

FS ME

**From:** Behram Shroff [mailto:Behram.Shroff@nrc.gov]  
**Sent:** Tuesday, July 22, 2008 11:59 AM  
**To:** Ken Milmine (USA)  
**Subject:** Info to be used in EA

Hi: For the sake of consistency, we are using the GEIS format for the EA. I had a look at the ER's Table of Contents for all three volumes for Moore Ranch but could not find anything. Below are the section headings for Chapter 2. Please refer me to any sources of information for Moore Ranch that can be used. Thanks

2.1	Overview of <i>In-Situ</i> Leach Uranium Recovery.....	2-1 (This should be in the GEIS?) ER Sec. 2 is a description of the Proposed ISL Operations
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2.1.3	General Description of ISL Facilities.....	2-4 (This should be in the GEIS?) ER Sec. 2 is a description of the Proposed ISL Operations
2.2	Pre-Construction.....	2-6 (What is Pre-Construction?)
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## Shroff, Behram

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**From:** Behram Shroff  
**Sent:** Monday, July 28, 2008 9:36 AM  
**To:** 'Ken Milmine (USA)'  
**Subject:** Pre-Construction

Ken: I finally got to this section and it's a bit misleading. It represents the "before" or base-line condition of the site and seems to be mostly in Section 2.0 of the ER, though I am sure you could refer me to specific parts. Pre-Construction is described as follows:

### Pre-Construction

In support of an application to NRC for a license under 10 CFR Part 40 to recover uranium using ISL methods the applicant must include a characterization of the potential site (NRC, 2003a, Chapters 2 and 7). During the initial licensing of a new ISL facility, NRC does not require a comprehensive discussion of all aspects of the site and of planned operations (NRC, 2003a). Instead, at this stage, the applicant needs to provide enough information to generally locate the uranium mineralization, understand the natural systems involved, and establish baseline conditions prior to operation. If a license is granted, the licensee would collect more detailed information as each well field is developed and brought into production (NRC, 2003a).

A number of general types of site baseline information to be provided by the license applicant are described in NRC guidance (NRC, 2003a, Chapter 2; 1982). Specific features of the site or its environs may also be identified and used by the applicant to support the proposed facility description. The applicant would provide maps to locate the proposed site, and identify proposed surface facilities, well fields, and other features of the ISL facility. In addition to providing information about the proposed site location and the environment in the vicinity of that location (e.g., water use, subsurface geology, hydrology, ecology, historical and cultural resources), the applicant also provides required population data and assessments of trends in population and industry patterns (NRC, 2003b, Appendix C).

Given the nature of the ISL uranium recovery process, hydrology characterization of the site is a critical component of the applicant's pre-construction activities. This characterization describes surface-water features in the site area and specific groundwater hydrogeology features, including the proposed uranium production zone, potentially affected aquifers, and low-permeability units that isolate the production zone.

Applicants are to determine baseline water quality for both the uranium mineralized production zone and for the surrounding aquifers (NRC, 2003a). The NRC-approved list of constituents to be sampled are shown in Table 2.2-1. To assist in monitoring and aquifer restoration when uranium recovery operations end, NRC requires that applicants and licensees establish pre-operational nonradiological and radiological groundwater quality baselines within the proposed permit boundaries and adjacent properties. These baseline conditions are based on samples collected over a period of at least 1 year, with a distribution that is sufficient to characterize the different aquifers and surface water bodies (NRC, 2003a).

License applicants also collect site-specific data to establish background radiological characteristics of the site. These data may include the results of measurements of radionuclides occurring in important flora and fauna species, soil, air, and surface and groundwaters that ISL operations could affect. NRC reviews the sampling program the applicant or licensee proposes and establishes the required sampling conditions by license conditions. The applicant or licensee proposes specific features of the pre-operational radiological monitoring program such as

- Which radionuclides are to be sampled and analyzed and appropriate detection limits
- Sampling locations
- Sample type
- Sampling frequency

- Location and density of monitoring stations

The adequacy of the design of this program is evaluated by the NRC staff as part of the licensing review.

Table 2.2-1. Typical Baseline Water Quality Parameters and Indicators*		
Physical Indicators		
Specific Conductivity	Total Dissolved Solids†	pH‡
Major Elements and Ions		
Alkalinity	Chloride	Sodium
Bicarbonate	Magnesium	Sulfate
Calcium	Nitrate	
Carbonate	Potassium	
Trace and Minor Elements		
Arsenic	Iron	Selenium
Barium	Lead	Silver
Boron	Manganese	Uranium
Cadmium	Mercury	Vanadium

Table 2.2-1. Typical Baseline Water Quality Parameters and Indicators* (continued)		
Physical Indicators		
Chromium	Molybdenum	Zinc
Copper	Nickel	
Fluoride	Radium-226§	
Radiological Parameters		
Gross Alpha	Gross Beta	
*Based on U.S. Nuclear Regulatory Commission (NRC). NUREG-1569, "Standard Review Plan for <i>In-Situ</i> Leach Uranium Extraction License Applications—Final Report." Table 2.7.3-1. Washington, DC: NRC. June 2003. †Laboratory only. ‡Field and laboratory determination. §If site initial sampling indicates the presence of thorium-232, then radium-228 should be considered in the baseline sampling, or an alternative may be proposed.   Excluding radon, radium, and uranium.		

**From:** Ken Milmine (USA) [mailto:Ken.Milmine@uranium1.com]  
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**To:** Behram Shroff  
**Subject:** RE: Info to be used in EA

Behram,

I put references to the Sections of the ER after each item below. I am not sure what pre-construction would be so I did not put a reference for that. The ER really does not contain a general ISR process description, rather a description of the proposed ISR operations at Moore Ranch. Let me know if this helps or if you need anything else.

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