

April 22, 2002

Chief, Rules Review and Directives Branch
U.S. Nuclear Regulatory Commission
Mail Stop T6-D59
Washington, DC 20555-0001

Dear Sir/Madam:

Attached are the comments of the National Mining Association (NMA) on NUREG-1569, Rev. 1 "Standard Review Plan for In Situ Leach Uranium Extraction License Applications." NMA's members are producers of most of America's coal, metals, industrial and agricultural minerals; manufacturers of mining and mineral processing machinery and supplies; transporters; financial and engineering firms; and other businesses related to mining. These comments are submitted on behalf of NMA's uranium recovery members who operate in situ leach facilities licensed by the Nuclear Regulatory Commission. While NMA generally supports the concept of Standard Review Plans, and believes NUREG-1569 Rev. 1 is generally a comprehensive and thoughtful treatment of closure issues, some changes are necessary. These changes are detailed in the enclosed comments. If you have any questions, please call me at 202/463-2627.

Sincerely,

/s/

Katie Sweeney
Associate General Counsel

QFB
per
J. Muszkiewicz

**NMA COMMENTS ON NUCLEAR REGULATORY COMMISSION'S
STANDARD REVIEW PLAN FOR IN-SITU LEACH (ISL) URANIUM
EXTRACTION LICENSE APPLICATIONS - - NUREG-1569, Rev. 1**

I. General Comments

- A. As a general proposition, NMA believes that the draft SRP, NUREG-1569, provides a improved basis for describing NRC's approach to the review and acceptance of new and amended licenses for *in situ leach* (ISL) uranium recovery (UR) facilities. The draft SRP incorporates a number of the comments made by NMA and other commentors, and NMA appreciates NRC Staff's attempt to respond to comments in a spirit of cooperation to improve the final product.

- B. NMA is still concerned that NRC staff does not understand or is unwilling to accept the fact that restoration of ground water in the mining zone must be addressed with extreme flexibility. A prescriptive approach to groundwater restoration by NRC in its licensing process makes no practical sense, adds nothing to the protection of public health and safety, and is absolutely inconsistent with risk-informed regulation. The water in the mining zone is exempted by EPA under its underground injection control (UIC) regulatory program because the water is not now and cannot be a future source of drinking water due to the mineralization involved. In the case of ISL uranium mining, the constituents of concern (COCs) in the exempted aquifer are uranium, radium and radon. Typically, the levels of these naturally occurring radionuclides make the water in the mining zone unsuitable for use as a drinking water source, indeed, for any use other than mining, prior to mining and after restoration. Therefore, attempting to tie licensees to prescriptive restoration requirements is unrealistic, unnecessary, and an expensive approach to final closure of ISL mines.

- C. NRC's continued failure to openly and explicitly acknowledge the fact that exempted aquifers are not and will not be drinking water sources provides an opportunity for those opposing ISL licensing activities to attempt to hold the licensees to the exact numbers established for background ground water constituent concentrations. Indeed, the discussion in the SRP about licensees being required to get a license amendment to use secondary standards as the basis for restoration is a perfect example of providing an opportunity for meddling and interference that has no significant health and safety basis, places an unreasonable performance burden and costs on ISL licensees, and often conflicts with already-established state standards.

- D. The discussion in the draft SRP, which indicates that NRC's post-restoration concern is potential impacts on adjacent non-exempted drinking water

sources, is appropriate. However, it is also true that EPA or the authorized state agency has the authority to require a licensee or a UIC permittee to clean up impacts on non-exempted adjacent drinking water sources. Thus, although UIC regulations do not require restoration and do not provide EPA with the authority to require restoration, the fundamental concern is addressed – that being, the protection of non-exempted adjacent drinking water sources.

- E. NMA cannot urge NRC Staff strongly enough in this document to explicitly acknowledge that once an aquifer is exempted by EPA, it is not going to be a drinking water source in the future. There are no provisions in the Safe Drinking Water Act (SDWA) or in EPA’s UIC regulations for revocation of an aquifer exemption. To our knowledge and to the knowledge of EPA headquarters, there has never even been a suggestion of revoking an aquifer exemption. Thus, NRC cannot rely on protecting public health and safety from public access to water in the exempted aquifer as a basis for prescriptive restoration requirements when the aquifer was unsuitable for drinking due to radionuclides pre-mining. It is worth noting that, had areas subject to ISL mining been mined conventionally, the aquifer at these sites would be completely destroyed.
- F. The draft SRP places great emphasis on avoiding duplicative staff review of proposals that have already been reviewed by other relevant regulatory authorities (i.e., states). While NMA fully appreciates NRC’s consideration of this issue, the actual utilization of this practice has yet to be realized.

II. Specific Comments.

A. Executive Summary.

- 1. p. XVII-The draft SRP acknowledges that the National Environmental Policy Act (NEPA) does not provide NRC with “any additional authority.” However, it notes that it does enforce NRC authority found in organic statutes by obligating NRC to evaluate both radiological and *non*-radiological environmental impacts for NRC-licensed sites. Also, the draft states NEPA, as interpreted by the courts, requires NRC to mitigate environmental impacts resulting from agency actions to the extent possible through its licensing. Therefore, “NRC can also condition commitments made by applicants to mitigate such environmental impacts.”

Comment: NMA agrees that NEPA requires NRC to evaluate potential radiological and *non*-radiological impacts of any NRC licensing action. NMA agrees that NRC licensing actions should, to the extent *legally appropriate*,

mitigate potential adverse environmental impacts. NMA is uncomfortable with the language that the agency is required to mitigate environmental impacts to the extent possible and can condition commitments. The language is broad and there is no additional explanation of what NRC intends. NMA believes that NRC can appropriately condition licenses on the basis of its own regulatory requirements and to the extent regulatory requirements under other statutes and regulatory programs apply. However, NRC is in no position to enforce requirements under other statutes, and NRC is in no position, generally, to make decisions that a license should not be granted, for example, if the licensee satisfies the appropriate permit, because NRC believes that further mitigation might be appropriate.

2. p. XIX-V. The draft SRP appears to contain a discussion about the relatively benign nature of ISL mining with respect to environmental and occupational hazards.

Comment: NMA agrees with that discussion and believes it should be expanded. In the draft being reviewed something has been omitted.

3. PXX-Paragraph 3 of the draft SRP states that “[b]eginning construction of processed facilities, wellfields, or other substantial actions that could adversely effect the environment of the site, before the staff has concluded the appropriate action is to issue the proposed license, is grounds for denial of the application [10 C.F.R. Part 40.32(e)].”

Comment: NMA questions the sweeping nature of this statement and the conclusion. NRC has no jurisdiction over wells in an exempted aquifer that are authorized by a UIC permit until the proposed NRC licensee begins to inject lixiviant into the wellfield. Prior to that, as far as NRC should be concerned, the wellfield is not within its jurisdiction. Therefore, this statement would appear to be improper and illegal.

4. p. XXV: This section references preparation of an Environmental Impact Statement (EIS) in accordance with 10 CFR §50.31.

Comment: This regulatory reference appears incorrect. The correct reference is likely 10 CFR §51.31.

5. p. XXVI: The draft SRP notes “flexibility is provided to enable licensees to achieve the type of operation desired at their facilities.”

Comment: NMA believes that this is a fundamentally important concept that should be emphasized in other places in the draft SRP. This is particularly important in order to improve communication with members of the public who are opposed to ISL operations so they do not attempt to suggest rigid prescriptive approaches that result in challenges to license amendments in hearings before NRC hearing panels.

6. p. XXVI: The draft SRP notes that the staff is willing to consider proposals for other solutions and approaches on a *generic* basis apart from a specific application to make the NRC process more efficient and cost-effective.

Comment: NMA supports this concept and believes that it should also be included in the draft SRP for conventional uranium mill tailings reclamation plans, NUREG-1620.

B. Chapter 1.0 Proposed Activities.

1. **Section 1.2, p1-1:** The draft SRP points out that ISL facilities do not begin operations with the kind of comprehensive information that might be expected from other types of licensed facilities. Because ISL facilities “obtain information to generally locate the ore body and understand the natural systems involved more detailed information is developed as each area is brought into production.” The draft SRP also acknowledges that operational experience from industry research and development projects at a particular site provide useful information for licensing actions.

Comment: NMA appreciates the clarity of this discussion as it is important, particularly for the members of the public to understand that the approach to developing a license for an ISL facility is not the same thing, either risk wise or information wise, as developing a license for a nuclear reactor or a fuel cycle facility.

C. Chapter 2.0 Site Characterization.

1. **Section 2.12, p2.2:** the draft SRP contains additional discussion along the lines of that noted in Section 1.2 above.

Comment: NMA incorporates its comment on Section 1.2 above.

2. Section 2.1.3 (2), Site Location and Layout, Page 2-2

Comment: There is an apparent typographical error. “In the call of renewals” should be “in the case of renewals”.

3. Section 2.2.1, Areas of Review, Page 2-4:

Comment: There is an apparent typographical error as 80-km should include “[50-mi]”.

4. Section 2.2.3(d), Acceptance Criteria, Drawdown, Page 2-5:

Comment: It should be noted that “drawdown” data is not usually available for area water wells.

5. Section 2.4, Historic, Scenic, Cultural Resources, Pages 2-9 to 2-11:

Comment: It is unclear if all the “Acceptance Criteria” would apply to an operation wholly located on private surface. If appropriate, this section should be revised to reflect differing requirements concerning public vs. private lands.

6. Section 2.4.3, p. 2.10-11 -- The Draft SRP discusses the contacts for appropriate tribal authorities regarding impact on North American cultural resources.

Comment: NMA notes that, in a recent Subpart L license proceeding, Executive Order No. 13175 was raised by an interested member of the public. Executive Order No. 13175 addresses contacts and consultations with Native American authorities on matters that may impact a tribe or tribes.

7. Section 2.6.1, Area of Review, Core Data, Pages 2-16

Comment: ISL licensees have not routinely collected and submitted core data “of the site and environs” to NRC as part of the site characterization. This type of information could be very costly and it is questionable whether it is needed

8. Section 2.6.3 (11), Geology and Seismology, Page 2-19:

Comment: Acceptance Criterion (11) requires that the short term seismic stability of the *facility* be demonstrated in accordance with Regulatory Guide 3.11, *Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills* (1977). As the title suggests, this regulatory guide addresses requirements for

embankment systems and does not appear to be applicable to a general facility evaluation as the SRP suggests. In addition, the acceptance criterion references Section 2.6. Regulatory Guide 3.11 does not have a Section 2.6. If it is intended that this seismic analysis only apply where evaporation ponds are planned, the SRP should clearly state this. NRC should clarify the reference to the proper section and insure that the methodology is current since this guidance is 25 years old.

9. Section 2.7, p. 2-20, 2-27. The discussion of hydrology and determination of background water quality and the Reference Table 2.7.3-1 addresses typical baseline water quality indicators and baseline water quality issues.

Comment: The discussion in this section is useful to indicate to members of the public that industry experience has demonstrated which common constituents, physical indicators, radiological parameters, and trace and other elements can be expected depending upon the site specific circumstances. The fact that some constituents are typically trace or minor elements does not mean that they all cannot be found in higher concentrations. This suggests that they typically do not require the same level of concern in terms of restoration activities.

10. Section 2.7.1 (5), Hydrology, p. 2-21:

Comment This area of review requires that licensees submit an assessment of seasonal ranges and historic extremes for surfaces of water bodies and aquifers. NRC should recognize that, in many cases, available data for this requirement is limited, particularly for aquifers that are not generally suitable for other uses and for small surface water features that may be near a proposed facility. Generally, the vast majority of available data will be preoperational characterization performed by the licensee and historical extremes will be difficult, if not impossible, to determine.

11. Section 2.7.2(4), Review Procedures, “Class of Use”, Pages 2-22:

Comment: The use of the term “class of use” is not appropriate as this term may only be applicable in certain states (i.e. Wyoming) and such states may not use the term in the same way. It is suggested that the term be eliminated.

Additionally, one of the major reasons for licensees to assess the background quality of ground water in the production zone is to assist in establishing the zone as an “**Exempted Aquifer**” in accordance with EPA or state requirements. Section 2.7 should be revised to reflect this important consideration.

12. Section 2.7.3 (4), Hydrology, Page 2-24 to 2-25:

Comment: Acceptance Criterion (4) discusses the preoperational determination of chemical and radiochemical conditions of aquifers at the proposed facility. Table 2.7.3-1 includes an list of constituents that NRC considers acceptable for this characterization. The SRP allows a licensee to propose an alternate list of constituents and discusses the type of justification necessary to remove constituents from consideration. Several parameters are discussed that need not be considered because it is not expected that ISL operations will affect their concentrations (i.e., aluminum and thorium-230)

Based on generic considerations, it is questionable whether radium-228 should be included in Table 2.7.3-1. Radium-228 occurs as the first decay product in the thorium-232 series, with a half-life of 5.7 years. Thorium is extremely insoluble and is not subject to mobilization in most groundwater environments. Conversely, uranium forms soluble complexes under oxidizing conditions and precipitates in reducing conditions, which is the mechanism that forms roll-fronts deposits and allows ISL mining. Since the mechanism of deposition for thorium and uranium are different, the baseline concentrations of each in the mining zone are independent of one another. Mining activities should not affect the long-term concentration of thorium-232 in the mining zone due to its insolubility. With no long-term affect on the thorium-232 concentration in the formation, the radium-228 concentration will not vary. The short half-life of radium-228 also precludes the potential for significant variation due to groundwater transport, so a concentration of radium-228 without the presence of thorium-232 is unlikely. Without a process whereby the thorium-232 concentration increases in the formation and with no potential for radium-228 concentration due to transport, the baseline concentration of radium-228 should not be affected by mining operations.

Studies cited by EPA in the Notice of Data Availability (65 FR 21576, April 21, 2000) for the Final Rule for Radionuclides in Drinking Water and the Technical Support Document for the Radionuclides Notice of Data Availability (EPA, March 2000) noted that about 90 percent of the samples for radium-228 from the most recent nationwide studies were below the detection level of 1.0 pCi/l. The median concentration of all positive results was 1.47 pCi/l. This data indicates that there is little likelihood that radium-228 will be found in significant concentrations at ISL facilities. This conclusion is supported by historical analytical data collected by active ISL mines. Baseline radium-228 concentrations are typically near detection levels, while radium-226 may vary between tens and thousands of picocuries per liter due to the presence of elevated concentrations of uranium-238 in the ore body. Sampling performed by licensees following mining and restoration activities has confirmed that there is no affect on radium-228 concentrations.

Based on this information, a conclusion similar to that cited by NRC for thorium-230 may be made for radium-228. Alternatively, NRC may determine that some limited radium-228 analysis as part of the initial site characterization process may be advisable in order to provide preoperational data. However, the inclusion of this isotope in Table 2.7.3-1 carries through the groundwater monitoring requirements in this SRP. Specifically, Section 5.7.8.3 (Ground-Water and Surface-Water Monitoring Programs)

references Table 2.7.3-1 for use as the parameter list during preoperational baseline sampling for *each new wellfield*. This analysis would apply to every monitor well and every baseline restoration well. Furthermore, including radium-228 in the baseline sampling regimen would result in post-mining and post-restoration stabilization sampling for this parameter. The cost for unnecessary radiochemical analysis for radium-228 would be significant for an ISL mine. Currently, radium-228 analysis using EPA Method 904.0 is at least \$75 per sample and is not included in the typical analytical suite used at most ISL mines.

13. Section 2.7.3(4), Table of Water Quality Parameters, pp. 2-24 and 2-25:

Comment: Table 2.7.3-1 contains several parameters which are not currently required for baseline sampling by all NRC licenses (eg. Ra-228, gross alpha, gross beta, silver, zinc). Existing state mining permits and current guidance also do not require the sampling of these parameters. The addition of these parameters would be very costly to licensees. It is recommended that NRC include a discussion of the planned Memoranda of Understanding (MOUs) with State agencies that have ISL mining regulations and programs required by State statute, and how NRC can rely on the State programs for activities at wellfields.

14. Section 2.7.3(4), Acceptance Criteria, "Four Sets of Samples", pp. 2-25:

Comment: The SRP should not require that "at least four sets of samples should be collected and analyzed for each listed constituent for determining baseline water quality conditions." Such a requirement is not consistent with current NRC licenses and State practices (e.g., Wyoming). For instance, some licenses only require certain parameters to be sampled four times. The proposed requirement would be very costly and would not result in a better assessment of baseline ground water quality conditions.

This position is supported by the fact that the water bearing zones of interest at ISL sites almost exclusively consist of confined aquifers which contain ground water of relatively consistent quality, as the water typically only moves at a rate of a few feet per year. It is well documented from existing ISL baseline water quality databases that four samples from each well are not needed. The minimal variability typically observed in these data result from sampling and analytical variation, not actual water quality changes.

15. Section 2.7.3(4), Acceptance Criteria, "Water Levels of Surface Water Bodies", pp. 2-26:

Comment: Due to the fact that ISL activities typically occur in confined aquifers, located at considerable depth, it is not appropriate to assess water levels of surface water bodies.

16. Section 2.9.2, Background Radiological Characteristics, p. 2-32:

Comment: The SRP adds the requirement that the preoperational monitoring program for radionuclides should be reviewed against NUREG-5849, *Draft Manual for Conducting Radiological Surveys in Support of License Termination* and NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, Revision 1. These new references are in addition to Regulatory Guide 4.14, *Radiological Effluent and Environmental Monitoring at Uranium Mills* (1980), which was cited in the Draft SRP. Both of these new references were developed for decommissioning activities and do not provide guidance relevant to baseline preoperational surveys. The intensity of the radiological surveys described in these documents are warranted during decommissioning activities, but should not be used as a basis for site preoperational characterization activities. If there are specific sections of these documents that NRC wants licensees to consider in preparing the preoperational monitoring program (e.g., instrument selection criteria), these sections should be explicitly referenced. Otherwise, Regulatory Guide 4.14 discusses an appropriate approach for determination of background radiological characteristics that suits uranium recovery facilities.

17. Section 2.10.3 (3), Background Non-Radiological Characteristics, Page 2-35:

Comment: Acceptance criterion (3) states that when land application of waste is involved, "...background concentrations for soil constituents are established." This criterion seems overbroad. There is no need to establish background for constituents that will not be affected by land application of waste. The SRP should be revised to require characterization of only those constituents that NRC expects will be affected by waste disposal operations.

D. Description of Proposed Facility

1. Section 3.1.1(5), Areas of Review, Small Waste Sites, Pages 3-1:

Comment: It is unclear what the "[r]eview of **process** to ensure that a proliferation of small waste disposal sites is avoided" means.

2. Section 3.1.2, Description of Proposed Facility, Page 3-1:

Comment: This paragraph requires that the licensee provide detailed justification of the well integrity test interval. In general, the test interval is determined by the requirements of the UIC program implemented by EPA or EPA-Authorized State regulations (40 CFR §146.8) and/or by the Class III UIC permit issued under these programs. The detailed justification may simply be meeting the requirements of the appropriate regulatory program.

The third paragraph contains a typographical error. “Weld integrity tests” apparently refers to “well integrity tests.”

3. Section 3.1.3 (2)(a), Description of Proposed Facility, Page 3-3:

Comment The SRP states that polyvinyl chloride (PVC), fiberglass, or acrylonitrile butadiene styrene (ABS) plastic casing is generally not strong enough for use in wells over 500 feet deep or those subject to high-pressure cementing techniques. The SRP states that the licensee should demonstrate that these materials may be safely used for wells completed to a greater depth. This requirement appears to overlook extensive operating experience in the industry and the standard reference that the reviewer is expected to use. For instance, the Crow Butte mine has routinely used PVC casing to depths up to 900 feet. Crow Butte has installed in excess of 2,500 wells using this material, using a high pressure cementing technique. Of these 2,500 wells, there have been no operational well failures due to a casing failure related to the materials of construction. Other operating sites have similar experience. Furthermore, the reference provided for reviewers in Section 3.1.2 (Driscoll, F. G. *Groundwater and Wells*, 1989) states that PVC casing is generally acceptable to depths of 1,000 feet. In order to be consistent with extensive operating experience and industry standards, NRC should revise this section to require justification for use of these materials only at depths greater than 1,000 feet.

This section also provides examples of acceptable well development methods. In addition to the cited methods, the EPA and State regulatory programs allow the use of other well development methods or a combination of methods. The SRP should recognize that other well development methods besides air lifting and swabbing are acceptable under the relevant regulatory programs.

4. Section 3.1.3, Description of Proposed Facility, Page 3-4:

Comment: Acceptance Criterion (2)(b) states that a well mechanical integrity test (MIT) is acceptable if a pressure drop of less than ten percent occurs over one hour or less than five percent over ½ hour. NRC should provide the reasoning for these acceptance criteria, since they are more stringent than those contained in State UIC programs and Class III UIC permits. For most licensees, the performance standards for MITs are set on a site-specific basis, often with input from the State Administered UIC program as well as the licensee. As noted in the comments on Section 3.1.2, MIT

requirements are part of the UIC regulatory program (40 CFR §146.8). These site-specific performance standards are often considerably different than those proposed in the SRP. Therefore, NRC acceptance should be based on meeting the appropriate UIC program and permit requirements.

Acceptance Criterion (5)(d) requires that the lixiviant makeup be described to address groundwater quality impacts and the ability to achieve restoration goals. This analysis is clearly covered by the EPA and State UIC permitting programs (40 CFR §146.34(a)). Independent review by NRC should not be necessary.

Acceptance Criterion (11) states that failure to submit a new disposal agreement within 90 days will result in prohibition of further lixiviant injection. The current standard License Condition contains a similar requirement, with the exception that some flexibility is allowed by the phrase “unless further delay is justified.” This flexibility should be retained in the SRP.

5. Sections 3.1.2 and 3.1.3, Description of Proposed Facility, Pages 3-2 through 3-6:

Comment: Section 3.1.2 states that the reviewer should review the design of lined impoundment for waste retention with the exception of erosion protection, which is evaluated in Section 2.7. The reason for separating these related design considerations in the SRP is not apparent. However, it should be noted that NRC has recognized in Section 2.7.3 (2) that surface impoundments are designed for tens of years and that the reviewer should consider this when evaluating these structures against the guidance contained in NUREG-1623, *Design of Erosion Protection for Long-Term Stabilization*, (1999). NUREG-1623 was prepared for use in evaluating a 1,000-year design life for large tailings structures. Since Section 3.1.3.(8) also references NUREG-1623, a caution to the staff similar to that in Section 2.7.3 should be added.

6. Section 3.2.1, Recovery Plant, Satellite Processing Facilities, Well Fields, and Chemical Storage Facilities – Equipment Used and Materials Processed, Page 3-8:

Comment: The SRP discusses chemicals of concern that are included in NUREG/CR-6733, *A Baseline Risk-Informed, Performance-Based Approach for In Situ Leach Uranium Extraction Licensees*, (2001). Reference is made to comments provided by the industry on this document regarding the conservative approach that was used to assess the risks at ISL mines from process chemicals. Specific reference is made to Comment #7 submitted by the Wyoming Mining Association, January 14, 2002. While process chemical safety is an important consideration at ISL facilities, control methods must be based on a realistic analysis of the hazards.

7. Section 3.2.1 and 3.2.3(6)(7), Hazardous Materials, Pages 3-8 and 3-9:

Comment: It is unclear what “hazardous chemicals that have the potential to impact radiological safety” means. It seems appropriate that the NRC should be concerned with the handling of all hazardous chemicals, not just those that could potentially impact radiological safety.

E. Effluent Control Systems

1. Section 4.2.3 (6), Effluent Control Systems, Liquids and Solids, Page 4-8:

Comment: Acceptance criterion (6) discusses the requirement for an acceptable disposal agreement and requires the termination of leachate injection similar to that discussed under Section 3.1.3 (11). It appears redundant to address this issue in both sections.

2. Section 4.2.4, Effluent Control Systems, Liquids and Solids, Page 4-9:

Comment: This section of the SRP discusses evaluation findings concerning Dam Safety Programs. However, this topic is not discussed in the review process in the previous sections of 4.2. It would also appear that this review is redundant with the discussion in Section 3.1.2. The Dam Safety requirements for evaporation ponds should be consolidated in one section. Additionally, NMA notes that reference is made to *Section 15, National Dam Safety Program of the Water Resources Development Act of 1966*. In Section 3.1.3, reference is also made to this document with a publication date of 1996.

3. Section 4.2.5, Effluent Control Systems, Liquids and Solids, Page 4-12:

Comment: For clarity, the first reference in this section should include the document identifier (Regulatory Guide 3.11.1).

F. Section 5, Operations,

General Comment: Throughout this section, reference is made to the following documents:

- Draft Regulatory Guide DG-8027, *Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Recovery Facilities Will Be As Low As Reasonably Achievable*, (2000);
- Draft Regulatory Guide DG-8026, *Health Physics Surveys in Uranium Recovery Facilities*, (2000)

These draft regulatory guides were published by NRC in October 2000 as complete revisions to Regulatory Guide 8.31, *Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills Will Be As Low As Reasonably Achievable*, May 1983 and Regulatory Guide 8.30, *Health Physics Surveys in Uranium Mills*, June 1983, respectively. Note that the UR industry provided comments on these two draft Regulatory Guides in late 2000. The final versions of these documents have not been published and industry comments have not been addressed. Reference to the draft Regulatory Guides throughout this section will make them the *de facto* criteria for reviewing proposed radiological protection programs in licensing actions. NRC should finalize DG-8027 and DG-8026 before issuing the final version of this SRP and should ensure that all references in this section are to the final guidance.

(To add further confusion, the SRP, as currently written, references the original 1983 version of Regulatory Guide 8.31 in Sections 4.1.3 (3) and 4.1.5. Similarly, the original 1983 version of Regulatory Guide 8.30 is referenced in Sections 5.7.2.3 (4) and 5.7.6.4. These references should also be updated. In addition, the draft Regulatory Guides have removed the term “mills” and replaced it with the more appropriate “recovery facilities.” In most references to the draft Regulatory Guides in Section 5, this change in the title is not used).

1. Section 5.2.2, Operations, Management Control Program, Page 5-4:

Comment: The first paragraph states that the reviewer should evaluate the methods for approval of non-routine work or maintenance activities by the “*radiation and occupational safety*” staff. Occupational safety at most ISL mines is regulated by the Mine Safety and Health Administration (MSHA) and is not under the authority of NRC. Reference to occupational safety should be removed from this section and from Section 5.2.3 (2) and 5.2.3 (3).

The final paragraph of this section and a similar paragraph in Section 5.2.3 (6) concerning the National Historic Preservation Act and the Archeological Resources Protection Act are redundant with the requirements contained in Section 2.4. These requirements should be consolidated in one section of the SRP.

2. Section 5.2.2, Review Procedures, Apparent License Condition, Pages 5-4:

Comment: The last paragraph of this section is confusing as it seems to require adherence to some sort of license condition.

3. Section 5.3.1.3(5), Acceptance Criteria, ALARA Report, Pages 5-8:

Comment: This section requires that the licensee include provisions to **submit** the Annual ALARA Audit to the NRC. This requirement is not consistent with current practice, which requires this report to be maintained at the licensed site.

4. Section 5.2.3 (1), Operations, Management Control Program, Page 5-4:

Comment: Acceptance Criterion (1) requires reporting to the “NRC Region IV Uranium Recovery Branch Chief and NRC Headquarters Project Manager.” Please clarify whether NRC desires reporting to NRC Region IV or the NRC Uranium Recovery Branch Chief (or both).

5. Section 5.2.3 (2), Operations, Management Control Program, Page 5-5:

Comment: The requirements for preparation of operating procedures cited in this section should be revised to supplement those contained in Section 2.2 of Regulatory Guide 8.31 where necessary, which states procedures should be developed "...for all activities that involve handling, processing, or storing radioactive materials." For instance, reference to procedures for the Safety and Environmental Review Panel (SERP) in the third paragraph should be retained since this expands the guidance provided in Regulatory Guide 8.31. However, it is unclear why NRC chose to include a requirement for operating procedures addressing "development of well fields" since these activities typically do not involve exposure to radioactive materials and are performed to meet UIC program requirements.

As previously noted, reference to occupational safety should also be removed from this section.

6. Section 5.3.1.2, Operations, Management Audit, Inspection, and Record Keeping Program, Page 5-7:

Comment: This section requires that the reviewer determine that the inspections of waste retention systems are in accordance with 10 CFR 40, Appendix A, Criterion 8(A). The inspection regimen in Criterion 8(A) is more stringent than that typically applied to evaporation ponds at ISL facilities. Evaporation pond inspections have been designed to conform to the recommendations contained in Regulatory Guide 3.11.1, *Operational Inspection and Surveillance of Embankment Retention Systems for Uranium Mill Tailings*, (1980), which provides detailed guidance and was specifically developed for these types of inspections. For instance, Criterion 8(A) requires that a daily inspection must be performed by "...a qualified engineer or scientist..." Regulatory Guide 3.11.1 recommends that the inspection program be performed by trained field inspectors under the direction of an experienced professional. Considering the potential hazards involved with these structures, the guidance in Regulatory Guide 3.11.1 is more appropriate to this task. Note that reference to Criterion 8(A) is also made in Section 5.3.1.4 and should be deleted and changed to Regulatory Guide 3.11.1.

7. Section 5.3.1.3, Operations, Management Audit, Inspection, and Record Keeping Program, Page 5-8:

Comment: Acceptance Criterion (1) should reference the inspection requirements from Regulatory Guide 3.11.1, which is more detailed than those contained in Regulatory Guide 3.11.

Acceptance Criterion (2) should also reference the reporting requirements in 10 CFR §40.60.

Acceptance Criterion (5) adds significant new reporting requirements in addition to the annual SERP report. Licensees are currently required to submit the annual summary of SERP actions and changed pages from the approved application. Criterion (5) adds requirements for submittal of an annual report "...that includes the as low as reasonably achievable audit report, land use survey, monitoring data, corrective action program report, one of the semiannual effluent and environmental monitoring reports, and the Safety and Environmental Review Panel information." Requiring submittal of this material will place an unnecessary burden on licensees to prepare the information and on the NRC staff to review it. All of the material that has been added to this requirement is currently maintained at the mine sites and has typically been reviewed by NRC during routine inspections. In fact, this new requirement of the SRP reverses a recent positive trend by NRC to *reduce* the amount of material that must be submitted by licensees and managed by NRC. Most importantly, the additional burden of submitting this information will not improve NRC oversight of ISL facilities.

8. Section 5.3.2.3, Operations, Record Keeping and Record Retention,
Page 5-10:

Comment: Criterion (3)(c) requires retention of records required by 10 CFR 40, Appendix A, Criterion 8(A) for the life of the facility. As previously noted, inspection requirements should be in accordance with Regulatory Guide 3.11.1. However, it is interesting to note that Criterion 8(A) only requires retention of these records for 3 years after the inspections are made. It is not clear why the SRP considers these records of such importance to require retention for the life of the facility. NRC should delete Criterion (3) and replace it with reference to the requirements contained in 10 CFR §20.2101 and §20.2108. These are the regulatory requirements for the types of records discussed in this criterion.

Criterion (3)(d) should be deleted in its entirety and replaced with a reference to 10 CFR §40.36(f). These are the appropriate regulatory requirements for retention of these records.

9. Section 5.3.2.4, Operations, Record Keeping and Record Retention,
Page 5-12:

Comment: The Evaluation Findings should be revised to reflect the recommended changes to Section 5.3.2.3.

10. Section 5.4.1, Operations, Qualifications for the Health Physics
Organization Staff, Page 5-13:

Comment: The first sentence of this section requires that the reviewer evaluate the minimum qualifications and experience levels proposed by the licensee for the health physics staff. Then, the reviewer is instructed to evaluate the qualifications of "...people specifically proposed for these positions." Does NRC intend that licensees must propose individuals and provide their qualifications with a license application? In many cases, these individuals have not been identified at this stage of the process. It would seem that a description of the proposed requirements would be adequate to meet NRC guidance regarding this aspect of the radiological protection program without the submission of individual qualifications.

11. Section 5.7.2.3, Operations, External Radiation Exposure Program,
Page 5-22:

Comment: Criterion (1) contains a reference to Regulatory Guide 4.14, Sections 1.1.1 and 2.1.2. It is unclear how this reference applies to this section of the SRP since these sections of the Regulatory Guide apply to preoperational and operational environmental air samples and provide no useful guidance appropriate to external radiation programs.

Criterion (6) should be clarified. It is unclear what corrective action levels from 10 CFR 20 should be addressed. The only corrective action level *per se* in Part 20 are contained in 10 CFR §20.1101, which apply to exceedance of the dose constraint for exposure to the public from air emissions.

12. Section 5.7.2.3(1) and 5.7.2.4, Acceptance Criteria, “Location of Monitors for External Exposure”, Pages 5-22 and 5-23:

Comment: It is not clear what the “location of monitors for external radiation” is references. It may be more appropriate to state the “location of survey stations used for personnel alpha monitoring,” or something similar.

13. Section 5.7.3.3, Operations, Airborne Radiation Monitoring Program,
Page 5-24:

Comment: Criterion (3) contains a reference to Regulatory Guide 8.24. The title of this guidance is *Health Physics Surveys During Enriched Uranium 235 Processing and Fuel Fabrication*. It appears that the correct reference should be Regulatory Guide 8.25, *Air Sampling in the Workplace*, Revision 1, June 1992. (Note that this reference is also not contained in Section 5.7.3.5.)

Criterion (6) contains reference to the wrong revision level of Regulatory Guide 8.15. The most recent revision is Revision 1 issued in October 1999.

14. Section 5.7.3.4, Operations, Airborne Radiation Monitoring Program,
Page 5-25:

Comment: The final sentence of the third paragraph states that airborne monitoring results “...will be used for employee exposure calculations.” Actually, 10 CFR §20.1204 also allows the use of bioassay samples, *in vivo* counting, or a combination of these methods to assess internal exposures. This section should state that employee internal exposure calculations will be performed in accordance with 10 CFR §20.1204(a).

15. Section 5.7.4.3, Operations, Exposure Calculations, Page 5-24:

Comment: The final sentence in Criterion (2) appears to be improperly worded. In addition, the implication of this sentence is that unless "...site-specific solubility characterization results..." are available, Class Y should be used as the most conservative solubility class. It is well known that Class Y uranium is produced as a result of drying uranium at high temperatures. The vacuum dryers currently used at most ISL facilities do not reach the temperatures necessary to produce Class Y (or Class W, for that matter) uranium. Does the SRP intend, as stated that, if a facility does not perform site-specific solubility analysis, they must apply the most conservative Class Y concentration values?

16. Section 5.7.4.4, Operations, Exposure Calculations, Page 5-28:

Comment: Reference to Regulatory Guide 8.13, Instruction Concerning Prenatal Radiation Exposure in this section is incorrect. Regulatory Guide 8.13 simply contains guidance for instructing employees concerning prenatal exposure and does not contain guidance for calculating prenatal and fetal exposures.

17. Section 5.7.5.3, Operations, Bioassay Program, Page 5-29:

Comment: Criterion (3) contains a reference to the incorrect revision level of Regulatory Guide 8.9. The correct revision level should be Revision 1, July 1993. This reference should also be corrected in Section 5.7.5.5.

Criterion (4) states that the NRC will establish a new License Condition that requires reporting corrective action to NRC within 30 days of receiving bioassay results at specified action levels. The action levels are taken from Table 1 of Regulatory Guide 8.22, *Bioassay at Uranium Mills*. The NRC should recognize that a final dose determination may not be available within 30 days and that the determination of appropriate corrective action may not be completed until the dose is determined. This is particularly true of exposure determinations related to Y Class material, which may involve off-site *in vivo* measurement and further sampling. In fact, NRC regulations (10 CFR §20.1204(d)) allow up to seven months to complete exposure determinations for Y Class material. Furthermore, NRC currently has regulatory reporting requirements (10 CFR §20.2203) that include reports of exposure that are in excess of specified action levels. It is unclear how these new reporting requirements would improve NRC oversight of ISL radiological protection programs. The regulatory reporting requirements should be used in this section.

Criterion (5) would add a License Condition requiring that the annual ALARA audit address corrective actions taken for all bioassay results that are above 15 µg/l. Regulatory Guide 8.31 (which is referenced in draft form in Criterion (1)) clearly lists the topics required in an annual ALARA report, including “bioassay program results”. It is unclear why a License Condition specifically requiring the ALARA report to address bioassay results at a specific concentration is necessary and how this will improve the radiological protection program. The guidance contained in Regulatory Guide 8.22 clearly addresses the proper response and corrective action requirements for bioassay monitoring results at several action levels. Regulatory Guide 8.31 contains the suggested topics for the annual ALARA Audit report. The addition of this License Condition is unnecessary.

18. Section 5.7.5.3(3), Acceptance Criteria, Bioassay, Pages 5-30:

Comment: The apparent requirement that urinalyses be completed “for all new employees and exit bioassays...” does not appear consistent with the referenced

regulatory guide and could be costly to licensees. Bioassays should only be required for “yellowcake workers”, or other workers that handle radioactive materials.

19. Section 5.7.6.2, Operations, Contamination Control Program, Page 5-32:

Comment: The reference to 10 CFR §20.1702 does not apply to personnel contamination surveys. This regulatory requirement is part of Subpart H, *Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Area* and provides that, when it is not possible to use engineering controls to limit concentrations of radioactive material in air, other administrative controls and protective equipment may be used. The reference to Regulatory Guide 8.30 (in draft form) later in this paragraph provides the correct accepted guidance for performing these types of surveys at uranium recovery facilities.

Section 5.7.6.2, Criterion (1) should also be modified to remove this reference to 10 CFR §20.1702.

20. Section 5.7.6.3, Operations, Contamination Control Program, Page 5-32:

Comment: Criterion (5) incorrectly references Regulatory Guide 8.7, *Instructions for Recording and Reporting Occupational Radiation Exposure Data*, as providing guidance related to contamination control programs. This Regulatory Guide provides guidance for preparation of NRC Form 5 exposure reports. In addition, the revision level is incorrect. The most recent revision of Regulatory Guide 8.7 is Revision 1 dated 1992. This comment also applies to Section 5.7.6.4.

Criterion (8) has been revised to reference NUREG-1575 (MARSSIM) for release of “...equipment, or scrap for unrestricted use.” The previous revision of this criterion also included the release of “premises.” It is unclear why the provision for release of premises was removed. However, since “premises” has been removed from this section, it should be noted that NUREG-1575 applies only to land and buildings. As stated in NUREG-1575, “...the release of contaminated components and equipment are ... not addressed by MARSSIM.” The only current NRC guidance for release of equipment and scrap material is contained in Annex B, *Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material*, May, 1987. These limits are currently contained in most ISL licenses and are reproduced in Table 5.7.6.3-1 of the SRP. Therefore, reference to NUREG-1575 is unnecessary and inappropriate for the materials discussed. (Note that the reference at the bottom of Table 5.7.6.3-1 is dated June 1974. The most recent revision of this information is contained in Annex B dated May 1987.)

Criterion (9) appears to apply to a specific decommissioning effort and not a general description of decontamination and release measures that may be used by a licensee during the normal operating life of a facility. In particular, subcriterion (a) through (c) require "...detailed information describing the equipment, or scrap" and "...a detailed health and safety analysis..." that addresses the risk from residual contamination to the public. This information would normally be contained in the Decommissioning Plan that must be submitted to NRC by license condition at the end of facility operations. This criterion should be revised to require a general description of the program that will be in place to control the release of residual radioactive material associated with equipment or scrap. These comments also apply to the evaluation findings contained in Section 5.7.6.4.

21. Section 5.7.7.2, Operations, Environmental Monitoring Programs,
Page 5-36:

Comment: This section requires that reviewers evaluate effluent and environmental monitoring programs to "...limit exposures and releases of radioactive and hazardous materials to as low as is reasonably achievable...in conformance with regulatory requirements identified in 10 CFR Part 20." The SRP should define "hazardous" and should provide the specific regulatory references from 10 CFR 20 that apply to hazardous material. The only obvious reference to hazardous material is in 10 CFR § 20.2007, which provides that nothing in Part 20 "...relieves the licensee from complying with other applicable Federal, State, and local regulations governing any other toxic or hazardous properties of materials that may be disposed of under this subpart."

Section 5.7.7.2 also refers to 10 CFR 20, Subparts D and F in relation to "hazardous" materials released to the environment. These subparts address radiation dose limits to the public and surveys and monitoring, respectively, and clearly do not regulate hazardous materials releases.

The SRP should reference 10 CFR § 20.2007, requiring that licensees comply with the appropriate Federal, State, and local regulations that govern this material.

22. Section 5.7.7.2 and 5.7.7.3, Environmental Monitoring Programs,
Pages 5-36 to 5-38:

Comment: This section includes considerable reference to the monitoring "requirements" included in NRC Regulatory Guide 4.14 "Radiological Effluent and Environmental Monitoring of Uranium Mills". It is not always appropriate to require ISL operators to submit environmental programs consistent with the requirements of RG 4.14, which is for **uranium mills**. For example, some operations may not have any drying facilities, or may utilize a vacuum dryer, which should negate the need for detailed air monitoring. Similarly, it is not apparent why an ISL operation would need to monitor surface soils, vegetation and stream or lake sediment on a routine basis. These requirements are very costly and are not currently required at all operating ISL sites.

23. Section 5.7.7.3, Operations, Environmental Monitoring Programs,
Page 5-37:

Comment: Criterion (3) apparently includes an incorrect reference. Regulatory Guide 4.14, Section 3 refers to the quality of environmental samples and does not provide guidance for the monitoring program for specific environmental media.

24. Section 5.7.7.3(7), Semiannual Effluent and Environmental Reporting,
Page 5-38:

Comment: It is unclear why this “Acceptance Criteria” requires the applicant to commit to the referenced reporting which is clearly required by 40.65 and it states that “A license condition will be imposed [to] specify these reporting requirements”.

Section 5.7.8, Ground Water and Surface Water Monitoring Programs, Pages 5-39 to 5-49:

Numerous concerns with this section follow:

Although Section 5.7.8.2 discusses that the reviewer should consider the “review of ground water activities conducted by State and other Federal agencies to identify any areas where dual reviews can be eliminated”, the “Acceptance Criteria” in Section 5.7.8.3 are too specific and not in accordance with approved NRC licenses and current State program requirements. It is recommended that NRC include a discussion of the planned MOUs with States that have ISL mining regulations and programs required by State statute, including how NRC can rely on the State programs for activities at wellfields, including monitoring and ground water restoration.

Discussions pertaining to the ground water monitoring programs fail to recognize that one of the major reasons for determining the baseline water quality of the production zone is to establish this zone as an “Exempted Aquifer” (see previous comment on Section 2.7.2(4)).

Section 5.7.8.3(1) states, in part, that the primary restoration goal is to return each wellfield to its pre-operational water quality conditions. It is not practicable to return all ground water quality parameters within the production zone to pre-operational conditions, nor is it required by all State programs and statutes. Additionally, EPA requirements result in the production zone being classified as an “Exempted Aquifer.”

Section 5.7.8.3(2) states that an applicant may choose to add a “non-reactive tracer” to act as an excursion indicator. This reviewer is not aware of the use of tracers at ISL sites for this purpose. The excursion parameters historically used have been shown to be very effective. It is recommended that reference to “non-reactive tracers” be deleted.

Section 5.7.8.3(2) discussed that excursion parameters should take into account **temporal** variations for the parameter concentrations within the ore zone. As previously discussed, ISL production zones are typically located in deep, confined aquifers, where temporal variations in ground water quality are virtually non-existent.

Section 5.7.8.3(5) states that an excursion is deemed to occur if any two excursion indicators exceed their respective UCLs, **“or a single excursion indicator exceeds its UCL by 20 percent”**. This statement conflicts with Section 5.7.8.3(2), which states an excursion occurs when two or more excursion indicators exceed the respective UCLs. There is no reference to one indicator exceeding its UCL by 20%. All existing licenses and State ISL permits do not include the provision that one indicator exceeding its UCL by 20% constitutes an excursion. History shows that such a provision is not needed.

Section 5.7.8.3(5), page 5-47, contains significant, and apparently new, onerous policy development concerning excursions and sureties. NRC needs to recognize that the production zone aquifer is an “Exempted Aquifer” and the water quality of wells on “excursion status” usually still meet drinking water standards.

Additionally, the apparent new policy that corrective actions for excursions can be determined complete when **all** excursion indicators are below the respective UCLs is not consistent with historic NRC policy, which conveyed that a monitor well no longer meets “excursion” criteria when the applicable criteria are no longer exceeded (e.g., If only one parameter is above its UCL, it is no longer on excursion). The historic policy is also consistent with some State programs.

25. Section 5.7.8.3, Operations, Ground-Water and Surface-Water Monitoring Programs, Page 5-41:

Comment: In Criterion (5), it appears that a portion of the final sentence has been deleted from the original draft SRP.

26. Section 5.7.9.2, Operations, Quality Assurance for Monitoring Programs, Page 5-50:

Comment: This section requires that the proposed quality assurance monitoring programs be in accordance with Regulatory Guide 4.15 and 10 CFR 40, Appendix A, Criteria 7 and 7(A). Note that Criteria 7 and 7(A) in Appendix A do not provide any regulatory requirements for quality assurance programs. This comment also applies to the evaluation findings discussed in Section 5.7.9.4.

G. Chapter 6. Groundwater Quality Restoration, Surface Reclamation Facility Decommissioning

1. Acceptance Criteria

Comment In general, the “Acceptance Criteria” for assessing the adequacy of ground water restoration at ISL sites also regulated by a State UIC program, State ISL mining program and statutes is far too detailed and onerous. The NRC should rely on any State with a recognized program to determine whether restoration of ground water in that State has been sufficiently restored.

2. **Section 6.1, p. 6-1:** The draft SRP states that some of the review methods and Acceptance Criteria in the following sections are “more rigorous than those previously used by NRC staff. They provide increased confidence in the adequacy of ground water restoration plans and the sureties associated with them.”

Comment: NMA questions the validity of requiring more rigorous criteria to address ground water restoration, for the reasons noted above, that the ground water in the exempted aquifer is not and will not be acceptable for drinking water usage, now or at any time in the future. Therefore, it appears that NRC’s approach as stated above is directly in conflict with the Commission’s policy on developing a *risk-informed* approach to regulation. NRC staff’s single-minded focus on restoration is simply so ill-advised and unrelated to protecting public health and safety that it has to be reconsidered. If necessary, NRC Staff should take this issue to the Commission for further discussion and NMA will be happy to participate in any such discussion.

3. **Section 6.1.2, p. 6.4:** The draft SRP states that “where appropriate, and when surety estimates are highly uncertain, the reviewer may use an alternative model to perform an independent technical assessment of ground water restoration.”

Comment: What does the phrase where surety estimates are “highly uncertain” mean? This unexplained statement again seems driven by this single-minded focus on restoration that is inappropriate and may prove to be a significant negative in the development of future ISL uranium recovery facilities.

4. **Section 6.1.3, p. 6.5**

Comment: In respect to Section 6.13, page 6-5, and the statement “[t]he EPA authorized state typically imposes the ground water restoration requirements in accordance with the state’s ability to implement requirements that are more stringent than the delegated federal program” is an incorrect statement. There are no EPA or other federally mandated regulations that require ground water restoration of an “Exempted Aquifer.” State regulations, such as those in Wyoming, that pertain to ground water restoration at ISL sites, are based on State statute and are not related to any federally mandated program.

5. Section 6.1.3, p. 6.5:

Comment: The draft SRP notes that EPA's aquifer exemption effectively removes that portion of the aquifer from any future consideration for ground water protection; however, the ground water protection provisions are still in effect for the aquifer adjacent to the exempted area. This is precisely correct and the focus on restoration for restoration sake is utterly misplaced in the context of the above-mentioned statement. The focus of restoration should be to assure that there will be no significant impacts on adjacent drinking water portions of the aquifer. Thus, if a licensee can demonstrate with reasonable assurance that, due to hydrogeological conditions, it is unlikely, improbable or even impossible that after restoration the ground water will adversely affect adjacent, non-exempted aquifers, there should be no need for additional restoration.

6. Section 6.1.3, Plans and Schedules for Ground-Water Quality Restoration, Page 6-5:

Comment: The introductory paragraph provides a good discussion of the regulatory programs that govern aquifer protection at ISL facilities, including the EPA UIC program and purpose of aquifer exemptions. The advice to closely coordinate with the EPA or EPA-Authorized State to avoid unnecessary duplication in reviewing restoration plans and results is appropriate. This section could also benefit from some discussion of how this coordination could be implemented. For instance, the Staff Requirements Memorandum (SRM) for SECY-99-0013, *Recommendations on Ways to Improve the Efficiency of NRC Regulation at In Situ Leach Uranium Recovery Facilities*, approved discussions with EPA and the EPA Authorized States to implement methods to reduce this duplication in effort, including the use of MOUs. The SRP should provide some direction to NRC staff on acceptable methods to coordinate with, and ultimately defer to, the appropriate UIC program.

Acceptance Criterion (4)(b) provides a discussion of acceptable secondary restoration standards. The Criterion states that since the return of all parameters to baseline concentrations is not likely, the applicant will identify acceptable secondary restoration goals based on the preoperational class of use and that these may be based on "drinking water, livestock, agricultural, or limited use." This part of the Criterion correctly recognizes that the secondary restoration goals will be based on the preoperational water quality and the class of use as determined by the appropriate State and that these standards will not necessarily correspond to the federal primary or secondary drinking water standards. However, the second paragraph of the criterion states that it is acceptable to apply the lower of the State or EPA primary or secondary drinking water standards. The second paragraph also states that radionuclide standards may be based on the concentrations for unrestricted release to the public from Table 2 of 10 CFR Part 20, Appendix B. The second paragraph directly contradicts the first and is incorrect. NRC

must recognize that ISL mining aquifers have been exempted from drinking water standards by the EPA and the State before mining is allowed. There is no mechanism for removing this exemption, so these aquifers will not be used as a source of drinking water in perpetuity. The use of the lowest drinking water standard for secondary restoration goals or radionuclide concentrations intended for unrestricted release to the public is not risk-informed and is inappropriate for these aquifers.

Acceptance Criterion (4)(b) also states that the secondary restoration goals will not be applied "...so long as restoration continues to result in significant improvement in groundwater quality." The criterion then states that license conditions should be set up to require an amendment before secondary goals may be applied. Since these secondary goals have been reviewed and approved by the EPA or EPA-Authorized State and the NRC during the licensing and permitting process, no benefit accrues from requiring a license amendment each time the secondary goals are applied. The licensee typically provides the agencies with a comprehensive restoration report that describes the efforts made to reach the primary restoration goals. These agencies can withhold approval of the restoration if it is determined that good faith efforts were not made to reach the primary goals. Since the secondary goals have been previously approved as protective of the public and environment, there is no basis for requiring that the application of these goals should require a license amendment. Approval of any standards that do not meet the primary or secondary goals (as discussed in Acceptance Criterion (4)(c)) would be appropriate for requiring a license amendment since these proposed standards would not be previously reviewed and approved.

7. Section 6.13(1), page 6-6

Comment: The importance of "temperature" for reactive transport modeling is questionable as the temperature of the production zone is constant as reflected by the depth and climate (latitude).

8. Section 6.1.3(3), page 6-7

Comment: Contrary to the discussion concerning reverse osmosis treatment, the injection of permeate is considerably less than injection rates typically used during production.

9. Section 6.1.3(4), pages 6-8 to 6-10

Comment: Concerning restoration standards, is much too detailed for licensees operating in states with a State ISL mining program (see previous Comment No. 1 in this section). Many of the "Acceptance Criteria" exceed current NRC license requirements and are not consistent with State program requirements. References to "Class of Use" are not appropriate, and the apparent requirement that "secondary restoration standards must be established by applying

the lower of the State or EPA primary or secondary drinking water standards” may be overly burdensome, and not consistent with State requirements. It should be noted that some water quality parameters routinely required for monitoring do not have any “primary” or “secondary federal drinking water standards”.

Additionally, why should “license conditions be set up such that a license amendment is necessary before the applicant can revert to secondary goals”? This requirement is not consistent with some existing ISL licenses.

10. **Section 6.1.3, p. 6.9:** The draft SRP notes that the primary restoration standards will be based on background water quality conditions and that there may be secondary restoration goals based on appropriate secondary restoration standards. It further states that license conditions should be set up such that a license amendment is necessary before the applicant can revert to secondary goals.

Comment: NMA believes that this is inappropriate. If the license condition explicitly incorporates the right of the licensee to move to a secondary goal or standard under certain circumstances, for example, with state approval, a license amendment should not be necessary.

This precise issue has come up in the Hydro Resources, Inc. Subpart L proceeding and the Presiding Officer in that case has suggested that a Commission decision in *In the Matter of Private Fuel Storage*, CLI-00-13, 52 N.R.C. 23, (August 1, 2000) requires that in any case where there is an exercise of judgment by the NRC staff there must be license amendment. NMA suggests that the Commission reconsider whether or not that opinion requires the interpretation placed on it by the Presiding Officer in the Hydro Resources matter and consider how that interpretation is in direct conflict with the *performance-based* and *risk-informed* regulatory policy of the Commission. That interpretation flies directly in the face of the entire concept of performance-based regulations, and, in any event, if there are criteria set forth in a license that a licensee must satisfy prior to going to secondary standards, there is no reason why, if those criteria are satisfied, that the licensee should not be allowed to go to the secondary standard.

11. **Section 6.1.3, p. 6.11:** In paragraph 9, the draft SRP indicates that a licensee may propose alternatives to restoring an ore zone to primary or secondary restoration standards. The SRP indicates that these alternatives will be evaluated on a case-by-case basis and must assure adequate protection of human health and safety and the environment and assure no unacceptable degradation to the use of adjacent ground water resources. Further, the SRP suggests that the licensee may, by using certain institutional controls, restrict access to the exploited ore zone if those institutional controls can assure that there will be no access that will allow harm to human health and that the aquifer adjacent would not be degraded.

Comment: This discussion addresses the functional equivalent of ACLs in certain site-specific circumstances at an ISL facility where it is not cost-effective or even necessary to protect public health and safety to restore ground water in the exempted aquifer for a certain constituent or constituents. This issue is something that should be addressed explicitly in a Part 41 rulemaking proceeding in conjunction with relevant, *and* applicable state requirements so that ISL licensees effectively have the right to propose an ACL or other appropriate standard.

The above discussion, however, muddles the question of the necessity of restoring the exempted aquifer. The ground water in the exempted aquifer or *exploited ore zone* is not appropriate for drinking water at any time. Following the logic of the discussion above, institutional controls to restrict access to the exempted aquifer would be necessary at every ISL mining facility. Of course, it would also mean that such institutional controls would be necessary *before* mining.

12. Section 6.1.3(6)

Comment: Section 6.1.3(6) states, concerning the “likely external effects of ground water restoration”, that “[g]round water quality should not exceed the appropriate State water use standards for aquifers that cannot support a drinking water use”. It is unclear what authority NRC has for this requirement, especially since some states may not have any standards for ground water which is currently not being used and/or is unsuitable for domestic drinking water.

13. Section 6.1.3(9)

Comment Section 6.1.3(9) states that an applicant who “proposes no ground water restoration activities within the exploited ore zone” would be required to show that adequate “institutional control provisions” are in place to assure that the exploited ore zone would not be accessed for use. It should be noted that the water in the ore zone naturally poses potentially significant health hazards prior to mining. It is questionable

whether mining, with or without any ground water restoration, significantly changes the health risks associated with this ground water. It is a general practice in Wyoming to ensure that the Wyoming State Engineer's Office has a record of all Commercial and R&D ISL operations in order that the future installation of wells in these areas is prevented, or limited to aquifers that do not naturally contain uranium and its daughters.

14. Section 6.1.3(9)

Comment: Section 6.1.3(9) states that the "applicant must maintain a financial surety to cover potential restoration costs in the event the modeling results cannot be verified through monitoring. Such an "Acceptance Criteria" is unacceptable as it is inherent that predictive modeling is a tool which is used to assess conditions at some distant point in the future. The fact that ground water in the deep aquifers at ISL sites typically only moves a few feet per year makes computer modeling a valuable tool to determine future off site impacts because monitoring is not feasible. The need to maintain a financial surety to cover potential restoration costs is unreasonable. NRC does not require such an approach at uranium mill tailings sites where geochemical modeling has been used to predict future ground water conditions.

15. Section 6.1.4, Plans and Schedules for Ground-Water Quality
Restoration, Page 6-12:

Comment The evaluation finding states that the "...applicant has identified and committed to use the federal primary and secondary drinking water standards" as a secondary restoration goal. This finding should be revised to reflect the comments on Criterion (4)(b) above.

The evaluation finding also states that the "...applicant provided an acceptable mix of ground-water sweep, reverse osmosis, and ground-water recirculation." This finding is too specific with regard to the restoration technologies that could be potentially used. The acceptance criterion at 6.1.3 (3) recognizes that additional technologies are currently used (e.g., reductant addition) and that other technologies are under development (e.g., bioremediation). The evaluation finding should not reference specific technologies to the exclusion of others that may be used

16. Section 6.1.4

Comment: Section 6.1.4 again requires that an applicant needs to commit, as a secondary restoration goal, to the **Federal Primary and Secondary Drinking Water Standards**. Please see previous concerns regarding this requirement..

17. Section 6.4.1, Decommission Surveys, Page 6-20:

Comment: This section requires NRC Staff to review the decommissioning radiological survey procedures, etc. during the initial licensing. This requirement conflicts with current NRC directives which require operators to submit this information just prior to the beginning of the decommissioning process.

18. Section 6.5.2, Long-Term Surveillance Costs, Page 6-23:

Comment: Contrary to this section, ISL licensees are not subject to the “long-term surveillance cost” provisions of 10 CFR Part 40.

19. Section 6.5.3(12), NRC Related Portion of the Surety, Page 6-25:

Comment: It is unclear why a licensee would need to identify “the NRC related portion of the surety” when it appears, especially considering this SRP and the recent NRC decisions concerning the definition of “By-Product Material”, that NRC regulates the entire ISL mining operation.

20. Section 6.5.3(14), Long Term Surveillance Costs, Page 6-25:

Comment: See previous comment regarding Section 6.5.2. It is NMA's understanding that Criterion 10 is intended for uranium mills and not ISL Uranium Recovery Facilities. ISL UR facilities produce no tailings, and all 11(e).2 byproduct material is disposed off-site at an approved byproduct material disposal site. Secondly, the underground ore bodies depleted by uranium solution extraction processes are excluded from the definition of byproduct material, as per 10 CFR § 40.4. The question becomes, why is there a need to assure that the conditions for Criterion 10 are met, when there is nothing remaining at the facility that would require long-term surveillance upon license termination.

H. Section 7 Environmental Effects

1. **Section 7.3.1.4.1, p. 13:** The draft SRP states that the staff should review estimates of the maximum annual dose could be received via all pathways described above by an individual at the site boundary and at the nearest residence.

Comment: It is NMA's understanding that the relevant provisions of 10 C.F.R. Part 20.1301, et. seq. are satisfied if the nearest individual does not receive a dose in excess of 100 mrem/y. Thus, the discussion is a bit confusing with respect to the dose at the fence line if the nearest individual is not living at the fence line. To the extent that the

dose received at the fence line would be higher than 100 mrem/y and no one lives there, the text is confusing as to what is required.

2. Section 7.6.2.1, Environmental Effects, Socioeconomic Costs, Page 7-24:

Comment: It is unclear why the reviewer should require corporate internal costs in order to determine the socioeconomic costs of a project. The capital cost of land acquisition, facility construction, and operating and maintenance costs during operation and restoration/decommissioning are not necessary to calculate socioeconomic costs as discussed in the Acceptance Criteria in Section 7.6.2.3 and represent proprietary business data that should not be publicly released. The first paragraph of Section 7.6.2.1 should be deleted.

This comment also applies to Section 9.3, Criterion (3) in the Cost-Benefit Analysis section of the SRP.

I. Chapter 8 Alternatives for Proposed Action.

1. **Section 8.2, p. 8-1:** The draft SRP discusses staff evaluation of potential alternatives to the licensees' proposals and that the staff should determine whether the applicant has considered "and chosen" alternatives that may reduce or avoid significant adverse environmental, and economic impacts, etc.

Comment: NMA's understanding of the consideration of alternatives does not entirely square with the discussion above. The licensee does not have to choose the most environmentally friendly alternative. In that case, if constructing a new facility, the no-action alternative might be the most attractive alternative. The implication that the licensee must choose the alternative with the least environmental impacts is, in NMA's view, incorrect, in light of NRC's 10 CFR Part 51 requirements as discussed at 49 Fed. Reg. 9352 *et seq.*

J. Section 10.2, Review Procedures, Page 10-1:

Comment: In the discussion of the various types of licenses that an applicant needs to satisfy, NRC apparently overlooked one of the most significant – a State ISL Mining Permit.

K. Appendix D - Recommended Outline for Site Specific In-Site Leach Facility Reclamation, Stabilization Cost Estimates

1. Appendix D, Section (II)(E)(1) and (2), Cost Estimates, Drill Holes, Page D-3:

Comment: NRC should use consistent terms when discussing “well plugging”. Reference to “drill holes” could be misleading.

2. Appendix D, Section (IV), Legal Expenses, Page D-3:

Comment: It should be noted that “legal expenses” have never been considered a cost item for ISL licensees. How would one estimate such an amount?

3. Appendix D, Section (VIII), Long Term Surveillance Fee, Page D-5:

Comment: ISL licensees are not required to “transfer a long-term surveillance and control fee” to the U.S. Treasury.

4. **PD-5:** The draft SRP states that in calculating estimated costs for a third-party independent contractor to satisfy surety requirements that equipment owned by the licensee and availability of licensee staff should not be considered in the estimate “to reduce cost calculations.”

Comment: NMA agrees that trying to reduce surety estimates in some smoke and mirror fashion is not appropriate. On the other hand, based on the views of a Presiding Officer in a recent Subpart L hearing, NMA is gravely concerned that an extreme interpretation of the statement in the SRP could lead to extravagantly expensive, and perhaps unattainable, surety requirements. For example, would all of the pipes and pumps that a licensee used to slurry material to the mill tailings pile have to be discounted as something that could be used by an independent contractor? In the context of an ISL facility, this could mean that every piece of pipe, all the pumps in all the wells, all of the pump house controls, all reverse osmosis (RO) equipment and ion-exchange (IX) columns would have to be disregarded and new equipment would have to be factored into the cost of surety. If this is so, then surety estimates could have to assume virtually every piece of equipment would have to be purchased new.

Secondly, if no licensee staff are presumed to be available, NRC should state that knowledgeable personnel may be assumed to be available and that NRC would require a knowledgeable third-party independent contractor. In a recent Subpart L proceeding, the Presiding Officer suggested that vast amounts of money could be spent by an independent contractor who had no knowledge of or experience with the requirements for license termination.

Even in the event of bankruptcy, presumably, NRC would not allow the sell-off of vital equipment that would assure that the surety amount would be inadequate because of the prohibitive cost of purchasing new. To the extent that any such equipment is deemed a waste because the operation is shut down, it could be 11e.(2) byproduct material until deemed otherwise by NRC. This is plainly a dangerous issue which could lead to licensees being unable to afford adequate surety. NRC must address this issue because it is of critical importance to the industry.