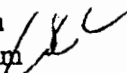


**By Hand Delivery**

TO: Thomas H. Essig, Chief  
Uranium Recovery and Low Level Waste Branch

CC: Maria E. Schwartz, Esq.  
Office of General Counsel

FROM: Anthony J. Thompson  
Warren U. Lehrenbaum 

DATE: February 1, 2000

RE: ~~Adequacy Of Institutional Controls Proposed For Western Nuclear Inc.'s Split  
Rock Facility, Source Material License No. SUA-56.~~

**I. BACKGROUND**

On October 29, 1999 Western Nuclear, Inc. ("WNI") provided NRC with a Site Closure Plan and a Site Ground Water Characterization and Evaluation Report for the Split Rock facility (for ease of reference we refer to these two documents together as the "Site Closure Plan"). The Site Closure Plan summarizes the steps that have been taken by WNI to satisfy the license and regulatory requirements pertinent to closure of the Split Rock site and termination of WNI's license. In addition, the Site Closure Plan presents a comprehensive strategy to assure protection of public health, safety, and the environment from site-derived constituents in groundwater. As reflected in the Site Closure Plan, the impact of byproduct material in groundwater presents the only significant issue remaining to be resolved as a predicate to site closure and license termination.

The Site Closure Plan submitted by WNI presents two alternative approaches for addressing groundwater concerns. The first approach relies on the establishment of alternate concentration limits (ACLs), as provided for in the Commission's regulations at 10 C.F.R. Part 40, Appendix A, Criterion 5B(5).<sup>1</sup> The second approach presented in the Site Closure Plan is based on a

<sup>1</sup> The ACLs that have been proposed by WNI are somewhat atypical in that they address more than one source term. As explained in greater detail in the Site Closure Plan, constituents from mill tailings at the Split Rock site have, over the

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determination that site-derived constituents are not capable of posing a substantial present or potential threat to human health or the environment, pursuant to the Commission's regulations at 10 C.F.R. Part 40, Appendix A, Criterion 5B(3). Both of these approaches rely primarily on ownership of the impacted land by the long term government custodian, and to a lesser extent on the use of other institutional controls, supplemented with an available alternate water supply. This combination of controls minimizes or eliminates future access to groundwater for domestic consumption within the boundaries of the long term control area. Thus, the Site Closure Plan provides the requisite *reasonable assurance* that there will be no human exposure pathway for site-derived groundwater constituents of concern.

In a letter to WNI dated December 15, 1999, you identified several questions that NRC Staff raised with respect to WNI's Site Closure Plan, and, in particular, with respect to the groundwater compliance component of that Plan. WNI addressed those questions in a submission to you dated January 17, 2000. This memorandum is intended to supplement WNI's January 17, 2000 submission. Specifically, a number of the questions raised in your December 15, 1999 correspondence pertain to the institutional controls that WNI proposes to put into place in order to minimize or eliminate the human exposure pathway. This memorandum is intended to demonstrate the adequacy of those institutional controls from a legal standpoint. In particular, this memorandum addresses the question of whether fee ownership of all of the property comprising the long term control area is required under the applicable law and the relevant regulations and guidance. In addition, this memorandum examines the broader question of whether or not the types of institutional controls proposed by WNI are legally adequate and appropriate for the portions of the site for which fee ownership will not be transferred to the long term custodian.

## II. FEE OWNERSHIP OF LAND IN THE LONG TERM CONTROL AREA

As a preliminary matter, it is important to recognize that under the Site Closure Plan put forward by WNI, approximately 94.5% of the land comprising the long term control area will be transferred *in fee* to the long term custodian. In addition, WNI has obtained restrictive covenants on another 2.5% of the land comprising the long term control area. These covenants run with the land owned by WNI (therefore, upon license termination, they will be enforceable by the long term custodian) and they provide rights that are essentially equivalent to fee ownership with respect to the ability to control access to groundwater. Thus, upon license termination, WNI will be in a position to transfer to the long term custodian fee ownership, or control over access to groundwater, with

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years, become associated with aquifer solids. These constituents are expected to slowly re-mobilize from aquifer solids into the groundwater over time. Thus, seepage from tailings is not the only source of groundwater constituents, as is assumed to be the case for the typical ACL application. However, to the extent that WNI's proposal does not fit precisely the paradigm of a typical ACL application it could be considered a licensee-proposed alternative to NRC's requirements, as provided for under Section 84(c) of the Atomic Energy Act (AEA), 42 U.S.C. § 2114(c).

respect to 97% of the long term control area. The remaining 3% of land, with respect to which fee ownership (or its equivalent) cannot be transferred by WNI, comprises the area designated as "Red Mule."

It is clear from the plain language of the AEA that the ability to transfer fee ownership to the long term custodian with respect to land used for the disposal of byproduct material is *not* a prerequisite to license termination. Section 83 of the statute provides that, upon termination of the license for a uranium mill tailings facility, title to the tailings and to the land used for disposal of the tailings must be transferred to the long term custodian, *unless* NRC determines that such transfer is not required to protect public health, safety and the environment.<sup>2</sup> Specifically, the statute states as follows:

The Commission shall require by rule, regulation, or order that prior to the termination of any license which is issued after the effective date of this section [November 8, 1981], title to the land, including any interests therein (other than land owned by the United States or by a State) which is used for the disposal of any byproduct material, as defined in section 11e.(2), pursuant to such license shall be transferred to --

(i) the United States, or --

(ii) the State in which such land is located, at the option of such State,

*unless the Commission determines prior to such termination that transfer of title to such land and such byproduct material is not necessary or desirable to protect the public health, safety, or welfare or to minimize or eliminate danger to life or property.*<sup>3</sup>

While this provision may not be directly applicable to WNI (because WNI's license was not issued after November 8, 1981), the general principle it establishes is important: transfer of title to land used for the disposal of byproduct material will not be required if NRC determines that such transfer is not necessary to protect public health, safety and the environment.

Moreover, with respect to sites licensed prior to 1981, like WNI's site, the statute provides NRC with even greater flexibility in determining whether to require transfer of title to land used for the disposal of byproduct material. Specifically, the statute provides that:

In the case of any such license under section 62, which was in effect on the effective date of this section [November 8, 1981], the Commission may require, before the termination of such license, such

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<sup>2</sup>42 U.S.C. § 2113(a), (b).

<sup>3</sup>42 U.S.C. § 2113(b).

transfer of land and interests therein (as described in paragraph (1) of this subsection) to the United States or a State in which such land is located, at the option of such State, as may be necessary to protect the public health, welfare, and the environment from any effects associated with such byproduct material. *In exercising the authority of this paragraph, the Commission shall take into consideration the status of the ownership of such land and interests therein and the ability of the licensee to transfer title and custody thereof to the United States or a State.*<sup>4</sup>

This provision is directly applicable to WNI.

Thus, the statute presumes that, in general, title to uranium mill tailings at licensed facilities, and title to the land used for disposal of such tailings, will be transferred to the government upon license termination, *unless* NRC determines that such transfer is unnecessary to protect human health, safety and the environment. In addition, in the case of source material licenses that were in effect as of November 1981, like WNI's license for the Split Rock facility, NRC is directed to take into account the status of land ownership and the ability of the licensee to transfer title when deciding whether to require transfer of title to the government. Consequently, if fee ownership of land used for the disposal of mill tailings is not necessary to protect public health and the environment, or, in the case of sites such as Split Rock that were licensed prior to 1981, if fee ownership of such land cannot as a practical matter be transferred to the long term custodian, then transfer of ownership of land used for the disposal of byproduct material is not required.

Similarly, NRC's guidance pertaining to ACLs (the Staff Technical Position on Alternate Concentration Limits; hereinafter, the "ACL Guidance")<sup>5</sup> also indicates that fee ownership of land used for the attenuation of groundwater constituents is not a prerequisite to obtaining an ACL.

In general, compliance with the groundwater concentration limits established by NRC is determined based upon monitoring results at a designated "point of compliance" ("POC"), which is defined as "the site specific location in the uppermost aquifer where the groundwater protection standard must be met."<sup>6</sup> When an ACL is sought for a groundwater constituent, a second point of reference, called the "point of exposure" or "POE" must also be considered. The POE is defined as the location(s) at which humans, wildlife or other environmental species could reasonably be exposed to hazardous constituents from groundwater.<sup>7</sup> In its ACL Guidance NRC explains that an ACL must be "adequately protective of human health and the environment" at the POE. This means

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<sup>4</sup>42 U.S.C. § 2113(b)(4) (emphasis added).

<sup>5</sup>U.S. Nuclear Regulatory Commission, *Staff Technical Position Alternate Concentration Limits for Title II Uranium Mills*, January 1996 (hereinafter, "ACL Guidance") at 6.

<sup>6</sup>10 C.F.R. Part 40, Appendix A, Introduction.

<sup>7</sup>ACL Guidance at 6.

that an applicant for an ACL must be able to demonstrate that the hazardous constituent covered by the ACL will not pose a "substantial present or potential hazard to human health or the environment" at the POE, as long as the ACL is not exceeded.<sup>4</sup> Significantly, when an ACL is established for a site, NRC will take into account any attenuation of the groundwater constituent that occurs between the POC(s) and the POE. Thus, the ACL that NRC establishes for a constituent may be less than adequately protective of human health and the environment at the POC(s) so long as the licensee can demonstrate that, because of attenuation that occurs between the POC(s) and POE, the constituent will fall within allowable health and environmental exposure levels in groundwater at the POE.<sup>5</sup>

NRC's ACL Guidance provides additional evidence that fee ownership of the property needed for the disposal of byproduct material (and transfer of fee ownership to the long term custodian) it is not a prerequisite to obtaining an ACL. The Guidance naturally begins with the presumption that the POE will be located in lands that will be transferred to the government. According to NRC, "in most situations, the POE will be located at the down-gradient edge of the land that will be transferred to the government for long term custody following license termination."<sup>6</sup> However, NRC also recognizes that in some instances it may be desirable for the POE to be located at a point that is some distance *outside* of the lands that are presumptively required to be transferred to the government under UMTRCA (i.e., *outside* of the lands used for the disposal of byproduct material). This is referred to in the ACL Guidance as a "distant" POE.<sup>7</sup> According to NRC, a distant POE might be justified on the basis that land ownership by the licensee or by the government "would ensure that no water resource use would exist on the property," thus ensuring that no unreasonable risk to human health or the environment would exist beyond the POE.<sup>8</sup> However, after stating that a distant POE might be justified on the basis that land ownership by the government custodian would prevent the use of groundwater between the POC and POE, the ACL Guidance goes on to provide as follows:

It should be noted that in some instances, a distant POE may be established without invoking land ownership or long-term custody; for

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<sup>4</sup>*Id.* at 8 (emphasis added).

<sup>5</sup>*Id.* at 6-7.

<sup>6</sup>ACL Guidance at 7.

<sup>7</sup>*Id.* This portion of the ACL Guidance is not, strictly speaking, applicable to the WNI proposal, since WNI is not proposing a "distant" POE; nevertheless, the Guidance is relevant by analogy. A "distant POE" is different from a POE that is simply located some distance from the POC(s). If the land that lies between the POC(s) and the POE is necessary for disposal of 11c.(2) byproduct material then under Section 83 of the AEA title to the land must be transferred to the long term custodian, provided that the licensee is able to transfer title and provided that NRC determines that transfer of title to such land is necessary to protect human health and the environment. In such a case, the POE would not be considered a "distant" POE under the ACL Guidance, even though the POE might be located a considerable distance from the POC(s). Under the ACL Guidance a "distant POE" is one where the land between the POC(s) and POE is *not* necessary for the disposal of 11c.(2) byproduct material.

<sup>8</sup>*Id.*

example, when the possibility of human exposure is effectively impossible because the ground water is either inaccessible or unsuitable for use.”

There are two important implications to this guidance: First, a distant POE and a POE located a distance from the POC(s) can be justified if there is adequate assurance that groundwater between the POC and POE will not be utilized. Second, given such assurances, *land ownership and transfer of custody to the long term custodian may not be necessary in order to establish such-a POE*. Later on, the ACL Guidance discusses the factors that should be evaluated in determining whether there is adequate assurance that groundwater between the POC and POE will not be utilized. Specifically, the Guidance provides that, when assessing whether there is a significant risk of human exposure to hazardous groundwater constituents (and, therefore, in determining whether a proposed ACL presents a “*substantial present or potential threat to human health*”) one must consider, among other things, the “availability and characteristics of alternate water supplies,” as well as any “statutory or legal constraints and institutional controls on water use in the site area.”<sup>14</sup> Thus, under the ACL Guidance, fee ownership of land used for the attenuation of groundwater constituents should not be required, provided that institutional controls, perhaps in combination with an alternate water supply, provide *reasonable assurance* that groundwater in the affected area will not be utilized. WNI’s Site Closure Plan provides for the availability of an alternate water supply for the Red Mule area, should such an alternate supply be needed. In addition, the Site Closure Plan proposes institutional controls for the Red Mule area. In the following section we address the adequacy of those controls.

### III. ADEQUACY OF INSTITUTIONAL CONTROLS PROPOSED BY WNI FOR THE “RED MULE” PORTION OF THE LONG TERM CONTROL AREA

In its Site Closure Plan, WNI has proposed four different types of institutional controls that are designed to prevent human exposure to site-derived groundwater constituents in the long term control area. For the bulk of the long term control area, two types of controls are proposed:

- Fee ownership of land. Upon license termination, fee ownership of lands in the long term control area owned by WNI in fee would be transferred to the long term custodian. In prior discussions of institutional controls, NRC has characterized fee ownership by the government as “the ultimate form of control.”<sup>15</sup> WNI has obtained fee ownership of approximately 94.5% of the land required for the long term control area at the Split Rock

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<sup>14</sup>*Id.*

<sup>15</sup> *Id.* at 18.

<sup>16</sup> Draft Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for Decommissioning of NRC-Licensed Nuclear Facilities, NUREG 1496 (April 1994) (hereinafter “Draft NUREG 1496”), vol. 2 at F-18.

site, which would be transferred to the long term custodian upon license termination.

- Restrictive covenants. These covenants apply to another 2.5% of the land comprising the long term control area. Since they run with the land owned by WNI, these restrictive covenants allow WNI -- and WNI's successors (i.e., the long term custodian) -- to prohibit the domestic use of groundwater and/or the drilling of new wells on the encumbered properties. In that sense, the restrictive covenants provide WNI and the long term custodian with rights that are akin to fee ownership with respect to the ability to restrict access to groundwater on the affected property.

Thus, for approximately 97% of the land in the long term control area, WNI has proposed institutional controls that provide fee ownership or equivalent control over access to groundwater. To date, WNI has been unable to obtain fee ownership or restrictive covenants for the 3% of the long term control area that comprises "Red Mule." Instead, WNI has proposed as an institutional control for the Red Mule area, the inclusion of a notation in the public land records indicating that groundwater in the area may be impacted by site-derived byproduct material.<sup>16</sup> In addition, WNI has proposed to make available an alternate water supply for domestic consumption in the Red Mule area, should site-derived hazardous constituents in groundwater reach unacceptable levels. As discussed below, this combination of institutional and engineered controls, in conjunction with the mandated long term government custodian, provides adequate assurance of protection of human health and the environment in the Red Mule area.

As a threshold matter, it is important to recognize that in evaluating the effectiveness of long term controls to protect against exposure to 11e.(2) byproduct material from the disposal of uranium mill tailings, the standard to be applied is one of *reasonable assurance*. Thus, NRC's regulations provide that designs for the disposal of byproduct material at uranium mill tailings facilities must provide "*reasonable assurance* of control of radiological hazards" for 1000 years to the extent practicable and, in any case, for at least 200 years.<sup>17</sup> Similarly, with respect to groundwater protection at mill tailings facilities, the Commission's regulations provide that the effectiveness of a groundwater corrective action program should be evaluated on the basis of whether available data "provide *reasonable assurance* that the [relevant] ground-water protection standard will not be exceeded."<sup>18</sup> Absolute certainty is not required. Moreover, in the context of decontamination and decommissioning (D&D), NRC has clearly indicated that institutional controls will be deemed

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<sup>16</sup> Notating land records, such as WNI has proposed, is one of several types of institutional control mechanisms that were specifically discussed by NRC in the development of its Decontamination and Decommissioning Rule (62 Fed. Reg. 39058 (1997)), where the Commission formally embraced the concept of releasing sites for restricted use, based upon the use of institutional controls. See Draft NUREG-1496 at vol. I, p.7-17 and vol. II, p. F-20.

<sup>17</sup> 10 C.F.R. Part 40, Appendix A, Criterion 6 (emphasis added).

<sup>18</sup> 10 C.F.R. Part 40, Appendix A, Criterion 5D (emphasis added).

adequate if they provide *reasonable assurance* that exposures will not occur above protective limits. Thus, NRC's D&D regulations provide that a site will be found acceptable for license termination under restricted conditions if, *inter alia*,

The licensee has made provisions for legally enforceable institutional controls that provide *reasonable assurance* that [the relevant dose criteria will not be exceeded].<sup>19</sup>

This focus on reasonable assurance is consistent with the broader position articulated by NRC that the effectiveness of long term controls with respect to long-lived radionuclides cannot be assured with absolute certainty, but instead can be demonstrated only with *reasonable certainty*. For example, the Commission has taken the position that its procedure for evaluating the adequacy of low level radioactive waste disposal plans:

cannot be used to demonstrate *unequivocally* that a site will be safe; rather it is a technique for examining factors that may affect site safety and providing a basis to assess whether *reasonable assurance* exists that a site will meet performance objectives.<sup>20</sup>

Similarly, with respect to the design of uranium mill tailings disposal facilities, NRC has explained that:

The very long-term performance of tailings isolation (that is several thousand years into the future and beyond) will be governed by climatic and geologic factors which cannot be predicted precisely . . . . The pertinent question is "What siting and design factors should be considered

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<sup>19</sup> 10 C.F.R. § 20.1403. It should be noted that in the preamble to the Federal Register notice setting forth the final D&D rule, NRC explains that where large quantities of long lived radionuclides (e.g., uranium or thorium) are concerned, "[m]ore stringent institutional controls will be required . . . such as legally enforceable deed restrictions and/or controls backed up by State and local government control or ownership, engineered barriers, and federal ownership, as appropriate." 62 Fed. Reg. 39058, 39070. Three aspects of this statement should be highlighted. First, since the D&D rule does not apply to uranium mill tailings facilities, there is no presumption built into the rule that a long term government custodian will monitor and oversee the decommissioned site. By comparison, for uranium mill tailings facilities such as WNI's, the statute *requires*, at least presumptively, that upon license termination, land used for the disposal of byproduct material will be monitored and overseen by a long term government custodian. Second, as we discuss in more detail later, in the case of the Red Mule area, WNI has proposed institutional *and* engineering controls *backed-up* by the oversight of a long term government custodian. In other words, WNI has proposed a "more stringent" kind of institutional control, as contemplated under the D&D rule. Finally, consistent with the notion of "reasonable assurance" NRC specifically states that "[r]equiring absolute proof that such controls would endure over long periods of time would be difficult, and the Commission does not intend to require this of licensees." *Id.*

<sup>20</sup> Evaluation of a Performance Assessment Methodology for Low Level Radioactive Waste Disposal Facilities, NUREG/CR-5927 (1993) vol.1, p. 5.



or taken into account in order to provide *reasonable assurance* of long term isolation of tailings. ”

In addition, with respect to ACLs in particular, NRC has taken the position that an applicant for an ACL must be able to demonstrate with *reasonable assurance* that the proposed ACL will not pose a significant threat to human health and the environment. Specifically, the ACL Guidance provides that for purposes of evaluating the potential for human exposure to site-derived hazardous constituents, “a technical basis would still be needed to provide a *reasonable assurance* that the proposed ACLs do not pose a health hazard to human health or the environment.”<sup>22</sup>

Thus, in evaluating the adequacy of the institutional and engineering controls that have been proposed for the Red Mule area, the relevant inquiry is whether those controls provide *reasonable assurance* that exposure to site-derived hazardous constituents above protective limits will not occur. As set forth more fully in the Site Closure Plan and in WNI’s submission of January 17, 2000, the controls that have been proposed by WNI for Red Mule do provide such reasonable assurance. Specifically, notations in the public land records will put all landowners on notice that groundwater in Red Mule may be affected by site-derived constituents. Moreover, in accordance with NRC’s regulations at 10 C.F.R. Part 40, Appendix A, Criterion 10, upon site closure, the long term custodian will be charged with monitoring the site, including site-derived hazardous groundwater constituents in the area of Red Mule. If the long term custodian detects concentrations of hazardous constituents that exceed protective levels, the custodian will be able to provide any residents in the potentially effected area with relevant information regarding any potential hazard (in addition to the warning provided by the notations in the public land records) and the custodian will be in a position to activate the alternative water supply provided for under WNI’s Site Closure Plan.

Thus, the combination of controls that has been proposed by WNI for Red Mule, namely (i) land record notations, (ii) an alternate water supply, and (iii) active oversight by the long term custodian, provides *reasonable assurance* that exposure to hazardous site-derived groundwater constituents will not occur in Red Mule. This reasonable assurance is augmented by the multiple conservative factors that have been built into WNI’s assessment of the potential risks to residents in Red Mule from site-derived groundwater constituents.<sup>23</sup> As that risk assessment demonstrates, the likelihood of site-derived constituents reaching Red Mule in concentrations that pose a risk to health is insignificant, even without taking into consideration the institutional and engineering controls discussed above. Those controls, which effectively eliminate the human exposure pathway, coupled with the low probability and relative insignificance of any potential incremental risk to public health that might result from exposure to site-derived constituents at Red Mule, provide an adequate basis upon which to approve WNI’s Site Closure Plan.

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<sup>21</sup> Final Generic Environmental Impact Statement on Uranium Milling, NUREG-0706 (1980), vol. II, p. 12-30 (emphasis added).

<sup>22</sup> ACL Guidance at 25.

<sup>23</sup> Shepherd Miller, Inc., *Supplement to October 29, 1999 Split Rock Site Closure Report* (January 14, 2000) at 2-4; 7-10.

