding to a spill. Section 4.2.3 of NUREG CR/6733 presents a conservative calculation that supports this conclusion. However, to maintain ALARA, once operations commence and the radionuclide content of the mining solutions is known, the RSO shall perform an analysis to determine if a credible scenario exists that could result in a significant dose to an employee or to a member of the public. For purposes of this determination, significant shall mean any dose greater than 10% of applicable regulatory limits. A spill response SOP will be in place before the initiation of operations, but the RSO will use the results of the analysis to ensure the SOP is adequate to ensure ALARA spill response. The RSO shall review the SOP at least annually to ensure continued accuracy and relevance. If a spill scenario is not described in an SOP, then an RWP must be written, pursuant to Section 5.2 of the Technical Report, before remediation can begin.

Inspections play an important role in preventing and discovering leaks. Sections 5.3.1 and 5.7.6.5 of the Technical Report address the inspection practices and frequencies. With regard to instrumentation used to detect leaks, see Responses Comment 3.2 #6 and 5.7.1 #3, as well as Sections 4.2.5.5 and 5.7.1.4 of the Technical Report.

3. ***The proposed storage ponds need to meet the applicable requirements of 10 CFR Part 40, Appendix A. LCI needs to provide the following additional information to allow for NRC staff to compare the proposed pond design to the applicable requirements of 10 CFR Part 40, Appendix A:***

    a. ***The results of the geotechnical investigation for the proposed pond location, including discussion of soil classification, grain size analysis, compaction, and density requirements. The results of the geotechnical investigation should also discuss the liquefaction potential of the soils that will be used to construct the storage pond embankments.***

    The geotechnical investigation has been completed, and the evaluations and analyses based on investigation results are underway. LC ISR, LLC anticipates submitting a response during the week of January 12, 2009.

    b. ***Evaluations of both slope stability and settlement demonstrating that the pond will remain stable and that the liner system will not be compromised. The slope stability analysis should consider the critical section of the proposed embankment under the anticipated loading conditions. The settlement analysis should reflect the foundation soil conditions, liner system, and anticipated loading conditions.***

    Please see Response to Comment 4.2 #3(a).

    c. ***An analysis of the required freeboard in the storage ponds. The storage ponds should have adequate freeboard to allow for transfer of liquids between the ponds in the event of a leak and prevent overtopping of the storage ponds by wave run-up or significant rainfall events. Note that wave run-up is dependent on the open area of the pond, the anticipated wind speeds, and the anticipated wind direction at the site.***

Please see Response to Comment 4.2 #3(a).

d. *Detailed discussion of the components of the liner system. The discussion should include: the required subgrade preparation techniques, the material and thickness for the impermeable liner, the anticipated liner seaming techniques, the permeability of the sand used in the leak detection layer, and chemical compatibility between the liner material and the liquids stored in the ponds.*

Please see Response to Comment 4.2 #3(a).

e. *A discussion of how the pond areas will be decommissioned and reclaimed.*

Please see Response to Comment 4.2 #3(a).

f. *A set of detailed drawings showing the planned location of the storage ponds, cross section of the liner system, and construction details.*

Please see Response to Comment 4.2 #3(a).

g. *A set of construction specifications for the storage ponds. This should include a quality assurance plan for soil and liner installation.*

Please see Response to Comment 4.2 #3(a).

h. *The results of the preoperational monitoring program to provide a determination of the baseline groundwater quality data in the vicinity of the storage ponds.*

Please see Response to Comment 4.2 #3(a).

i. *A detection monitoring program to identify if the storage ponds are leaking. This program should include: the frequency for monitoring the leak detection system, justification for the selection of indicator parameters for sampling liquids found in the leak detection layer and surrounding groundwater monitoring wells, action levels for obtaining chemical samples of liquids in the leak detection system, notifications to be made upon leak identification, and follow up actions after a leak has been identified. Note that the indicator parameters selected should allow for a clear distinction to be made between the liquids contained in the pond and groundwater.*

Please see Response to Comment 4.2 #3(a).

j. A discussion of the location of the ponds and the measures that will be taken to protect the ponds from surface water run on. This may require a review of the upstream catchment area and any diversion channels or slope protection around the embankments.

Please see Response to Comment 4.2 #3(a).

k. A discussion of any anticipated maintenance activities that may be required over the life of the storage ponds.

Please see Response to Comment 4.2 #3(a).

4. A demonstration that well completion, development and pumping test water originating from the extraction zone will have a minimal potential radiological impact on health and safety.

Groundwater generated during well completion, well development, sample collection and pump tests before injection of lixiviant in a mine unit is outside the jurisdiction of the NRC and is therefore regulated by OSHA under 29 CFR 1910.1096. Any discharge of these fluids to the surface may be regulated by the WDEQ under the Wyoming Pollution Discharge Elimination System (WYPDES) program if dictated by the radionuclide content or other parameters. During well development/completion, sample collection, and pump testing, this water will be discharged to the surface under the provisions of a general WYPDES permit, if required, in a manner that mitigates erosion, or will be reused in the drilling process.

During lixiviant injection in a mine unit and prior to completion of mine unit restoration, liquid 11(e)(2) byproduct or source material that may be generated from activities such as well completion or development will be carefully collected in a manner that minimizes direct employee contact. For example, when completing or developing a well which contains NRC regulated material, the water will be directed to a lined pit or directly to a water tank to prevent contamination of the soil. The water will be collected and disposed of in the facility's licensed waste water system. The RSO shall develop procedures for these activities that ensure dose to employees is minimized by time, distance and shielding as appropriate. Potentially affected employees will be trained in the SOP. The RSO shall also, upon initiation of operations, perform an analysis to determine the potential dose from the source material based on actual radionuclide chemistry. The results of the analysis will be used to write the SOP in an ALARA manner. Since these solutions will be contained in pits, tanks and piping conveyances, the external radiologic consequence to employees and members of the public will be less than that generated by the solution spill scenario contemplated in Section 4.2.3 of NRC NUREG CR/6733 which is characterized as having "no significant external radiological consequences." As long as the solutions are contained the only pathway for exposure would be external.

5. ***The basis for reaching a conclusion on the number of deep wells needed for liquid waste disposal and a description of the location, target formation depth, design, and capacity of deep disposal wells.***

   Please see the Response to Comment 3.3 #3(a) for information on the number and capacity of the deep wells.

   Location: The anticipated locations for the disposal wells are the southern portion of the Permit Area. The locations of the wells will greatly depend on the results of the test well being drilled at this time. Preliminary well locations are based on the regional geology, anticipated zones of possible injectivity, and maintaining the zone of influence within the permit area.

   Target Formation Depth: The selection of the receiver formation will depend on water quality, injectivity and existence of a satisfactory aquiclude or aquitard above the injection zone. The target receiver formation is anticipated to be between 6,000 feet and 10,000 feet below ground surface.

   Design and Construction: The wells will be designed and constructed in accordance with the UIC Class I well standards established by WDEQ/WQD, which has primacy in Wyoming for the UIC Class I wells.

6. ***A discussion of how LCI will evaluate the impact to the surficial aquifer from a surface spill.***

   The uppermost saturated geologic zone at Lost Creek is approximately 150 feet below ground surface. Numerous clay and silt zones above this saturated zone will prevent the migration of spilled solutions from contaminating this zone. However, a very large or long term leak could result in a perched aquifer. Since there is no simple method for determining the depth of penetration of a spill, LCI will attempt to determine the depth of penetration with a soil probe or by digging. If there is evidence that a perched aquifer may have been generated by a large or long term spill, an exploration type hole will be drilled to determine the depth of penetration of the spill and appropriate mitigation measures.

7. ***Information regarding the ability of the sump system to handle the volume of the largest hazardous materials source.***

Due to the possible reactions between chemicals and the other materials that might be in sumps, a full sump system connected to the waste water tanks is not planned in the chemical area. Releases from the waste water tanks, the soda ash storage, and the bicarbonate tank, which should not pose a reaction threat, will go directly to the sump system.

The sodium chloride (NaCl), sodium hydroxide (NaOH), and hydrogen peroxide (H_2O_2) all have separate berms around each tank. If a leak initiates from any of these tanks, the operator will typically be alerted through the instrumentation. The operator can then evaluate the problem and respond accordingly per standard procedures and safety guidelines. If compatible, the material can be transferred into the sump; otherwise it will be properly disposed of according to the Material Safety Data Sheet.

Volume of the tanks:
- The largest chemical tank is 16920 gallons (~2262 ft^3). The largest tank in the area is the waste water tank, 20726 gallons (~2771 ft^3).

Volume of containment:
- Area of chemical room: 39 ft x 77 ft = ~3003 ft^2
- Area taken up by tanks/pumps/berms: ~1075 ft^2
- Total useable area: 3003 ft – 1075 ft = 1928 ft^2
- Volume of sloping foundation: (0.5) x (1928 ft^2) x (.396 ft) = ~382 ft^3
- Minimum height of berm: 1 ft
- Volume of bermed area: 1 ft x 1928 ft^2 = 1928 ft^3
- Volume of sumps (2 at 9.5 ft^3 each) = 19 ft^3
- Total containment volume: 1928 ft^3 + 382 ft^3 + 19 ft^3 = 2329 ft^3

The containment area would contain an entire chemical spill in the event of a complete tank failure. For the waste water, it would not be completely contained in the chemical room. The foundation design allows for a shorter berm wall on the inside of the chemical room than on the exterior wall. This will direct any excess flow (in the event of a complete waste water tank failure) to be directed into the bermed area of the main plant rather than outside the building.

All chemicals stored outside, will have their own containment berm if required. Each berm will have the capacity for 110% of the associated tank volume. The acid, gasoline and diesel tanks will have separate berms. Oxygen and carbon dioxide tanks do not require berms.

Section 4.3 Solid Wastes

Provide a commitment to develop an agreement for off-site disposal of 11e.(2) byproduct material disposal at an NRC or Agreement State licensed facility. The

agreement should include commitments to notify NRC within 7 days if it is terminated and to submit a new agreement for NRC approval within 90 days of expiration or termination.

LC ISR, LLC commits to developing a disposal agreement with a facility licensed by the NRC or an Agreement State to accept 11(e)(2) materials. In the event such an agreement is terminated, LCI will notify NRC within seven (7) days and will submit a new agreement for NRC approval within 90 days of expiration or termination.

RESPONSES TO NRC COMMENTS
of 11/6/2008 on

SECTION 5.0
Description of the Proposed Facility

in the Technical Report for the
LOST CREEK PROJECT
Wyoming

Section 5.1 Corporate Organization and Administration

LCI has not provided sufficient information regarding the corporate organization and administration in Section 5.1 for the staff to fully understand this topic. Specifically, please address the following issues:

1. ***Figure 5.1-1 identifies the position of Manager Environmental Health and Safety (EHS) and Regulatory affairs and the position of Radiation Safety Officer (RSO). However, Section 5.1.5 of the application provides the details of the Site Supervisor EHS/RSO. This position is not identified on Figure 5.1-1, and it is not clear if the EHS and RSO responsibilities at the site level will be fulfilled by one or two people. Please reconcile this inconsistency between section 5.1.5 and Figure 5.1-1.***

   A revised Figure 5.1-1 is attached at the end of the responses for TR Section 5.0,

2. ***Based on the staff's review of Section 5.1, it is not clear who is responsible for construction of the facility. Please identify the department that is responsible for construction of the facility and details on the integration of construction activities with overall plant management.***

   The construction of the facility and the subsequent integration of the construction activities with operations will be overseen by the Engineering Staff which is managed by the Project Engineer. The Environmental Health and Safety Staff will also play an integral role in facility design and start-up and will work closely will all parties during the development of procedures, training, and inspections to ensure the As Low As Reasonably Achievable (ALARA) principle is adhered to throughout the Project.

3. ***The description of the Lost Creek organization does not specify which personnel will be onsite and which personnel are in corporate level positions. LCI needs to show its aspect of the site organization, including the role of the different organizations within the management chain (i.e., Ur-Energy USA, Inc.). The site level management text should discuss the independence of the Mine Manager, RSO, and SERP for raising significant safety issues to senior management. Also, please discuss and show the integration among groups that support construction, operation, and maintenance of the facility.***

   All LC ISR, LLC employees responsible for day-to-day operation of the facility will spend the majority of their time at the mine site. These include the positions of Mine Manager, Site Supervisor Environmental Health and Safety/Radiation Safety Officer (EHS/RSO), Health Physics Technician, Department Heads, and Uranium Recovery Workers. The positions of President, General Manager, and Manager EHS and

Regulatory Affairs will generally work out of the Casper, Wyoming office. LC ISR, LLC is a 100% owned subsidiary of Ur-Energy USA Inc. The President of LC ISR, LLC also serves in a senior management position with Ur-Energy USA Inc.

The Site Supervisor EHS/RSO will report directly to the Manager EHS and Regulatory Affairs and neither position shall have direct production responsibilities. This will allow the individuals filling these two positions to make sound decisions regarding EHS and radiation safety without being unduly pressured by production concerns. The Site Supervisor EHS/RSO shall have complete authority and responsibility to halt any work which they deem unsafe. The Mine Manager shall also have the authority and responsibility to halt any work which may be unsafe. No employee, regardless of position, shall place production ahead of protection of employees, the public, and the environment. No employee will be forced to perform work which, in their view, is unsafe or could result in an unnecessary exposure to radiation.

Members of the Safety and Environmental Review Panel (SERP) shall be allowed to consider proposed actions without undue influence from senior management. In other words, the result of the SERP will not be a foregone conclusion, but will be based on a thorough review of the proposal and its merit.

The successful construction and operation of an in situ recovery facility relies on the close cooperation of several groups. Construction of the facility will be managed by the Engineering Group under the leadership of the Project Engineer. While the facility is being designed and constructed, members of the EHS Department will be regularly involved to ensure EHS and radiation issues are being properly addressed. During construction, daily safety inspections will be performed by the EHS Department to ensure construction activities are being performed in a manner consistent with regulations. The Engineering Group shall perform regular inspections during construction to ensure the facility is constructed in a manner consistent with the approved design. During operations, all significant projects and maintenance will be performed under a work order system. The work order system will include a mechanism for convening a SERP if warranted. All work orders will be reviewed by the Engineering Group and EHS Department before initiation of work to ensure the proposed work is technically sound and protective of employees, public and the environment.

Section 5.2 Management Control Program

Providing the information presented below will allow NRC staff to ensure that the proper information is being reported and cultural resources will be protected. Lost Creek needs to provide a commitment to administer a cultural resources inventory

before engaging in any development activity not previously assessed by NRC, and that any disturbances associated with such development will be completed in compliance with the National Historic Preservation Act, the Archeological Resources Protection Act, and their implementing regulations. In addition, LCI needs to commit to cease any work resulting in the discovery of previously unknown cultural artifacts to ensure that no unapproved disturbance occurs.

Class I and III archeological studies were performed for the entire project area as described in Section 2.4 of the Technical Report. LC ISR, LLC commits to abiding by the requirements of the National Historic Preservation Act and the Archeological Resources Protection Act and their implementing regulations. In addition, LC ISR, LLC commits to ceasing work resulting in the discovery of previously unknown cultural artifacts to ensure that no unapproved disturbance occurs.

Section 5.7.1 Effluent Control Techniques

LCI did not provide sufficient information regarding effluent controls for the proposed facility. This information is necessary for the NRC staff to assess the ability of LCI to control and monitor emissions, protect worker health, and collect the necessary data to calculate doses to the public. Please provide the following information:

1. ***In regards to 10 CFR 20.1301/1302, provide an analysis of the maximum expected dose to members of the public in restricted areas and other areas within the permit area. This analysis should include contractors receiving a public dose while in restricted areas and other areas within the permit area.***

   Prior experience at similar in situ recovery (ISR) facilities and conventional uranium mills indicates that it is unlikely that escorted visitors or contractors on site for limited periods of time will receive doses in excess of 100 millirem (mrem) per year from site operations. It is not possible to estimate the maximum expected dose to members of the public in the restricted areas and other areas of the site prior to site operations, since the areas where visitors and contractors may go and the time they may spend in these areas have not been determined. Such dose rates will depend on a number of factors, including As Low As Reasonably Achievable (ALARA) reviews. Doses to contractors will be estimated on a task-specific basis, and will be controlled to applicable limits.

   LC ISR, LLC will implement a radiation safety program for contractors and visitors. All contractors who work in restricted areas unescorted will be considered radiation workers and will receive radiation worker training. Escorted visitors and contractors will receive training commensurate with their potential exposures and the expected duration on site. The RSO will estimate the potential dose to visitors and contractors based on knowledge of where they are likely to be in the plant and current, measured exposure rates.

Prior to any work on the site by contractors, the RSO will estimate the maximum potential dose based on the expected tasks, previously measured external exposure rates in the areas to be occupied by contractors, and estimated exposure to airborne radionuclides. Radiation Work Permits (RWPs) will be issued for non-routine work. The potential doses to individuals performing such work will be estimated and noted on the RWPs.

Contractors who have a potential to receive doses in excess of 100 mrem in a year will be designated as radiation workers, will receive radiation worker training and will be subject to the same monitoring requirements as LC ISR, LLC site employees including personal dosimetry and bioassay. Doses to contractors will be tracked and recorded on the NRC Form 5 or equivalent if the doses exceed 500 mrem in a year.

Visitors or other unmonitored individuals will not be allowed in areas where the exposure rate exceeds 2.0 mrem/hr per the requirements of 10 CFR 20.1301(a)(2). Visitors will be on site for only short periods of time, minimizing the possibility of receiving significant radiation doses. Therefore, visitors will not be monitored.

2. ***Provide information on the testing, maintenance, and inspection of the ventilation equipment, including frequencies and minimum performance specifications. Where applicable, compare proposed testing, maintenance, and inspection to the manufacturers' recommendations.***

   Testing, maintenance, and inspection of the ventilation equipment will be done to the manufactures recommendations. The final equipment that will be used in the plant has not been specified or ordered yet. From the engineering design of the ventilation system, the general size and flow rates are known. Looking up the operational and maintenance manual on a representative system, periodic maintenance is required. From the manual, it is recommended that periodic maintenance be performed on the belts, bearings, fasteners, including lubrication and removal of dirt. Since the manual states "periodic" instead of a time frame (i.e. monthly) or operation time (i.e., 100 hours), the initial maintenance schedule will be to check all of the ventilation equipment quarterly. This schedule may be adjusted once operations start and maintenance personnel have evaluated the system's performance.

3. ***Regarding the release of pregnant lixiviant, LCI states: "NUREG/CR-6733 considers two conservative scenarios involving the release of pregnant lixiviant and loaded resin. In both scenarios, the authors determined that the spills would have no significant external radiological risks. The risks from associated radon releases are***

discussed in Section 5.7.1.1. All process and effluent liquids will be contained within pipelines, tanks, and storage ponds that are inaccessible to members of the public." NUREG/CR-6733, A Baseline Risk-Informed, Performance-Based Approach for In Situ Leach Uranium Extraction Licensees, is for guidance only. However, it does state that these types of spills cannot be discounted from risk assessment on the basis of probability and concludes that effluent levels and internal doses can be significant due to spills of pregnant lixiviant. LCI must analyze the risk regarding the release of pregnant lixiviant. Please provide a site-specific analysis for a spill of pregnant lixiviant in the field, including:

a. Mitigation against occurrence;

An evaluation of the risks is underway. LC ISR, LLC anticipates submitting a response during the week of January 12, 2009.

b. Spill response;

Please see Response to Comment 4.2 #2.

c. Remediation, including checks for undetected leaks; and

Please see Response to Comment 4.2 #2.

d. A detailed pathway analysis (including an analysis of onsite and offsite surface water bodies, including drainages) of potential dose to members of the public.

Both employees and members of the public may be exposed to radioactive constituents in a spill through: direct exposure; inhalation/ingestion of fluids or dry particulates and/or inhalation of radon. Exposure to radon is not considered a significant concern since it rapidly disperses outdoors.

Before a spill dries, the generation of airborne particulates and airborne fluids is improbable since there is no credible mechanism of generation. However, once a spill dries it is conceivable, if not likely, that some airborne particulate will be created by the wind. To assess the potential for exposure, it is reasonable to consider Section 4.4.3 of NRC NUREG CR/6733. The spill scenario presented is conservative given the extreme size of the spill and the elevated concentration of radium-226 (3,400 pCi/L) and uranium (39,700 pCi/L). Most ISR facilities have significantly lower radium-226 concentrations and slightly lower uranium concentrations. Despite the conservative values used, the analysis reveals that the soil would be below the decommissioning standard for radium-226 and uranium. Since this standard is intended to protect a member of the public who may actually live on the spill site after decommissioning, the soil should be considered safe with respect to radium-226 and uranium. However, in an effort to maintain ALARA, the RSO, upon initiation of operations, shall review the actual radionuclide content of the lixiviant and determine potential doses to employees and members of the public as the result of air particulate derived from credible spill scenarios. The existing SOP will be adjusted, if necessary, to ensure employees safely recover spills and effected soil and minimize the potential for public exposure. The RSO, as required, will review the SOP annually to ensure continued accuracy and relevance.

External exposure to radionuclides in the spill is addressed in NUREG CR/6733 and is characterized as a "negligible hazard" despite using conservative examination. The concentrations of radionuclides used in the NUREG analysis are significantly higher than those anticipated in the lixiviant at Lost Creek but the exposure pathway is the same. However, in an effort to maintain ALARA, the RSO, upon initiation of operations, shall review the actual radionuclide content of the lixiviant and determine potential doses to employees and members of the public as the result of external exposure resulting from credible spill scenarios. The existing Standard Operating Procedure (SOP) will be adjusted, if necessary, to ensure employees safely recover spills and effected soil and minimize the potential for public exposure. The RSO, as required, will review the SOP annually to ensure continued accuracy and relevance.

Section 5.7.2 External Radiation Exposure Monitoring Program

LCI did not provide sufficient information regarding the external radiation exposure monitoring program for the proposed facility. This information is necessary for the NRC staff to determine whether or not LCI's proposed program adequately protects worker and public health. Please provide the following information:

1. ***Details of survey equipment calibration methods***

Radiation detection instruments will be calibrated by the manufacturer or a qualified calibration laboratory at the manufacturer's suggested calibration intervals, in any case not to exceed one year. Calibration procedures used by Ludlum Instruments, Inc. are included in TR Attachment 5.7-1 Standard calibration at Ludlum Measurements, Inc. includes: "as found" readings; two calibration points per range; National Institute of Standards and Technology (NIST) traceable sources; and compliance with American National Standards Institute (ANSI) N323.

Instrument response using a check source in fixed geometry, and background checks will be performed each day the instrument is used. The results of the checks will be recorded on a standard form to be developed based on the individual instrument to be used. Control charts will be maintained for each instrument. The average of at least 20 measurements will be used to determine the standard deviation of the response. The mean of the measurements and three standard deviations above and below the mean will be indicated on the chart. The instrument will be deemed acceptable for use if the daily check source reading is within three standard deviations of the mean.

The counting yield (efficiency) for alpha detection equipment used for counting filters and wipes will be determined at least monthly using a NIST traceable standard source. Alpha survey meters used for detecting surface contamination on skin and clothing will be checked at least weekly to determine whether the instrument is operating within the prescribed limits, i.e., within three standard deviations of the mean value, determined as noted above. The RSO or HPT will review the control charts routinely to look for trends in check source response values. If a trend is noted, the instrument will be taken out of service and evaluated.

2. ***Regarding beta radiation surveys, LCI states: "If beta surveys are necessary, the RSO shall develop a monitoring program detailing frequency, acceptable equipment, calibration, methodology, and location in accordance with NRC Regulatory Guide 8.30 Appendix C. Instrumentation for monitoring beta radiation will be a Ludlum Model 44-9 pancake probe with a Model 3 meter (or equivalent)." However, Regulatory Guide 8.30, Appendix C, discusses a GM probe with an open/close window configuration while LC proposes to use a pancake probe. Assuming that beta monitoring will be required at some point during plant operations, provide information on the beta monitoring program detailing frequency of surveys, acceptable equipment, calibration methodology, and location for the type of detector proposed.***

Direct beta radiation surveys will be conducted at the facility in accordance with the requirements in Regulatory Guide 8.30. The Lost Creek facility will not have a yellowcake drying circuit. Yellowcake slurry will be shipped off site for drying and packaging. Therefore, there will be no large quantities of aged yellowcake that would indicate the need for routine direct beta radiation surveys. However, such surveys will be performed using a pancake Geiger Mueller (GM) probe and a Model 3 survey meter (or equivalent) as necessary in accordance with Regulatory Guide 8.30. Appendix C of Regulatory Guide 8.30 refers to a GM probe with a window that can be open or closed. Appendix C refers to a one-time determination of the correction factor for the instrument. The correction factor can be determined using a pancake probe and any shield that absorbs beta particles. If beta dose rate measurements are deemed necessary based on the presence of dried or aged yellowcake, the beta correction factor will be calculated as described in Regulatory Guide 8.30 and measurements will be made with a shielded and unshielded pancake probe. The beta dose rate will be calculated as described in Regulatory Guide 8.30.

3. ***To what energies will survey equipment be calibrated?***

Survey instruments will be calibrated according to the standard procedures of the calibration facility. In most cases, calibration facilities calibrate gamma survey meters against a cesium-137 source with a gamma energy of 0.662 million electron volt (MeV).

Alpha survey meters will be calibrated using a thorium-230 source (principal alpha energy = 4.68 MeV) or as prescribed by the calibration facility.

The beta survey instrument, a Model 3 survey meter or equivalent with a Model 44-9 GM pancake probe, will be calibrated using a technetium-99 source (maximum beta energy = 0.292 MeV) or a Sr-Y strontium-yttrium source with maximum beta energies of 0.546 MeV and 2.27 MeV, respectively.

4. ***The suggested sodium iodide survey meters for direct gamma exposure measurements are energy dependent detectors. What correction factors, if any, will be applied to determine the dose rate for the Lost Creek facility?***

The purpose of gamma radiation exposure rate surveys at uranium recovery facilities is to determine whether the dose rate in any area of the Plant is such that a worker could receive a dose in excess of 5 mrem in one hour. Such an area would be designated as a "Radiation Area" and marked with the appropriate signage. In addition, gamma survey readings can be used to determine whether a worker is likely to receive a radiation dose in excess of 500 mrem per year, thus requiring personal dosimetry measurements. A second purpose for the external exposure rate surveys is to evaluate whether radiation doses are being maintained ALARA and to note any unusual exposure rates.

The sodium iodide survey meters will be used to measure direct gamma exposure rates. While the meters are energy dependent, they generally overestimate the actual radiation dose rate at the gamma energies commonly associated with uranium recovery, particularly if they are calibrated against cesium-137. The survey meter measurements are not used to calculate doses to workers. Therefore, measurements made with a sodium iodide detector are inherently conservative.

Doses to workers will be determined using Thermoluminescent Dosimeters (TLD) or Optically Stimulated Luminescent (OSL) dosimeters provided by a National Voluntary Laboratory Accreditation Program (NVLAP) certified vendor as required by 10 CFR 20 (i.e., when the potential dose to the worker could exceed 500 mrem per year). External dose rates at the site boundary and various locations within the Lost Creek facility will be measured using TLD or OSL dosimeters.

Since TLD or OSL dosimeters will be used to assess dose to workers and dose rates at the perimeter of the facility, the use of sodium iodide detectors for measuring exposure rate is acceptable. There is no need to cross-calibrate the detectors against a Pressurized Ion Chamber to obtain the true exposure rate.

5. ***Discuss expected external exposure rates throughout the Plant and wellfield.***

Occupational radiation dose rates at typical ISR facilities are generally less than 200 mrem per year. The areas where direct radiation doses may be elevated are associated with radium precipitation in pipes, and radium and its decay products accumulating in IX resins and other filters. In some areas the dose rate may be as high as 8 mrem/hour. Previous experience with ISR facilities indicates that external gamma doses may be readily controlled to between 100 and 200 mrem per year (Brown, 2007). The dose rates in the mine units are generally indistinguishable from background (Dr. Tom Johnson, personal communication).

References:

Brown, S. H. 2007. Radiological Aspects of In Situ Uranium Recovery. American society of Mechanical Engineers, Proceedings of 11th international conference on Environmental Management, Bruges, Belgium, September 2007.

Johnson, T. 2009. Colorado State University Department of Environmental and Radiological Sciences. Personal communication.

<u>Section 5.7.3 In-Plant Airborne Radiation Monitoring Program</u>

LCI has not provided sufficient information regarding the airborne radiation monitoring program. Information regarding the air sampling program and administrative action levels is necessary to determine if the airborne radiation program is protective of worker health. Please provide the following information:

1. ***Regarding the lower limit of detection (LLD) of uranium particulate air sample analyses from Section 5.7.3.1, LCI states: "The quantity of air sampled and the method for analysis should allow a lower limit of detection (LLD) of at least 1 x 10-11 microcuries per milliliter (μCi/mL) as per Regulatory Guide 8.30 (NRC, 2002)."***

The generally acceptable value of LLD will be 10 percent of the applicable limit. The applicable limit will depend on the appropriate DAC which will be driven by the solubility classification of the material in question. In this case, LCI should reevaluate the LLD in light of its response to the questions regarding solubility classification and dose calculation in Section 5.7.4. Provide an LLD(s) that is representative of particulate uranium throughout the plant.

Uranium will be precipitated as uranyl peroxide, a Class D compound, as defined in Appendix B of 10 CFR 20. The airborne uranium in the ISR facility is expected to be Class D (soluble) with a non-stochastic Derived Air Concentration (DAC) of 5×10^{-10} μCi/ml throughout the plant. There will be no drying or packaging operations. The yellowcake slurry will be shipped to another site for precipitation and packaging. Therefore, there should be no insoluble forms of uranium in dust on site. A Lower Limit of Detection (LLD) of 1×10^{-11} μCi/ml is appropriate for the ISR facility as it is less than 10% of the DAC.

<u>Section 5.7.4 Worker Dose Calculations</u>

LCI does not provide sufficient information regarding the exposure calculation methods. This information is important as it provides a basis for determining compliance with worker and public dose limits. Please provide the following information:

1. ***LCI states: "Alternatively, the annual doses may be calculated directly using monitoring data and established dose conversion factors (DCFs) from Federal Guidance No. 11 (EPA, 1988), or the dose coefficients (DCs) from ICRP Report No. 68 (ICRP, 1994 and ICRP, 2001)." However, 10 CFR Part 20 does not permit the use of the revised and updated internal dosimetry models without an approved exemption request (see 10 CFR 20.1204(c)). Please clarify that all internal doses will be calculated using data that is based on ICRP Publication 30.***

   As requested by the NRC, internal doses will be calculated using dose conversion factors from EPA Federal Guidance Report No. 11 (1988) which is based on International Commission on Radiological Protection (ICRP) Publication 30 (even though dose coefficients from ICRP 68 are more accurate, based on the ICRP 66 lung model). LCI may petition the NRC for an exemption as per 10 CFR 20.1204 that would allow the more accurate determination of worker doses. Alternatively, doses may be calculated by comparison of airborne radionuclide concentrations to the stochastic DAC as described in Regulatory Guide 8.36.

2. Equation 1 is used to calculate the intake of radionuclides:

Equation 1: Calculation of Long-Lived Radionuclide Intake Using Monitoring Data

(Note: Doses from inhalation of airborne particulate matter will be calculated only when the measured concentration exceeds ten percent of the DAC.)

$$I_r = \sum_{i=1}^{i=n} (BR)(C_r)(H)(10^6 \text{ ml}/\text{m}^3)/PF$$

Where BR = breathing rate (cubic meters per hour [m3/h]). The values in 10 CFR 20, Appendix B are predicated on a standard breathing rate. Clarify what breathing rate will be used to determine the intake of radionuclides in Equation 1.

The standard breathing rate used in 10 CFR 20 Appendix B, 1.2 cubic meters per hour, will be used for calculating the intake of radioactive material unless, in the professional opinion of the Radiation Safety Officer, the breathing rate should be adjusted to reflect actual work conditions. In no case will a breathing rate less than 1.2 cubic meters per hour be used in dose calculations.

3. Regarding "H" in the above Equation 1 (number of hours of exposure), LCI states: "Exposure times will be estimated using worker time studies or using recorded time spent on the task for which a RWP was issued." Provide details on how worker time studies will arrive at an exposure time.

In most cases, for tasks where the concentration of airborne radionuclides might exceed 10% of the DAC, worker exposures will be monitored using breathing zone samplers. Start and stop times for the sampler will be recorded. Where the worker exposure is covered by a breathing zone sample, the actual time the sampler was worn will be assumed to be the time of exposure. If a single breathing zone sampler is used to represent exposure to a group of employees, the entire group will be assumed to be exposed to the same concentrations as the individual wearing the sampler. For areas where the airborne radionuclide concentrations are likely to be greater than 10% of the DAC and the concentrations are monitored using general air samples rather than breathing zone samplers, employee time sheets will be used to estimate hours spent in specific activities where there is exposure to airborne radioactivity at concentrations likely to be greater than 10% of the DAC averaged over an 8-hour day.

4. Regarding air sample analyses, LCI states: "In general, the in-Plant air particulate samples will be analyzed for gross alpha but assumed to be primarily, if not all, due to natural uranium." This assumption needs to be justified in order to correctly

calculate the dose (e.g., no thorium or radium in the air sample). Please address 10 CFR20.1204(g) regarding mixtures of radionuclides and provide a technical justification for using a gross alpha count and attributing all dose to natural uranium.

The lixiviant used in the process mobilizes 5 to 15 percent of the radium-226 in the ore body. The solution is maintained in a closed loop; therefore, it is unlikely that the radium-226 would be present in the work environment air. The DAC for radium-226 is 3×10^{-10}. Assuming approximately 15% of the alpha count is due to radium-226, the DAC for the mixture would be approximately 4.5×10^{-10} µCi/ml. Nearly all the thorium-230 mobilized in the process is retained in the barren lixiviant and reinjected, based on concentrations in pregnant and barren lixiviant reported by Brown (2007, see Response to Comment 5.7.2 #5 for complete reference). Since the stochastic DAC for natural uranium is actually 8×10^{-10}, the difference between the calculated DAC for the mixture and the natural uranium DAC is not significant.

5. ***LCI states: "The DAC for Class D uranium (5 x 10-10 µCi/mL) will be used if this dose calculation method is employed as per NRC Regulatory Guide 8.30." However, Regulatory Guide 8.30 does not specifically address the solubility of uranyl peroxide or other forms of uranium. Please provide a technical basis for the use of "Class D" uranium throughout the plant. This discussion should address all forms of uranium that may be encountered during routine and off-normal circumstances including maintenance.***

   Uranyl peroxide is the only form of uranium precipitate likely to be encountered in the Plant. Uranyl peroxide is considered to be soluble. Therefore, it is reasonable to assume that airborne uranium will be Class D.

6. ***The proposed DAC value (5 x 10-10 µCi/mL) is relevant for calculating the non-stochastic dose to the bone surface. Please justify the use of the proposed DAC for calculating the committed effective dose equivalent (CEDE).***

   10 CFR 20 Appendix B gives an Allowable Level of Intake (ALI) of 1 µCi for the bone surface. The stochastic ALI is 2 µCi. The stochastic DAC can be calculated by dividing the stochastic ALI by the volume of air inhaled during a year. That is the stochastic DAC for natural uranium would be 2.4×10^{9} or 8×10^{-10} µCi/ml as per Regulatory Guide 8.36. Regulatory Guide 8.36 notes that it is preferred but not required that the stochastic DAC be used to calculate dose. The stochastic DAC will be used to calculate dose; however, the non-stochastic DAC will be used for control purposes and for determining whether an airborne radioactivity hazard exists.

7. ***LCI states: "The dose to the fetus from internally deposited radionuclides must be determined if the intake is likely to exceed one percent of the ALI (0.02 microCuries [µCi])." The referenced ALI appears to be the stochastic ALI for class "D" natural uranium. Based on LCI's response to previous RAIs regarding the DAC proposed in Section 5.7.4, it needs to reevaluate the trigger for determining the dose to the fetus of a declared pregnant worker. If the proposed DAC changes, please provide a revised trigger for calculating the dose to the fetus based on the new DAC value.***

   The stochastic ALI for soluble uranium will be used to establish an action level for determining dose to the fetus.

Section 5.7.5 Bioassay Program

LCI does not provide sufficient information regarding the bioassay program. This information is important as it provides a basis for determining compliance with worker dose limits. Please provide the following information:

1. ***LCI states: "Bioassays will also be performed if there is any reason to suspect that an inhalation exposure has resulted from exposure to an average yellowcake concentration equal to or exceeding ten percent of the DAC for soluble uranium (5 x 10-11 µCi/mL) for a 40-hour workweek." Based on LCI's response to questions on the DAC in Section 5.7.4, it needs to reevaluate the trigger for bioassays. If the proposed DAC changes, please provide a revised trigger for performing bioassays.***

   The DAC for soluble uranium is appropriate, as noted in Response to Comment 5.7.3 #1

Section 5.7.6 Contamination Control Program

LCI does not provide sufficient information regarding the contamination control program. This information allows the staff to assess whether or not LCI has established administrative and technical controls to detect and control releases. Please provide the following information:

1. ***Regarding removable contamination, LCI states: "Alternatively, total contamination surveys may be performed. If the total contamination level exceeds the removable contamination limit, the removable contamination level will be determined using smears." Specify the "removable contamination limit" that will be used at Lost Creek.***

   The contamination limits to be used at the Lost Creek facility are specified in Table 2 of Regulatory Guide 8.30. While these limits are intended to apply to conventional uranium mills, they are appropriate for ISR facilities. Radium-226 and thorium-230 are not likely to be in equilibrium with the uranium at an ISR. Approximately 5 to 15 percent of the radium in the ore body will be mobilized with the uranium, therefore, there will be a deficit in the concentration of decay products present at the facility. The radium-226 and any thorium-230 that is mobilized will be contained in a closed loop so that the probability that surface contamination would contain significant fractions of the decay products is very small. The release limits for uranium and daughters given in Table 2 of Regulatory Guide 8.30 are conservative for the mix of contamination likely to be present at the Lost Creek facility.

2. ***Please describe how contamination on the interior of pipes, drain lines, duct work, and similar items will be determined prior to release.***

   Equipment that cannot be adequately surveyed for contamination will not be released for unrestricted use.

3. ***For releasing potentially contaminated items from the facility, discuss specifically what contamination limits will be used. In your discussion, address the following issues:***

   a. ***Items potentially exposed to pregnant lixiviant. If proposing the limits for natural uranium, demonstrate that radium is in equilibrium with the uranium and explain why the separate radium limit in Table 1 of NRC "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material" should not apply.***

      As noted in Response to Comment 5.7.6 #1, the natural uranium limits are conservative when applied to contamination at an ISR facility. Table 2 in Regulatory Guide 8.30 does not specify that the decay products must be in equilibrium with the natural uranium for the natural uranium contamination limits to apply. Table 2 was adapted from the <u>Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, or Special Nuclear Material</u> (NRC, 1993) which applies to natural uranium, uranium-235, and uranium-238 and associated decay products with no requirement that the decay products be in equilibrium. It is highly unlikely that the activity of radium-226 or thorium-230 would exceed the activity of the parent uranium-238 given the fact that most of the decay products remain in the ore body. Therefore, the radium-226 contamination limit should not apply.

b. ***Items potentially exposed to barren lixiviant after ion exchange. If proposing the limits for natural uranium, explain why the separate radium limit in Table 1 of NRC "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material" should not apply.***

Please see Response to Comment 5.7.6 #3a above. Items to be released for unrestricted use that potentially have radium-226 contamination levels greater than the uranium-238 levels, such as ion exchange tanks and associated piping, will be subject to the more stringent radium-226 release limits or release limits established by NRC in the future.

5.7.7 Airborne Effluent and Environmental Monitoring Program

LCI does not provide sufficient information regarding the airborne effluent and environmental monitoring. This information allows the staff to assess whether or not LCI has established the proper programs to estimate worker and public doses. Please provide the following information:

1. ***LCI has not proposed an effluent monitoring program that would satisfy the requirements of 10 CFR 40.65. The report specified in 10 CFR 40.65 requires that the licensee "... must specify the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents...." Provide a description of your proposed stack effluent monitoring program, including radon.***

   LC ISR, LLC, and it health physics contractor, have made a concerted effort to identify detection equipment that is capable of measuring radon in stack effluent. While at least one instrument has been identified that is designed for radon sampling in stacks, its detection range precludes its use, as currently designed, at an ISR facility. Therefore, LC ISR, LLC contends that it is not technically feasible to measure radon effluent from the stacks.

   10 CFR 20.1302 requires the licensee to measure or calculate the maximum total effective dose equivalent to the individual likely to receive the highest dose. 10 CFR 40.65 is worded differently but has the same goal, "...to establish maximum potential annual radiation doses to the public..." LC ISR, LLC intends to comply with these regulations by measuring radon as described in TR Section 5.7.7. In the past, NRC has approved this type of monitoring at ISR facilities and most if not all such facilities currently comply with 10 CFR 40.65 in this manner. Specifically, MILDOS modeling is used to calculate the dose to members of the public before operations begin. Once

operations are initiated, alpha track etch detectors are used to measure potential exposure to members of the public.

LC ISR, LLC believes that with respect to 10 CFR 40.65, the intent of the regulation is to determine dose to members of the public and not to determine the total number of curies of radon released. Finally, the concentration of radon within the stack is not directly relevant to public safety since the public does not have access to the stacks. What is relevant is the actual exposure members of the public may receive.

2. ***Regarding operational environmental monitoring, LCI states: "Because there will be no significant release of airborne particulate during operations and there are no credible accident scenarios that could result in a significant release of material, LCI does not propose to perform routine air particulate, soil, vegetation, or surface water sampling during operations." Both pregnant lixiviant field spills and transportation accidents have been shown to have the ability to result in a significant release of licensed material. In addition, radon daughters from operations can accumulate in soil, vegetation, and surface water. Please reevaluate the operational environmental monitoring program for Lost Creek and submit a program to adequately monitor the release of licensed material and verify the effectiveness of in-plant measures used for controlling the release of radioactive materials.***

LCI has reconsidered the issue of operational effluent monitoring by reviewing the potential credible scenarios that could lead to the release of effluent. The review made it apparent that the only credible sources of effluent are radon emissions, water sent to deep disposal and upset conditions (including excursions and surface spills). The types of effluent monitoring recommended for mills in Regulatory Guide 4.14 were reviewed to see how they might be implemented at Lost Creek:

PARTICULATE MONITORING.
Since LC ISR, LLC is not proposing to install a yellowcake dryer at this time the only credible source of airborne particulate would result from the spill of yellowcake slurry or lixiviant. In the case of a lixiviant spill, the solution does not contain a sufficient concentration of radionuclides to generate enough airborne particulate to be of concern. Please see the evaluation in Section 4.4.1 of NRC NUREG CR/6733 and the Response to Comment 5.7.1 #3.

Any spill of yellowcake slurry would likely occur inside the plant or during transport. In either event, area air samplers will be installed downwind of the spill before the spill dries out and particulate can be generated. The sampler will run continuously until such time as the spill is cleaned up. An upwind sampler will be used to determine background.

GROUNDWATER.
LC ISR, LLC has proposed a detailed groundwater monitoring program in TR Section 5.7.8.2 to identify excursions. The proposed groundwater monitoring program includes monitoring of aquifers above and below the mining zone and a monitor well surrounding the mining zone. Additionally, LC ISR, LLC will sample private or BLM wells within one kilometer of the permit area on a quarterly basis. The storage ponds will be installed with dual containment, a leak detection system and a series of wells that will be checked for pond seepage per TR Section 5.7.8.3. The proposed deep disposal well will be constructed with a sealed pressurized annulus which will be monitored continuously with instrumentation to ensure there is no leakage of injectate. Response to Comment 4.2 #6 addresses the impact of surface spills on shallow aquifers and how LC ISR, LLC will respond.

SURFACE WATER.
The Lost Creek Permit Area has three shallow ephemeral drainages within the permit area. The only time these drainages contain water is immediately after a heavy rain storm or during snow melt. The Lost Creek Project is located in high desert terrain which receives minimal precipitation. For example, the weather station at nearby the Lost Soldier property recorded less than 5 inches of precipitation in the 2006 to 2007 monitoring period (TR Figure 2.5-2). LC ISR, LLC does not propose to perform routine surface water sampling simply because surface water is rarely present. However, if a spill impacts a drainage, an automatic sampler will be installed in the downstream and upstream channel to quantify the radionuclide content of the water during the next precipitation event that results in flow in the channel. The upstream sampler will serve as a background measurement.

There are no impoundments within the permit area or in the immediate vicinity that contain water so no impoundment sampling is proposed during operations.

BIOTA.
LCI does not believe that, during routine operations, foragable vegetation will be exposed to any contaminants (TR Figures 2.4-2a through h as well as TR Section 2.81). The site has abundant sage brush but sage brush is not foragable for cattle and the root system of sage brush is too deep to quickly absorb surface contamination. Although not a significant issue, the minimum amount of vegetation needed to complete a radionuclide analysis with an acceptable LLD is 2 pounds. In order to sample foragable vegetation, the sample would have to be collected one stalk at a time until at least two pounds is collected, which may result in loss of sage brush. For the above reasons, LC ISR, LLC is not proposing to perform operational vegetation sampling. In the event of a spill of yellowcake slurry or lixiviant outside the processing plant, the affected area will be surveyed

and/or sampled to ensure the cleanup was successful. This practice will ensure that vegetation is not impacted by accidents. LC ISR, LLC has collected baseline vegetation samples as described in Response to Comment 2.9 #3.

Given the lack of dose sources, LC ISR, LLC does not propose to perform food sampling. The only food source of importance in the area is beef. Cattle will be fenced out of the wellfield and plant area so the only potential exposure of contaminants to cattle would be from a spill of lixiviant or yellowcake slurry outside the fenced area. If such an event happens, LC ISR, LLC commits to cleaning up the spill to decommissioning standards and then sampling the effected soil to ensure the cleanup was successful. Additionally, because the concentration of vegetation is very low, the concentration of animals is also very low. Cattle and wildlife must have large ranges in order to find enough food to survive. Therefore, they spend very little time around the Permit Area during the summer months. Additionally, due to the harsh winters, cattle are generally in the Great Divide Basin for only a few months out of the year (about June till November). Tissue sampling from cattle will not provide a reliable estimate of effluent because cattle spend a very small percentage of their time in the area of the mine. The Great Divide Basin contains uranium mineralization from surface to depth so cattle can be exposed to radionuclides from numerous locations throughout the basin. LC ISR, LLC is proposing to collect baseline tissue samples from cattle as described in Response to Comment 2.9 #6.

There is insufficient water in the area to support aquatic life so fish sampling will not be performed.

Section 5.7.8 Groundwater and Surface Water Monitoring Programs

The groundwater and surface water monitoring programs have not been sufficiently described to determine if they will detect an excursion from the ISL operations in an effective and timely manner. Provide the following information:

1. ***A description of the sampling procedures for all monitoring and private wells to ensure sampling is consistent for all wells during operations.***

During baseline and stabilization water well sampling, all wells will be purged of at least three casing volumes before the final sample is collected. A casing volume is equal to the volume of casing below the water table. The water to be sampled must also be stable with regard to the field parameters of temperature, pH, and conductivity. A total of three stability samples will be collected no closer than ten minutes apart. The water will be considered stable if there is less than a 10% change between each of the three samples for each of the analytes.

During operational sampling of mine unit monitor wells, the well will be purged at least one casing volume before collecting a sample. The purge volume is relaxed during operations because the wells are sampled frequently which prevents the water in the casing from becoming stale. The stability sampling will be the same as above to ensure that the formation water is being collected. If private wells are sampled, the sampling protocols described above will be followed

Samples will only be collected in clean, non-reactive containers. The samples will be kept cool (not frozen) until analyzed and preserved using WDEQ guidelines if the analysis will not be performed within two days. The Quality Assurance Program shall describe a rigorous system of checks to ensure samples are being collected and analyzed properly.

Before purging any well, the water level will be measured (if the wellhead design allows access) to within 0.1 feet and the data will be recorded and maintained for the life of the facility.

2. ***An explanation of how UCLs will be set for each of the individual sands in the HJ horizon as they are mined in succession.***

   As explained in the Response to Comment 6.2 #2, "Plans and Schedules for Groundwater Quality Restoration," the thin shales within the HJ horizon are localized and therefore the water within the HJ Horizon is a single aquifer with relatively uniform chemistry. The HJ Horizon will be mined as a single unit even though well completions will focus on the mineralized interval. As such, Upper Control Limits (UCLs) for excursion detection will be set for the HJ Horizon as a whole and not for each completion interval.

3. ***An excursion correction strategy for correcting excursions into the FG sand where it is offset across the fault from the extraction zone. (Figures 2.6-1c-e)***

   This information will be provided in the Mine Unit 1 Well Data Package.

4. ***An excursion correction strategy for correcting excursions into the KM sand where it is offset across the fault from the extraction zone. (Figures 2.6-1c-e)***

   This information will be provided in the Mine Unit 1 Well Data Package.

Section 5.7.9 Quality Assurance Program for Radiological Monitoring Programs

LCI has stated that it will implement a quality assurance program but has not provided any details of that program. This information is necessary to ensure that the quality of the data collected is acceptable for estimating doses to employees and members of the public. Please provide:

1. ***A comprehensive description of a quality assurance program applicable to all radiological, non-radiological, effluent, and environmental monitoring programs.***

   A Draft Quality Assurance Table of Contents with Executive Summary is attached for review. A complete Quality Assurance Program will be written and installed before initiation of construction activity and will address environmental monitoring, effluent monitoring, and health physics.

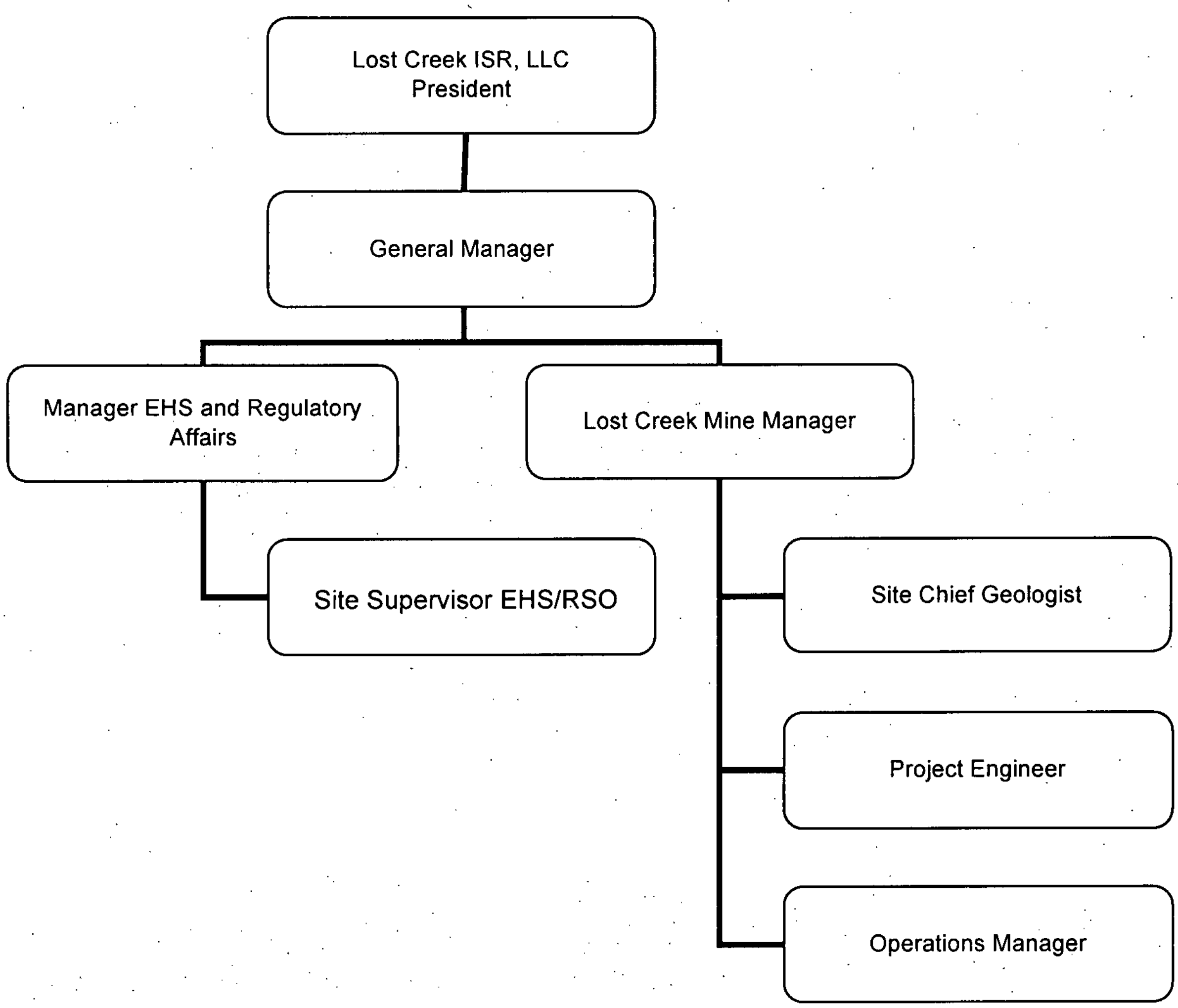
2. ***A statement that survey and calibration records will be kept for 3 years and will reflect updated 10 CFR Part 20 requirements that LCI maintain records used to demonstrate compliance and evaluate dose, intake, and releases to the environment until license termination.***

   Survey and calibration records will be kept for a minimum of three years and will reflect updated 10 CFR 20 requirements. Records will be kept to demonstrate compliance and evaluate dose, intake, and releases to the environment until license termination.

List of Information Included with the Responses
to
NRC Comments on Lost Creek TR Section 5.0
December 12 2008

For Comment 5.1 #1:
Revised Figure 5.1-1 - Lost Creek ISR, LLC Organization Chart

Figure 5.1-1 Lost Creek ISR, LLC Organization Chart



RESPONSES TO NRC COMMENTS
of 11/6/2008 on

SECTION 6.0
Groundwater Quality Restoration,
Surface Reclamation, and Facility Decommissioning

in the Technical Report for the
LOST CREEK PROJECT
Wyoming

<u>Section 6.2 Plans and Schedules for Groundwater Quality Restoration</u>

The plans and schedules for groundwater quality restoration have not been sufficiently described to determine if they will achieve the required goals of restoration. Considering the timeliness in decommissioning requirements of 10 CFR 40.42, the schedule provided by LCI constitutes an alternate restoration schedule and is an important component of the restoration discussion. Provide the following information:

1. ***LCI should state that it is requesting an alternate schedule and should acknowledge that changes to the restoration schedule must be requested through a license amendment application.***

   LC ISR, LLC requests that the restoration schedule presented in the application be considered as an alternate schedule pursuant to 10 CFR 40.42. While LC ISR, LLC believes the groundwater restoration and surface reclamation can be completed within 24 months for each mine unit, the associated regulatory reviews and approvals will lengthen the schedule beyond 24 months. LC ISR, LLC understands that any revision to the alternate schedule must be requested through a license amendment application.

2. ***A statement that LCI will return the groundwater quality to the standards listed in Criterion 5B(5) of 10 CFR Part 40, Appendix A, and a revised pore volume estimate to meet these standards as necessary.***

   LC ISR, LLC will use Best Available Technology (BAT) to return the groundwater to the quality described in 10 CFR Part 40 Appendix A Criterion 5B(5) or to baseline if baseline is higher. If LC ISR, LLC determines that despite the implementation of BAT that the groundwater cannot be returned to background, an Alternate Concentration Limit will be requested.

   LC ISR, LLC will perform an annual review of the surety estimate, including a review of the restoration status. The restoration schedule and surety will be revised annually, as needed, to reflect any changes to the timing of restoration.

3. ***A technical basis for LCI's ability to meet the standards in Criterion 5B(5) of 10 CFR Part 40, Appendix A, through restoration.***

   Increasingly detailed information on the geohydrologic conditions at the Lost Creek site is becoming available (TR Section 2.7), and LC ISR, LLC is in the process of updating the geohydrologic information and associated information on drawdowns, pore volumes, and other aspects of mining and restoration. LC ISR, LLC anticipates submitting the updated information during the week of January 12, 2009.

4. ***A description of the expected water quality in the mine unit at the beginning of restoration.***

The precise groundwater chemistry at cessation of mining will not be known until that time. However, the Draft Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities provides Table 2.4-1 entitled "Typical Lixiviant Chemistry." The table provides relatively large ranges for a variety of constituents, so the following table was generated, based on experience from other operations in the region, in an attempt to provide more concise ranges:

Expected Concentrations of Various Parameters

Parameter	Range (in mg/L unless shown otherwise)	
	Low	High
Sodium (Na)	400	1,000
Calcium (Ca)	20	150
Magnesium (Mg)	2	35
Potassium (K)	5	50
Manganese (Mn)	0.4	2.0
Carbonate (CO_3)	2	40
Bicarbonate (HCO_3)	1,000	2,200
Chloride (Cl)	300	600
Sulfate (SO_4)	100	400
Uranium (as U_3O_8)	1	15
Vanadium (as V_2O_5)	.01	3
Selenium (Se)	.001	.3
Total Dissolved Solids	1,500	3,000
pH in standard units	7.0	9.0
Radium-226	200 pCi/L	2,500 pCi/L

5. ***An explanation of the timeline for restoration of nine months for sweep, nine months of RO, and one month for homogenization considering the low conductivity of the HJ horizon and the described stacked sand restoration approach.***

Increasingly detailed information on the geohydrologic conditions at the Lost Creek site is becoming available (TR Section 2.7), and LC ISR, LLC is in the process of updating the geohydrologic information and associated information on drawdowns, pore volumes, and other aspects of mining and restoration. LC ISR, LLC anticipates submitting the updated information during the week of January 12, 2009.

6. ***A description of how stability will be monitored in the stacked sands of the HJ horizon (LHJ, MHJ and UHJ) as they are sequentially restored (e.g., six months for each with individual monitoring wells, six months after all are restored with completely penetrating monitoring wells, etc).***

   The HJ Horizon is a single confined aquifer overlain by the Lost Creek Shale and underlain by the Sage Brush Shale. While the HJ Horizon contains several interbedded low permeability units, these units are localized in areal extent and do not divide the HJ Horizon into separate, confined aquifers. The interbedded low permeability units caused the oxidation/reduction chemical boundary to divide and coalesce, resulting in 'sub-rolls', i.e., ore deposition at different levels within the Horizon, hence the terms UHJ for the uppermost ore within the HJ Horizon. The water quality throughout the HJ is significantly consistent regardless of the vertical position. The ore sub-rolls in the HJ Horizon will be mined and restored as a single horizon as has been and is the practice at virtually all in situ recovery mines. The ore zone monitor wells will be completed to target discrete ore levels within the Horizon at a density and spacing prescribed by WDEQ regulations. These wells will be sampled during stabilization to demonstrate the success of groundwater restoration.

7. ***An estimate of porosity for each mine unit and an explanation of how this value is to be determined. (A valid justification for this number (e.g., wireline logs, core measurements) is needed as this value is critical for pore volume calculations).***

   The 26% porosity value used in the surety calculation was derived from the direct measurement of porosity in several core samples from numerous areas around the property. LC ISR, LLC believes these samples are representative of the property. This value is also consistent with other in situ properties.

8. ***A justification for the method to estimate well field pore volume and the assumed 20 percent vertical and horizontal flare (No technical details are provided for estimating the well field pore volume and the associated horizontal and vertical flare.) Also please explain why a 10 percent vertical and 10 percent horizontal flare estimate was used in the surety calculations, when each flare was stated to be 20 percent.***

   Increasingly detailed information on the geohydrologic conditions at the Lost Creek site is becoming available (TR Section 2.7), and LC ISR, LLC is in the process of updating the geohydrologic information and associated information on drawdowns, pore volumes, and other aspects of mining and restoration. LC ISR, LLC anticipates submitting the updated information during the week of January 12, 2009.

9. ***A comprehensive discussion and justification for the estimate of six pore volumes (1 sweep, 5 RO) for restoration of MU1, which appears very low, using a basis of comparable field experience.***

Increasingly detailed information on the geohydrologic conditions at the Lost Creek site is becoming available (TR Section 2.7), and LC ISR, LLC is in the process of updating the geohydrologic information and associated information on drawdowns, pore volumes, and other aspects of mining and restoration. LC ISR, LLC anticipates submitting the updated information during the week of January 12, 2009.

10. ***If LCI retains the estimate of six pore volumes for restoration, provide a substantial justification using analytical methods or numerical modeling. These estimates should also take into account unique issues presented by the sequential stacked sand restoration approach and address any difference in pore volumes needed if biological reductants are used.***

LC ISR, LLC continues to estimate six pore volumes for restoration as described in the application. The use of six pore volumes for restoration is an industry standard that has been accepted by NRC in the past and continues to be used by many licensees (including Christensen Ranch and Smith Ranch). A Technical Memorandum comparing restoration factors at Christensen Ranch and Lost Creek is attached at the end of the Responses for TR Section 6.0. As LC ISR, LLC gains experience at restoring mine units at Lost Creek, it may become necessary to adjust the number of pore volumes needed to restore a mine unit. If a pore volume adjustment becomes necessary, based on operating experience at Lost Creek, LC ISR, LLC will update the annual surety and restoration schedule as part of an amendment request.

Pump tests have shown that aquifer properties at Lost Creek are higher than at many other in situ facilities, which will allow for sustained operational pumping rates that are more amenable to ISR. This will enable LC ISR, LLC to produce and restore the mine unit more quickly than at other facilities. Also, LC ISR, LLC has committed to the WDEQ to install all significant restoration equipment (pipelines and reverse osmosis systems) before beginning mining and to initiate groundwater restoration without unnecessary delay upon completion of mining. Finally, and perhaps most importantly, LC ISR, LLC will treat approximately 200 gallons per minute of production water with reverse osmosis before piping that water back out to the field. This practice will result in several pore volumes of groundwater treatment during production and will reduce the number of pore volumes of treatment needed during restoration.

As stated in Response to Comment 6.2 #6 above, the ore sub-rolls within the HJ Horizon will be mined at the same time as is standard industry practice. Likewise, restoration of the sub-rolls will occur at the same time. The use of bioreductants may result in a reduced number of pore volumes required for restoration. However, LC ISR, LLC will not propose a reduced number of pore volumes for bonding purposes until technical justification is provided (see Response to Comment 6.2 #13 below).

11. ***A description of the criteria that will be used to determine when well fields will be taken out of production and started in restoration to meet the regulatory requirements of timeliness of decommissioning as outlined in 10 CFR 40.42.***

The decision to take a mine unit out of production and place it into restoration will be based solely on economic and technical considerations. As long as a mine unit is economic and there are not technical issues preventing production, the mine unit will remain in production status (TR Section 6.1). Pursuant to 10 CFR 40.42(d), if an area must be temporarily shut down for any reason, decommissioning will commence within 24 months unless NRC grants an exemption.

12. ***A statement that NRC will be informed when a transition from production to restoration occurs in a mine unit.***

For each mine unit, LC ISR, LLC will inform NRC of the transition from production to restoration.

13. ***A description of the biological reduction method(s) to be used to achieve restoration for targeted constituents in the proposed wellfield extraction zone including: the efficacy of the chosen method; additives and rates; how progress will be monitored; estimates of pore volumes required when using biological reductants; and how the stability of water quality in zones treated with biological reductants will be monitored and established.***

The use of biological reductant as a restoration method is speculative at this time in the application process. If biological reduction is still considered as an alternative when the decommissioning plan for any of the mine units is submitted (see Response to Comment 6.2 #2), a full description, including supporting documentation, will be sent at that time for approval prior to use.

14. ***A detailed description about the comprehensive safety plan regarding any reductant use.***

The type of reductant to be used during restoration is unknown at this time, therefore, a comprehensive safety plan cannot be developed at this time. However, LC ISR, LLC commits to developing a comprehensive safety plan for any reductant used. The safety plan will include the following components: proper handling; possible chemical interactions; spill clean-up; proper personal protective equipment; response to credible accident scenarios; a description of the chemical hazards to personnel and dose pathways. Before installing a reductant system, the EHS Department and the Engineering Department will participate in a SERP to ensure the system is properly designed, installed, and used.

15. An estimate, with supporting analysis, of how much waste water would be produced during restoration and the ability of the disposal wells to handle the rates and volumes.

Please see the Response to Comment 3.3 #3 for discussion of the waste water stream and the ability of the disposal wells to handle that stream.

16. A description of how waste fluids will be handled if any or all of the disposal wells became inoperable.

As noted in Comment 3.3 #3, the purpose of more than one disposal well (regardless of capacity) is to allow for maintenance, down time, operational testing and degradation of injection capacity over time. So, the desired injection capacity in all the wells should allow for less than maximum use of each or all over the life of the project. Two scenarios, loss of one well and loss of all wells, are outlined below.

Scenario 1: Loss of one well.
The redundancy of the wells in conjunction with the storage capacity of the ponds at the plant will allow for little or no effect on the project. As described in Response to Comment 3.3 #3, the processes for operations and restoration should not be diminished. The ponds are designed to store 60 gallons per minute of waste water for up to two weeks without having to discharge for disposal.

Scenario 2: Loss of all wells.
If all disposal capacity is lost (short or long term), all unnecessary operations will cease and reverse osmosis will be used where possible to minimize waste fluids. All waste fluids will be stored in plant tanks (approximately 30,000 gallons per tank) and the lined ponds will also be used for storage (1.25 million gallons per pond). Eventually, if the disposal wells remain unavailable and all storage options are used, all operations will cease until the wells are repaired or replaced. This is obviously a rare case and the reason why backup secondary or tertiary disposal wells are installed.

17. ***A justification for the selection of a six month stability monitoring time period to determine restoration success. Additionally, the criteria which will be used to establish that the water quality in the restored zone is stable.***

The stability monitoring time period should read as nine months rather than six months, for consistency with the WDEQ application. This time frame is considered appropriate in the Lost Creek setting because the intent of the restoration procedures is to return the groundwater oxidation/reduction conditions to the reduced state present before mining. Mobilization of the uranium requires its oxidation, which in this case requires injection of a bicarbonate lixiviant under pressure. The restoration procedures are designed to remove the oxidizing material introduced during mining. Once the oxidizing material is removed, then the groundwater conditions revert to the reduced state present before mining. Remobilization would again require introduction of an oxidizing agent which cannot readily happen. In addition, the restoration monitoring is designed to provide information throughout the mine unit, i.e., both in the production zone and in the adjacent monitor ring. This allows for identification of 'hot spots' in the production zone, i.e., production wells possibly requiring well-specific treatment, which have historically been a cause for difficulties in meeting restoration standards.

Historically, slow restoration of mine units at other operations can generally be attributed to maintenance of production at the expense of restoration, inefficient monitoring, and similar operational practices which LC ISR, LLC has committed to avoid. Also, as pointed out in Response to Comment 6.2 #10, LC ISR, LLC will be using reverse osmosis even during production, which will improve restoration efficiencies.

WDEQ/LQD Guideline 4 recommends a submittal after six months of stability monitoring for an evaluation of what steps should be taken based on groundwater quality conditions at that time. This guideline also recommends various methods for evaluating the water quality data, including parameter-by-parameter evaluations, and careful selection of statistical methods to avoid 'false positives'. The specific method will depend in part on the natural variability in the groundwater quality, which will be determined on an individual mine unit basis.

6.2 Plans for Reclaiming Disturbed Lands

Please note that the above section number and title appear to be from the Moore Ranch application. The Lost Creek application is organized somewhat differently, in that Section 6.3 addresses Mine Unit Reclamation, which will occur periodically throughout the life of the project, and Section 6.4 Reclamation and Decommissioning of Processing and Support Facilities. LC ISR, LLC will incorporate the following responses into the application text in the appropriate sections, with cross-references as appropriate, if requested by NRC.

1. ***The discussion of reclamation of surface features does not appear to adequately describe the techniques that will be used during decommissioning. Please provide discussion that addresses the following issues: (i) the techniques used to conduct the pre-reclamation surveys; (ii) the cleanup criteria that will be followed; (iii) the analysis techniques that will be used to compare the pre-reclamation survey to the pre-operation survey to identify contaminated areas; and (iv) discussion of the areas on the site that are may become contaminated, such as header houses, areas adjacent to well heads, the area near the storage ponds, etc.***

   The following discussion of reclamation procedures is applicable to reclamation of the mine units and the processing and support facilities (see Comment 6.5 #4 also):

   (i) Prior to decommissioning , LC ISR, LLC will perform a soil radiometric study in a manner similar to that used to determine baseline conditions (TR Section 2.9.1). In addition to the general survey of the area to be decommissioned, LC ISR, LLC will review the spill records and perform an additional survey in any impacted location. Locations impacted by a spill will be surveyed on a one-meter grid using a properly calibrated instrument capable of detecting activities exceeding the decommissioning standards. As contaminated piping is removed, a survey of the trench will be performed at least every fifteen feet to ensure no spills went undetected. Any soil which does not meet the clean-up criteria will be removed and disposed of at an NRC or Agreement State licensed facility.

   (ii) Soil cleanup will not be complete until the cleanup criteria in 10 CFR 40 Appendix A Criterion 6 are reached.

   (iii) Please see Response to Comment 6.5 #4.

   (iv) Any area at the facility which processes or conveys mining solutions could become contaminated (header houses, piping trenches, soil under pond liners, etc.). Each of these areas will be thoroughly surveyed during reclamation to ensure the cleanup is performed safely and is complete.

2. ***Please provide a commitment in the license application that Lost Creek will submit a decommissioning plan for NRC staff's review and approval at least 12 months before planned commencement of decommissioning.***

   For each mine unit, LC ISR, LLC will submit a decommissioning plan as part of the mine unit package (see Comment 3.2 #11). For the processing and support facilities that will not be removed until the end of the Project, LC ISR, LLC will submit a decommissioning plan for those facilities at least 12 months prior to removal of those facilities.

3. ***Please provide discussion of decommissioning of non-radiological hazardous constituents as required by 10 CFR Part 40, Appendix A, Criterion 6 (7).***

   All sanitary waste will typically be collected and taken into Rawlins, WY or other nearby town and properly disposed of in a licensed landfill.

   An application is planned to be submitted to have a landfill on-site for disposal of the non-radiological construction type material. During closure, all steps will be followed to ensure compliance with the landfill permit.

   As discussed in Section 4.3.1 of the TR, non-radiological hazardous wastes will be stored in accordance with OSHA and EPA requirements and disposed of off-site by a licensed contractor.

4. ***Please discuss the quality control program that will be followed during decommissioning.***

   Please see the Response to Comment 5.7.9 #1. Additionally, as noted above in Comment 6.2 (Plans for Reclaiming Disturbed Lands) #2, LC ISR, LLC will submit a decommissioning plan, which will address quality assurance issues, to NRC for review and approval at least 12 months before initiating decommissioning.

Section 6.3 Mine Unit Reclamation

Please discuss how on-site disposal of non-contaminated materials is consistent with the requirements of 10 CFR Part 40, Appendix A, Criterion 2. Note that disposal of waste materials on Bureau of Land Management or State-owned land may require separate approvals. Please discuss the process of contamination surveys on large equipment or pieces with unique construction. If the equipment cannot be surveyed, it should be presumed to be contaminated in excess of the release limits.

10 CFR Part 40, Appendix A, Criterion 2 clearly prohibits disposal of 11(e)(2) material at a site such as Lost Creek, and LC ISR, LLC is not proposing to dispose of 11(e)(2) material at the site. LC ISR, LLC may seek a permit for a "construction" landfill at the site from the Bureau of Land Management and WDEQ. This type of landfill can be used to dispose of wood, brick, plastic, and other construction material. If such a landfill is permitted, only non-contaminated items will be placed in the landfill. Any item which has been in a process area (e.g., the Plant, active header house, or active mine unit) will

not be disposed of in the landfill unless it has been surveyed by the Radiation Safety Officer (RSO) or Health Physics Technician and meets the release standards outlined in Section 5.7.6.2 of the TR. If an item may be contaminated and cannot be adequately surveyed due to its shape or other factors, it will be considered contaminated and will be disposed of as 11(e)(2) material at an off-site facility licensed by the NRC or an Agreement State. If an on-site landfill is used, the RSO will ensure a stringent Standard Operating Procedure for usage and maintenance of the landfill is written and implemented with employee training.

<u>Section 6.5 Post-Reclamation and Decommissioning Radiological Surveys</u>

LCI does not provide a discussion of methodologies for conducting post-reclamation and decommissioning radiological surveys. Provide a description of procedures for conducting these surveys, including:

Please note that LC ISR, LLC has committed to providing decommissioning plans 12 months prior to decommissioning of each mine unit and prior to decommissioning the processing and support facilities (see Response to Comment 6.2 (Plans for Reclaiming Disturbed Lands) #4. The following responses provide the framework for the details that will be included in those decommissioning plans.

1. ***How the cleanup criteria for radium in soils as provided in 10 CFR Part 40, Appendix A, Criterion 6(6), will be met.***

   The Appendix A cleanup criteria for radium-226 are specified in 10 CFR 40. "Impacted areas" of the site, as defined in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), will be identified based on a "historical" site assessment and characterization survey prior to development of a decommissioning plan. Direct gamma surveys as well as soil sampling protocols will be developed in accordance with the number and extent of impacted areas.

   The "benchmark approach" will be used to define the cleanup criteria for other radionuclides, as described in Appendix E to NUREG 1569. Impacted soils will be excavated or treated to meet those criteria.

2. ***Acceptable cleanup criteria for uranium in soil, such as those in Appendix E of NUREG–1569, Standard Review Plan for In-Situ Leach Uranium Extraction License Applications.***

   The cleanup criterion for uranium in soil will be determined at the time the decommissioning plan is developed in accordance with Appendix E to NUREG 1569. It is premature to develop the criterion prior to operation of the facility as situations and surrounding land uses might change, and the "benchmark dose" is sensitive to the land use scenarios used in the calculations.

3. ***Assurance that the survey method for verification of soil cleanup is designed to provide 95 percent confidence that the survey units meet the cleanup guidelines.***

The verification survey and final status survey methods will be developed on a statistically valid basis to provide 95 percent confidence that the survey units meet the cleanup guidelines, and those methods will be described in each decommissioning plan. Several statistical approaches, including but not limited to MARSSIM, will be considered in designing the surveys.

4. ***A discussion of the soil cleanup program. The discussion should include: the areas planned to be surveyed (such as wellfield surfaces, areas around structures in process and storage areas, on-site transportation routes, historical spill areas, and areas near deep disposal wells); details of the pre-reclamation radiological survey, particularly, specifics on how it and the baseline survey will be used to identify potential contamination areas; details on how the final radiological soil conditions after cleanup will be measured and documented.***

A GPS-based gamma radiation survey will be performed of the area to be decommissioned (i.e., mine unit or facility area) using techniques similar to those that were used to determine baseline site conditions. A statistically defensible number of soil samples will be collected throughout the site at varying soil radium-226 concentrations (based on the gamma radiation survey). The soil samples will be analyzed for radionuclides of concern and the results will be plotted against the readings from the area survey. In this manner, a correlation between the two measurement types can be established. If the decommissioning survey reveals any location which appears to approach the decommissioning standard, the baseline background will be subtracted from that location's apparent Ra-226 concentration. If the apparent concentration thus calculated approaches the decommissioning standard, a soil sample will be collected and analyzed to determine actual radionuclide concentrations and to assist in determination of an appropriate remedial action.

5. ***Provide a discussion of plans for decommissioning non-radiological hazardous constituents as required by 10 CFR Part 40, Appendix A, Criterion 6 (7).***

During decommissioning, LC ISR, LLC will decommission tanks and piping associated with chemicals which are classified as hazardous (e.g., hydrochloric acid or sulfuric acid). Any remaining bulk quantities of material will be sold to another responsible company or will be transferred to other LC ISR, LLC properties for use.

The tanks will then be washed out to remove any residual chemicals and sold or moved to another property for use.

The piping associated with hazardous chemicals will be washed out with water. If the piping cannot be re-used by LC ISR, LLC or sold to another company for similar use, the EHS Department shall verify the pipe does not constitute a hazardous material and the piping will be sent to an off-site licensed landfill for disposal. All of the hazardous chemicals proposed for usage at LC ISR, LLC are highly soluble and should be easy to remove from tanks and piping.

All tank and pipe cleaning shall be performed in a manner that is protective of the employees and the environment. A qualified individual in the EHS Department shall review tank and pipe decommissioning plans and operations to ensure operations are carried out in a protective manner. All potentially affected employees shall be trained in the hazards of chemicals and how to protect themselves. Equipment and fluids used for cleaning will be collected and disposed of in accordance with applicable regulations.

6.8 Financial Assurance

During its review, the staff determined that the information regarding financial assurance was insufficient to determine if LCI appropriately estimated the surety amount. A proper surety amount is necessary to ensure that the LCI facility can be property restored and decommissioned in the event LCI becomes insolvent. Please provide the following information:

1. ***The current financial assurance information indicates the estimate is provided in current dollars, but does not indicate if this is 2007 or 2008 dollars. Please indicate the year that the costs are referenced to. The estimate should be adjusted for inflation at the time of license issuance and should include an adjustment for annual inflation in future years.***

   The financial assurance information is in 2008 dollars. This information is under detailed review by LC ISR, LLC, including adjustments for inflation, changes in equipment and fuel costs, and similar items. It is anticipated that revisions will be submitted during the week of January 12, 2009.

   The reclamation bond must be approved by NRC prior to issuance of the license, and if approval is delayed beyond 2009, the bond amount can be adjusted for inflation as necessary. Future adjustments to the reclamation bond, whether for revised operations and/or inflation, will be submitted to NRC and WDEQ for review and approval as part of the required Annual Report.

2. ***Please identify the financial assurance funding mechanism (i.e., surety bond, cash deposit, certificate of deposit, deposit of government securities, etc.) that will be used for the Lost Creek project.***

   The financial assurance funding mechanism(s) will be identified once the reclamation bond amount is approved by NRC and LC ISR, LLC obtains the bond, which must be done prior to issuance of the license. Given current economic conditions, LC ISR, LLC is considering a variety, and possible combinations, of mechanisms, so identification at this time is not possible.

3. ***LCI needs to provide indication in Section 6.8 that it will 1) automatically extend the existing surety amount if the NRC has not approved the extension at least 30 days prior to the expiration date; 2) revise the surety arrangement within 3 months of NRC approval of a revised closure (decommissioning) plan, if estimated costs exceed the amount of the existing financial surety; and 3) provide NRC a copy of the State's surety review and the final surety arrangement.***

   LC ISR, LLC commits to automatically extend the existing surety amount, if NRC has not approved the extension at least 30 days prior to the expiration date. However, it should be noted that per WDEQ requirements, reclamation bonds do not expire, and the bonds for in situ operations are generally held by WDEQ, with the amounts based on review and approval by NRC and WDEQ. LC ISR, LLC also commits to increase the surety arrangement within three months of NRC approval of a revised closure plan which includes an increased surety amount. Again, it should be noted that WDEQ will not approve changes to restoration/reclamation plans *until* any surety amount increase is in place. LC ISR, LLC also commits to providing NRC with a copy of WDEQ's surety review and final surety arrangement.

4. ***The following items in the Financial Assurance estimate in Table 6.8-1 of the application need to be discussed, explained, or calculated further:***

   a. ***Page 9 provides an estimate of the total amount of water to be disposed of via the deep disposal well. Please provide additional details on the planned deep disposal well capacity to verify that this amount of liquid can be disposed of while maintaining enough deep disposal well capacity for the wellfield production bleed.***

      Please see Response to Comment 3.3 #3.

   b. ***The timeline provided in Table 6.8-1 indicates that the time required for groundwater restoration is approximately 25 months (7 months for groundwater sweep, 9 months for reverse osmosis, and 9 months for stabilization). The NRC***

staff is not aware of any approved ISL wellfield groundwater restoration activities that have been completed in this timeframe. Please provide justification for this restoration timeframe, or revise the table to reflect an alternate timeframe. Note that the restoration timeframe should take the available required number of pore volumes for restoration as well as the deep disposal well capacity. The restoration timeframe may impact costs related to electrical power, monitoring and sampling, and labor.

The time required to restore a mine unit is largely dependent upon pumping rates, and the pumping rates at Lost Creek (approximately 32 gallons per minute (gpm)) are significantly higher than most other in situ projects (5 to 25 gpm). This will allow the treatment of the necessary pore volumes in a relatively short time period. LC ISR, LLC intends to perform one pore volume of groundwater sweep to satisfy WDEQ regulations followed by five pore volumes of reverse osmosis. LC ISR, LLC has completed a water balance calculation (TR Figure 3.2-5) to determine the necessary disposal capacity. If the required disposal capacity cannot be installed, then the restoration schedule and surety will be adjusted accordingly, and NRC will be provided with the revised information. Please also see Response to Comment 6.2 #10.

5. ***Worksheet 7, Page 25 of 35, provides an estimate of potential costs related to surface reclamation in the mine units. The cost estimate indicates that there will be no surface spills requiring cleanup in the mine unit. Please provide justification for this assumption, or revise the spill cleanup portion based on a likely occurrence of spills.***

   The financial assurance information is under detailed review by LC ISR, LLC, including adjustments for inflation, changes in equipment and fuel costs, and similar items. It is anticipated that revisions will be submitted during the week of January 12, 2009.

6. ***The financial assurance cost estimate does not appear to include operational costs that would need to be continued during restoration. Items such as sampling and testing of the monitoring wells and mechanical integrity testing (MIT) of all the wells will need to be continued during groundwater restoration. Please discuss where these costs are included in Table 6.8-1 or revise the financial assurance estimate to include these costs.***

   The financial assurance information is under detailed review by LC ISR, LLC, including adjustments for inflation, changes in equipment and fuel costs, and similar items. It is anticipated that revisions will be submitted during the week of January 12, 2009.

List of Information Included with the Responses to NRC Comments on Lost Creek TR Section 6.0 December 12 2008

For Comment 6.2 #10:

Technical Memorandum - Comparison of Lost Creek, Christensen Ranch and Irigary ISR Projects, with Respect to Aquifer Restoration

TECHNICAL MEMORANDUM

TO: UR Energy

FROM: Petrotek Engineering Corporation

DATE: 12/09/08

SUBJECT: Comparison of Lost Creek, Christensen Ranch and Irigaray ISR Projects, with Respect to Aquifer Restoration

UR Energy has applied for a permit to mine the Lost Creek ISR uranium project in Sweetwater County, Wyoming. A key component of the permit application is the requirement to restore aquifer water quality following mining. A comparison is made between the Lost Creek project, currently being permitted, and the COGEMA Irigaray and Christensen Ranch ISR uranium projects that have completed production and restoration operations. Similarities between Lost Creek and the COGEMA sites indicate that aquifer restoration at Lost Creek is achievable following ISR of uranium. Extenuating factors suggest that aquifer restoration can be accomplished at the Lost Creek project with less pore volumes (PVs) of treatment/reinjection/disposal than was required at the COGEMA sites.

The Irigaray site has received approval of aquifer restoration from the Wyoming Department of Environmental Quality (WDEQ) and the Nuclear Regulatory Commission (NRC). COGEMA has submitted a Wellfield Restoration Report for the Christensen Ranch project that is currently under review by WDEQ. These two ISR projects are located within a similar geologic trend as the Lost Creek Project. Hydrogeologic characteristics of Irigaray and Christensen Ranch are also similar to Lost Creek.

The geologic, hydrogeologic and water chemistry properties of the Irigaray, Christensen Ranch and Lost Creek ISR projects are summarized in Table 1. All three of the projects target uranium ore within fluvially deposited sands of Eocene age. Uranium ore within the COGEMA projects was produced from the Wasatch Formation in the Powder River Basin. The Lost Creek uranium deposits are located within the Great Divide Basin, within the Battle Springs Formation, which is laterally equivalent to the Wasatch Formation. Depths to the ore bearing units are similar in each site (100 to 500 feet below ground surface). Hydrologic properties of the sites are also similar, with transmissivity on the order of 50 to 150 ft^2/d and hydraulic conductivity generally between 0.5 and 1 ft/d. Porosity and hydraulic gradient are also in the same range, resulting in calculated groundwater velocity of similar magnitude.

Baseline water quality of the three projects are generally similar, although the Lost Creek site is more of a calcium-sulfate to calcium-bicarbonate water type whereas Irigaray and Christensen Ranch are predominately sodium-sulfate type water. TDS, sulfate and sodium levels tend to be lower at the Lost Creek project. Trace minerals arsenic and manganese, and radionuclides uranium and radium–226 are in the same range at all three sites. Selenium tends to be lower at Lost Creek than at Irigaray and Christensen Ranch. Based on these similarities and the projected use of similar lixiviant, it is anticipated that mining impacts to Lost Creek water quality prior to restoration, will be similar to post-mining water quality at Christensen Ranch and Irigaray.

Based on the comparison of geologic, hydrologic and water chemistry properties of Irigaray, Christensen Ranch and Lost Creek, it is reasonable to expect that aquifer restoration can be achieved at Lost Creek. Furthermore, there are several reasons to expect that restoration can be achieved with fewer PV) of treatment and reinjection or disposal as described below.

Additional evaluation is provided with respect to the number of PVs of treatment that will be required to achieve restoration of the production zone aquifer. Table 2 presents a summary of the restoration schedule and volumes for Irigaray and Christensen Ranch. As shown on the table, the average number of PVs extracted and treated/reinjected/or disposed was 13.6 for Irigaray and 12.6 for Christensen Ranch. However, several points can be made that suggest that the number of PVs required to restore the aquifer at Lost Creek will be less than at Christensen Ranch and Irigaray. Circumstances at both those ISR projects resulted in increased PVs to achieve restoration goals including the following:

- Production and restoration were not conducted sequentially, and were hindered with extended periods of shut-in and standby, with delays of up to several years in some cases;
- During early production at Christensen Ranch, the lixiviant was an ammonium bicarbonate with hydrogen peroxide, which resulted in extensive additional restoration efforts;
- Groundwater sweep, the initial phase of restoration, was often largely ineffective and in some cases may have exacerbated the mining impacts to water quality; and
- RO was continued in some wellfields after it was apparent that little improvement in water quality was occurring.

Restoration was not performed immediately following the completion of production, and in some cases, there were long periods of inactivity during the production and restoration phases. At Irigaray, production was interrupted for a period of almost six years in MU1 through MU5 (Figure 1). Similarly, there was a three-year break in production in MU6 through MU9, when the operation was in standby status. Restoration did not commence at MU1 through MU3 until a year after production had ended. At MU4 and MU5, restoration operations did not begin until two years following production. Restoration commenced shortly after the end of production at MU6 through MU9. However the project was on standby status between the completion of groundwater sweep and the beginning of the RO phase of production, resulting in a break of one to two years, depending on the MU. Restoration was initiated sooner after the end of production at Christensen Ranch, with the exception of MU3 and MU4. However, there were periods of standby between groundwater sweep and RO treatment/injection of up to a year. These delays between and during production and restoration operations most likely increased the number of PVs required to complete aquifer restoration. UR Energy will commence restoration activities immediately upon completion of production within a wellfield, thus eliminating this factor in prolonging aquifer restoration.

Results of the effectiveness of groundwater sweep (or lack of it) were clearly demonstrated in the Christensen Ranch Wellfield Restoration report (CRWR) (COGEMA 2008). Examples of plots from that report of mean wellfield water quality at the end of mining, groundwater sweep, RO and stabilization monitoring are attached. Plots of TDS for MU3, MU5 and MU6 (Figures 5-7, 5-8 and 5-7, from the respective Mine Unit Data Packages of the CRWR), indicate minimal improvement following groundwater sweep at MU3 and MU5 and an actual increase at MU6. Following application of RO, the TDS values at MU5 and MU6 decreased to levels below the target Restoration Goal. Uranium increased in MU5 and MU6 following groundwater sweep (Figures 5-12 and 5-13 from the respective Mine Unit Data Packages of the CRWR), and then was significantly lowered during RO. Approximately 1,8. 4.8 and 1.5 PVs of groundwater were removed from MU3, MU5 and MU6, respectively, during groundwater sweep. This water removal was totally consumptive by design, in that none of it was returned to the aquifer. Based on the results, minimal benefit, if any, was derived from this phase of restoration. Groundwater sweep is an unnecessary, ineffective and consumptive step in the restoration process. Eliminating, or at least reducing the groundwater sweep phase, will reduce the number of PVs required to reach aquifer restoration goals.

In some cases, RO was continued longer than necessary or at least longer than any improvements to water quality were occurring. A review of the uranium and conductivity trend plots from the Irigaray recovery wells during restoration (included in the Irigaray Mine Wellfield Restoration Report (COGEMA 2004) show this to be the case. Figures 4-4 through 4-7 from the Irigaray report show that RO was often continued for several PVs beyond the point that water quality had stabilized. The additional PVs of RO resulted in no direct benefit to aquifer water quality and only resulted in consumptive use of the groundwater resources. RO typically results in disposal of approximately 20 percent of the recovered groundwater with reinjection of the remaining 80 percent following treatment. Terminating RO once water quality has stabilized will minimize the consumptive use of groundwater and reduce the number of PVs of treatment.

In addition to the improvements to restoration methods described above, UR Energy intends to conduct RO concurrent with production operations. Rates of up to 200 gpm will be treated using RO within portions of the wellfield while production is ongoing. This action will result in better water quality at the termination of wellfield production. This means that the starting point for restoration will be closer to the target restoration goals for the project.

The net result of each of these strategies (implementation of RO during production operations, immediate restoration following production, elimination of groundwater sweep, terminating RO once restoration is achieved or water quality has stabilized) should reduce the number of PVs required to achieve aquifer restoration. It is difficult to quantify how effective each of these strategies will be until actual field measured data become available. Substantial justification of the number of PVs estimated for restoration of Lost Creek following ISR mining using analytical methods or numerical modeling, given the degree of uncertainty that exists in many of the parameters that would be used in such a demonstration, does not seem appropriate at this time. The preferred approach is the one presented in this response; to use existing analogs to the site, and to adjust the PV approximation based on "lessons learned" from those sites.

Table 1. Geologic, Hydrologic, and Water Quality Properties- Lost Creek, Irigaray, and Christensen Ranch ISR Projects

	Lost Creek	Irigaray	Christensen Ranch
Permit Area	4,400 Acres	700 Acres	14,000 Acres
Wellfield Area	6 Mine Units - 235 Acres	9 Mine Units - 30 Acres	5 Mine Units - 200 Acres
Geology			
Basin	Greate Divide Basin	Powder River Basin	Powder River Basin
Location within basin	Northeast edge of basin	West central-east of basin axis	West central-east of basin axis
Depositional Setting	Fluvial/alluvial fan deposits	Fluvial/channel sands	Fluvial/channel sands
Formation	Eocene-Battle Springs(Wasatch Equivalent)	Eocene-Wasatch	Eocene-Wasatch
Regional Dip		NW at 1 to 2 1/2 degrees	NW at 1 to 2 1/2 degrees
Formation Lithology	Interbedded sandstone, siltstone and shales	Interbedded sandstone, siltstone and mudstone with thin coal beds	Interbedded sandstone, siltstone and mudstone with thin coal beds
Primary Ore Bearing Unit	HJ Horizon	Upper Irigaray Sandstone	K Sandstone
Lithology of ore bearing unit	fine to crse gr, poorly srtd, arkosic sd	fine to crse gr, poorly srtd, arkosic sd	fine to crse gr, mod srtd, arkosic sd
Ore bearing unit thickness	100 - 160 ft	75-130 ft	50 to 210 ft
Ore type	Roll Front/Tabular Deposits	Roll Front	Roll Front
Ore thickness	5 to 28 ft	15-25 ft	15-25 ft
Depth to ore zone	300 to 450 feet	100 to 300 ft	250 to 500 ft
Porosity	25 - 30%	23-29%	26 - 29 %
Overlying confining unit thickness	5 to 45 ft	18-25 ft	5-150 ft
Underlying confining unit thickness	5 to 75 ft	10-30 ft	20-70 ft
Hydrology (Ore bearing unit)			
Groundwater Flow Direction	West-Southwest	Northwest	Northwest
Hydraulic Gradient	0.0035 - 0.0056 ft/ft	0.005 ft/ft	0.004 to 0.010 ft/ft
Transmissivity (ore bearing unit)	60 to 100 ft^2/d	40 to 136 ft^2/d	33 to 138 ft^2/d
Hydraulic Conductivity	0.2 to 3.0	0.37 to 1.4 ft/d	0.32 to 1.6 ft.d
Storativity	3.3 E-05 to 9.1 E-04	2.70E-04	4.5E-05 to 1.3E-03
Groundwater Velocity	0.0025 to 0.054	0.019 to 0.03 ft/d	0.0088 to 0.043 ft/d
'Baseline Water Chemistry (Ore Bearing Unit)			
Water type	Calcium Sulfate to Calcium Bicarbonate	Sodium Sulfate	Sodium Sulfate
TDS (mg/l)	100 - 600	270-1050	400-1200
Sulfate (mg/l)	25 - 300	130-630	230-680
Calcium	5 - 150	1-34	10-50
Sodium (mg/l)	20 - 40	95-280	150-280
Bicarbonate (mg/l)	30 - 170	5-144	130-210
Manganese (mg/l)	0.01 - 0.03	0.05-0.19	0.01-0.05
Selenium (mg/l)	0.001 - 0.002	0.001-0.416	0.003-0.03
Arsenic (mg/l)	0.001 - 0.014	0.001-0.105	0.002-0.01
Uranium (mg/l)	0.001 - 0.844	0.0003-18.6	0.034-0.376
Radium (pCi/l)	0 - 550	0-250	83-430

Table 2. Production and Restoration Schedule and Volumes, Christensen Ranch and Irigaray ISL Uranium Projects

Christensen Ranch Production/Restoration

	Production[1]	GWS	RO	Recirculation	Stability Monitoring	Total Volume Restoration (million gallons)	Total PVs Restored	PV of GWS	PV of RO	PV of Recirc
MU2	Jul-93,May-97	May-97, Jul-98	Oct-00, Mar-02	Apr-03, Mar-04*	Apr-04, Jan-05	394	14.4	2.2	10.8	1.4
MU3	Mar-89-Jun-95	Mar-97, Sep 98	Feb-99, Aug-02	Feb-04, Sep-04*	Oct-04, Jul-05	443	19.8	1.8	16.4	1.6
MU4	Jun-94, Aug-97	Aug-97, Jul-98	Apr-01, Mar-03*	Mar-03, Apr-04	Apr-04, Jan-05	250	12.8	1.9	9.8	1.0
MU5	Jun-95, Mar-00	Aug-00, Jun-01	Feb-01, Nov-03	-	Nov-03, Aug-04	757	10.1	4.8	5.3	0.0
MU6	Jan-97, Jun-00	Sep-00, Feb-03	Oct-03,May-05	-	Jun-05, Mar-06	757	6	1.5	4.5	0.0
					Average	520.2	12.6	2.4	9.4	0.8

1 - 'Lixiviant was Sodium Bicarbonate with gaseous O2
* included H2S injection

Irigaray Production/Restoration

	Production[2]	GWS	RO	Recirculation	Stability Monitoring	Total Volume Restoration (million gallons)	Total PVs Restored	PV of GWS	PV of RO	PV of Recirc
MU1 - MU3	Oct-78, Oct-81 Aug-87, Jun-89	May-90, Apr-91	Apr-91, Oct-92	Oct-92, Nov-92	Dec-92, Sep-93	216	18.4		13.2	
MU4 - MU5	Oct-78, Oct-81 Aug-87, Jun-89	Jun-91, Oct-95	Oct-95, Aug-98	Aug-98, Sep-98	Oct-98, Jul-99	142	13.9		9.5	
MU6	Jun-88, Feb-90 Aug-93, Nov-94	Jan-96, Aug-98	Jul-00, Oct-01	Oct-01, Nov-01	Dec-01, Aug-02	127	9.5		7.1	
MU-7	Jan-88, Feb-90 Aug-93, Nov-94	Apr-95, Sep-97	Feb-00, Jul-01	Jul-01, Aug-01	Aug-01, Jun-02	189	14.3		11.7	
MU-8	Feb-88, Feb-90 Aug-93, Nov-94	Apr-95, Sep-97	Mar-99, Jun-00	Jul-00, Aug-00	Sep-00, Jun-01	55	12.5		10.2	
MU-9	Mar-88, Feb-90 Aug-93, Nov-94	Aor-95, Sep-97	Nov-98, Apr-00	May-00, May-00	Jun-00, Jan-01	110	13		10.7	
					Average	140	13.6		10.4	

2 - Liviant was Ammonium Bicarbonate with Hydrogen Perioxide in MU1 -MU5 from 1977 to May 1980. Thereafter Sodium Bicarbonate with gaseous O2 was utilized.

PV - Pore Volume
GWS - Groundwater Sweep
RO -Reverse Osmosis and Reinjection
Recirc - Recirculation

Figure 1. Production and Restoration Sequence, Irigaray And Christensen Ranch ISR Uranium projects

Irigaray Mine Units 1 through 9

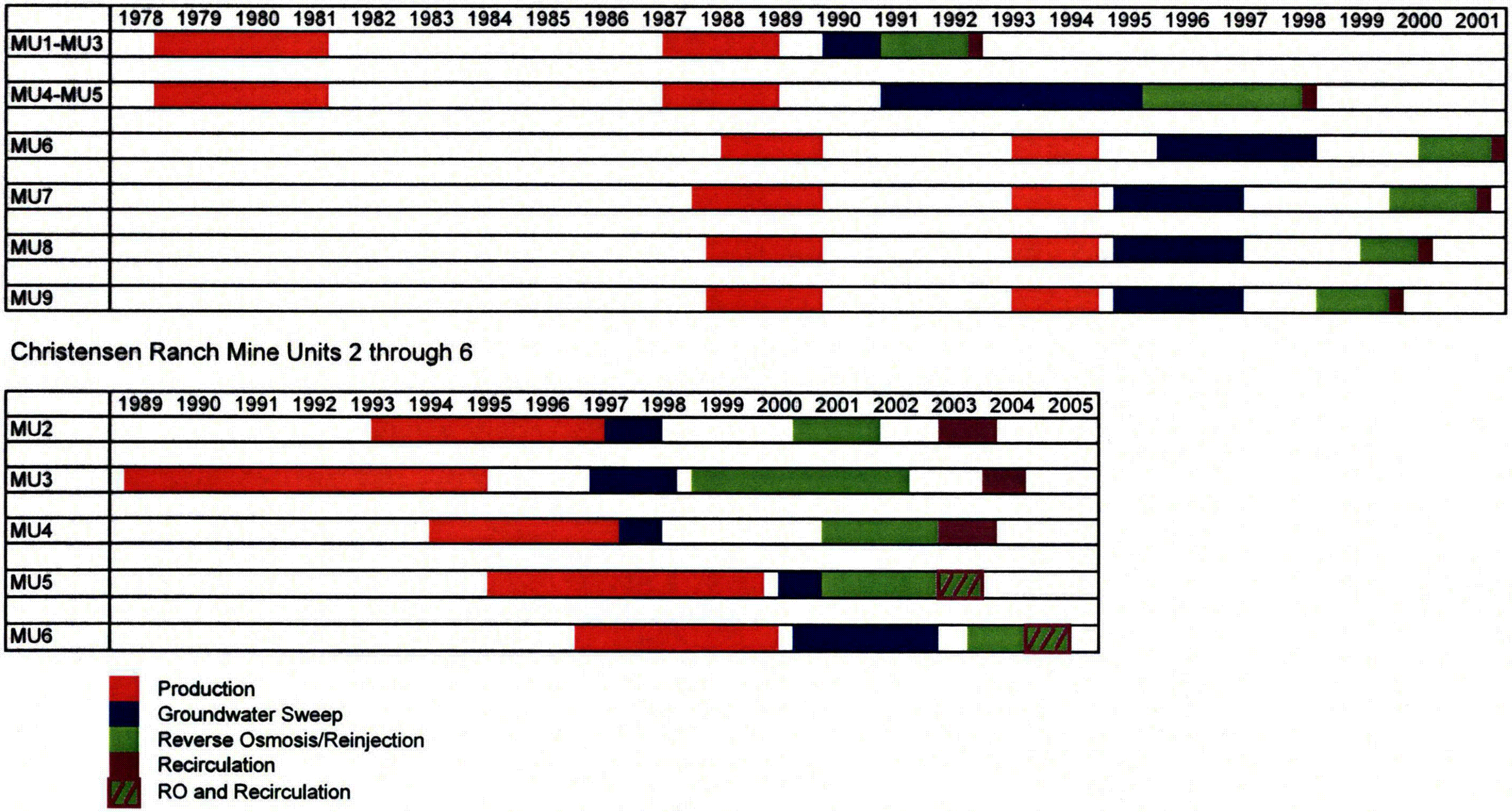


Figure 5-7. Mean TDS Concentration-Post Mining Through 4th Stability Round
Mine Unit 3, Christensen Ranch, Wyoming, Cogema Mining, Inc.

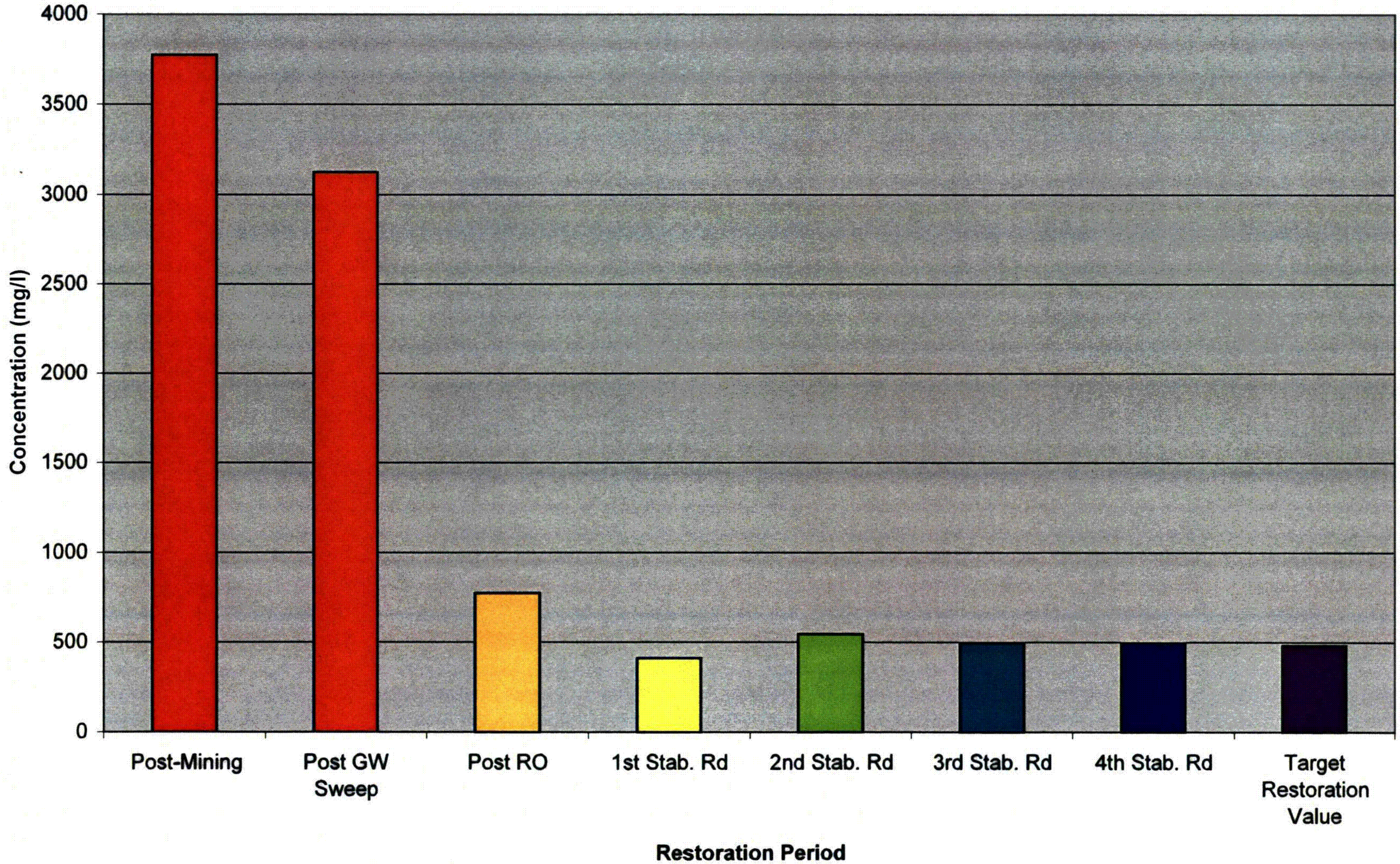


Figure 5-8. Mean TDS Concentration-Post Mining Through 4th Stability Round
Mine Unit 5, Christensen Ranch, Wyoming, Cogema Mining, Inc.

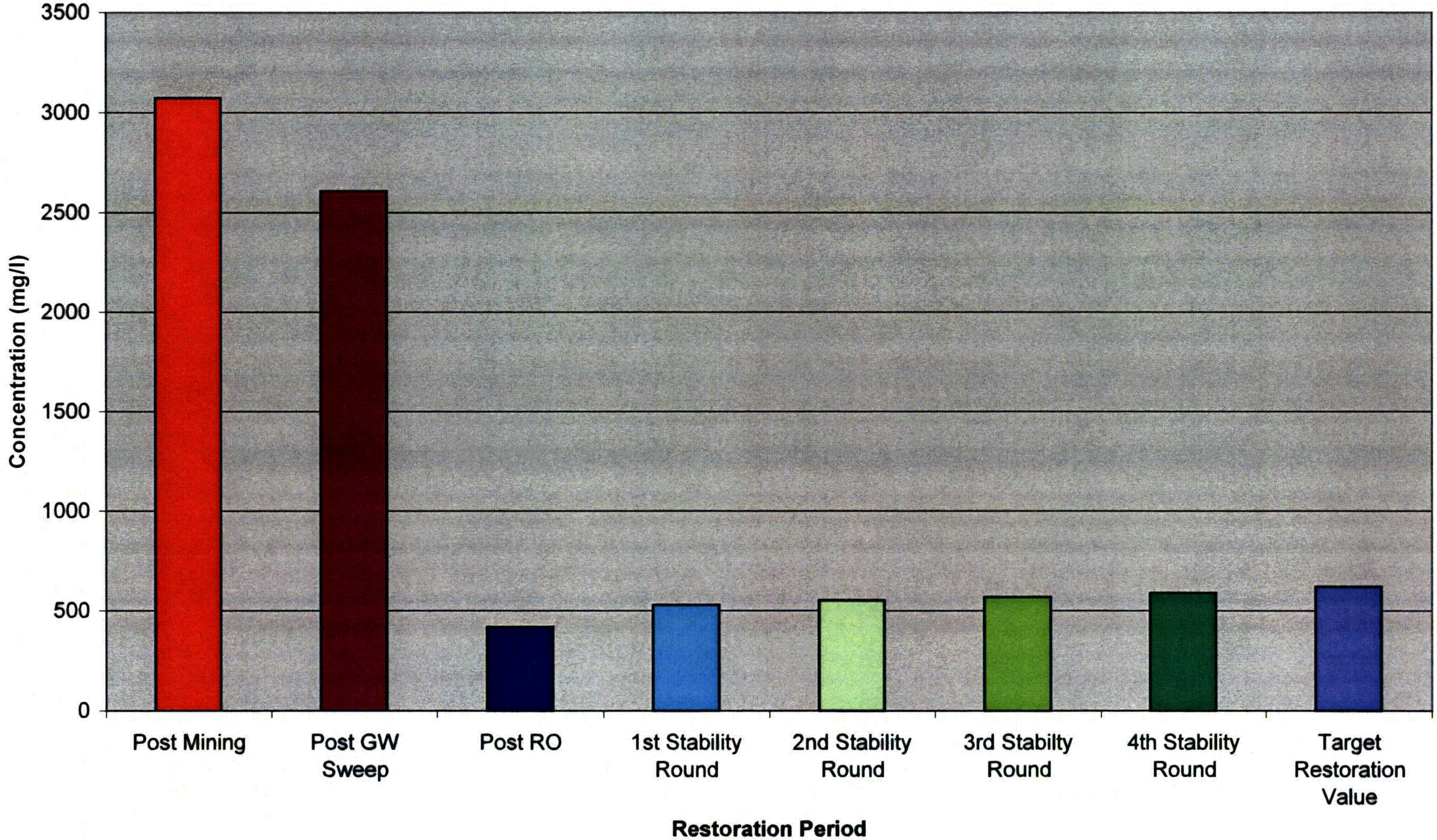
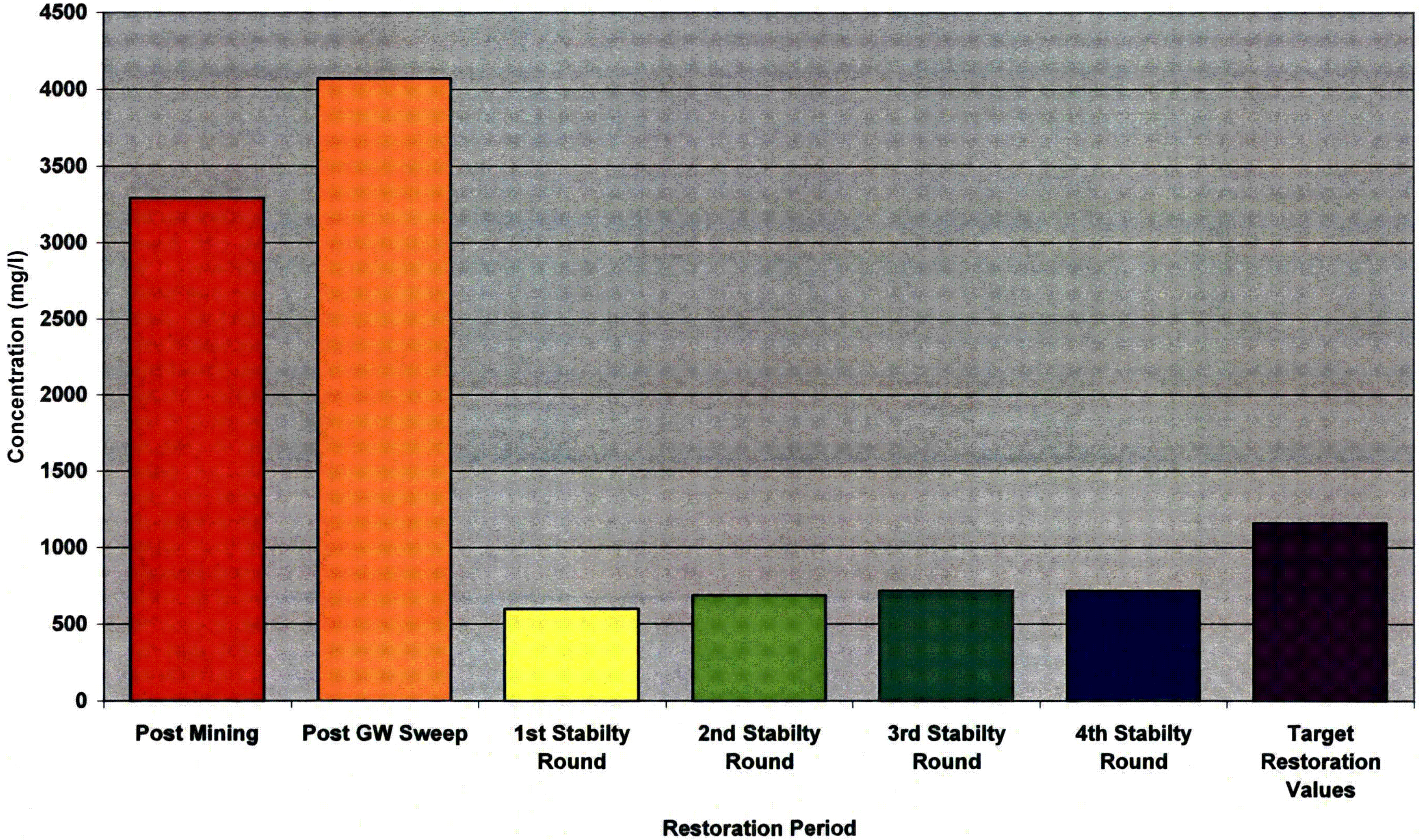


Figure 5-7 Mean Total Dissolved Solids Concentration-Post Mining Through 4th Stability Round
Mine Unit 6, Christensen Ranch, Wyoming, Cogema Mining, Inc.



Figuire 5-12. Mean Uranium Concentration-Post Mining Through 4th Stability Round
Mine Unit 5, Christensen Ranch, Wyoming, Cogema Mining, Inc..

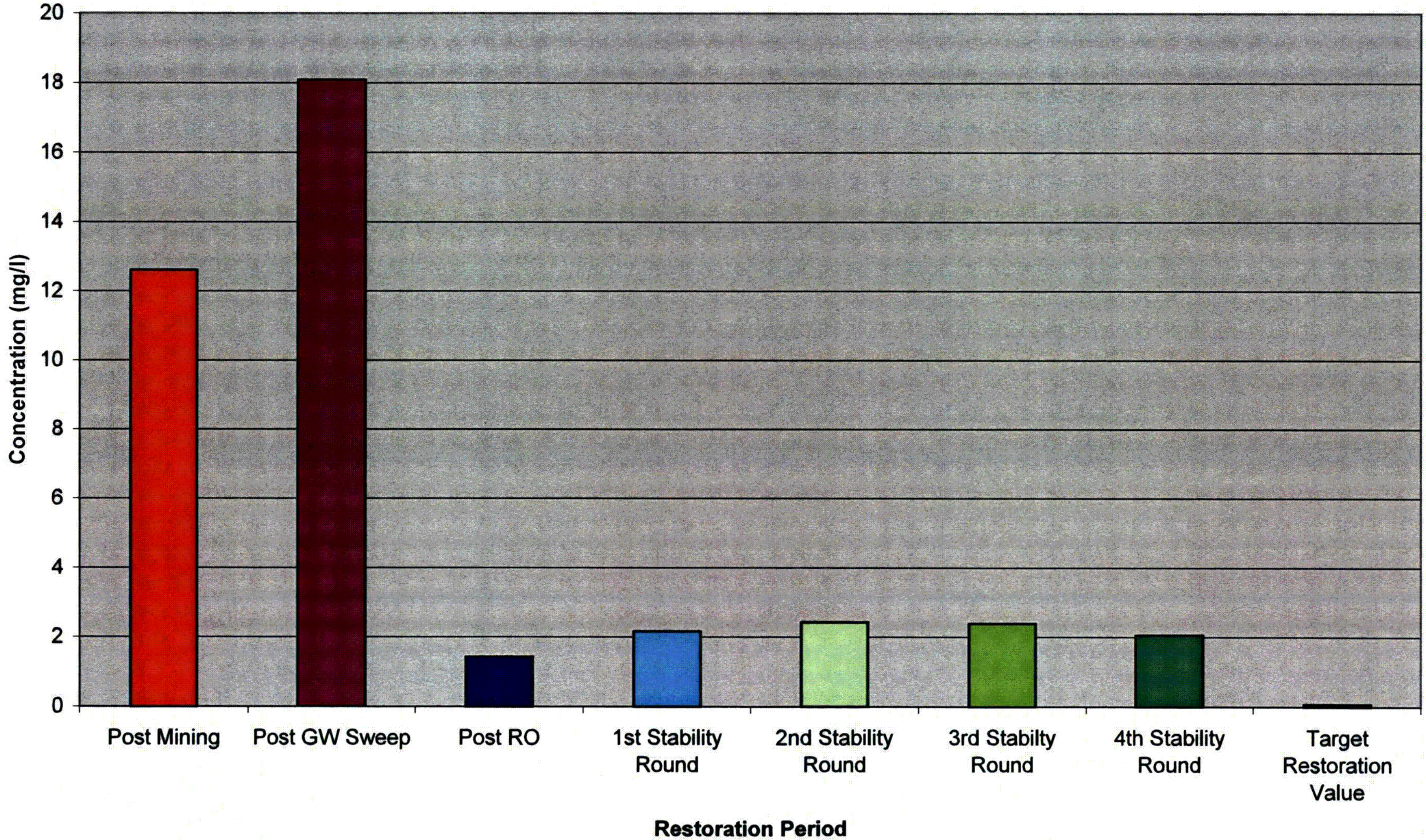


Figure 5-13 Mean Uranium Concentration-Post Mining Through 4th Stability Round
Mine Unit 6, Christensen Ranch, Wyoming, Cogema Mining, Inc.

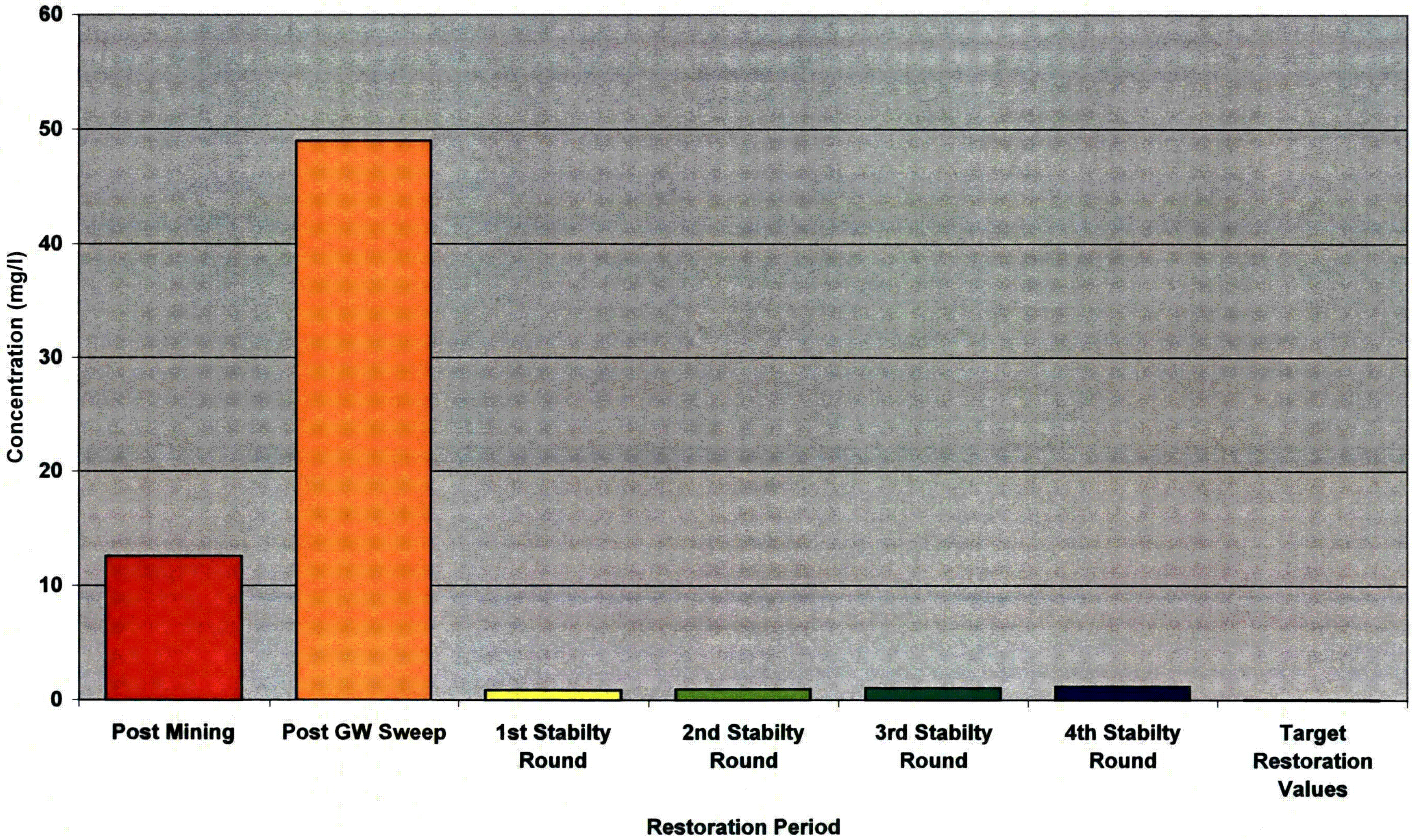


FIGURE 4-4
CONDUCTIVITY AND URANIUM TRENDS
PRODUCTION UNIT 6, RO PHASE
(MONTHLY RECOVERY WELL AVERAGES)

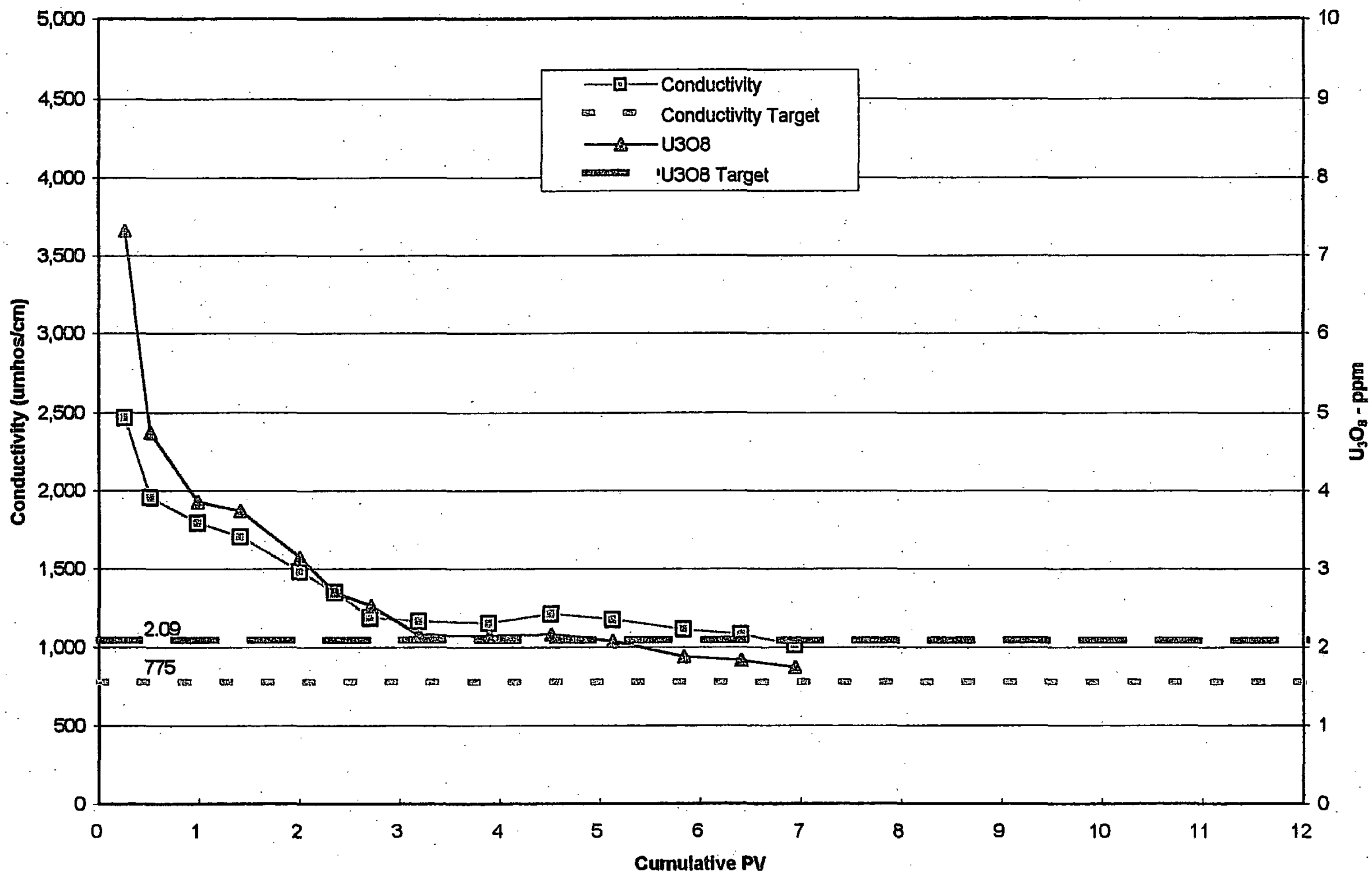


FIGURE 4-5
CONDUCTIVITY AND URANIUM TRENDS
PRODUCTION UNIT 7, RO PHASE
(MONTHLY RECOVERY WELL AVERAGES)

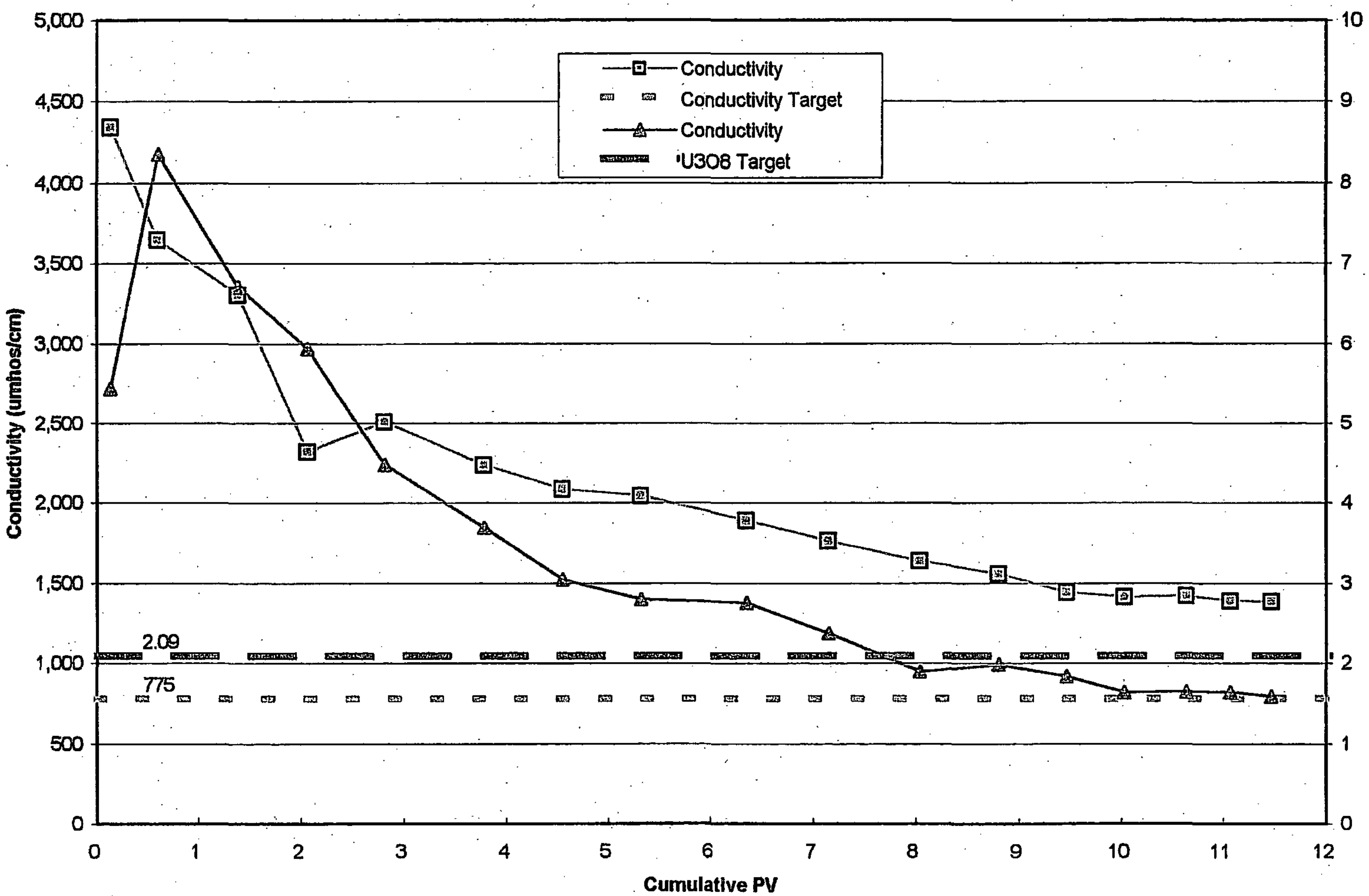


FIGURE 4-6
CONDUCTIVITY AND URANIUM TRENDS
PRODUCTION UNIT 8, RO PHASE
(MONTHLY RECOVERY WELL AVERAGES)

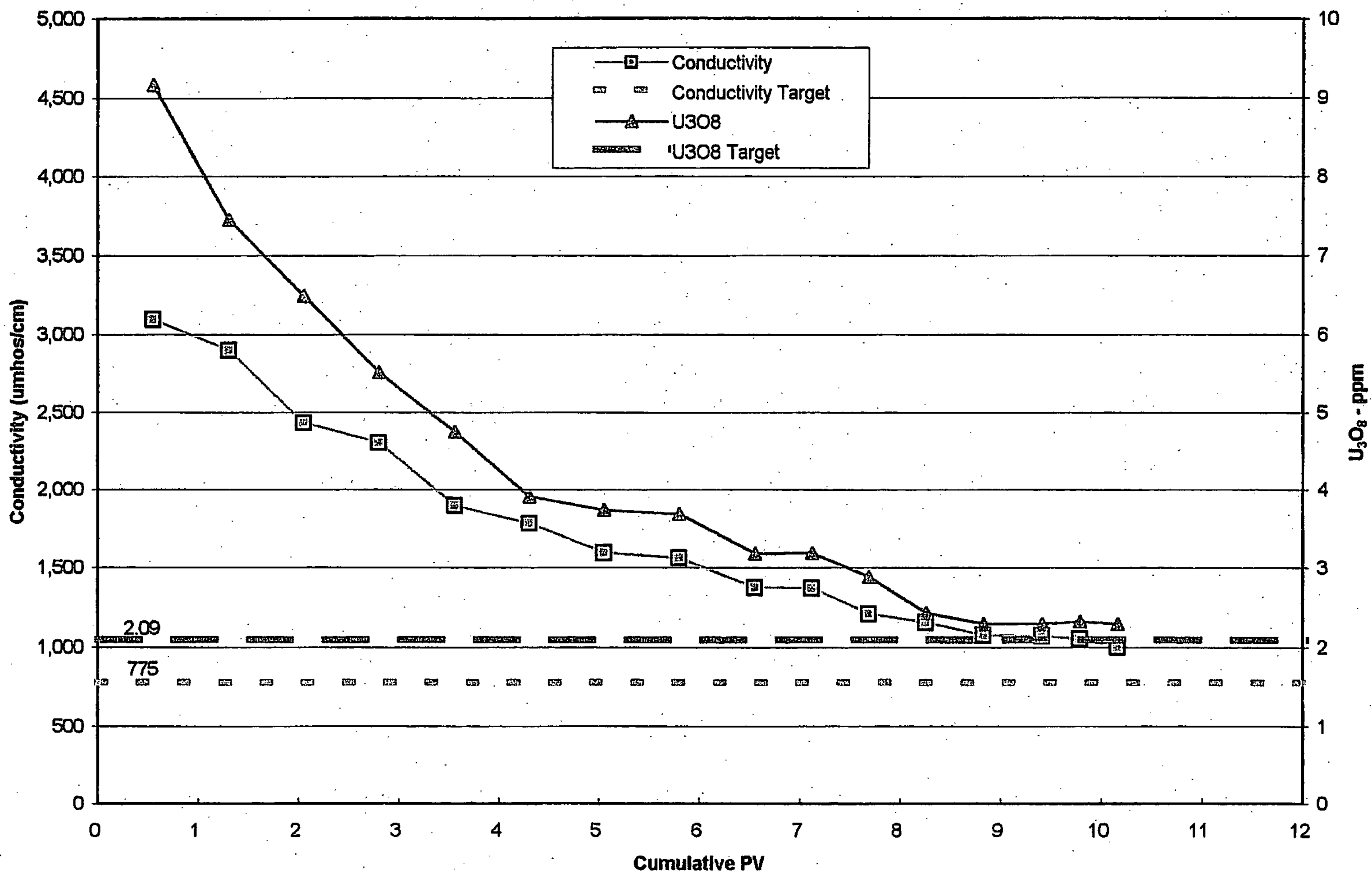
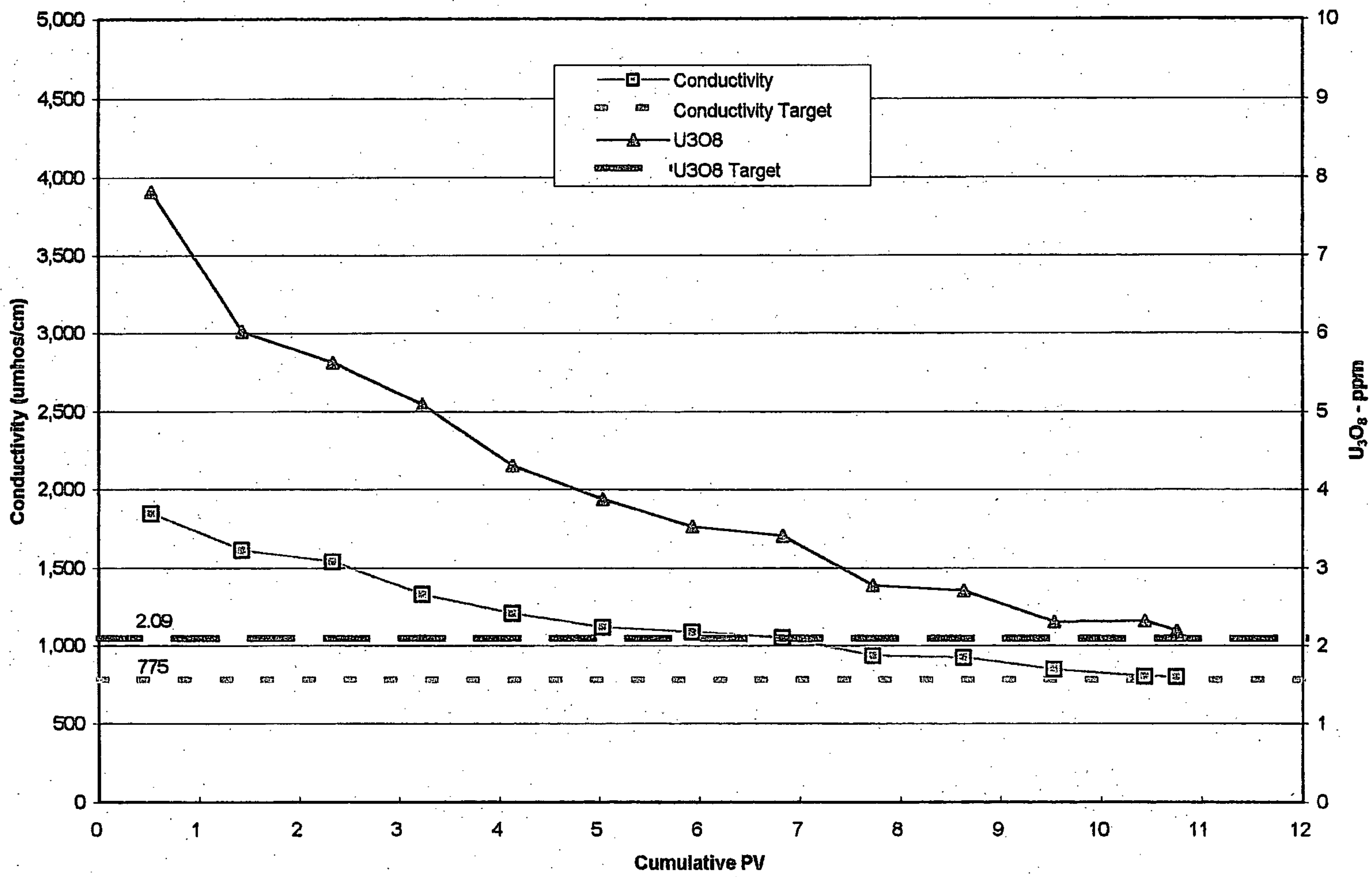


FIGURE 4-7
CONDUCTIVITY AND URANIUM TRENDS
PRODUCTION UNIT 9, RO PHASE
(MONTHLY RECOVERY WELL AVERAGES)



RESPONSES TO NRC COMMENTS
of 11/6/2008 on

SECTION 7.0
Environmental Effects

in the Technical Report for the
LOST CREEK PROJECT
Wyoming

7.2 Radiological Effects

LCI did not provide sufficient information regarding radiological effects. Information regarding dose to members of the public and meteorological data are important for assessing LCI's ability to operate the proposed facilities safely. Please provide the following information:

1. ***Attachment 7.2-1 data appears to conflict with data in Section 7.2. For example, data in Figure 7.2-3 and Table 7.2-1 in Section 7.2 indicate a maximum dose to a receptor at SEB1 of 3.01 mrem while Figure 3 and Table 6 of Attachment 7.2-1 indicate a maximum dose to a receptor at NB of 136 mrem. Review all data in Section 7.2 and Attachment 7.2-1 and provide an explanation for the differences.***

   The version of Attachment 7.2-1 included in Volume 3 of 4 of the Technical Report is an old version (September 2007), which should have been replaced with a newer, revised version of Attachment 7.2-1 (March 2008). The revision was necessary because of differing interpretations of the definitions of a couple of the MILDOS input parameters. The newer version of Attachment 7.2-1 is included in Volume 4 of 4 of the Technical Report, and the figures and tables in Section 7.2 are from the newer version. LLC ISR, LLC apologizes for the oversight in not replacing the old version of the attachment in Volume 3.

2. ***Typographical errors:***
   Proofread, and revise as applicable, typographical errors relating to figures and tables including the following:

   a. ***On page 7-15, LCI refers to Table 7.3-1. The correct reference appears to be Table 7.2-1.***

      As noted by the reviewer, the correct reference should be Table 7.2-1. LC ISR, LLC will provide a replacement page if requested by NRC.

   b. ***LCI states: "Most mine units are upwind of the SEBI location. Calculated receptor doses for the plant are shown in Figure 7.2-4." However, Figure 7.2-4 shows doses to workers.***

      As noted by the reviewer, the correct reference should be Figure 7.2-3. LC ISR, LLC will provide a replacement page if requested by NRC.

c. ***LCI states: "Moving the plant to the alternate location (Plant 2 in Figure 7.2-3) ..." However, Figure 7.2-3 shows dose at the preferred plant site.***

As noted by the reviewer, the correct reference should be Figure 7.2-2. LC ISR, LLC will provide a replacement page if requested by NRC.

In addition, the reference to Table 7.3-4 on Page 7-16 should be to Table 7.2-4. LC ISR, LLC will provide a replacement page if requested by NRC.

<u>Section 7.4 Effects of Accidents</u>

This section describes the environmental effects of various accident scenarios. However, LCI needs to provide information regarding the systems and procedures that it will use to prevent accidents at the facility or minimize the effects of such accidents on worker and public health. The requested information is described in Section 7.5. of Regulatory Guide 3.46.

1. ***Regarding a pipeline failure event, LC states: "If the volume and/or concentration of the solutions released in such an accident did constitute an environmental concern, the area would be surveyed and the contaminated soils would be removed and disposed of according to NRC and/or state regulations." Please define what constitutes an environmental concern" in regards to spills of pregnant and barren lixiviant.***

   With regard to radionuclides, any soil affected by a spill resulting in an exceedance of the 10 CFR 40 Appendix A Criterion 6 decommissioning standards will be cleaned up in a timely manner to prevent any harm to the environment or to employees.

   With regard to non-radionuclide hazardous constituents, any soil contaminated by a spill in such a manner that it exceeds the Toxicity Characteristics Leaching Procedure (TCLP) limits established in 40 CFR 268 will be treated or removed. In order to determine what soils exceed the TCLP limits, the Environment, Health, and Safety Department will ensure an annual analysis of pregnant lixiviant is performed for all constituents listed in 40 CFR 268 and calculate the potential for exceeding the TCLP standard (using the same calculation method in NUREG/CR-6733). If the calculation reveals that the leachate is more than 15% of the TCLP limit, then any soil impacted by a spill will be sampled and analyzed by TCLP. The soil will be removed or treated if the analysis reveals the TCLP standard has been exceeded. LC ISR, LLC will also comply with all Wyoming Department of Environmental Quality standards with respect to soil contamination.

2. ***What is the minimum leakage rate that will be detectable with installed instrumentation?***

The minimum detectable leakage will typically depend on the area, the system and the location of the leak. For example:

LCI is planning on installing wellhead leak detection inside the wellhead covers. This detection system will typically use simple circuit completion as the tool to alarm in the event of a leak. Anything from a drip to a small leak will be detectable if it will "puddle" water.

LCI is also planning on installing sump pumps in the mine unit header houses. The sump pumps will notify the main system when they become operational. If the leak is large enough to generate two or more gallons, the alarm should initiate. This will contain all leaks within the header houses. In the case of a catastrophic failure within the header house, the sump pump will not be able to keep up with the leak rate, and a high level shut down point will be reached. At that time, the injection and production line control valves will shut and the pumps associated with those lines motor control center will also shut down.

Leaks between the header house and the wellhead are the hardest to detect and at the same time the rarest. There are typically no fittings outside the header house or the wellhead cover, only high density polyethylene (hdpe) pipe. Typical failures occur at connections or fusion joints. The flow rates and pressures for injection and production wells will normally be monitored and compared through the main system, i.e., differential flow and pressure analysis. An upset will usually be defined in the range of 10% to 25% difference in flow or pressure and will generate an alarm for the operator's attention.

As with all leak detection systems, they are augmented by a strong operations and field presence with routine checks on pipelines, wellheads and other production components.

3. ***Provide verification that the accident response program includes notification to NRC in compliance with the requirements of 10 CFR 20.2202 and 20.2203.***

Please see Sections 4.2.5.5 and 5.7.6.5 of the TR. LCI will write and implement an Emergency Response Standard Operating Procedure (SOP) which clearly defines under what circumstances reporting is required and to which agency(ies). The SOP will provide guidance on how to determine the doses which require reporting under 10 CFR 20.2202 and 2203.

4. ***Please provide a description of how a facility wide power outage would be handled and resolved in the main plant, mine unit, pond, and disposal well operations.***

For a facility wide power outage, the only processes that would typically remain operational are the emergency and critical systems in the Plant, which are listed below. All other processes, including those related to the mine units, storage ponds, and disposal wells, would normally remain down until power is restored. Shutting down the majority of the operation until full power is restored will stop flows and reduce the chance of an undetected leak.

The emergency or critical systems in the plant that would typically remain operational are:

- General heating, ventilation, air conditioning, and lighting in the Plant and Office;
- Plant Operator's computer;
- All ventilation systems;
- Tank agitators;
- Instrumentation;
- Any safety systems (i.e. safety showers, eyewash stations, etc); and
- Any installed security systems.