

## Ludeman Application Acceptance Review Comments

<b>Chapter 1 - Proposed Activities</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
(1a) Operating plans, design throughput, and annual U <sub>3</sub> O <sub>8</sub> production	Section 1.7	No annual production rate provided in this section.
(1b) Surety arrangements for facility decommissioning, ground-water restoration, and site reclamation	Sections 1.12, 6.6	Surety discussion is not consistent with the requirements of Part 40, App. A, requirements.

<b>Chapter 2 - Site Characterization</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<b>2.1 Site Location and Layout</b>		
(1) Maps – diversion channels		Not provided on maps
(2) Maps of exclusion area boundaries and fences		Not provided on maps
<b>2.2 Meteorology</b>		
(1) Meteorological data used for assessing impacts are substantiate as being representative of expected long-term conditions	Section 2.2.3.3	Provides rationale for using substitute data as representative, but does not compare one year of data to longer period against another site to determine if data is representative.
(2) Description of existing air quality (ISL air quality impacts are indistinguishable from background - radiological and non-radiological)		Not addressed in meteorology section

<b>Chapter 2 - Site Characterization</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<b>2.3 Hydrology</b>		
(1) Seasonable/historical variability in potentiometric head		Not addressed
<b>2.4 Background Radiological Characteristics</b>		
(1) Monitoring programs to establish background radiological characteristics	Section 2.4.2 - 2.4.10	Gamma surveys vary from RG 4.14 Includes GW and SW
	Section 2.4.11	No food varies from RG 4.14

<b>Chapter 3 - Description of Proposed Facility</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<b>3.1 <i>In Situ</i> Leaching Process and Equipment</b>		
(1a) Effects of ISL are likely to have on surrounding water users	Section 7.2.5.1. 7.2.5.2, Figure 7.2.-1, Figure 2.2-9	Discussed in detail previously
(1ai) Ability to control lixiviant from the production zones to surrounding environs	Section 7.2.5.1. 7.2.5.2, Figure 7.2.-1	Discussed in detail previously
(1aii) Ground-water and surface water pathways that might transport solutions off-site in event of uncontrolled excursion	Section 7.2.5.1. 7.2.5.2, Figure 7.2.-1	Discussed in detail previously
(1aiii) Impact of ISL operations on ground-water flow patterns and aquifer levels	Section 7.2.5.1. 7.2.5.2, Figure 7.2.-1	Discussed in detail previously

<b>Chapter 3 - Description of Proposed Facility</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
(2) Results from other production areas		
(3) Approved waste disposal agreement for 3e.(2) byproduct materials disposal.		

<b>Chapter 4 - Effluent Control System</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<b>4.1 Gaseous and Airborne Particulates</b>		
(1) Monitoring and control systems are located to optimize their intended function.	Section 4.1.1	Describes controls to prevent build-up of radon gas using vents and states will monitor effluent. Does not describe air monitoring within the building in Section 4.1. States no air particulates because only ion exchange program.
(2) Monitoring and control systems are appropriate for the types of effluents generated.		Does not describe controls for header houses.
(3) Demonstrates that the effluent control systems will limit exposures under both normal and accident conditions	Section 4.1.1 and 4.1.2	Does not address air particulates produced from spills or radon progeny build-up within header houses.
(4) Demonstrates that the operations will be conducted so that all airborne effluent releases are as low as reasonably achievable.		Does not provide a demonstration, just a commitment to keep exposures less than regulatory limits

**Chapter 4 - Effluent Control System**

Section - Criteria	Location in report	Note
<b>4.2 Liquids and Solids</b>		
<p>(1) Common liquid effluents generated from the process bleed, process solutions, wash-down water, well development water, pumping test water, and restoration waters are properly controlled</p>		<p>More details will be needed to make the determination that liquid wastes will be properly controlled</p>
<p>On-site land applications                      (i) description of waste physical/chemical properties                      (ii) description of the proposed manner and condition of waste disposal                      (iii) analysis/evaluation of pertinent information on affected environment                      (iv) information on nature and location of other facilities likely to be affected                      (v) analyses and procedures to ensure that doses are maintained as low as is reasonably achievable</p>		
<p>For land applications                      (i) concentrations of radioactive contaminants in soils to show that levels of radium and other nuclides in the soil will not exceed the standard in 10 CFR part 40, Appendix A                      (ii) impacts to ground-water and surface-water quality                      (iii) impacts on land use, particularly crops and vegetation                      (iv) exposures and health risks that may be associated with radioactive constituents reaching the food chain. Doses and risks conform to 10 CFR part 20</p>		

**Chapter 4 - Effluent Control System**

<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<p>(2) On-site evaporation systems are designed and operated in a manner that prevents migration of waste from the evaporation system to the subsurface monitoring and inspection programs                      Actions to be taken if surface impoundment water analysis indicates leaking                      (i) notify NRC with 48 hours                      (ii) analyze standpipe water quality samples for leak parameters for specified period                      (iii) file written report with NRC within 30 days of first notification</p>	<p>4.2.2</p>	<p>Note there are ponds planned but they will be surge ponds for use as backup to the deep disposal wells in the event of need for shutdown of wells.</p> <p>There is no discussion of reporting pond leaks in either section 4.2.2 (liquid waste disposal) or section 5.1.10 (reporting procedures)</p>
<p>(3) Design, installation and operation of surface impoundments used to manage 11e.(2) byproduct material meet relevant guidance provided in Regulatory Guide 3.11, Section 1                      Inspections consistent with Regulatory Guide 3.11.1</p> <p>Sufficient capacity and designed, constructed, maintained, and operated to prevent overtopping during                      (i) normal or abnormal operations, overfilling, wind and wave action, rainfall, or run-on                      (ii) malfunctions of level controllers, alarms, and other equipment                      (iii) human error</p>	<p>Section 4.2.2                      Figures 4.1 and 4.2</p>	<p>This section and the figures provide only a very general description of the surge ponds, i.e., size, cross section and some details of the liner and leak detection system.</p> <p>There is no analysis or discussion pertinent to the needs presented in RG 3.11.</p>

**Chapter 4 - Effluent Control System**

<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<p>(4) Design of surface impoundment used to manage 11e.(2) byproduct material meets or exceeds the requirements in 10 CFR Part 40, Appendix A, Criterion 5(A)</p> <ul style="list-style-type: none"> <li>- Design details, drawings, and pertinent analysis should be provided</li> <li>- Tests should show that liner will not deteriorate when subjected to the waste products and expected atmospheric and temperature conditions</li> <li>- Quality control program for installation components</li> <li>- Protection features to prevent damage to impoundments components</li> <li>- Leak detection system</li> <li>- Inspections</li> </ul>		<p>There are no details provided to meet the requirements of Appendix A criterion 5(A).</p>
<p>(6) Contains a description of the methods to be used for disposing of contaminated solid wastes that are generated during the operation of the facility</p> <p>Applicant has an approved waste disposal agreement for 11e.(2) byproduct materials disposal at an NRC or NRC Agreement State licensed disposal facility.</p>	<p>Section 4.4</p>	<p>Agreement for 11e(2) byproduct material not completed.</p>
<p>(7) Water quality certification and discharge permits have been obtained, or plans are in place to obtain them.</p>	<p>Section 4.2</p>	<p>State permitting process for deep disposal wells is underway</p>

<b>Chapter 4 - Effluent Control System</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<b>4.3 Contaminated Equipment</b>	Section 4.4	Section 4.4.1 is not adequate for volumetrically contaminated construction debris. The application states that decontaminated materials must have activity levels lower than those specified in NRC guidance (USNRC, 1987) which is FC 83-23. FC 83-23 applies only to surficially contaminated material and does not apply to volumetrically contaminated materials such as construction debris.

<b>Chapter 5 - Operations</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<b>5.2 Management Control Program</b>		
(1) Exempted from requirements of 20 CFR 1902(e) for areas within facility provided proper signs are conspicuously posted.		No mention of posting at entrances in lieu of 20.1902
(2) Licensee has agreed to administer a cultural resources inventory before engaging in any development activity not previously assessed by NRC.		.....there is no commitment to administer additional inventory before engaging in any development activity not previously assessed
Section 5.2.3 (8c) 10 CFR 40, Appendix A, Criteria 8 and 8A		Not included in Section 5.2.3, "Record Keeping and Retention"

**Chapter 5 - Operations**

<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<p>Criterion 8--Milling operations                      Criterion 8A--Daily inspections of tailings or waste retention systems</p> <p>Regulatory Guide 3.11.1 - Operational Inspection and Surveillance of Embankment Retention Systems for Uranium Mill Tailings (Rev. 1, ML003740229)</p>		<p>No mention of inspection records for ponds</p>
<p>Section 5.2.3 (8d)(ii) – info of site characterization, residual soil contamination, hydro, geo, surface impoundments, ponds, lagoons, and well field aquifer anomalies.</p>		<p>Not in Section 5.2.3</p>
<p>Section 5.2.3 (8d)(iii) – drawings of buried pipes or pipelines</p>		<p>Not in Section 5.2.3</p>
<p>(3) Licensee demonstrates that records can be provided to a new owner or new licensee or licensee in the event that the property or license is transferred or to NRC after license termination</p>		<p>No commitments regarding record transfers</p>
<p>(4) New licensees or owners demonstrate that any such records received from a previous owner or licensee will be retained or turned over to NRC after license termination.</p>		<p>No commitments regarding record transfers</p>
<p>(5) Reports of spills, evaporation pond leaks, excursions of source, 11e.(2) byproduct material will be made to Headquarters Project Manager within 48 hours of the event. Written notice within 30 days of notification.</p>		<p>Not in Section 5.2.3</p> <p>No reporting commitments other than the annual SERP report</p>



<b>Chapter 5 - Operations</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<b>5.3 Management Audit and Inspection Program</b>		
The proposed frequencies, types, and scopes of reviews and inspections, action levels, and corrective action measures are acceptable to implement the proposed controls (see Regulatory Guides 3.11, 3.11.1, and 8.31). ALARA Policy	Sections 5.3.1, 5.3.2	Nothing about the inspection of embankment systems  Nothing on ponds
<b>5.4 Radiation Safety Controls and Monitoring</b>		
<b>5.4.1 Effluent Control Techniques</b>		
(1) Radon gas from processing tanks within enclosed buildings is properly controlled.	Section 5.4.1	Does not address radon progeny (particulates) emission, but either does the NUREG or RG 8.30.
(2) Emissions from yellowcake drying operations are properly controlled.		
Release of liquids into surface waters must comply with the public dose limits in 10 CFR 20.1301, which must be demonstrated by one of the following methods: (3a) The licensee demonstrates compliance with 10 CFR Part 20, Appendix B (i) Showing that the discharge of effluent from any surface impoundment is within 10 CFR part 20, Appendix B, limits at the point of discharge (ii) Monitoring the incoming process water to demonstrate compliance with the effluent discharge requirements of 10 CFR Part 20, Appendix B for process water. (3b) The licensee demonstrates that the total effective dose equivalent to the individual likely to receive the highest dose from the facility does not	Discussion of liquid effluents in Section 5.4.1.2	Although liquid effluents are discussed, there is no discussion about meeting the release limits of part 20, App B.

<b>Chapter 5 - Operations</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
exceed the annual dose limit for the public.		
(4) Record keeping for the effluent control techniques is sufficient to meet requirements in 10 CFR 20.2103(b)(4).		Not addressed
(5) The applicant describes emergency procedures in the event of equipment failures or spills, references existing emergency procedures, or commits to the development of emergency procedures.		Not addressed
(6) The effluent control techniques are designed to keep exposures to members of the public as low as is reasonably achievable as described in Regulatory Guide 8.37, Section 2.		Not addressed
(7) The effluent control techniques are designed to limit exposures to members of the public from emissions to air ( <u>excluding Radon-222 and progeny</u> ) to no greater than 0.1 mSv (10 mrem/yr).		Not addressed Applicant states that no other emissions than Rn-222 will occur.
<b>5.7.2 External Radiation Exposure Monitoring Program</b>		
(1) The application contains one or more drawings that depict the facility layout and the location of monitors for external radiation. (Regulatory Guide 4.14, Section 1.1.5 and 2.1.6)	Section 5.7.2 Figure 5-2	Not addressed Drawings do not include gamma monitor (e.g. TLD) The map shows where Rn and gamma dose rates will be surveyed. Not IAW RG 4.14
(3) All monitoring equipment has a lower limit of detection that allows measurement of 10 percent of the applicable limits (Regulatory Guide 8.3)	Section 5.7.1	Describes the MDL, but does not describe the LLD IAW RG 8.30

<b>Chapter 5 - Operations</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
(4) Application presents radiation dose levels for corrective action that are consistent with 10 CFR Part 20	Section 5.7.2	Does not anticipate elevated doses, so no corrective action plan
(5) Radiation doses will be kept as low as is reasonably achievable by following Regulatory Guide 8.10 1a, 1c, 1e and 1f 1b 1d Regulatory Guide 8.31		ALARA not addressed specifically. Does not anticipate doses above 1% of regulatory limit.
<b>5.7.3 Bioassay Program</b>		
Bioassay program is acceptable if it meets: (1) Consistent with applicable sections of Regulatory Guide 8.22 and Regulatory Guide 8.31. Can confirm results from airborne radiation monitoring program and exposure calculations.	Section 5.7.3	Program will consist of baseline and final urinalysis as a minimum and to confirm results of airborne U particulate monitoring. Do not plan to monitor for U unless accident or during maintenance.
(4) Action levels for bioassay monitoring are set in accordance with Regulatory Guide 8.22, Section 5	Section 5.7.3	Just a commitment to meet requirements in RG 8.22
(5) All reporting and record keeping are done in conformance with the requirements of 10 CFR Part 20, Subparts L and M		Not addressed
<b>5.7.6 Contamination Control Program</b>		
(1) Monitoring equipment by type, specification of the range, sensitivity, calibration methods and frequency, availability, and planned use is adequately described.	Section 5.7.6	Does not include specification of range in this section.

<b>Chapter 5 - Operations</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
(2) The licensee will ensure that radioactivity on equipment or surfaces is not covered by paint, plating, or other covering material unless contamination levels are below limits specified in Table 5.7.6.3-1		Not specifically addressed (e.g. material coverings).
(3) The licensee will make a comprehensive radiation survey, in conformance with Regulatory Guide 8.30, Section 1 and NUREG-1575, Rev. 1.	Section 5.7.6	Comprehensive survey in conformance with NUREG 1575 not addressed
(4) Appropriate criteria are established to relinquish possession or control of equipment or scrap having surfaces contaminated with material in excess of the limits specified in Table 5.7.6.3-1 (a) Provide detailed information describing the equipment, or scrap, radioactive contaminants, and the nature and extent, and degree of residual surface contamination.	Section 5.7.6	Does not address Beta-Gamma contamination, only alpha.
(4b) Applicant includes materials created by special circumstances including, but not limited to, the razing of buildings, transfer of structures or equipment, or conversion of facilities to a long-term storage facility or to standby status		
<b>5.7.7 Airborne Effluent and Environmental Monitoring Program</b>		
(1) The proposed airborne effluent and environmental monitoring program is consistent with: Regulatory Guide 4.14, Sections 1.1 and 2.1 Regulatory Guide 4.14, Sections 1.1 and 2.1 Regulatory Guide 8.37, Section 3.	Section 5.7.7	Sampling locations are consistent with RG 4.14 for environmental monitoring, but effluent monitoring is supposed to be described here according to statements in Section 4.1.

<b>Chapter 5 - Operations</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<p>(2) The proposed locations of the airborne effluent monitoring stations are consistent with guidance in Regulatory Guide 4.14, Section 1.1.1 Regulatory Guide 4.14, Section 2.1.2.</p> <p>Criteria used in selecting location Sampling locations show on topographic map</p>		Implies that environmental monitoring is effluent monitoring.
<p>(3) The proposed sampling methods are consistent with guidance in Regulatory Guide 4.14, Section 3 (Quality of Samples)</p>	Section 5.7.7	Effluent monitoring not explicit. States that will use source term method to determine effluents released and addressed in section 7.3.
<b>5.7.8 Ground-Water and Surface-Water Monitoring Programs</b>		
<p>(1) For each new well field, the applicant's approach for establishing baseline water quality is sufficient to:</p> <p>(i) define the primary restoration goal of returning each well field to its pre-operational condition (ii) provide a standard for determining when an excursion has occurred.</p>	<p>(i) Section 5.7.8.2.1 (ii) Section 5.7.8.2.4</p>	<p>(i) The applicant proposes only two comprehensive rounds of samples for baseline. In the last two they will not sample for constituents which were non-detects in the first two rounds. This is not acceptable for establishing baseline water quality and RTVs.</p> <p>ii) The applicant proposes only one comprehensive rounds of sample for baseline. In the last three rounds they will only sample for UCL parameters which is not acceptable for establishing baseline for clean up goals.</p>
<p>(2) If ISL is located adjacent to bodies of surface-water, the applicant must establish a surface-water monitoring program that will be effective to detect migration of contaminants into surface-water bodies or demonstrate that the risk is negligible.</p>	Section 5.7.8.2.8, Appendix A1	Appendix A1 for impacts to North Platte river connection/ Peterson site ore zone outcrops near surface discharge to stream drainage and no analysis was done

<b>Chapter 5 - Operations</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<b>5.7.9 Quality Assurance</b>		
(1) The quality assurance program has been established and applied to all radiological, effluent, and environmental programs (Regulatory Guide 4.14, Section 3 and 6 and Regulatory Guide 4.15)	Section 5.7.10, addendum 5-A	Section 5.7.10 states that the QA program applies to all relevant operational monitoring and analytical procedures. It does not cover all radiological, effluent and environmental programs. The Plan written in Addendum 5-A is lacking.
(2) All reporting and record keeping will be done in conformance with the criteria presented in Section 5.3.2 of this standard review plan.		Not adequate coverage of document control in Section 5.2.3

<b>Chapter 6 - Ground-Water Quality Restoration, Surface Reclamation, and Facility Decommissioning</b>		
<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
<b>6.1 Plans and Schedules for Ground-water Quality Restoration</b>		
(1) External effects of ground-water restoration	Section 6.1.7	Only brief description, no analysis
(2) alternatives to primary or secondary standards		Not addressed
<b>6.2 Plans and Schedules for Reclaiming Disturbed Lands</b>		
(1) any changes to existing NRC-approved radiation safety program		Should at least contain a statement that no changes are expected

**Chapter 6 - Ground-Water Quality Restoration,  
Surface Reclamation, and Facility Decommissioning**

Section - Criteria	Location in report	Note
(2) approved waste disposal agreement		Commitment to have one, but not in place yet
(3) Decommissioning addresses non-radiological hazardous constituents		Although gw restoration addresses non-rad, I see nothing on non-rad in land cleanup
(4) QA/QC program addresses all aspects of decommissioning		The QA plan in 5.7.10 should indicate that it is applicable to decommissioning also.
<b>6.3 Procedures for Removing and Disposing of Structures, Waste Materials, and Equipment</b>		
(1) A contract between the licensee and a waste disposal operator exists to dispose of 11e.(2) byproduct material.		Commitment, but no contract yet
<b>6.4 Methodologies for Conducting Post-Reclamation and Decommissioning Radiological Surveys</b>		
(2) The survey method for verification of soil cleanup is designed to provide 95-percent confidence that the survey units meet the cleanup guidelines.	Section 6.4.3	95% confidence not addressed. Does not follow criteria in NUREG-1569, just RG 8.30.
<b>6.5 Financial Assurance</b>		
(1) The applicant commits to updating the surety value annually, in response to changes in closure or decommissioning plans, and as necessitated by changes in the facility and its operations.	Section 6.5	Commitment is only regarding the annual update
(2) The licensee commits to submitting for NRC approval an updated surety to cover any planned expansion or operational change not included in the annual surety update at 90 days prior to beginning associated construction.		Commitment not included

**Chapter 6 - Ground-Water Quality Restoration,  
Surface Reclamation, and Facility Decommissioning**

<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
(3) The licensee commits to providing NRC with copies of surety-related correspondence submitted to a state, a copy of the state's surety review, and the final approved surety arrangement.		Commitment not included

**Chapter 7 - ALTERNATIVES TO PROPOSED ACTION**

<b>Section - Criteria</b>	<b>Location in report</b>	<b>Note</b>
1) The applicant considers process alternatives to the proposed action	Section 7.1	
a) Construction of a central processing facility versus use of satellite facilities		Not addressed