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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BEFORE THE PRESIDING OFFICER

In the matter of)
)
HYDRO RESOURCES, INC.)
2929 Coors Road, Suite 101)
Albuquerque, New Mexico 87120)

OFFICE OF SECRETARY
RULEMAKING AND
ADMINISTRATIVE STAFF
Docket No. 40-8968-ML
Re: Leach Mining and Milling License

NRC STAFF'S RESPONSE TO INTERVENOR PRESENTATIONS
ON LIQUID WASTE DISPOSAL ISSUES

INTRODUCTION

On November 9, 1998, intervenors Eastern Navajo Diné Against Uranium Mining (ENDAUM), Southwest Research and Information Center (SRIC), Grace Sam, and Marilyn Morris filed written presentations¹ pursuant to 10 C.F.R. § 2.1233. In accordance with the Presiding Officer's Memorandum and Order (Scheduling and Partial Grant of Motion for Bifurcation), dated September 22, 1998 (unpublished) (September 22 Order), and the subsequent Joint Notice of Modification of Schedule for Written Presentations dated November 5, 1998, the November 9 filings are the first in a series of four presentations on issues involving the proposed in situ leach (ISL) uranium mining by licensee Hydro Resources, Inc. (HRI). Pursuant to the September 22 Order, HRI filed its response to the November 9 filings on December 9, 1998; the Staff hereby submits its response to the intervenor and HRI filings.

¹ The November 9 brief filed jointly on behalf of ENDAUM and SRIC, and the November 9 brief filed jointly on behalf of Ms. Morris and Ms. Sam, will be referred to, respectively, as the SRIC Disposal Brief and the Morris Disposal Brief.

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As discussed below, the Staff finds that neither the SRIC nor the Morris Disposal Brief supports action being taken against HRI's 10 C.F.R. Part 40 license, or any of the other relief sought by the Intervenors. *See* SRIC Disposal Brief, at 54; Morris Disposal Brief, at 15.

BACKGROUND

The following information from NUREG-1508, Final Environmental Impact Statement to Construct and Operate the Crownpoint Uranium Solution Mining Project, Crownpoint, New Mexico (February 1997)(FEIS), and other materials in the hearing file, is considered relevant to the liquid waste disposal issues raised in the SRIC and Morris Disposal Briefs.

Liquid waste from ISL mining is one of the two major types of effluents (the other being radon gas and airborne particulates) that would be produced by HRI's proposed operations. *See* FEIS, § 2.1.2, at 2-14. Liquid waste is produced during ISL mining when about one percent of the mining solution (known as "lixiviant") injected into the uranium ore body is subsequently drawn out of the system. The volume of the withdrawn solution thereby produced is commonly known as "production bleed." This production bleed helps control the chemistry of the mining process, and helps maintain negative well field pressure (a factor in inhibiting lixiviant excursions). *See id.*, § 2.1.2.2, at 2-16; *see also* Affidavit of William H. Ford, attached as Staff Exhibit 9 to "NRC Staff's Response To Motion For Stay, Request For Prior Hearing, And Request For Temporary Stay," dated February 20, 1998, at ¶ 15. The production bleed's volume could be as much as 40 gallons per minute (g.p.m.) at HRI's Church Rock site,² if the well fields there are fully developed. *See* FEIS, § 2.1.2.2, at

² By contrast, due to the large amount of water required, the process of restoring groundwater quality at a well field following ISL mining is expected to produce liquid waste
(continued...)

2-16. Smaller amounts of liquid waste would be produced periodically during ISL operations from flushing to clean the injection system, and washing filters. *See id.*; *see also* HRI's Consolidated Operations Plan, Rev. 2.0, dated August 15, 1997 (COP), § 4.4.2, at 52.

To recover the mined uranium, before the production bleed is drawn off and routed to the retention ponds, the uranium is removed from the pregnant lixiviant by the ion exchange process. At this point in the ISL mining cycle, the pregnant lixiviant also contains radium, which precipitates out of the uranium ore body into the lixiviant during the time the lixiviant circulates within the ore body. Most of the radium is reinjected into the ore-bearing body as part of the closed loop ISL cycle. *See* FEIS, § 2.1.1.4, at 2-9 to 2-12.

Liquid waste is the largest potential source of radon emissions at ISL mining operations. Radon gas will escape to the atmosphere from the production bleed. *See* FEIS, § 2.1.2.1, at 2-15. To minimize the amount of radon available for such release, intermediate holding tanks with vacuum pumps will be used to compress the gas and dissolve it back into the closed lixiviant injection system. *See id.*; *see also* HRI's COP, § 5.2.1, at 62. The production bleed will also contain radium. To remove this radium, HRI will use a barium chloride treatment whereby the barium and radium would form an insoluble salt with the sulfate which is already present in the production bleed. Using this treatment method, more than 99% of the radium in solution is removed, resulting in radium concentrations below one percent of allowable limits for release to surface waters. *See* FEIS, § 2.1.2.3, at 2-16; *see also* HRI's COP, § 4.5.2.1.2, at 55.

²(...continued)
at rates between 150 and 250 g.p.m. *See* FEIS, § 2.1.2.2, at 2-16; *see also* HRI License Condition 9.5.

To handle the production bleed, retention ponds at ISL sites are necessary. These ponds serve to safely store the liquid waste by promoting evaporation, and by maintaining control of the by-product material contained in the production bleed. *See* FEIS, § 2.1.1.5, at 2-12. During any ISL operations, HRI would be required to inspect the retention ponds, measure the storage space left in the ponds (typically referenced as the "pond freeboard"), and check for evidence of any pond leaks. *See id.*; *see also* HRI License Condition 10.5. The retention ponds will have double synthetic liners to prevent any leaks. *See* FEIS, § 2.1.1.5, at 2-12; *see also* § 2.3 of HRI's COP, at 29, providing a further description of the liners to be used.

At the end of ISL operations, the radium-contaminated sludge at the bottom of the retention ponds (resulting from the barium chloride treatment), and any other leftover byproduct material, will be transported off site for disposal at a licensed facility. *See* FEIS, § 2.1.2.3, at 2-16 to 2-17. As the Staff previously explained in its February 20, 1998 filing in this proceeding, ISL uranium mining does not produce any mill tailings. *See* Affidavit of Christopher A. McKenney, attached as Staff Exhibit 10 to "NRC Staff's Response To Motion For Stay, Request For Prior Hearing, And Request For Temporary Stay," at ¶ 30. No permanent onsite by-product waste disposal is authorized by HRI's license. *See* HRI License Condition 9.6.

DISCUSSION

A. Requirements Intervenors Seek to Impose on HRI Do Not Apply to ISL Mining

The intervenors' regulatory analyses are based on a fundamental misinterpretation of the 10 C.F.R. Part 40 requirements applicable to ISL uranium mining. The intervenors rely on

10 C.F.R. § 40.31(h)'s general reference to the provisions of 10 C.F.R. Part 40, Appendix A, "Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content" (Appendix A) in arguing that HRI's license application should have been rejected. *See* SRIC Disposal Brief, at 9-12; Morris Disposal Brief, at 2-4. However, the intervenors fail to discuss any of the relevant regulatory history behind the promulgation and development of 10 C.F.R. § 40.31(h) and Appendix A. As will be demonstrated below, 10 C.F.R. § 40.31(h) does not apply to ISL license applicants, and in implementing the general requirements of 10 C.F.R. § 40.32 instead, the Staff properly imposes only certain individual Appendix A criteria on ISL operations.³

In arguing the applicability of various Appendix A criteria to HRI's license application pursuant to 10 C.F.R. § 40.31(h), the Intervenor ignore the statutory basis underlying these regulatory provisions. To address these arguments, a review of the regulatory background regarding the control of wastes from the mining and milling of uranium, including a summary of Appendix A's development, is necessary.

³ For example, HRI License Condition 10.26 references Appendix A's 5A criteria, and HRI License Condition 9.5 references Appendix A's Criterion 9.

1. Regulatory Background

Potential harm arising from unregulated uranium tailings piles left at milling sites led to passage of the Uranium Mill Tailings Radiation Control Act of 1978, 42 U.S.C. §§ 7901 *et seq.* (UMTRCA),⁴ in which Congress stated in part as follows:

The Congress finds that uranium mill tailings ... may pose a potential and significant radiation health hazard ... [and this requires] that every reasonable effort be made to provide for the stabilization, disposal, and control in a safe and environmentally sound manner of such tailings in order to prevent or minimize radon diffusion into the environment and to prevent or minimize other environmental hazards from such tailings.

42 U.S.C. § 7901(a) (emphasis added). Based on this finding, Congress further stated that UMTRCA's purposes were to provide regulatory programs (1) at inactive [Title I] uranium mill tailings sites "to stabilize and control such tailings"; and (2) at active [Title II] mill operations, to be applicable during operations and after milling operations cease, "in order to stabilize and control such tailings." 42 U.S.C. § 7901(b)(1-2).⁵ The UMTRCA

⁴ See *Dunn v. U.S.*, 842 F.2d 1420, 1424-25 (3rd Cir. 1988). Many of the UMTRCA's provisions amended the Atomic Energy Act, 42 U.S.C. § 2011 *et seq.* (AEA), *e.g.*, by adding sections 83, 84, and 275, 42 U.S.C. §§ 2113, 2114, and 2022, and amending sections 161 and 274, 42 U.S.C. §§ 2201 and 2021.

⁵ UMTRCA's legislative history provides the following excerpts describing and explaining why tailings piles were of such concern:

Uranium mill tailings are the sandy waste produced by the uranium ore milling process. Because only 1 to 5 pounds of useable uranium is extracted from each 2,000 pounds of ore, tremendous quantities of waste are produced as a result of milling operations ...

[and these wastes are left] in generally unattended piles. As a result of many years of uranium ore processing, about 140 million tons have now accumulated at active and inactive milling sites.

(continued...)

defines "tailings" as "the remaining portion of a metal-bearing ore after some or all of such metal, such as uranium, has been extracted." 42 U.S.C. § 7911(8). At the time of enactment Congress was aware of ISL mining,⁶ yet nowhere in the UMTRCA is there specific mention of ISL mining waste despite the fact that by 1977, one year before UMTRCA's passage, about 3% of the total yellowcake produced in the United States resulted from ISL mining.⁷

The UMTRCA authorized the United States Environmental Protection Agency (EPA) to establish standards of general application covering radiological hazards from uranium mill tailings, and gave the NRC the responsibility for implementing and enforcing these standards on a site specific basis under its existing licensing authority. *See* AEA §§ 275b and d, 42 U.S.C. §§ 2022(b) and (d). Pursuant to this licensing authority, the Staff imposes license conditions on ISL licensees, including those Appendix A criteria necessary to properly regulate ISL operations. *See* n. 3, *supra*.

In 1983, following EPA delays in establishing standards of general application, Congress amended the UMTRCA (by Act of Jan. 4, 1983, Pub.L. No. 97-415, 96 Stat. 2067,

⁵(...continued)

H.R.Rep. No. 1480, 95th Cong., 2d Sess., pt. 1, at 11, and pt. 2, at 25, *reprinted in* 1978 U.S.Code Cong. & Admin.News at 7433 and 7451.

⁶ *See* Cong. Rec., daily editions, October 13 and 14, 1978, at pp. S18748 and S19037 (colloquies between Senators Hart and Wallop, discussing the minimal surface disturbance present at ISL mining sites, and the consequent lack of need to transfer title to such sites to the federal government pursuant to what was to become AEA section 83b by UMTRCA's enactment).

⁷ *See* NUREG-0706, Final Generic Environmental Impact Statement on Uranium Milling (GEIS), dated September 1980, section 3.2.3 at 3-4. The GEIS contains the "detailed bases" for the Appendix A criteria. 45 Fed. Reg. 65521, at 65529 col.1 (October 3, 1980). For example, the GEIS discussion in § 12.2.1, ¶ 8, at 12-5, became Criterion 2 of Appendix A.

adding AEA section 84c, 42 U.S.C. § 2114(c)) and gave the NRC authority to approve licensee-proposed site-specific alternatives to EPA's general standards. *See Quivira Min. Co. v. NRC*, 866 F.2d 1246, 1248-49, 1258-60 (10th Cir. 1989); *Environmental Defense Fund v. NRC*, 866 F.2d 1263, 1268 (10th Cir. 1989).⁸

To implement the UMTRCA, the NRC, in 1979, issued immediately effective regulations amending 10 C.F.R. Part 40, and published proposed amendments to 10 C.F.R. Part 40, including a draft Appendix A. *See* 44 Fed. Reg. 50012 (August 24, 1979), and 44 Fed. Reg. 50015 (August 24, 1979), respectively. Among the immediately effective regulations were changes to the 10 C.F.R. § 40.4 definition of "byproduct material" to include "discrete surface wastes resulting from uranium solution extraction processes"; and the addition of a 10 C.F.R. § 40.4 definition of "uranium milling" as meaning "any activity that results in the production of byproduct material as defined in this Part." 44 Fed. Reg. 50012, at 50013-14. Accordingly, the 10 C.F.R. Part 40 regulations were explicitly made applicable to ISL mining.⁹

Consistent with the UMTRCA's focus on the control of tailings, the Commission described the proposed changes to 10 C.F.R. Part 40 in part as follows:

The Commission notes in this regard that milling results in the production of large quantities of byproduct material as tailings per year. When construction

⁸ The EPA recognizes that under the UMTRCA, as amended, the EPA has no permitting authority or implementing responsibility regarding the control of hazardous materials from uranium tailings. *See* preamble to EPA's UMTRCA regulations, 48 Fed. Reg. 45926, at 45941-42 (October 7, 1983).

⁹ However, as discussed in Sections A.2 and A.3, *infra*, the Staff does not agree with intervenors that 10 C.F.R. § 40.31(h) and all of Appendix A's criteria apply to ISL license applicants.

of a mill commences, nearly irrevocable commitments are made regarding tailings disposal. Given that each mill tailings pile constitutes a low-level waste burial site containing long-lived radioactive materials, the Commission believes that prudence requires that specific methods of tailings disposal, mill decontamination, site reclamation, surety arrangements, and arrangements to allow for transfer of site and tailings ownership be worked out and approved before a license is granted.

44 Fed. Reg. 50015, at 50018 col. 1 (emphasis added). The significance of the underlined wording is discussed *infra* in Section A. 2.

Similarly consistent with the UMTRCA's focus on the control of tailings is the Commission's description of the draft Appendix A, which states in part as follows:

This appendix is divided into four major categories: technical criteria; financial criteria; site and byproduct material ownership; and long-term site surveillance. The technical criteria deal primarily with specifications for siting tailing areas, options for storing tailings below and above ground, seepage controls, minimum cover requirements for tailings at the end of milling operations, preoperational site monitoring requirements, and effluent controls during milling operations. ...

The Commission believes that compliance with these criteria will ensure that milling operators, who are responsible for the generation of tailings, will bear the costs of tailing reclamation and long-term site surveillance and that government ownership of tailings and disposal sites will ensure adequate long-term control of the tailings.

44 Fed. Reg. 50015, at 50017 cols. 2-3 (emphasis added).¹⁰

The September 1980 uranium milling GEIS contrasts the impacts of open pit and conventional underground mining of uranium, with its attendant production of tailings, and

¹⁰ A year later the focus remained on the control of tailings, as the Statement of Considerations (SOC) published with Appendix A's promulgation summarizes the new requirements by stating in part that they "allow achieving an optimum tailings disposal program on a site specific basis." 45 Fed. Reg. 65521, at 65529 col.1 (October 3, 1980) (emphasis added).

the lesser impacts of ISL mining. The traditional mining methods involve removing the uranium-bearing ore from the ground, then crushing and grinding the ore at a mill, producing an average of 1800 tons of tailings per day. *See* GEIS, § 5.2, at 5-1 to 5-5; and GEIS Appendix B, at B-2 to B-4. The total volume of waste from ISL mining is much smaller,¹¹ and thus contains much less of the radium and other uranium progeny than that found in mill tailings¹² (which in turn are much less toxic than spent fuel from nuclear reactors). *See* GEIS, § 3.3.1, at 3-8 to 3-9; and § 12.3.3.4, at 12-11. *See also* NUREG 0489, Final Environmental Impact Statement for the Exxon Highland ISL Mining Project, § 12.1.3.2, at 12-3 (comparing ISL mining impacts to impacts of underground and open-pit uranium mining methods).

¹¹ For example, at an Exxon uranium mining operation using traditional and ISL methods, the Staff calculated that ISL mining would produce an inflow of 20 g.p.m. of liquid waste into a tailings pond, as opposed to 850 g.p.m. of mill tailings liquid and 3000 tons per day of mill tailings solids going into the pond. *See* NUREG 0489, Final Environmental Impact Statement for the Exxon Highland ISL Mining Project, dated November 1978, § 4.4.1.2.1, at 4-12. Later, the EPA similarly concluded that ISL mining "produces much less waste than conventional mining and milling operations." 50 Fed. Reg. 5253, at 5258 col. 1 (February 7, 1985)(partial approval of aquifer exemption request regarding ISL mining site in Nebraska, pursuant to EPA's Underground Injection Control (UIC) permitting authority). The EPA repeated this finding in 1990 regarding the Nebraska site. *See* 55 Fed. Reg. 21191, at 21198 col. 3 (May 23, 1990)(giving full approval to exemption request).

¹² For each ton of ore mined using traditional methods, more than 1900 pounds of tailings are produced, which contain nearly all of the associated radium-226 and other daughter products present in the unmined ore. By contrast, subjecting the same ton of ore to ISL mining brings less than 5 % of the existing radium to the surface. *See* NUREG 0481, Final Environmental Impact Statement for the Wyoming Mineral Corporation Irigaray ISL Mining Project, dated September 1978, § 3.1, at 3-1.

In October 1980, 10 C.F.R. § 40.31(h) and Appendix A were promulgated in final form. *See* 45 Fed. Reg. 65521, at 65528 col.2, and 65529 col.1 (October 3, 1980).¹³ Since its promulgation, the wording of 10 C.F.R. § 40.31(h) (discussed *infra*, in Section A.2) has not changed. With respect to the Appendix A criteria promulgated in 1980, the "detailed bases" for those criteria are set forth in the GEIS. 45 Fed. Reg. at 65529 col.1. The GEIS focused on the impacts of conventional uranium milling operations, while giving limited consideration to the impacts of nonconventional uranium recovery processes such as ISL mining. *See* GEIS, § 1.2, "Scope of Statement," at 1-1 to 1-2. This limited consideration is evident in the wording of the Appendix A criteria. Criterion 2 is the only one of the Appendix A criteria which references ISL mining operations.¹⁴

In administrative proceedings opposing the NRC's 1980 UMTRCA regulations, the Commission explained in 1981 that the new rules:

establish a comprehensive regulatory regime for protection of the public health and safety and the environment from hazards associated with uranium milling

¹³ At 65529, the 1980 SOC erroneously refers to "a new paragraph (g)" being added to 10 C.F.R. § 40.31. The error is corrected at 46 Fed. Reg. 13497 (February 23, 1981).

¹⁴ Criterion 2, which the intervenors do not discuss, states in full as follows:

To avoid proliferation of small waste disposal sites and thereby reduce perpetual surveillance obligations, byproduct material from in situ extraction operations, such as residues from solution evaporation or contaminated control processes, and wastes from small remote above ground extraction operations must be disposed of at existing large mill tailings disposal sites; unless, considering the nature of the wastes, such as their volume and specific activity, and the costs and environmental impacts of transporting the wastes to a large disposal site, such offsite disposal is demonstrated to be impracticable or the advantages of onsite burial clearly outweigh the benefits of reducing the perpetual surveillance obligations.

and the large quantities of mill tailings that generate. The Commission's authority to establish this regulatory regime is provided by UMTRCA.

Uranium Mill Licensing Requirements (10 C.F.R. Parts 30, 40, 70 & 150), CLI-81-9, 13 NRC 460, 462 (1981) (emphasis added). The Commission further stated that as discussed in the rulemaking's SOC, the UMTRCA and its legislative history establishes that the NRC's duty is to "ensure that the management of uranium mill tailings is carried out in a manner that will protect the public health and safety and the environment." *Uranium Mill Licensing Requirements*, 13 NRC at 466 (emphasis added).

As referenced above, *supra* n.8, the EPA promulgated its UMTRCA regulations in 1983, and pursuant to those regulations and the UMTRCA, as amended, the NRC modified Appendix A in 1985 by revising the Introduction and criteria 1, 3, 4, 5, 6, and 8. *See* SOC, 50 Fed. Reg. 41852, at 41859-60 (October 16, 1985). These revisions (a) added the flexibility required by the 1983 UMTRCA amendments;¹⁵ (b) clarified that the criteria establish goals rather than standards; (c) clarified that no seepage of waste from surface impoundments is allowed; (d) added detail regarding the siting of tailings disposal areas; and (e) adopted the EPA goals of longevity regarding tailings covers and reducing radon releases during operations. *See id.* at 41856-59. Wastes from ISL mining are not discussed.

¹⁵ The 1983 UMTRCA amendments required, in part, that the Commission take into account economic costs when considering how best to protect public health and safety from the radiological hazards of byproduct material. *See Quivira, supra*, 866 F.2d at 1250-51; *see also Environmental Defense Fund, supra*, 866 F.2d 1263 (10th Cir. 1989) (upholding 1985 amendments to Appendix A). Consistent with the UMTRCA, as amended, the appeals court described Appendix A as consisting of "general guidelines to be applied flexibly, rather than specific iron-clad rules." *Quivira*, 866 F.2d at 1254.

The NRC modified Appendix A again in 1987 by revising the Introduction, criteria 5, 6, and 7, and adding Criterion 13. *See* SOC, 52 Fed. Reg. 43553, at 43557-561 (November 13, 1987). These revisions added definitions of 14 terms to the Introduction; and incorporated into Appendix A most (but not all) of the EPA groundwater protection standards applicable to the disposal of mill tailings. *See id.*, at 43555-58.¹⁶ Appendix A's focus remained on the proper disposal of uranium mill tailings at licensed disposal areas. *See, e.g., id.* at 43554 cols. 1-2, and 43555 cols. 2-3. Again, wastes from ISL mining are not discussed.

To further implement the UMTRCA's title transfer provisions regarding the long-term custody of tailings disposal areas (*see* n.20, *infra*), Appendix A was again revised in 1990 by amending Criterion 12's reporting requirements regarding inspections of tailings disposal areas.¹⁷ *See* SOC, 55 Fed. Reg. 45591, at 45591-92 (October 30, 1990). Emphasis was placed on monitoring ground water conditions at disposal areas to detect any changes caused by the tailings, ensuring that the proper long term care of the sites is taken, and confirming the integrity of the stabilized tailings. *See id.*, at 45595, cols. 2 and 3.

Appendix A took its present form in 1994, when it was amended to conform with EPA requirements regarding timely placement of final radon barriers at mill tailings disposal areas. *See* SOC, 59 Fed. Reg. 28220, at 28221 col. 3 (June 1, 1994). These revisions added definitions of an additional seven terms to the 14 in Appendix A's Introduction; amended

¹⁶ *See also American Min. Congress v. NRC*, 902 F.2d 781, 785 (10th Cir. 1990) (upholding revised Criterion 5 liner requirements), and *Environmental Defense Fund v. NRC*, 902 F.2d 785, 787-90 (10th Cir. 1990) (upholding refusal to incorporate all of EPA's standards into Appendix A).

¹⁷ The 1990 rulemaking also added §§ 40.27 and 40.28 to 10 C.F.R. Part 40.

Criterion 6; and added a new Criterion 6A. *See id.*, at 28222-23. This final rule again makes no mention of wastes from ISL mining.¹⁸

With this background information as discussed above, the proper application of 10 C.F.R. § 40.31(h) and the Appendix A criteria are more easily understood.

2. Requirements of 10 C.F.R. § 40.32 Govern ISL License Applications

In their written presentations filed in this proceeding, the Intervenors must describe how HRI's license application was deficient. *See* 10 C.F.R. § 2.1233(c). In attempting to do so, Intervenors seek to hold HRI to various Appendix A criteria by citing 10 C.F.R. § 40.31(h),

¹⁸ However, as explained in the 1993 SOC published with the proposed changes to Appendix A, to avoid a possible confusion between EPA's use of the term "in-situ" in 40 C.F.R. 192.32(a)(3), and waste to be accepted during a tailings disposal area's Commission-approved closure process pursuant to Criterion 6A(3), the Commission adopted its own wording for Criterion 6A(3) rather than EPA's, stating:

[T]he Commission understands that EPA's use of the term "in-situ" in this paragraph means on site, that is, the material that may be accepted from other sources would be compared to the tailings or waste already in the pile or impoundment to determine suitability for disposal. Proposed paragraph (3) of Criterion 6A does not include this term. The Commission agrees that it must approve the disposal of materials from other sources on a number of bases, including the suitability and compatibility of the materials for disposal in the particular pile or impoundment and has incorporated the alternative wording "already in the pile or impoundment." The term "in-situ" has a particular meaning in the uranium industry and to the NRC, referring to a particular method of uranium mining. The Commission believes that use of the term otherwise in this context could be confusing.

58 Fed. Reg. 58657, at 58662 cols. 1-2 (November 3, 1993).

which generally references those criteria, and allege that HRI's license application fails to meet those criteria.¹⁹

The erroneous premise that 10 C.F.R. § 40.31(h) governs the Staff's review of ISL license applications is belied by its wording, which has not changed since its promulgation in 1980, and which states in full as follows:

An application for a license to receive, possess, and use source material for uranium or thorium milling or byproduct material, as defined in this part, at sites formerly associated with such milling shall contain proposed written specifications relating to milling operations and the disposition of the byproduct material to achieve the requirements and objectives set forth in appendix A of this part. Each application must clearly demonstrate how the requirements and objectives set forth in appendix A of this part have been addressed. Failure to clearly demonstrate how the requirements and objectives in appendix A have been addressed shall be grounds for refusing to accept an application (emphasis added).

The underlined wording clearly indicates that 10 C.F.R. § 40.31(h), pursuant to the UMTRCA, only applies to the review of applications for licenses authorizing uranium mining at sites on which tailings piles are present. *See* 42 U.S.C. § 7901(b)(2). No such piles are present at HRI's Church Rock site.

The NRC rule's application only to such mill sites is further indicated by the 1979 SOC discussion set forth in Section A. 1, *supra*, in which the Commission, speaking in the context of the need to control tailings at traditional mill sites, stated its belief that "prudence requires that specific methods of tailings disposal, mill decontamination, site reclamation,

¹⁹ To the extent that these Intervenor arguments may be read as a challenge to the Staff's review standard, this subpart L proceeding is not the proper forum for such an attack. The Staff used the general standards of 10 C.F.R. § 40.32 in reviewing HRI's application. *See* Staff's December 1997 Safety Evaluation Report (SER), at 34. In one section of their brief, Ms. Morris and Ms. Sam do seem to recognize that the general standards 10 C.F.R. § 40.32 are applicable. *See* Morris Disposal Brief, at 12-13.

surety arrangements, and arrangements to allow for transfer of site and tailings ownership be worked out and approved before a license is granted." 44 Fed. Reg. 50015, at 50018 col. 1 (emphasis added). The underlined wording clearly indicates that these traditional mill sites are the ones to which 10 C.F.R. § 40.31(h) was meant to apply. The provision in 10 C.F.R. § 40.31(h), stating that a license application's failure to show how Appendix A's requirements and objectives have been addressed "shall be grounds for refusing to accept an application," addresses the concern quoted above from the SOC, but this rule clearly was only meant to apply to the review of applications for licenses at those sites which already contained the type of tailings piles with which the UMTRCA was concerned. *See* 44 Fed. Reg. at 50018 col. 1.

Moreover, the general reference to Appendix A in 10 C.F.R. § 40.31(h) indicates that all of the Appendix A criteria are meant to apply to license applications covered by this rule. Yet, for example, there would be no reason for having Appendix A's Criterion 11 (regarding transfer of site ownership of tailings disposal areas to the federal government, the wording of which has not changed since its 1980 promulgation²⁰) apply to the review of ISL license

²⁰ Criterion 11 implements the AEA's title transfer provisions set forth in Section 83b(1)(A), 42 U.S.C. §2113(b)(1)(A). In adopting the 1994 amendments to Appendix A (discussed *infra*), the Commission provided the following description of these title transfer provisions:

Although decommissioning normally includes cleanup of a site, appendix A provides the detailed closure requirements for mills in which the reclamation of tailings is covered as a separate activity and, thus, is an exception to the general requirements for decommissioning. This is a result of the unique treatment of tailings under UMTRCA, which provides for the ultimate custodial care of tailings by the Federal government rather than a return to unrestricted use.

(continued...)

applications, as ISL operations do not produce the large tailings piles requiring the creation of tailings disposal areas.

Accordingly, in the absence of any 10 C.F.R. Part 40 licensing sections specifically applicable to ISL mining on sites not having uranium mill tailings, the general requirements of 10 C.F.R. § 40.32 governed the review of HRI's license application.

3. Appendix A Criteria 7 and 7A Are Not Applicable To ISL Mining

As shown below, many of the Appendix A criteria, including Criterion 7 and Criterion 7A, do not apply to ISL mining, contrary to arguments made by the intervenors.²¹ Both sets of intervenors begin their Criterion 7A arguments by referencing "disposal areas" (SRIC Disposal Brief, at 26; Morris Disposal Brief, at 9), but both fail to recognize that this term carries special meaning, as it is defined in Appendix A's Introduction as "the area containing byproduct materials to which the requirements of Criterion 6 apply." In the context of properly applying Criterion 7A, this defined term is important, because Criterion 7A provides in pertinent part that the initial purpose of its specified detection monitoring program "is to detect leakage of hazardous constituents from the disposal area so that the need to set ground-water protection standards is monitored" (emphasis added).

Accordingly, to determine if Criterion 7A is applicable, one must first refer to Criterion 6, which begins by stating:

²⁰(...continued)
SOC, 59 Fed. Reg. 28220, at 28225 cols. 1-2 (June 1, 1994).

²¹ Both sets of intervenors argue that Appendix A Criterion 7A applies to ISL mining. See SRIC Disposal Brief, at 26-29; Morris Disposal Brief, at 9-11. SRIC and ENDAUM also argue that Appendix A Criterion 7 applies to ISL mining. See SRIC Disposal Brief, at 23-26.

In disposing of waste byproduct material, licensees shall place an earthen cover (or approved alternative) over tailings or wastes at the end of milling operations and shall close the waste disposal area in accordance with a design which provides reasonable assurance of control of radiological hazards to (i) be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years (footnote omitted).

This introductory wording of Criterion 6, combined with its later reference to other features of the earthen cover "necessary for long-term control of the tailings," make clear that Criterion 6 applies only to the long-term storage of tailings produced by conventional uranium milling operations.²² Since ISL mining does not produce the large tailings piles which the UMTRCA was enacted to control, there would be no legitimate basis for imposing Criterion 6 on HRI.

This same reasoning leads to the conclusion that the requirements of Criterion 7A also do not apply to HRI, since there will be no permanent "disposal area" created by HRI's proposed ISL operations. This is why HRI must have an agreement in place with a licensed disposal facility for the eventual offsite disposal of any leftover byproduct material produced by HRI's ISL operations. See HRI License Condition 9.6. This is a standard requirement applicable at all NRC-licensed ISL operations. See FEIS, at 2-14, and 4-7.²³

²² This intended focus of Appendix A criteria on long-term tailings control is further reinforced by the following wording in Appendix A's Introduction:

Where later expansions of systems or operations may be likely (for example, where large quantities of ore now marginally uneconomical may be stockpiled), the amenability of the disposal system to accommodate increased capacities without degradation in long-term stability and other performance factors must be evaluated. [Emphasis added].

²³ Both sets of intervenors implicitly recognize that ISL mining does not involve the creation of an onsite "disposal area" as defined in Appendix A. See Morris Disposal Brief, at (continued...)

In arguing the applicability of Criterion 7A, Ms. Sam and Ms. Morris cite the 1995 "Staff Technical Position on Effluent Disposal at Licensed Uranium Recovery Facilities" (Effluent STP). *See* Morris Disposal Brief, at 4 n.1, 10, and 10 n.6. The Effluent STP provides a general guide to the NRC staff in reviewing waste disposal proposals at both uranium mills and ISL facilities. *See* Effluent STP, at 1. As a result, its wording is necessarily broad. Consistent with its status as a general guidance document, the wording of the applicable regulations controls for purposes of legal enforcement. *See id.*, at 2.

How the Effluent STP supports the intervenors' argument that HRI did not provide sufficient detail in its license application regarding its deep well disposal option (*see* Morris Disposal Brief, at 10) is not clear, as the Effluent STP makes no specific reference to Criterion 7A. Moreover, as 10 C.F.R. § 20.2002 (also cited in support of the argument) states, "[a] licensee or applicant for a license may apply to the Commission for approval of proposed [disposal] procedures"... (emphasis added). Thus, contrary to intervenors' argument, disposal procedures need not be finalized at the time a 10 C.F.R. Part 40 license is issued.

The SRIC and ENDAUM argument that pursuant to 10 C.F.R. § 40.31(h), Appendix A Criterion 7 applies to ISL mining, is similarly unsupported. *See* SRIC Disposal Brief, at 23-26. As discussed above, these regulatory provisions must be read against the backdrop of the UMTRCA, the GEIS, and the introductory text to Appendix A. When considered in this light,

²³(...continued)

13 (acknowledging fact that HRI License Condition 9.6 prohibits permanent disposal of byproduct material on lands at HRI's Churchrock, Unit 1, or Crownpoint sites); and SRIC Disposal Brief, at 47 (citing FEIS at 4-7, and acknowledging that contaminated soil in retention ponds would ultimately be disposed of with other byproduct material).

it is evident that Criterion 7's provisions apply to uranium mill tailings, not to ISL mining wastes. Criterion 7 states in full:

At least one full year prior to any major site construction, a preoperational monitoring program must be conducted to provide complete baseline data on a milling site and its environs. Throughout the construction and operating phases of the mill, an operational monitoring program must be conducted to measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; to evaluate environmental impacts of operation; and to detect potential long-term effects (emphasis added).

Additionally, Criterion 7's use of the terms "milling site" and "long-term effects" is another indication that this provision is directed towards the control of tailings. The milling process is the conventional way in which uranium ore is first crushed and ground, thus producing the tailings. *See* GEIS, § 5.2, at 5-1 to 5-5; and GEIS Appendix B, at B-2 to B-4. *See also* Appendix A, Criterion 12 (referencing the "tailings" left behind at "milling sites," requiring long-term surveillance of the sites). Moreover, "long-term" is more consistent with the hundreds of years tailings must be controlled (*see* discussion of Criterion 6, *supra* at XX), as opposed to the decades in which ISL sites are monitored before being released for unrestricted use.

Notwithstanding the inapplicability of Criterion 7, the Staff has imposed environmental monitoring requirements on HRI's proposed ISL operations as described in HRI License Condition 10.30. SRIC and ENDAUM fail to show why these monitoring requirements will be inadequate to protect the environment after lixiviant injection occurs, or that these requirements are not commensurate with the environmental risks posed by ISL mining.

Accordingly, for the reasons discussed above, the Presiding Officer should reject the intervenor arguments regarding Appendix A criteria 7 and 7A, as those arguments are based on the erroneous premise that those criteria apply to HRI's proposed operations.

B. Intervenors Misapply Appendix A Criteria 5A

A large part of SRIC's and ENDAUM's argument regarding Appendix A concerns the criteria 5A provisions governing surface impoundments. *See* SRIC Disposal Brief, at 13-23, *citing* criteria 5A(1), 5A(2), 5A(4), and 5A(5). Ms. Morris and Ms. Sam also base part of their arguments on the criteria 5A provisions. *See* Morris Disposal Brief, at 5-7, and 11-13. As discussed below, these criteria were addressed in HRI's license application, and are incorporated in HRI's license.

The criteria 5A provisions include specifications on liners to be used to prevent seepage from the impoundments (criteria 5A(1) - (2)),²⁴ design requirements to prevent liquid from escaping over the top of the impoundments (Criterion 5A(4)), and design requirements applicable to when dikes are used for above-grade impoundments (Criterion 5A(5)). The criteria 5A provisions were made part of Appendix A in the 1987 rulemaking summarized in Section A. 1, *supra*. Criterion 5A(1) states that it "is a design standard for surface impoundments used to manage uranium and thorium byproduct material." This standard incorporates EPA regulation 40 C.F.R. § 192.32(a)(1), which in turn incorporates by reference EPA regulation 40 C.F.R. § 264.221(a). *See* SOC, 52 Fed. Reg. 43553, at 43554 Table 1 (November 13, 1987). The criteria 5A provisions are applicable to HRI's proposed operations

²⁴ Use of synthetic liners has long been considered to be the most effective way of controlling seepage from surface impoundments, thereby reducing the potential for any groundwater contamination to occur. *See* GEIS, § 12.3.5, at 12-23 to 12-24.

because ISL mining operations generally use surface impoundments, and because such operations produce "byproduct material." See 10 C.F.R. § 40.4 definition; see also Staff's December 1997 SER, at 29 (recognizing applicability of criteria 5A provisions to HRI's proposed operations).

While there is thus no dispute that the Appendix A criteria 5A provisions may become applicable to HRI's proposed ISL mining operations, this does not mean that all other Appendix A criteria are similarly applicable. The intervenors' attempt to make other Appendix A criteria applicable to HRI pursuant to 10 C.F.R. § 40.31(h) should be rejected for the reasons discussed in Section A. 2, *supra*. See also SER, at 26-32 (evaluating HRI's plans to comply with the criteria 5A provisions).

SRIC and ENDAUM argue that HRI's COP, in failing to specify (1) how large the liners will be; (2) how the liners will be installed or constructed; and (3) how the liners will be removed during "remediation," provided insufficient information to satisfy Appendix A Criterion 5A(1). See SRIC Disposal Brief, at 17-19. The Staff disagrees. As set forth in the SER, at 28-30, the Staff concluded that impoundment requirements can be met,²⁵ and the

²⁵ In contending that HRI License Condition 10.26 improperly allows HRI to defer submitting impoundment information, SRIC and ENDAUM cite *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-298, 2 NRC 730, 736-37 (1975). See SRIC Disposal Brief, at 17. *Perry* was a construction permit proceeding in which the licensing board improperly authorized site work to proceed at the applicant's risk before a construction permit had been issued, contrary to 10 C.F.R. § 50.10(e). See *Perry*, 2 NRC at 731-2. Due to the presence of two geologic anomalies in the site bedrock the Staff had not recommended issuing a limited work authorization, but the licensing board did so for the limited purpose of determining whether the site should still be considered suitable for a nuclear plant. See *id.*, at 733-4. SRIC and ENDAUM fail to explain how this decision is relevant to the HRI proceeding. Moreover, even if *Perry* was a Part 40 case, it would not be relevant to the deferral issue, since the Staff has determined there are no anomalies at HRI's

(continued...)

intervenors have not challenged these conclusions. Moreover, providing such details is not required by the wording of Appendix A Criterion 5A(1), which rather than establishing rigid rules, only sets forth general standards from which an "applicant or licensee" may obtain exemptions pursuant to Appendix A Criterion 5A(3). By including "licensee," the wording of Appendix A Criterion 5A(3) further rebuts intervenors' 10 C.F.R. § 40.31(h) arguments, since it signifies that a license may be issued notwithstanding the lack of certain information in a license application (e.g., the location of impoundments) pending the receipt of additional information after the license is issued.

SRIC and ENDAUM also misinterpret Criterion 5A(4), in arguing that its provisions require "applicants to provide sufficient information" to show that surface impoundments will be designed to prevent overtopping. SRIC Disposal Brief, at 20 (emphasis added). Criterion 5A(4) does not contain the word "applicants," and does not specify when the required information must be provided.

Similarly, Criterion 5A(5) does not specify when the required design information must be provided, and the Staff's conclusion that if HRI decides to build above-ground impoundments "there are no site conditions which would require a unique design feature" (SER, at 29) is not challenged by SRIC and ENDAUM.

Accordingly, the SRIC and ENDAUM arguments concerning the criteria 5A provisions should be rejected. Their conclusion that the "deferral of this material licensing information is unacceptable," and that HRI's license should therefore be revoked "for failing

²⁵(...continued)

Church Rock site which would prevent construction of one or more surface impoundments there. See SER, at 27 and 29.

to include information demonstrating compliance with Criteria 5" (SRIC Disposal Brief, at 23), lacks adequate supporting authority. *See* n. 25, *supra*.

The conclusion offered on this topic by Ms. Morris and Ms. Sam-- that the "absence of any detail regarding evaporation ponds made HRI's application defective and should have compelled NRC to deny the application" (Morris Disposal Brief, at 7)-- is similarly unsupported and should be rejected. The only twist on the SRIC and ENDAUM arguments offered by Ms. Morris and Ms. Sam is the contention that there are significant differences between "retention ponds" and "evaporation ponds," with the latter to be used "to handle the final disposition of liquid wastes." Morris Disposal Brief, at 7 n.4. No support for this statement is cited, and it is incorrect. No "final disposition" of wastes on any of HRI's sites is allowed by HRI's license. *See* Background at 4, *supra*. Additionally, no difference in meaning between the terms "retention pond" and "evaporation pond," is intended, as the Staff uses them interchangeably (*see, e.g.*, HRI License Condition 10.26; SER, at 29), and both fall within the scope of "surface impoundment" as that term is defined in Appendix A's Introduction. *See* SRIC Disposal Brief, at 13-14, in this regard.

Ms. Morris and Ms. Sam also rely on Criterion 5A(4) in arguing that HRI's license improperly fails to specify pond freeboard requirements. *See* Morris Disposal Brief, at 11-13, referencing three ISL licenses which do specify pond freeboard requirements.²⁶ The term "pond freeboard" used in HRI License Condition 10.5 refers to a surface impoundment's available space to accept additional waste water. For any given surface impoundment, the

²⁶ The three ISL licenses attached to the Morris Disposal Brief as Exhibits 2-4 all reflect situations where the surface impoundments are already in place and operating.

specific amount of proper pond freeboard space to be required cannot be determined until the surface impoundment is built. To compensate for the lack of certain detailed design information in HRI's application, including such information regarding surface impoundments, the Staff included condition 10.26 in HRI's license, as explained in the Staff's SER, at 26-32. Ms. Morris and Ms. Sam fail to address HRI License Condition 10.26 and the Staff's relevant SER discussion, and thus fail to show that their health and safety interests have been or will be harmed.

Accordingly, the intervenors' arguments regarding the criteria 5A provisions in Appendix A should be rejected.

C. Other Appendix A Arguments Lack Merit

Ms. Morris and Ms. Sam argue (without citing any supporting authority) that HRI was required, pursuant to 10 C.F.R. § 40.31(h), to show in its license application how it would meet EPA standards for "process wastewater," which are incorporated by reference in Criterion 8 of Appendix A.²⁷ See Morris Disposal Brief, at 7-8. The EPA standards at issue are the new source performance standards (NSPS) applicable to ISL mining, which state that "there shall be no discharge of process wastewater²⁸ to navigable waters ... from mines and

²⁷ Criterion 8 is mainly concerned with preventing offsite radiation exposure "from dry surfaces of the tailings disposal area not covered by tailings solution and emissions from yellowcake drying and packaging operations." Criterion 8, ¶ 1.

²⁸ The term "process wastewater" is discussed in EPA's preamble to the NSPS standards for ISL mining. The EPA stated in relevant part:

[T]he no discharge standard of performance for in situ leach methods is applicable to the process wastewater used in and resulting from the actual in

(continued...)

mills using in situ leach methods." 40 C.F.R. § 440.34(b)(1). Criterion 8 contains no requirement compelling an NRC license applicant to show how the NSPS will be met. Should HRI choose to discharge process wastewater into navigable waters, a permit to do so would have to be issued by the EPA. Additionally, as discussed *supra* in Section A. 2, 10 C.F.R. § 40.31(h) does not apply to ISL license applicants.

SRIC and ENDAUM cite a portion of Appendix A's Introduction in arguing that HRI's license application must be rejected due to its failure to show how its existing disposal system could accommodate future expansions of ISL operations. *See* SRIC Disposal Brief, at 27-29. As stated in HRI's COP, these expansions would require HRI to submit one or more additional license applications. *See* COP, at 78. Any consequences arising from the filing of such applications are clearly outside the scope of this proceeding.

Accordingly, these additional intervenor arguments relying on Appendix A should be rejected.

D. ENDAUM'S and SRIC'S Part 20 Argument Does Not Support License Revocation

ENDAUM and SRIC rely on 10 C.F.R. § 20.2002 and other Part 20 provisions in arguing that HRI's license application lacked required information, and that HRI's license should accordingly be revoked. *See* SRIC Disposal Brief, at 29-37. The argument begins by quoting most (but not all) of 10 C.F.R. § 20.2002, followed by these conclusory statements:

²⁸(...continued)

situ operation itself. In situ mine and mill process wastewater does not include discharges from wells from within or surrounding in situ mines used to restore aquifers after all actual mining activity (extraction of the ore, or pregnant liquor from the in situ process) has been completed.

47 Fed. Reg. 54598, at 54604 (December 3, 1982).

It would be inappropriate for HRI to submit this information [required by 10 C.F.R. § 20.2002] in a license amendment application. The purpose of 10 C.F.R. § 20.2002 is evident on its face: it provides an exception from disposal by evaporation.

SRIC Disposal Brief, at 30. After criticizing the details of various waste disposal options described in HRI's COP, and discussing other Part 20 provisions,²⁹ ENDAUM and SRIC conclude their Part 20 argument by claiming there has been an

unlawful deferral of material information necessary to determine whether the [HRI] license will be inimical to health and safety. Because HRI has failed to meet these [10 C.F.R. Part 20] requirements, the license and application must be rejected.

SRIC Disposal Brief, at 37. As discussed below, these arguments lack merit and should be rejected.

First, ENDAUM and SRIC fail to explain why it would be "inappropriate" for HRI to submit applications for license amendments. The first sentence of 10 C.F.R. § 20.2002 makes the provision applicable to licensees as well as license applicants. The claim that the purpose of 10 C.F.R. § 20.2002 is to provide "an exception from disposal by evaporation" is not supported by any citation. Even if this statement is accurate, it is not clear how this would make applications for license amendments "inappropriate."

Second ENDAUM and SRIC fail to offer any supporting authority for their "unlawful deferral of material information" argument. To the extent that they may be relying on *Perry*,

²⁹ Additionally, ENDAUM and SRIC recycle portions of Dr. Marvin Resnikoff's affidavit originally filed in January 1998 in connection with intervenor efforts to stay the effectiveness of HRI's license. See SRIC Disposal Brief, at 35-36. The opinions of Dr. Resnikoff on which ENDAUM and SRIC now seek to rely were rebutted by the affidavit of Christopher A. McKenney, attached as Staff Exhibit 10 to "NRC Staff's Response To Motion For Stay, Request For Prior Hearing, And Request For Temporary Stay," at ¶¶ 11-29.

supra, that decision is not applicable here. *See* n. 25, *supra*. Moreover, the SOC issued with the promulgation of the 1991 revisions to 10 C.F.R. Part 20 shows the flexibility with which some of Part 20's applicable requirements may be applied to ISL licensees.³⁰

Accordingly, the ENDAUM and SRIC arguments regarding provisions of 10 C.F.R. Part 20 do not support license revocation, and should be rejected.

E. Immediate Offsite Disposal of Byproduct Material Not Necessary

Ms. Sam and Ms. Morris argue that 10 C.F.R. § 40.32 is violated by the 90-day window provided by HRI License Condition 9.6, during which time HRI would be required to obtain a replacement agreement for the offsite disposal of byproduct material while still being allowed to inject lixiviant. *See* Morris Disposal Brief, at 2, and 13-15. This argument reflects a basic misunderstanding of the wastes produced by ISL mining.

As detailed in the Background and Section A. 1, *supra*, waste from ISL mining is produced in very small quantities relative to the large volumes of tailings produced by traditional uranium mining methods, and has lower amounts of radium. These intervenors offer no scenario in which HRI's ISL operations would generate so much byproduct material in three months that its onsite waste treatment system would be overburdened. The contention that the Staff failed to consider (1) "how 11e(2) byproduct material would or should be stored pending its transfer to an off-site facility" (Morris Disposal Brief, at 14); and (2) "what precautions ought to be taken during such storage to ensure that human health and safety and

³⁰ *See, e.g.*, 56 Fed. Reg. 23360, at 23375 cols. 2-3 (May 21, 1991) (discussing allowable variances to the requirements of 10 C.F.R. §§ 20.1301 and 20.1302). *See also* SER, at 14-23, discussing provisions of 10 C.F.R. Part 20 applicable to HRI, including many of those cited by ENDAUM and SRIC. *See* SRIC Disposal Brief, at 32-34.

the environment are adequately protected" (*id.*), is simply incorrect. HRI License Conditions 10.5 and 10.26 contain detailed requirements which HRI must meet to ensure that liquid wastes from ISL mining are safely stored onsite pending the ultimate transfer of leftover byproduct material to one or more licensed offsite disposal areas.

Moreover, in the EPA proceedings referenced in Section A. 1, *supra*, the EPA did not identify any concerns regarding such temporary onsite storage of ISL wastes (*see* 55 Fed. Reg. 21191, at 21195 col.3), as long as the material is removed at the end of ISL operations.³¹

Accordingly, Ms. Morris and Ms. Sam have not shown that HRI License Condition 9.6 violates the 10 C.F.R. § 40.32 safety standard, and their request for license revocation, or the imposition of additional conditions, should be rejected.

F. ENDAUM'S and SRIC'S NEPA Argument Does Not Support License Revocation

The 1997 FEIS contains over 250 pages of analysis, not including appendices. Even if all of the criticisms offered by ENDAUM and SRIC regarding the FEIS (*see* SRIC Disposal Brief, at 38-53) were valid (which, as discussed below, they are not), their arguments would fall far short of establishing that the NRC failed to take the "hard look" required by the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321 *et seq.* (NEPA).

³¹ As the EPA had earlier explained in 1985 regarding the ISL operation in Nebraska:

Reclamation of the pond area will be done by transferring any remaining liquids to tank trucks of suitable construction and shipped to an approved disposal site. The remaining contaminated solid wastes will be packaged and disposed of at an approved disposal site to prevent future contamination.

50 Fed. Reg. 5253, at 5257 col.1.

There are a number of inaccuracies in the SRIC and ENDAUM presentation regarding the FEIS.

First, ENDAUM and SRIC state that various production bleed estimates³² are inconsistent, leading them to further state:

If the liquid waste discharged to the environment is higher (10 g.p.m. rather than 1 g.p.m.) then the waste stream is greater than the NRC and HRI thought it was and the impacts on waste disposal must be analyzed differently. Second, if in fact, 39 g.p.m. is returned to the aquifer, the production bleed is much less than 1% and HRI may not be able to maintain its pressure sink in the mine, which may cause an excursion in the aquifer.

SRIC Disposal Brief, at 45-46 (footnote omitted). The intervenors are incorrect. The production bleed in the FEIS is considered to be 1% or 40 g.p.m. of water which is not returned to the aquifer. *See* FEIS, § 4.3.1, at 4-26. In agreement with the FEIS, COP Figures 3.1-2 fn 3.1-1 both show a 40 g.p.m. production bleed for various options of waste water treatment. HRI's response to RAI No. 29 again quotes a 40 g.p.m. bleed for a reverse osmosis unit option, producing 30 g.p.m. of clean water and 10 g.p.m. of waste water. The response to this RAI goes on to state that clean water from reverse osmosis or brine concentration will be reinjected into the Westwater Canyon Formation where individual constituent concentrations are less than those found in the native ground water, and that aquifer recharge will be performed pursuant to 40 C.F.R. §§ 144-148 of EPA's regulations.

Second, SRIC and ENDAUM, citing page 2-20 of the FEIS, state that 150-250 g.p.m. of water "would be withdrawn during groundwater sweep", and that after treatment, "all those

³² As described by these intervenors, the estimates are 1% or 40 g.p.m. on page 2-16 of the FEIS; 39 g.p.m. in Figures 3.1-2 fn 3.1-1 of the COP; and 10 g.p.m. in HRI's response to Staff's Request For Additional Information (RAI) No. 29.

gallons would be re-injected [in]to the aquifer." SRIC Disposal Brief, at 46. These intervenors further state that this FEIS description (1) "leads one to believe that restoration does not produce liquid waste, but that instead, restoration is a closed loop system"; (2) disagrees with Figure 2.7 on FEIS page 2-22; and (3) that the FEIS thus "fails to adequately describe the amount of liquid waste generated daily at each site," so that disposal system impacts cannot be assessed. *Id.* SRIC and ENDAUM are incorrect. The FEIS adequately describes the volume of liquid waste generated by each site. The volume of liquid waste produced is directly correlatable to the volume of water consumed by the project (i.e., the volume of water not returned to the aquifer). The FEIS, at pages 4-58 to 4-60, estimated consumptive water volumes for each of the proposed ISL mining sites singly, and in combination. At page 2-20, the 150 to 250 g.p.m. flow is represented as an average 200 g.p.m. flow in Figure 2.7. Neither the FEIS text on page 2-20, or Figure 2.7, states that restoration does not produce liquid waste. Rather, the text on page 2-20 states that the permeate (clean water produced by the reverse osmosis treatment option) would be reinjected into the aquifer. Figure 2.7 shows restoration flows for various restoration options, and shows that a 200 g.p.m. restoration flow would produce 150 g.p.m. of clean water (permeate), and 50 g.p.m. of waste water.

Third, ENDAUM and SRIC state that the FEIS does not discuss evaporation ponds in terms of soil impact from ground disturbance. *See* SRIC Disposal Brief, at 48. Again, these intervenors are not correct. Impacts to soils from evaporation pond construction are described on pages 4-6 to 4-14 of the FEIS, along with estimates of disturbed acreage for various alternatives. Furthermore, as pointed out in the staff requirements on FEIS page 4-14, HRI

will be required to submit a detailed site reclamation plan for NRC review and approval, which must address how soil reclamation will be accomplished. This stated requirement is now HRI License Condition 12.7, which states in full that:

As part of the licensee's decommissioning activities for a site, the licensee shall submit to the NRC for review and approval a detailed site reclamation plan. The plan shall be submitted at least 12 months prior to the planned final shutdown of uranium extraction operations at the site. If depressions appear at the land surface due to subsurface collapse from in situ leach uranium extraction activities, the licensee shall return the land surface to its general contour as part of the surface reclamation activities. Before release of any site to unrestricted use, the licensee shall provide information to the NRC verifying that radionuclide concentrations, due to licensed materials, meet radiation standards for unrestricted release.

Fourth, ENDAUM and SRIC state that evaporation ponds are left out of the FEIS discussion on how ground water must be protected from the effects of pond leakage. *See* SRIC Disposal Brief, at 48. This contention is also incorrect. Page 2-12 of the FEIS states that any waste retention ponds "would have double synthetic liners". This means that during normal operation there should be no impacts to groundwater because there should be no leakage from the ponds. *See* discussion of Appendix A criteria 5A (1-2) in Section B, *supra*. Furthermore, retention pond leak detection monitoring, and corrective actions to be taken in the event of a retention pond leak, are discussed on pages 4-25 to 4-26 of the FEIS. In addition, pursuant to this FEIS discussion, HRI License Condition 10.5 was made part of HRI's license, and this condition states in full as follows:

A leak detection monitoring system shall be installed for all retention ponds. The licensee shall measure and document pond freeboard and fluid levels in the leak detection system daily, including weekends and holidays. If fluid levels greater than 6 in (15.2 cm) are detected in the leak detection sumps, the fluid in the sumps shall be sampled and analyzed for specific conductance and chloride. Elevated levels of these parameters shall confirm a retention pond liner leak, at which time the licensee shall take the following corrective

actions: (a) analyze standpipe water quality samples for leak parameters once every 7 days during the leak period, and once every 7 days for at least 14 days following repairs; and (b) locate and repair the area of liner damage. After a confirmed leak, the licensee shall also file a report pursuant to LC 12.2. At all times, sufficient reserve capacity shall be maintained in the retention pond system to enable transferring the contents of one pond to the other ponds. In the event of a leak and subsequent transfer of liquid, the freeboard requirements may be suspended during the repair period.

See also HRI License Condition 10.26 (specifying how waste retention ponds must be built); and HRI License Condition 12.2 (requiring HRI to notify the NRC in the event of a confirmed pond liner leak, and to provide a written report including analytical data, a description of the corrective action taken, and the results of that action).

Fifth, citing page 2-18 of the FEIS, SRIC and ENDAUM claim that during groundwater restoration, the capacity of the evaporation ponds may be exceeded by the quantity of wastewater produced, and that the FEIS does not examine the environmental effects if pond capacity is exceeded. *See* SRIC Disposal Brief, at 49. This contention is a misinterpretation of the FEIS. The FEIS statement on page 2-18 that "HRI could dispose of excess wastewater by deep-well injection, land application, or surface discharge subject to prior NRC approval" does not signify that pond capacity would thereby be exceeded, thereby causing pond failure with its associated impacts. Rather, this statement signifies that evaporation ponds may not be the only alternative to liquid waste disposal, and that as discussed in the FEIS other waste disposal alternatives may be used. Furthermore, HRI License Condition 10.5 (set forth above) contains freeboard requirements, so that if a leak occurs the contents of the leaky pond can be transferred to other ponds so that further leakage is prevented. After the leak is repaired, the pond can be refilled. Therefore, ponds would never be allowed to contain so much liquid that their capacity would be exceeded.

Sixth, in characterizing as incomplete the FEIS analysis at 4-11 concerning the land application liquid waste disposal option, ENDAUM and SRIC state that

the Churchrock land application will probably be on 80 acres in Section 17, but HRI is considering flat mesa land onto [sic] 206 acres of Section 8, flat mesa land of 270 acres in Section 12, or pasture land of 640 acres in Section 16.

SRIC Disposal Brief, at 52. This statement incorrectly implies that the FEIS only considered such impacts for the 80 acres in Section 17. However, as also stated on FEIS page 4-11, the NRC Staff assumed that land application at the Church Rock site could occur on any of the four sections specified above, but that no more than 640 acres would be affected. On the same topic, ENDAUM and SRIC incorrectly state that HRI's license does not limit HRI's use of any of these potential land application sites. See SRIC Disposal Brief, at 52. On the contrary, HRI License Condition 11.8 states in full as follows:

Prior to land application of waste water, the licensee shall submit and receive NRC acceptance of a plan outlining how the licensee will monitor constituent buildup in soils resulting from the land application. The plan should identify the constituents resulting from land application that will be monitored, constituent threshold values for discontinuing land application and justification for the values selected.

Seventh, ENDAUM and SRIC also incorrectly state that "apart from simply describing the possible locations for land application, the FEIS does not contain a detailed discussion of the *impacts* of land application." SRIC Disposal Brief, at 52. On the contrary, land application impacts for the Crownpoint and Unit 1 sites are described on FEIS pages 4-7 and 4-10, respectively; and as to the Church Rock site the FEIS further states on page 4-11 that land application there would have impacts similar to those described for the Crownpoint and Unit 1 sites.

Eighth, ENDAUM and SRIC state that HRI, in calculating the average quality of water that could be disposed of by land application, removed from its calculation the values for the elements of manganese, molybdenum, and selenium that were present in the Mobil Section 9 lixiviant, and that this served to substantially lower the average concentrations of these contaminants. *See* SRIC Disposal Brief, at 53. As far as it goes, this contention is correct. However, ENDAUM and SRIC fail to point out that in the response to RAI 29, HRI also stated that these elements were removed from the Mobil data because, with respect to the data regarding ore bodies acquired by HRI at Church Rock, Crownpoint, and Unit 1, these elements are either absent or are present only in insignificant amounts. *See* Table 29-1 of HRI's response to RAI 29 (pregnant lixiviant data); *see also* HRI's December 9, 1998 filing, at 51.

Ninth, ENDAUM and SRIC state that there is no discussion of whether barium-chloride treatment and/or ion exchange can successfully reduce selenium concentrations from 4.6 milligrams per liter (mg/L) in the pregnant lixiviant to 0.013 mg/L in the estimated land application water quality. *See* SRIC Disposal Brief, at 53. Again, as far as it goes, this contention is correct but it is also irrelevant. There was no such discussion in the FEIS because those treatment processes do not apply to selenium,³³ and because, as discussed above, HRI's data demonstrated that the ore bodies to be mined do not contain significant amounts of selenium.

Additionally, the SRIC and ENDAUM argument regarding pond impact on migratory waterfowl (*see* SRIC Disposal Brief, at 50-52) lacks merit because, as that argument shows,

³³ Barium chloride treatment removes radium from the production bleed, and ion exchange removes uranium from the pregnant lixiviant. *See* discussion in the Background section, *supra*.

the FEIS fully considered the impact as required by NEPA. As to the complaint that this FEIS discussion was not converted into a license condition, the Staff explained that only those matters deemed as requirements (as opposed to recommendations) would be imposed on HRI as license conditions. See FEIS § 4.7.3, at 4-91 to 4-92. Moreover, this decision not to impose any requirements on HRI in this regard cannot fairly be viewed as "an arbitrary and capricious act" (SRIC Disposal Brief, at 50) given the fact that in a similar situation, the EPA found that the presence of ISL evaporation ponds would not harm waterfowl.³⁴

Accordingly, the ENDAUM and SRIC arguments based on NEPA do not support license revocation, and should be rejected.

CONCLUSION

The Staff has considered all of the arguments made by the intervenors in their November 9, 1998 written presentations. As discussed above, and as shown by the information in the hearing file, the intervenors have failed to identify any matters supporting

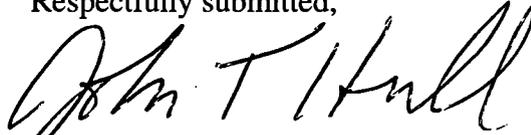
³⁴ In the EPA's 1990 UIC permit proceeding referenced in Section A. 1, *supra* (approving 3000-acre aquifer exemption request on ISL site in Nebraska), the EPA found in pertinent part as follows:

While waterfowl occasionally could land on the evaporation ponds, EPA finds that the ponds associated with the project would not significantly affect waterfowl populations in the area. No long-term impacts from the project are anticipated, and no impairment of ecological stability or diminishment of biological diversity are expected.

55 Fed. Reg. 21191, at 21197 col. 2 (May 23, 1990).

the relief they request. Accordingly, the Staff requests the Presiding Officer to deny the relief sought.

Respectfully submitted,

A handwritten signature in black ink that reads "John T. Hull". The signature is written in a cursive style with a large, prominent "H" and "U".

John T. Hull
Counsel for NRC Staff

Dated at Rockville, Maryland
this 16th day of December, 1998

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

'98 DEC 16 P4:17

BEFORE THE PRESIDING OFFICER

In the Matter of)

HYDRO RESOURCES, INC.)

2929 Coors Road, Suite 101)

Albuquerque, New Mexico 87120)

Docket No. 40-8968-MD

(Leach Mining and Milling License)

OFFICE OF SECRETARY
RULEMAKING AND
ADJUDICATIONS STAFF

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF'S RESPONSE TO INTERVENOR PRESENTATIONS ON LIQUID WASTE DISPOSAL ISSUES" in the above-captioned proceeding have been served on the following by U.S. Mail, first class, or, as indicated by a single asterisk through deposit in the Nuclear Regulatory Commission's internal mail system, or, as indicated by double asterisks, via e-mail, or, as indicated by triple asterisks, by facsimile, this 16th day of December, 1998:

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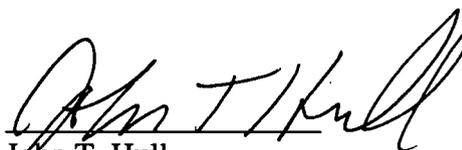
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