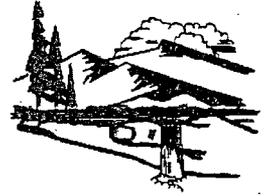




Department of Environmental Quality



To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director

December 31, 2008

Mr. Ken Milmine
Uranium One
907 North Poplar Street, Suite 260
Casper, WY 82601

RE: Completeness Review, In Situ Mine Application for the Antelope and JAB Uranium Project, Uranium One, TFN 5 1/044

Dear Ken:

Thank you for your patience as we try to manage our increasing workload. I have completed the Completeness Review for the above listed permit application. In order to conduct a thorough Completeness review I inevitably generate Technical Review comments. In this case, the technical review comments are fairly comprehensive. However, the second round of review will include new technical comments, based on new information submitted as well as those items that were not reviewed in detail. For example, I have not checked all of the Appendix A and Appendix B maps and tables for accuracy, or reviewed the reclamation cost estimate in any detail.

These technical comments can be addressed at a later date, and do not affect the completeness status of the application. Several Land Quality staff contributed to this review. Mark Moxley did a general review; Craig Smith reviewed the vegetation and wildlife aspects of the application; and Brian Wood reviewed the surface water hydrology portion. Their comments are designated with a "MM", "CS" and "BW", respectively, at the end of each comment. Although an effort was made to avoid duplicate comments, we recognize that there may be some overlap, especially where the topic is presented in more than one section of the application.

COMPLETENESS COMMENTS:

1. Form 8, Surface Owner consent. This form must be completed for any private or state lands within the permit area.
2. The Reclamation Cost Estimate is presented, and once the amount is approved as part of the Technical Review, the operator will submit a Letter of Credit.

Lander Field Office • 510 Meadowview Drive • Lander, WY 82520 • <http://deq.state.wy.us>

ABANDONED MINES
(307) 332-5085
FAX 332-7726

AIR QUALITY
(307) 332-6755
FAX 332-7726

LAND QUALITY
(307) 332-3047
FAX 332-7726

SOLID & HAZARDOUS WASTE
(307) 332-6924
FAX 332-7726

WATER QUALITY
(307) 332-3144
FAX 332-7726



3. Appendix A contains the Archeological reports for both the JAB and Antelope properties. The Antelope report, conducted by Jones & Stokes did not include 117 acres of the permit area. This area was reportedly surveyed in 2008 yet is not included. In addition, the Jones & Stokes report lacks the level of detail provided for the JAB site's inventory prepared by ARCADIS. The Arcadis report includes site maps, photos and detailed write-ups for each site identified. No SHPO concurrence or determination letter is provided.
4. The maps illustrating the permit boundary (e.g. Fig. 1-4) must be presented on a USGS quad map, or a high quality reproduction, with a scale of 1" = 2,000'. (MM)
5. Figures 1.2, 1.3, 3-10, 3-11, 6-1 and 6-2 should show a definitive annual schedule for the operation (one year increments) not two year increments. (MM)
6. Figures 1-2 and 1-3. Production, Restoration and Decommissioning Schedules. The operations plan must demonstrate that reclamation will be contemporaneous with mining operations. Definitive commitments such as the following should be provided:
 - seamless transition from production to restoration with no wellfield down time
 - no inactive wellfields for periods exceeding 30 days
 - no more than three wellfields in production at any given time
 - complete restoration of the first wellfield before initiating production from the 5th (MM)
7. There are large portions (entire sections) of the permit area where no wellfields (or mineralization) is shown (Figure 1-4). These lands may not be included in the permit unless there is a plan to mine in these areas. If there are potential ore deposits in these areas then they should be shown on the map. If not, then these areas should be removed from the permit area. (MM)
8. Any proposed on-site solid waste landfill (Section 1.9.2) must be permitted as part of the WDEQ/LQD mine permit, subject to landowner consent. Complete plans and specifications must be included. (MM)
9. Section 2.2.3.5 (page 2.2-19) states that minimal effects are anticipated as a result of drawdown, but no supporting information is provided. W.S. 35-11-428(a)(iii)(E) requires an assessment of impact to water resources on adjacent lands and the steps that will be taken to mitigate the impacts. Drawdown projections should be developed for all aquifers that could potentially be affected by the operation and drawdown maps presented to illustrate the extent of projected drawdown. (MM)
10. Section 2.6.4 Drill Holes. There are over 1500 historic drill holes at the JAB property and close to 4,000 historic drill holes at the Antelope property. There are reportedly no abandonment records available for the drill holes, other than those drilled by Uranium One. Section 2.7.2.4 Site Specific Aquifer Properties, concludes that hydraulic communication observed during the MP - 2103 pump test is potentially from historic drill holes, and that "corrective action may be taken to eliminate potential communication pathways". What measures have been taken to locate and identify the locations of these old drill holes and to determine their status? Prior to mining there needs to be assurances that these holes have

- been properly abandoned, and will not provide a conduit for the movement of fluids between aquifers. WDEQ/LQD Chapter 11, Section 3(a)(xii) and Section 8.
11. Figures 2.6-3 through 2.6-6 The cross sections for the JAB site simply identify the several hundred feet overlying what is identified as the 'Overlying Sand' as 'Overlying Undifferentiated Units'. The stratigraphy of these units needs to be defined. Sandstones and shales should be identified. Are there any other potential aquifers within the 'Overlying Undifferentiated Units'? Are there any shales acting as aquitards? Similarly the 'Underlying Differentiated Units' below the 'Production Sand' also need to be defined, discussed and represented in the cross sections. WDEQ/LQD Chapter 11, Section 3(a)(viii and ix).
 12. Section 2.7.2.2 Site Hydrogeology. Any potentially affected aquifer within the permit boundaries needs to be identified. (WDEQ/LQD Chapter 11, Section 3(a)(xiii)) Furthermore potentiometric surface maps of these aquifers need to be presented for the entire permit area, baseline water quality of each aquifer needs to be defined with a minimum of four quarters of data, as per WDEQ/LQD Guideline 8. Any aquifer overlying the production sands needs to be characterized. It may be necessary to drill some exploration holes with air to determine if any unidentified aquifers exist overlying the producing sandstones.
 13. Section 2.7.2.1 Regional Hydrogeology. This section states that there are Quaternary gravels present at the JAB site that though discontinuous could yield large amounts of water. This aquifer needs to be identified as a potentially affected overlying aquifer and should be identified by monitoring wells, a possible potentiometric surface map, and aquifer characteristics. As stated in Chapter 11, Section 3, any aquifer that could potentially effected by mining operations must be characterized. Any aquifer overlying the production zone has the possibility of being affected. Section 2.7.2.4 Potential Groundwater Impacts from Spills mentions "potential for impact of the shallow aquifer".
 14. Section 2.7.2.2 Site Hydrogeology – JAB Hydrostratigraphic Units. The Quaternary gravel needs to be identified and characterized.
 15. Figures 2.7-20 and Figure 2.7-21 Groundwater Trilinear Diagrams. A diagram should be provided for each potentially affected aquifer. The trilinear diagram for the Antelope site has lumped all of the sandstone units into one diagram. Chapter 11, Section 3(a)(xv).
 16. Table 2.7-14 Summary of Water Quality Averages– Antelope and JAB Uranium Project. The groundwater water quality should be distinguished for each aquifer, and not lumped into one average for the project areas.
 17. Addendum 2.6-G Antelope and JAB Soil Maps are missing from the permit document.
 18. Addendum 2.8-B (Summary Cover data): This section is incomplete. Please correct the following:
 - a. Antelope, Breaks Grassland: information is not present.
 - b. Antelope, Mix-grass/Mat-cushion Grassland: information is incomplete.

- c. Antelope, Intermittent Stream Grassland: information is incomplete.
 - d. JAB, Big Sagebrush Shrubland: information is not present.
 - e. JAB, Sagebrush Grassland: information is not present. (CS)
19. Section 2.8.6.6, Conclusion: It is stated that the Corp of Engineers has not yet determined if wetlands in the permit are non-jurisdictional. Please indicate the Corp of Engineers decision. (CS)
 20. Section 2.8.7 Wildlife. Written documentation from the Wyoming Game & Fish and U.S. Fish and Wildlife Service which addresses any specific permitting requirements that they wish to impose based on the wildlife survey results, needs to be included in the permit document.
 21. Definitive commitments are required for monitoring and protecting sage grouse. It appears that the two known leks that are within the permit area are at least ½ mile from any proposed operations. It would seem that a commitment could and should be made to maintain a ½ mile, year round "no disturbance" buffer around these two leks. (MM)
 22. Section 2.9.2.4 Site Specific Aquifer Properties. Admittedly additional aquifer testing will need to be conducted at both sites. Pump tests should define whether any aquifers overlying or underlying the ore zone will be influenced during mining. WDEQ/LQD Chapter 11, Section 4(a)(xii). All aquifers overlying production zones need to be characterized with monitoring wells, potentiometric maps and aquifer characteristics determined from pump test results.
 23. Section 3.0 Description of Proposed Facilities, and Figure 3-2 Typical Well Completion. All monitoring well completion logs need to be included as part of the permit document. It would be preferable if these logs contained the stratigraphic log with it, otherwise the stratigraphic logs should be included separately. WDEQ/LQD Chapter 11, Section 3(a)(xi)(A)
 24. Section 3.0 Description of Proposed facility, paragraph 2 states "There are no evaporation or holding ponds planned for the Antelope or JAB project areas at this time." The facility will need to have an alternate storage option for the water generated from the pumping operations during the downtime of injection wells or a major spill clean-up. Evaporation ponds will need to be designed and sized accordingly.
 25. Section 3.0 Description of Proposed Facility, Section 4.0 Effluent Control Systems, and Section 6.1.9 Restoration Wastewater Disposal. Deep disposal wells are a key component of this project. Permits for these wells should be included as part of the mine permit application. The feasibility of a series of deep disposal wells at the site has not been explored and will be required in permit application. The viability of a deep aquifer that would meet Class I (or Class V) disposal well requirements needs to be presented. An exploration hole will need to be drilled to adequately provide the necessary information.
 26. Section 3.0 Description of Proposed Facilities. Subsidence or the lack of subsidence anticipated at the mine site needs to be addressed as per Chapter 11, Section 4(a)(xix).

27. Section 3.0 Description of Proposed Facilities. Fencing specifications and locations need to be presented. Fencing should be adequate to keep livestock from entering the mine area.
28. Section 3.1.4 Well Construction and Integrity Testing. This section should be expanded to include a well maintenance plan which will meet the requirements outlined in Chapter 11, Section 4(a)(A through D).
29. Section 3.1.5 Wellfield Design and Operations. This section is conceptual in discussion since a well field package for the first mine unit is not included. The WDEQ/LQD Administrator has determined that a permit will not be approved, without a detailed wellfield package for at least the first mine unit as part of the application. Current figures, maps, and timetables should all be titled "Conceptual.." and a wellfield package for at least the first mine unit should be prepared and submitted as part of the permit application.
30. Section 3.1.5 should include a plan for wellfield layout and installation, including a schematic drawing. This plan should justify and demonstrate why the wellfield is designated as a "minor disturbance" area, thus not requiring topsoil stripping. This plan should address the specific measures to be employed to minimize disturbance and protect the native vegetation and soils. These measures should include up-front planning and installation of appropriate service roads (with topsoil salvage); establishment of designated temporary off-road traffic routes; construction of appropriate drainage crossings, culverts or graveled low-water crossings; centralization and co-location of pipelines and utility lines; restricting off-road operations during wet or muddy conditions; orderly and sequenced installation of wells and utilities, designation of zones or corridors of "no disturbance"; use of low-round pressure vehicles; and appropriate enforcement of these protective measures. The goal is to preserve a substantial portion (at least 50%) of the native vegetation in the wellfield. If this is not achievable then topsoil stripping may be required prior to wellfield development. (MM)
31. Section 3.5 Access Roads Construction and Maintenance. Uranium One must obtain a Right-of-Way agreement, including a legal description (metes and bounds or quarter-quarter) and documentation of the final (reclaimed) condition, from the BLM for the primary access (Connector) road between the JAB and Antelope Projects. As the road will not receive maintenance by a Public entity, rather maintenance will be incumbent on Uranium One, the Connector road should be incorporated into the permit area. Please provide a ROW agreement and revise the permit area boundary to include the Connector road. (BRW)
32. Figure 3-12 and Figure 3-15. Detailed site plans should be presented for the facilities areas to replace Figures 3-12 and 3-15. Site plans should be presented on a topographic base at a scale of 1"=100' with a 2' contour interval. All facilities and structures should be shown, including lay-down yards, ponds, site drainage control features and topsoil stockpiles. (MM)
33. Section 4.2.2 Liquid Waste Disposal. This section states that the average disposal waste stream throughout operations and restoration will be 150 gpm. Chapter 11, Section 4(a)(ii)(D) states: "The capacity of the water / wastewater treatment systems and

correlation of the capacity with the mining and restoration schedules" must be discussed and illustrated in relation to the proposed mining schedule. Please indicate over the life of the mine and the development schedule of the well fields and through restoration what the required capacity values will be. In addition, the capacity of the disposal wells, and their ability to keep up with the production schedule must be clearly presented. Also, given that the restoration plan in Section 6.0 states that groundwater sweep may or may not be utilized greatly affects the gpm generated during restoration. The water balance must detail the capacities required for mining, all phases of restoration, and the ability to pump additional waters during an excursion event.

34. Section 6.0 Groundwater Quality Restoration, Surface Reclamation, and Facility Decommissioning. Similar to the Operations Plan, the majority of this section is conceptual in nature. Detailed specifics and water balance information, at least for the first well field package, will be required for the application to be deemed complete.
35. Section 6.1.3 must specify in detail the methods and efforts that will be employed to restore the groundwater to background water quality levels (i.e. define BPT): This description should specify the volumes of water (pore volumes, including the PV calculation) to be treated, re-injected and circulated and the specific treatments to be used. The application must provide detailed justification to demonstrate that the prescribed methods have been proven to be successful in restoring groundwater to background water quality levels and thus constitute BPT. Once approved, WDEQ/LQD will expect the operator to employ these prescribed restoration efforts. The reclamation bond will be calculated based on the estimated cost of completing these prescribed efforts. BPT will thus be defined and approved up-front for each wellfield. Restoration will be considered to be complete once the approved BPT efforts have been conducted, assuming that the class of use has been achieved. This process of defining and approving BPT will provide a measure of certainty to all parties. It is envisioned that the definition of BPT could change for future wellfields. (MM)
36. Section 6.1.6 Environmental Effects of Groundwater Restoration. Chapter 11, Section 4(a)(xxi) states that "an assessment of impacts that may reasonably be expected as a result of the mining operation to water resources and water rights inside the permit area and on adjacent lands, and the steps that will be taken to mitigate these impacts." be included in the permit application. Please add this discussion to the permit.
37. Section 6.6 and Appendix D. Reclamation cost estimate :
 - a. The reclamation cost estimate must be accompanied by a detailed critical path time schedule.
 - b. The reclamation cost estimate must include a detailed description of labor requirements and assumptions and fully itemized labor costs for all phases of the reclamation project. It is noted in section 7.5.2 that the projected workforce for the project will be 40-60 people. Section 9.3.1 discusses a maximum workforce of 80 workers. Restoration operations would require a similar workforce. (MM)

38. Section 10. A sample of the Public Notice text should be provided, as well as details as to who needs to be notified, and what the public notice, and public comment procedures are, as provided in Chapter 11, Section 21.

TECHNICAL COMMENTS:

1. Form 1 UIC, Item 6 has two different acreages listed on the form. The form was originally completed with 14,574 acres, but was revised by hand to 14,578.05 acres. Appendix C indicates the acreage as 10,538.12 for Antelope and 4,039.93 for JAB, a total of 14,578.05 acres.
2. Adjudication Appendixes A, B and C should be listed in the Table of Contents and tabbed for ease of reference. It would be helpful if each section of the permit document (e.g. soils, vegetation, wildlife, wetlands, etc.) were separated and identified with a divider tab. (MM)
3. Appendix A, Figure 1-1. The Surface and Mineral Ownership Map, Figure 1-1 lists the BLM and State of Wyoming as surface and mineral owners and shows easements for Sweetwater County Roads, PP&L Powerlines and Oil and Gas Pipelines. Exxon and Frontier Pipeline Co., are listed in Appendix A as having surface ownership. The map should distinguish which pipeline corridors belong to which company.
4. Figure 1-4. JAB and Antelope Site plans. This map should also identify any existing gas or water well, or spring within three miles of the permit boundary, as per WDEQ/ LQD Guideline No. 8.
5. Figure 1-4. JAB and Antelope Site Plans and Figure 1-2 and 1-3 Production, Restoration, and Decommissioning Schedule. The schedules indicate two wellfields for JAB and six well fields for Antelope, yet the Site Plan only indicates one wellfield for JAB and five for Antelope. Please indicate where the additional well fields will be located on Figure 1-4.
6. County roads should be identified by name and county road number on the maps. (MM)
7. Figures 1-2 and 1-3, Production, Restoration and Decommissioning Schedules. The time frame allotted for each well field is identical. Approximately 9 months for construction, 34 months for production, 34 months for groundwater restoration, and 24 months for decommissioning. No consideration is given for the relative size of each wellfield, the variability in uranium concentration across the site or the variability in aquifer characteristics across the site. How were these timeframes derived? What assumptions were made? Without the detailed information on wellfield packages, these figures should be labeled 'Conceptual'. With the submittal of the first mine unit wellfield package, a detailed production, restoration, and decommissioning schedule should be provided.
8. The permit for the domestic sewage/septic system should be included in the mine permit application. The statement on page 1-12 that the permit for the septic system is issued by

the county under WDEQ-WQD Class V UIC regulations is incorrect and should be revised. (MM)

9. Appendix C, Antelope Permit area – No Right to Mine, Page 3 of 3 has a typo. Total permit area should be 10,538.12, as opposed to 10,358.12.
10. Each page of the Appendix C, permit area legal description, must be signed and dated by the applicant. (MM)
11. Section 2.2 Use of Adjacent Lands and Waters. As stated in the Introduction to this section, the purpose is to characterize the surface water regime of the area surrounding the proposed permit area. The majority of the surface area lies within the Great Divide Basin, while the remainder can be found within the Sweetwater River Basin. To characterize the area within the Great Divide Basin, two former USGS gaging stations are utilized: (1) Delaney Draw and (2) Separation Creek. These stations are located 40+ miles to the south of the proposed permit area. From the information presented, I have the following issues:
 - a. No text or analysis is presented to relate the gaging station analyses presented back to the subject area;
 - b. Flood estimates are provided for the 100-year event. Considering the limited amount of data utilized in the analysis and the potential for over and under prediction exceeds 100 percent, the validity of the estimate is questionable. Please revise the text accordingly.
 - c. The text states that average instantaneous peakflow is 180 cfs for the Delaney Draw gage. Considering the data are not close to being normally distributed, perhaps the median value of roughly 82 cfs would be a better way of characterizing the data. In addition, I do not believe that developing an average for a peakflow data series provides much information; if the intent is characterize what normally could be expected, the analysis should reflect estimates of events with returns periods of 1.5 to 2 years, approximately 50 cfs and 90 cfs, respectively. Please revise the text appropriately. (BRW)
12. Section 2.5 Meteorology. The text on page 2.5-2 indicates that the Seminole II Mine meteorological data are the most representative available data set for the site specific analysis. Further down the page there is an extended discussion regarding a comparison between data collected at the Sweetwater Mill and the Seminole II Mine. The Sweetwater Mill station is located approximately 12 miles from the proposed permit area in comparison to 70 miles for the Seminole II site. There is an extended effort to justify the use of the Seminole II Mine data as being representative through a comparison to Sweetwater Mill data. Please explain why Sweetwater Mill data was not used to climatologically characterize the proposed permit area given that a fairly extensive data set appears to exist and it is almost 60 miles closer. (BRW)
13. Section 2.6 Geology and Soils. The nomenclature for naming the units at the JAB and Antelope sites should be consistent. The permit boundaries are four miles apart, and may some day connect, yet the mineralized zone for JAB is simply referred to as 'Mineralized Zone' and is 22-54 feet thick. At Antelope there are several mineralized zones identified as

- the 240-200 sand, the 190-150 sand, and the 140-100 sand all between 200-300 feet thick. Is there any correlation between the two sites, or are they from two separate alluvial fan systems that has totally different depositional characteristics?
14. Section 2.6 Geology and Soils. Pump test results presented in Section 2.7.2.4 Site Specific Aquifer Properties, raises questions over the nomenclature assigned to the Antelope sandstone units. These units range in thickness from 167 to 405 feet thick, with an average thickness of 250 – 300 feet, yet do not behave as one aquifer unit according to pump test results. If it is not one continuous sandstone unit and will not be mined as one continuous unit, then it should not be designated as such.
 15. Table 2.6-1, Antelope and JAB Drill Holes. This table lists the locations and total depths of these holes, and which company drilled them. The table should also include the status of the drill holes abandonment. If the hole was properly abandoned as per DEQ regulations, if the hole was located, if an open hole was found, if it was re-worked, etc.
 16. Section 2.6.4 Drill Holes. Uranerz apparently installed a water supply well at the Antelope site. Its status should be discussed.
 17. Figure 2.6-37. The map legend is not legible.
 18. Section 2.6.6.4 Probabilistic Seismic Hazard Analysis. Intensity VII Seismic Activity is said to be capable of causing damage to masonry and chimneys. This section should discuss the potential this type of seismic event would have on the well casings and pipelines that would exist at the site.
 19. Section 2.6 Geology and Soils. The cross section lines should be presented on one topographic map which indicates the drill hole and monitoring well locations.
 20. Figure 2.6-3 The A1-A1' cross section should be extended to the north if there is any information available from the northwest corner of the permit area.
 21. Figure 2.6-4, Stratigraphic Cross Section Q-Q' indicates two faults at the JAB site, yet the isopach maps Figure 2.6-8 through 2.6-12 only indicate one fault within the JAB area.
 22. Section 2.6 Any faults within the JAB or Antelope permit area should be indicated on the requested topographic map with the cross section lines. (e.g. Figure 1-4 and the new geologic x-section topo map requested, Figure 2.7-8 and Figure 2.7-9 JAB and Antelope Sampling Location Maps)
 23. Figure 2.6-6 Stratigraphic Cross Section 4-4' has not been labeled in the title block. Please add Figure 2.4-6 to the Drawing No..
 24. Section 2.6.2.1 The faults identified within the JAB project area should be discussed in terms of their connection to any activity with the Chicken Springs Fault or South Granite Mt. fault.

25. Section 2.6.2.1 The 1984 Hydro Engineering, Historic JAB Hydrologic Report, in Appendix B, references two faults in the area of the JAB project. One fault to the south, with a 1,000 foot displacement is said to cross the southwest corner of the project area. The second fault, to the north, with a 39 foot displacement is said to be outside the project area. Where are these faults relative to the current proposed permit boundary? In addition, the exhibits from this report which indicate the fault locations and geologic cross sections are not included. Please provide these exhibits, if available.
26. Section 2.6 Geology and Soils. Identified mineralized zones within all units should be identified on the cross section maps.
27. Figures 2.6 Geology and Soils All cross section Figures require a PG stamp and signature.
28. Figure 2.6-8 through 2.6-12 JAB Isopach Maps. These maps need to cover the entire permit area, not just the mineralized zones.
29. Figure 2.6-7 is a typical log for the JAB site and Figure 2.6-13 is a stratigraphic log for the Antelope site. Figure 2.6-7 includes a geophysical log, whereas Figure 2.6-13 does not. Geophysical logs for many drill holes are shown on the geologic cross sections yet are not readable. The permit application should provide, at a minimum, copies of the geophysical logs for all of the monitoring wells.
30. Figure 2.6-8 through 2.6-12. The isopach maps for JAB do not include the drill hole locations. Please add the drill locations to the map, at a font and scale that is readable.
31. Figure 2.6-14 through 2.6-24. The isopach maps for Antelope show the drill holes but their designations are not readable. Please revise so that this information is readable.
32. Figures 2.6-8 through 2.6-24. When an isopach map interprets that a bed is less than ten feet thick, please indicate at specific drill hole locations the actual thickness of the unit. This is especially important for shale units that are to be the confining layers to the system.
33. Addendum 2.6-E Antelope and JAB Laboratory Results. Please indicate on each analysis sheet what the sample is. Also, the font size is difficult to read. In addition, the title of the Addendum should be revised to specify what type of laboratory results are being presented.
34. Section 2.7 Hydrology. Baseline surface water quantity should discuss generally what falls within the permit area and potentially the contributing drainage area above. While the discussion and runoff estimates for Arapahoe Creek are relative in terms of the JAB project, evaluating all of Osborne Draw in terms of the Antelope Project is not. A discussion of the entire Upper and Lower Lost Creek Basins does not appear to be applicable given the limited amount of drainage area of each basin that falls within the two project areas. Please revise the analysis and text accordingly. (BRW)
35. Section 2.7 Hydrology. The discussion on Osborne Draw indicates that there 7.5 acres of wetland in this watershed. The entire watershed is represented by map with a scale of 1"

equals 4 miles, which makes it virtually impossible to figure out where the potential areas are in relationship to the proposed permit area. Please provide a map of reasonable scale to illustrate the location of the surface water features. (BRW)

36. Section 2.7 Hydrology. Please illustrate the location of SW-4 on either Figure 2.7-8 or Figure 2.7-9. (BRW)
37. Section 2.7 Hydrology. Please provide a description of each sampling site (e.g., Spring, Stream Channel, or Reservoir). (BRW)
38. Section 2.7 Hydrology. Baseline mapping of the area utilizes USGS topography at a scale of 1:24,000 and a contour interval of 20 feet. Given the topography in the proposed permit area is relatively flat, it would seem that attempting to develop an erosion control plan for the site would be difficult given this gross-scale of mapping. Please provide mapping for each site using contour interval of five feet or less. (BRW)
39. Section 2.7.2.4 Site Specific Aquifer Properties. In summarizing all of the pump tests please revise the description so that each test includes the date of the test and the time pumped.
40. Section 2.7.2.4 Site Specific Aquifer Properties. For each pump test conducted please indicate the screened interval for each of the wells used in each test.
41. Section 2.7.2.4 Site Specific Aquifer Properties. (MP-4 Pump Test) MP-4 is in the 190-150 sand (screened from 426-446 ft.) and MU-4 is in the lower portion of the 190-150 sand (screened from 657 - 667 ft.) and seven feet away from MP-4 yet sees no immediate impact from pumping. In fact the 0.11 foot of drawdown 50 hours into the test is most likely due to barometric conditions. If the upper and lower portions of this 190-150 sand are not in communication then there must be a significant confining layer which separates them, and therefore they should not be thought of as one continuous sand unit with an average thickness of 252 feet.
42. Section 2.7.2.4. Site Specific Aquifer Properties, (MP-2069 Aquifer Test) Without an underlying sand or production sand well on both sides of the fault it is not clear what effect the fault may have on the system. There is said to be 'limited hydraulic communication'. This could be due to barometric pressure, the fault, the confining unit, or old improperly abandoned drill holes. Additional testing with additional wells will need to be done to better define the groundwater hydrology, and what effect the fault may have. The amount of offset of the fault should be described.
43. Figure 2.7 - 8. JAB Sampling Location Map. The spacing and designations of the wells in the two well clusters are not readable due to the scale of the map. A blow up of these two areas clearly showing the relationship of the wells to each other should be provided. The map should also indicate the location of the fault.

44. Figure 2.7-9. Antelope Sampling Location Map. The two well clusters which include MU-4 and MU-16 should also be blown up (perhaps as an insert on the map) indicating the relationship of these wells to each other on a smaller scale.
45. Figure 2.7-14. JAB Potentiometric Surface Map, September 2007. This map represents the potentiometric surface of one aquifer at the JAB site. The aquifer needs to be identified. Also, the data does not cover the western third of the permit area due to lack of monitoring wells across the permit area. The baseline information needs to adequately cover the entire permit area.
46. Figure 2.7-15. Antelope Potentiometric Surface Map, March – April 2008. This map represents the potentiometric surface of one aquifer at the Antelope site. Yet the twenty two monitoring wells reportedly monitor different producing sand horizons as well as one or more underlying sandstone. Unless indicated that these sands act as one unit they should be treated as separate aquifers with separate potentiometric maps. (*Section 2.7.2.3 indicates that there is a 40 ft. head difference between the 90-50 sand and the 140-100 sand*) In addition, potentiometric maps of any potentially affected overlying or underlying aquifer need to be presented.
47. Addendum 2.7B Aquifer Test Data. Many of the Google maps indicating the well locations are not readable due to overlap of the well id's. Please indicate well locations on a topographic map and be sure that the well id's are readable. Also, not all of the wells involved in the pump tests are indicated on these maps, and the fault is not indicated on these maps. All wells and the fault should be included on the maps for each pump test.
48. Addendum 2.7B Aquifer Test Data. Many of the drawdown maps are not readable due to the legend symbol for the observation wells not being distinguishable (e.g. Page 2.7-B5)
49. Addendum 2.7B Aquifer Test Data. The title page should be revised to read "Aquifer Test Data – JAB site".
50. Addendum 2.7D Water Quality Data. JAB Groundwater Quality Results by Well. The font for this table is too small to be readable. Please revise accordingly.
51. Addendum 2.7E Water Rights. The font for this table is too small to read. Please revise accordingly.
52. Section 2.8.2, Regional Setting: No Township Range Section description of permit location is given. Please include a TRS description. (CS)
53. Section 2.8.3, Climate: There is no reference to where climatic data was obtained. Chapter 2, Section 2(a)(i)(C) and (D) of the DEQ non-coal rules state to reference the nearest weather station or actual data recorded on site. Reference a weather station or other data source. (CS)

54. Section 2.8.5.1, Survey Methodology, Extended Reference Area: It is not stated if these areas were mutually agreed upon by BKS and WDEQ/LQD. Please reference the study plan methodology, or other communication. (CS)
55. Section 2.8.5.3 – 2.8.5.10, Vegetation: Sample adequacy calculations used mean and standard deviation of “hits” data, not mean cover. WDEQ/LQD Guideline 2 Section IV(B) designates cover data be used for this calculation. Please recalculate using cover data instead of “hits” data. (CS)
56. Table 2.8-5, Antelope License Area 2007 Absolute Cover for the Breaks Grassland Vegetation Community: Absolute total ground cover is less than absolute vegetative cover. This cannot be. Please check the numbers and make necessary corrections. (CS)
57. Section 2.8.5.11, Vegetation Survey Discussion: It is stated that no noxious weeds were encountered in the License area. Was there consultation with Sweetwater County Weed and Pest district to see if their database contains any records of weeds in the permit area? Cite any consultation with Sweetwater County Weed and Pest. (CS)
58. Section 2.8.5.11, Vegetation Survey Discussion: It is stated that no threatened or endangered species were encountered. Please provide a list of BLM and state T&E species and provide potential habitat suitability in permit area. For example see Addendum 2.8-L for wildlife species. (CS)
59. There is no discussion of vegetation diversity per DEQ rules Chap. 11 Sec. 3(a)(v). Diversity is defined in DEQ rules Chapter. 1 Sec. 2(bd). The information is present in the report (in table form) but not addressed in the text. Please add a discussion in the text. (CS)
60. On the top of page 2.8-61 there is a statement that “Uranium One uses a single drill rig during exploration operations...” This is not correct. Uranium One stated on 12/9/08 that they have been using five drill rigs. Please correct. (MM)
61. Addendum 2.8-A: Antelope site perennial grass list includes *Carex* and *Juncus* species which are not grasses. Please label this list “grass and grass like perennial species” or something similar. (CS)
62. Addendum 2.8-A: Antelope site perennial forbs list includes a *Cirsium* species. Identification to the species level of this specimen is warranted because of the number of state listed noxious *Cirsium* species in Wyoming. Please identify this specimen to the species level. (CS)
63. Maps: Figures 2.8-1A; 2.8-1B: The scale of these maps is too small. WDEQ/W Guideline 4 section IV(B)(4)(a) states an appropriate scale between 1”=400’ and 1”=800’. Increase the scale to between 1”=400’ and 1”=800’. (CS)

64. The vegetation photographs (section 2.8.5, Appendix 8E) are too small to be useful. Guideline No. 2 recommends a minimum size of 3 1/2" X 5". (MM)
65. Figure 2.8-4 shows an incorrect permit boundary. Please correct. (MM)
66. Maps Figures 2.8-1A, 2.8-1B: The direction and length of sampling transects is not indicated on the map. Please show direction and length of sampling transects on the map. (CS)
67. Map Figure 2.8-1B: Sample points B26 and S48 appear to be out of permit boundary area. This could be an artifact of the GIS system. Please clearly identify if these points are inside the permit boundary area. (CS)
68. Addendum 2.8-H: There is no key to indicator status for species list. Please add a key to this table for clarity. (CS)
69. Map Figure 2.8-2A, 2.8-2B: The scale of these maps is too small. WDEQ/LQD Guideline 4 section IV(B)(4)(a) states an appropriate scale between 1"=400' and 1"=800'. Increase the scale to between 1"=400' and 1"=800'. (CS)
70. The wildlife maps (Figs. 2.8-3 through 2.8-6) should be presented on a USGS quad map, or high quality reproduction, with a scale of 1" = 2,000'. This will facilitate overlaying the site plan map to determine potential conflicts. (MM)
71. Section 2.8.7.1, General Setting: Section 2.8.5 states that black sagebrush is present and dominant in some settings. This section does not mention black sagebrush. Clarify what type of sagebrush is present. (CS)
72. Section 2.8.7.1, General Setting: This section states noxious weeds were present around livestock watering areas but section 2.8.5.11 states there are no noxious weeds present. Please clarify and positively identify any noxious weeds present in the permit area. (CS)
73. Section 2.8.7.3, Baseline Survey Results: This section states winter survey for sage grouse completed in entire permit area but section 2.8.7.1 states winter grouse surveys were not possible in West JAB area due to weather. Please clarify when sage grouse surveys were completed and in what areas they were completed. (CS)
74. Section 2.8.7.4, Environmental Consequences: As a mitigation measure, it is recommended that all construction and drilling activity in sage grouse lek sites be outside of the March 15 – June 15 window. (CS)
75. Section 2.8.7.4, Environmental Consequences: Because this is a sage dominated area and because of the presence of sage grouse, every measure to ensure the establishment of sagebrush in the reclamation should be done. This includes seeding sagebrush and modifying reclamation practices (i.e. broadcasting the sage seed). (CS)

76. Section 2.8.7.6:1.3, Big Game: This section mentions the Moore Ranch Project. It is not clear what this project is. Include a reference to clarify what the Moore Ranch Project is. (CS)
77. Section 2.8.7.9.2, Raptors: Due to the large area of prairie dog colonies it is recommended that activity in these areas be limited to the non-breeding season of Mountain Plover and Burrowing Owls. This would also protect the prairie dogs during their most probable breeding times. (CS)
78. Section 2.8.7.10; BLM Sensitive Species: This section references appendix B. The reference should be to addendum 2.8-L. (CS)
79. Section 2.8.7.10.1.2, BLM Sensitive Species: This section references appendix A. The reference should be to addendum 2.8-K. (CS)
80. Section 2.8.7.10.1.1, BLM Sensitive Species: This section states there are 878 acres of prairie dog colonies in the permit area. Section 2.8.7.10.1.5 states there are 415 acres of prairie dog colonies in the permit area. Please clarify the correct acreage of prairie dog colonies. (CS)
81. Section 2.8.7.10.1.5, BLM Sensitive Species: The section states 10% of the permit area will be affected but later on states that 9% of the permit area will be affected. Over the whole area, 1% will add up to a sizeable number of acres. Please clarify the amount of area that will be affected. (CS)
82. Section 2.8.7.11.1, Other Migratory Bird Species of Management Concern in Wyoming: This section references appendix C. The reference should be to addendum 2.8-M. (CS)
83. Addendum 2.8-K: This addendum includes a raptor nest site list. This list is also included as a table (2.8-27) in the text. It is not needed twice. Eliminate the raptor nest site list in addendum 2.8-K. (CS)
84. Addendum 2.8-N: Figures 2.8-3 and 2.8-4 are unclear. Please include clearer titles and put fewer features on each map (i.e. make additional maps). (CS)
85. Figures 2.9-7, 2.9-8, 2.9-13 - 2.9-16, 2.9-21, 2.9-22 - 2.9-24, 2.9-26 - 2.9-29 radiological survey result maps need to be presented at a larger scale (1 in : 2,000 ft.) with USGS topo overlay for point of reference for the maps.
86. Tables 2.9-8 and 2.9 - 9 Baseline Radiological Characteristics in groundwater should distinguish which aquifer each well is monitoring.
87. Section 3.1 In-Situ Recovery Process: According to water balance diagrams presented, the deep disposal well(s) must have a minimum capacity of 370 gpm. No information has been provided regarding the viability of a deep disposal well(s) and whether the characteristics of the formation would be sufficient to meet the project demand stated above. Prior to

- WDEQ/LQD permit approval, plans and specifications, and approval for a deep disposal well(s) must be secured from the appropriate regulatory authority. Please provide. (BRW)
88. Section 3.1 In-Situ Recovery Process. Sufficient redundant disposal capacity must be made available. This issue is addressed even more conceptually than primary disposal. Please provide a complete plan for redundant disposal capacity. (BRW)
 89. Section 3.1.4.1 Well Materials of Construction. The first paragraph describes the possible use of self tapping screws. Self tapping screws will not be approved due to the possibility of them corroding out, resulting in holes in the casing and leakage. Piping should be joined mechanically with square threads or a water-tight O-ring, T-lock). Please revise the section accordingly.
 90. Section 3.1.4.1 Well Materials of Construction, and Figure 3-2 Typical Well Completion. This section and figure lists Schedule 40 PVC casing in addition to SDR-17 casing. SDR-17 casing is preferred due to its higher resistance to hydraulic collapse pressure. The 5" Schedule 40 PCV is only rated to depths of approximately 300 feet, whereas the SDR-17 has strengths up to 700 feet, beyond that depth, stainless steel should be utilized. Please revise the section to eliminate the use of Schedule 40 PVC for wells deeper than 300 feet.
 91. Section 3.1.4.4 Well Integrity Testing. The well testing criteria is said to be at 120% of operating pressure, over a ten minute period, the well must maintain 90% pressure. A more conservative approach, used at some facilities is 125% of Maximum operating pressure, over ten minutes 95% of pressure must be maintained. *The Land Quality Division will be developing a recommended standard so that all mines are consistent with their MIT testing methodology.*
 92. Section 3.1.4.4 Well Integrity Testing, and Section 3.1.5 Wellfield Design and Operations states that operating pressure may be 150 psi, yet depending on the piping material utilized, the pressure rating is from 160 to 300 psig. At 150 psig operating pressure, 125% would be 187.5 psig which exceeds the pressure rating for some piping. The piping specifications must be adequate to handle the MIT testing pressures. Please revise these sections accordingly.
 93. Section 3.1.5 Wellfield Design and Operations. Greater detail regarding the pipe and pump specifications layout and burial depths to prevent freezing needs to be presented. How buried pipelines will be protected from the vibrations of vehicle traffic should also be discussed.
 94. Section 3.1.5 Wellfield Design and Operations. As per Chapter 11, Section 4(a)(xi) all new Class III wells must have a determination or calculation presenting the fluid pressure, fracture pressure, and physical and chemical characteristics of the receiving strata fluids.
 95. Section 3.1.5 refers to "wellfield package information described in Section 5." This reviewer is unable to find the referenced section. Please provide a description of the wellfield permitting process. (MM)

96. Section 3.1.6 Process Description. The first step should stipulate that the lixiviant will be injected in to the ore body and a step should be added to state that the pregnant lixiviant will be pumped to the surface and transported to the surface facility.
97. Figure 3-5. Typical Wellfield Layout. The typical configuration of the piping and utilities for the wellfield area should be presented.
98. Section 3.5 Access Roads, Construction and Maintenance. Two types of roads are described; a Primary and Secondary Access Roads. The Primary Road, designated as BLM Local, will be the road between the two facilities. The secondary access roads will be used to access wellfield headerhouses and are to be designed for one way traffic and light use. Section 3.5.3 Construction is the only mention that "topsoil must be salvaged where available". Please add topsoil stripping as a design requirement in Sections 3.5.1.1 and 3.5.2.1.
99. Section 3.5 Access Roads, Construction and Maintenance. The proposed Connector Road will cross the Jeffrey City - Wamsutter Road (Sweetwater County Road 23N). Please provide a letter from Sweetwater County Road and Bridge Department indicating they have been contacted and any issues that they may have concerning traffic control have been addressed. **(BRW)**
100. Section 3.5 Access Roads, Construction and Maintenance. Considering the main access roads to proposed facility areas and the connector road will need to be designed early in the construction process in order to bring in any sizeable building materials and equipment, please provide specifications and design details for the Primary Access Roads, including any hydraulic structures (i.e., culverts, low water crossings, etc.). **(BRW)**
101. Section 3.5 Access Roads, Construction and Maintenance. The text on page 3-53 states that the location of each culvert will be shown on the plan and profile...submitted to the BLM in the Right-of-Way application. The location of each culvert and crossing should also be illustrated on a map submitted to the WDEQ/LQD. In areas that will be constructed prior to well-field installation (e.g., Primary Access Roads, and Facilities Area), this map should accompany the current permit application and instances where the road is well-field specific, the well-field specific hydrologic control plan map can wait and accompany the well field package. In addition to the above no details have been provided regarding the layout of the facilities. Please revise the text accordingly and supply text and a map that details the Permit Area hydrologic control plan. **(BRW)**
102. Section 3.5 Access Roads, Construction and Maintenance. How will two tracks be utilized? What type of access will there be to the monitoring wells and monitoring well ring?
103. Section 3.5.2 (page 3-49) discusses secondary access roads to access wellfield headerhouses. Please clarify when such roads will be installed. These roads should be planned installed early in the wellfield installation process so that off-road traffic and damage to soils and vegetation are minimized. **(MM)**

104. Section 3.5.3 (page 3-51) discusses salvage of topsoil during road construction and re-spreading topsoil "to the greatest degree practical". Topsoil should not be re-spread in or near road ditches as it will be contaminated or lost during road maintenance operations. Topsoil should only be re-spread on large cut or fill slopes where slopes are 3:1 or flatter. With average topsoil depths of approximately one foot, there will be a significant amount of topsoil that will have to be stockpiled. Topsoil should be stockpiled in low piles set back a minimum distance of 20 feet from the outside edge of the road ditch or the edge of the cut/fill slope. Topsoil stockpiles should be located on flat terrain and away from drainages. Piles should be sloped to 3:1 or flatter on all sides and seeded with the approved seed mix. Please incorporate these specifics into the plan. (MM)
105. Section 3.5.5 Road Maintenance. Maintenance activities, including snow removal, are dictated for all primary and secondary roads. When access to monitoring wells and injection or production wells, fencing and/or pipelines is required in the winter, it is likely that snow removal will be required in some locations to provide access. How will snow removal off primary and secondary roads be protective of topsoil and vegetative cover?
106. A comparison of the water balances for the Antelope and JAB properties (Figures 3-6 and 3-7) shows that the projected production flows for the two areas are identical at 3,000 gpm but the restoration flows for the JAB are only half of the restoration flow for Antelope (500 gpm vs. 1,000 gpm). Please explain why such a difference in restoration effort is warranted, or revise the plan to reflect equivalent efforts. (MM)
107. Figure 3-8. Process Flow Diagram. The 1% bleed from the lean eluate and the injection of the lixiviant into the ore body should be indicated on the process flow diagram.
108. Figure 3-9. Satellite Process Flow Diagram. Some of the smaller font is difficult to read.
109. Section 4.2.1.1 Liquid Process Waste. This waste is to be routed to the deep disposal well(s). Please go into greater detail regarding the route to the wells, e.g. buried pipeline? How far will the waste travel via pipeline prior to disposal? Are separate disposal well fields planned for JAB versus Antelope?
110. Section 4.2.1.1 Liquid Process Waste. If the deep disposal well is down due to mechanical failure, pipeline problems, capacity, or MIT testing, another disposal options such as evaporation ponds or existing commercial ponds must be in place as a backup.
111. Section 4.2.1.4 Stormwater Runoff. This paragraph indicates that all stormwater will be diverted around the facilities, and BMP will be in place to ensure that any runoff will not be a source of pollution. Please outline the BMP's which will prevent the contamination of any runoff from the facilities area. With chemical storage, trucks transporting by-products from one site to the next, as well as potential spills and vehicle leakage, a site containment pond to collect stormwater runoff or spills from the facility area seems an appropriate BMP. The need for a retention pond is mentioned in Section 7.2.3.2 Soil Impacts of Operation, yet no size calculation, design criteria or location is provided.

112. Section 4.2.1.4 Stormwater Runoff and Section 7.2.3.2 Soil Impacts of Operations. Chapter 11, Section 4(a)(v) requires that all temporary and permanent surface water diversion structures be described. The layout of the all permanent and temporary diversion structures around the wellfields and facilities will be required. Also, required sizes of the structures needs to be presented based on drainage basin run-off calculations.
113. Section 4.2.2.1 Liquid Waste Monitoring and Reporting. WDEQ Rules and Regulations, Chapter VIII, Section 7 is referenced. This should be revised to read, "WDEQ WQD Rules and Regulations."
114. Section 4.2.3 Potential Pollution Events Involving Liquid Waste. What is the specific training that will be provided all employees? What is the frequency of the training? What is the frequency of the inspections to be conducted? How will the inspections be documented? The detailed procedures to be outlined in the Environmental Management Programs should be presented as part of the mine permit. Surface and pipeline spills have been a common occurrence at ISL facilities in the past. The Division is requiring that detailed, documented, training and inspections be clearly outlined in the Operations Plan.
115. Section 4.2.3.1 Spills from Wellfield Buildings, Pipelines, and Well Heads. This section seems to indicate that since the pipeline is checked for leaks, prior to going into operation, that future spills are unlikely. Yet weather, animals, vehicle traffic, and human error can all contribute to releases once a wellfield is operational. This section should be revised to specifically address the operational procedures to be taken to prevent spills and releases.
116. Section 4.2.3.1 Spills from Wellfield Buildings, Pipelines, and Well heads. The last paragraph states that 'engineering and administrative controls will be in place'. These controls need to be specified in detail. Chapter 11, Section 4(a)(xx) requires that the permit describe the "measures employed to prevent an excursion, and contingency and corrective action plans to be implemented in the event of an excursion, in accordance with Section 12 and Section 13 of this Chapter."
117. Section 4.4.3 Septic System Solid Waste. Disposal of septic system solid wastes are regulated by the Water Quality Division, Chapter 11 Rules and Regulations, as opposed to Solid Waste Management rules and regulations.
118. Section 4.4.4 Hazardous Waste. The permit should also specify the facility's EPA ID no., and where the designated hazardous waste storage area will be within the facilities. It should preferably be located inside, and should have secondary containment. If there are no floor drains and curbing at the building thresholds, the building would be the secondary containment.
119. Section 4.4.5 Soil Contaminated as a Result of Wellfield Releases. Paragraph 1 states that all pipelines will be buried for frost protection. Please indicate the depth of the frost line, and the burial depth to be specified.
120. Section 4.4.5 Soil Contaminated as a Result of Wellfield Releases. Paragraph 2 states that individual wells, along with the main trunk lines, may have high and low flow alarms limits

set in the header house. The control system will need to be clearly defined as part of the well package approval.

121. Section 4.4.5 (page 4-11) contains a statement that individual wells may have high and low flow alarm limits set in the header house. Section 3.4 (page 3-46) states that instrumentation will be provided on each well to record an alarm in the event of a change in flow that might indicate a leak or rupture in the system. Section 4.4.5 should be corrected to be consistent with section 3.4. **(MM)**
122. Section 4.4.5 Soil Contaminated as a Result of Wellfield Releases. Uranium One commits to implementing a program of continuous wellfield monitoring by roving operators, and will require a minimum of daily inspections of each wellfield that is in service or restoration. Documentation of these inspections should be discussed, and the inspection form to be utilized should be provided in the permit application.
123. Section 4.4.5 Soil Contaminated as a Result of Wellfield Releases. Contaminated soils resulting from a spill are to be delineated horizontally based on gamma radiation. It then states that if found to be contaminated, the soil is sampled and analyzed. This section should address how vertical depth of contamination is determined and mapped.
124. Section 4.4.5 Soil Contaminated as a Result of Wellfield Releases. In addition to contamination from gamma radiation it is possible that the soils may be impacted by high salts within the lixiviant. SAR analysis should also be conducted to determine if the salt loading to the soil has rendered it contaminated.
125. Section 4.4.5 Soil Contaminated as a Result of Wellfield Releases. The application states that annual releases from the site will be documented with a map in the WDEQ/LQD Annual report. The map should be a cumulative map indicating the footprint of the recent years spills in addition to any previous spills. This map should be accompanied by a table outlining the history of each release, including the estimated amount (gallons) of the release, footprint of contamination, depth of contamination, initial contamination levels, their sample locations, and any history of remediation efforts.
126. Section 5.7 Radiation Safety Controls and Monitoring. The text on page 5-62 indicates that all streams within the proposed permit area are ephemeral. This seems to contradict statements made in Section 2.7 (for example, please see page 2.7-5). Please revise the text as appropriate. **(BRW)**
127. Section 5.7.8 Groundwater/Surface Water Monitoring Program. Although it would be incomplete at this time, please include a Table of the monitoring wells and surface water monitoring points. The table should provide the monitoring frequency for each well, and the parameters to be analyzed. The table should be organized with groupings of private wells, regional background wells, mine unit wells, and mine unit monitoring wells. Distinctions should be made as to which aquifer the well is located.
128. Section 5.7.8.2 Groundwater Monitoring. Well sampling methods. The permit lists three different recommendations for purging a well prior to sampling. One method from EPA,

- and two alternate methods from the Wyoming DEQ, Guideline 8; and low flow purging. Please indicate which method, Uranium One plans to utilize. Pumping until pH, conductivity and temperature equilibrate is preferable, and may result in less water to be disposed than the EPA method of three casing volumes.
129. Section 5.7.8.2 Groundwater Monitoring, Excursion Verification and Corrective Action. If an excursion is confirmed the application states that "the WDEQ/LQD is notified by telephone or e-mail within 24 hours...". The notification must be done verbally. Please revise the text accordingly.
 130. Section 5.7.8.2 Groundwater Monitoring, Excursion Verification and Corrective Action. The application states that if UCL's do not decline within 60 days that the corrective action will be to suspend injection in the area. It then states (on Page 5-61), "Additional measures will be implemented if a declining trend does not occur in a reasonable time period:". Please explain the additional corrective action measures that could be taken, as well as what will be considered a "reasonable time period". Also, if the excursion is not in control within 60 days the Administrator, with concurrence of the Director of the DEQ, has the authority to terminate the mining operation and revoke the permit (Chapter 11, Section 12(d)(ii)). To avoid this situation, the operator may want to cease injection into the area under question, prior to 60 days into the corrective action process.
 131. Section 5.7.8.2 Groundwater Monitoring, Excursion Verification and Corrective Action. The application state that in the case of an excursion, a written report will be provided to the NRC within 60 days. In addition, Chapter 11, Section 12(a)(ii) requires that a written report be provided to the Administrator of the Land Quality Division within five (5) days of becoming aware of the noncompliance occurrence. The contents of the report are outlined in Section 12(a)(ii)(A, B, C, and D). A copy of this report is forwarded to the Administrator of the Water Quality Division. Please add this commitment to this section.
 132. Section 5.7.8.2 Groundwater Monitoring. Sampling frequency and analysis criteria are outlined for private wells, wellfield wells, and wellfield monitoring wells. Please also include the criteria for sampling the regional baseline wells.
 133. Section 4.0 Effluent Control. In the Cross Reference Table provided by Uranium One, it is noted that Section 4.0 addresses the Lixiviant Control between the ore body and overlying and underlying aquifers. This information is not included in this section which is more specific to liquid and solid waste control and disposal. Please add the discussion of lixiviant control to this section.
 134. Section 6.1.1 Paragraph one states that "Groundwater restoration prevents any mobilized constituents from affecting aquifers adjacent to the ore zone." This could be more clearly stated as "Groundwater restoration prevents any mobilized constituents from affecting adjacent aquifers and other water within the same aquifer as the production zone."
 135. Section 6.1.3.2 Groundwater Sweep. The use of groundwater sweep is not considered to be BPT due to excessive consumption of groundwater and resultant impacts to groundwater resources. This methodology should be removed from the process description. (MM)

136. Section 6.1.3.2 Groundwater Sweep. The last sentence in paragraph one states that "The water produced during groundwater sweep is disposed of in an appropriate manner." This statement is very vague. Given the large volume of water created by this process, and the unknown capacity of any injection wells, or the overall water balance of the site. This statement needs to be changed to clearly indicate how the system will handle the predicted volume of water generated by groundwater sweep.
137. Section 6.1.3.3 Groundwater Treatment. Paragraph 4 states that "clean water, called permeate, will be re-injected or stored for use in the mining process." There are no provisions in the facilities description for storage of treated groundwater. If this is part of the plan then storage capacities, relative to the water balance will need to be addressed.
138. Table 6-2 Irigaray Post-Mining Water Quality. The table compares the baseline range of water quality for each constituent with a mean of the post-mining levels across nine production units. Why are some of the values represented with a "<" sign. For example the baseline range for dissolved Arsenic is <0.001 – 0.105mg/l, yet the post-mining mean is listed as <0.601 mg/l.
139. Section 6.1.7.2 Restoration Stability Monitoring. This section states that stability monitoring will be every two months over a six month period. The Division is requiring that stability monitoring be conducted for a minimum of 12 months with sampling and analysis conducted quarterly. Sampling should include the field measurement of water level, temperature, pH and EC.
140. Section 6.1.8 Well Plugging and Abandonment. Paragraph one references WDEQ/LQD Rules, Chapter VIII Section 8. This section does not exist. There is Guidance provided in WQD, Chapter XI, Section 70, or WDEQ/LQD Guideline 8, Appendix 7.
141. Section 6.1.8 Well Plugging and Abandonment. The program states that "when practicable, all pumps and tubing will be removed from the well." "When practicable" should be dropped from the statement.
142. Section 6.1.8 Well Plugging and Abandonment. The alternate method of plugging, using a bentonite water slurry is not allowable as per WQD, Chapter XI, Section 70(e).
143. Section 6.2.2, New Drill Hole Site Preparation, Hole Abandonment and Site Reclamation: The text states that subsoil will be placed on native soil. If topsoil and subsoil are to be segregated it is advisable to strip the topsoil were the subsoil is to be stockpiled. This will aid in maintaining good soils for reclamation. (CS)
144. Section 6.2.2 (at the top of page 6-21) contains a commitment to backfill open drill holes to the surface with bentonite chips. WDEQ/LQD considers this to be a best management practice and commends Uranium One for making this commitment. No response necessary. (MM)

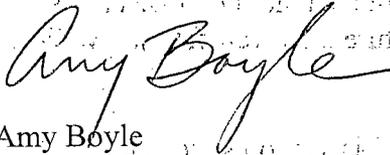
145. Section 6.2.4 states that typical topsoil stripping depths are expected to range from 3 to 12 inches. This is not consistent with the discussion in section 2.6.5.2 (page 2:6-11) that states the average topsoil depth is 12 inches. Please correct this inconsistency. (MM)
146. Section 6.2.4, Topsoil Handling and Replacement: The test states topsoil stock piles will be seeded with the permanent seed mix. It is necessary to use only the grass species when seeding topsoil piles. This will reduce the seeding cost of topsoil stock piles. (CS)
147. Section 6.2.4: Please include a statement in section 6.2.4 that all topsoil stockpiles will be sloped on all sides to 3:1 or flatter prior to seeding. (MM)
148. Table 6-4, Seed Mix: The seed mix indicated is inappropriate for the area. There is no sagebrush in the mix. Slender wheatgrass is not the best choice for a native wheatgrass, there is no Prairie junegrass or Sandburg's bluegrass in the mix both of which comprise a significant portion of the native grasses. The seeding rate (28+ lbs/ac) is much too high for drill seeding. A possible seed mix is:
- | | |
|---------------------------------------|---------|
| Thickspike wheatgrass: | 4lbs/ac |
| Sandburg's bluegrass: | 2lbs/ac |
| Bluebunch wheatgrass: | 4lbs/ac |
| Prairie junegrass: | 3lbs/ac |
| Bottlebrush squirreltail: | 1lb/ac |
| <i>Artemisia spp.</i> (Big or Black): | 1lb/ac |
| Gardner Saltbush: | 5lbs/ac |
- Note: Do not drill seed the sagebrush seeds. Other possible grasses include: Sheep fescue, needle and thread grass, western wheatgrass, and Indian ricegrass. (CS)
149. Section 6.2.6 Final Contouring: As per Brian Wood's comment on the contour interval of baseline mapping (Technical comment for Section 2.7 Hydrology. A final topographic contour map should be provided of the facility area with a contour interval of two-feet.
150. Section 6.2.7 discusses the use of a nurse crop. The use of a nurse crop is not recommended in arid areas such as the Red Desert. Please remove any reference to the use of a nurse crop. (MM)
151. Section 6.3.3. The disposal site for 11e.(2) byproduct materials should be identified (sections 1.9.2 and 6.3.3). (MM)
152. Section 7.1.2, Land Use Impacts of Construction: This section states forage loss would be negligible for fencing the disturbed area (approximately 1400 acres). Forage loss on 1400 acres may not be negligible. Please provide an AUM or vegetative production loss estimate. (CS)
153. Section 7.2.5 Visual and Scenic Impacts. Pipelines should be included as a short term or long term visual impact. The estimate of reclamation of pipeline corridors within a two year timeframe is optimistic given the desert conditions.

154. Section 7.2.6.1 Groundwater Consumption. Paragraph one states that the consumptive use of groundwater is expected to be minimal. In addition to the 1% bleed during mining, what will the consumption of groundwater be during restoration?
155. Section 7.2.7.1 Surface Waters and Wetlands. This section indicates that there will be no impact to wetland areas. Please Comments 27-2 above regarding illegible mapping provided concerning wetlands. As Uranium One's mapping of the proposed facilities area as well as wetland areas is not to an acceptable scale, verification cannot be made at this time. In addition, evaluations will also be completed in the future on a well-field by well-field basis. (BRW)
156. Section 7.2.7.2 Surface Water Impacts from Sedimentation. This section states that all streams are ephemeral which contradicts the text on page 2.7-5. Furthermore, through precipitation and runoff events are "uncommon", the problem is when they do occur, they tend to be substantial. Therefore, please rephrase the first paragraph in this section to eliminate the somewhat dismissive undertones. (BRW)
157. Section 7.2.7.2. Surface Water Impacts from Sedimentation. The second paragraph contains a statement concerning "absorptive capacity of the soils". Brief review of the information provided in the soils section of the permit does not appear to include any information regarding the hydrologic characteristics of the soils present. Please provide some basis for the statement. (BRW)
158. Section 7.2.8.1, Ecological Impacts of Operations, Vegetation: Please consult with Sweetwater County Weed Control District supervisor if or when any weed concerns arise to determine best control practices. (CS)
159. Section 7.2.9 Noise Impacts of Operations. Due to the lack of occupied housing in the vicinity of the permit area, the noise levels are not addressed. Please include a discussion of what the sources of noise, and potential noise levels could be. Wildlife can be effected by noise from mining operations.
160. Section 7.3.2 Exposure from Water Pathways. Paragraph one states that "the overlying aquifer will also be monitored". This statement should be revised to read that all overlying aquifers and the aquifer immediately underlying the ore zone, will be monitored.
161. Section 10 Approval and Consultations. Permits from SEO will be required for all wells and any (to be designed) evaporation pond.
162. Section 10. Environmental Approvals and Consultations. The aquifer exemption application is said to be issued by the DEQ, yet is actually issued by the US EPA. The table should be revised to indicate that the application will be submitted to the US EPA.
163. Section 10. Environmental Approvals and Consultations. An AQD permit will also be required for the mine site, yet has not been listed. Generators or other emissions from the

facilities building will require permits. Please contact Chad Schlichtemeier (307) 777-5924, or Darla Potter (307) 777-7346 with the DEQ AQD permitting group in Cheyenne.

Once you have had a chance to review these comments, if you require any further clarification, please feel free to contact me at (307) 335-6941 or aboyle@wyo.gov.

Sincerely,



Amy Boyle
Geologic Project Analyst
Land Quality Division

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