



STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
LANSING

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June 27, 2002

Mr. Sam Nalluswami, PhD, P.E.
Decommissioning Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop T7F27
Washington, DC 20555-0001

Re: Comments on the NRC-Generated "Report of the Meeting to Discuss Dose Modeling Scenario(s) in Connection With the Preparation of the Decommissioning Plan for the Michigan Department of Natural Resources Site, Bay County, MI"

Dear Mr. Nalluswami,

In response to the above-captioned meeting report (hereafter "Report") produced by the U.S. Nuclear Regulatory Commission (NRC) to document the content of the meeting held on April 9, 2002, the Michigan Department of Natural Resources (MDNR) offers the following comments.

Generally, the MDNR understood the Report to be an account of the presentation made by MDNR at the meeting and the intervening discussion. However, a number of editorial statements are made in the Report covering subjects that were not explicitly discussed at the meeting. In a few instances the Report does accurately document the proceedings of the meeting. In other instances, the materials are not presented to reflect what transpired. However, some of the extra-curricular comments do provide the MDNR, as the licensee, with NRC staff input and comment on those topics.

MDNR's specific comments on the Report follow:

Page 1, DISCUSSION, Land Use Scenario: The NRC seems to suggest that the site-specific scenarios presented for consideration are not normal since they are not consistent with a default scenario used in the derivation of screening level soil concentrations. The resident subsistence farmer scenario is postulated by the NRC, as a worst-case scenario for generic use at any site, without consideration of the site-specific conditions unique to that particular site, and represents a more radical departure from normal (the word normal used here to depict likely or expected conditions) than any scenario postulated by MDNR. The wording seems to imply that any scenario other than the subsistence farmer scenario used to derive generic screening level concentrations is abnormal. It also suggests that the NRC regards the use of default assumptions as somehow more adequate (or at least preferable to) the use of site-specific scenarios using realistic site-specific exposure assumptions in the development of Derived Concentration

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Guideline Levels (DCGLs). This is in clear contrast with current NRC guidance that favors the use of site-specific data (where they are available and cost effective in the overall license termination process) and exposure assumptions that are reflective of realistic potential future land uses in the locality of the site (DG-4006, NUREG-1549, NUREG-1727). The meeting Report further impugns the recreational land use scenarios proposed by MDNR, by stating that this scenario will yield a radiological dose only if the clay cap is violated or penetrated. While this is essentially true, it must be noted that no scenario, other than one that would completely remove the cap, would result in significant dose. The cap is the only portion of land in the near vicinity that is not saturated. Removal of the cap would result in the site's ground surface returning to the saturated conditions that are found immediately adjacent to the capped area. It is unreasonable to presume that any future use of the site would purposely compromise the cover over the entire footprint of the disposal area, as is implied with some of the NRC-proposed scenarios (e.g. residential subsistence farmer).

The NRC Report states: "the licensee needs to address the integrity of the slurry wall. Will it be maintained in good condition during a 1000-year period?" Relative to the concentrations of the radionuclides, the existence and integrity of the slurry wall does not impact the fate and transport of the radionuclides. In fact, the site conceptual model proposed by the MDNR does not rely on the existence of the slurry wall.

The NRC Report states: "the licensee should also address reasonable land use scenarios during a 1000-year period." MDNR agrees that caution must be exercised in the selection of values for parameters used to assess the potential future dose to receptors exposed at the site. Such caution is warranted in light of the long-lived nature of the contaminants of concern, and the need to demonstrate protectiveness of the selected remedy for 1000 years into the future. The 1000-year outlook criterion does not, however, infer that one must envision potential future land use scenarios for the next 1000 years as indicated in the Report. In fact, current NRC and relevant EPA guidance concerning radiological risk assessment acknowledge the serious limitations related to predicting land uses far into the future (FR Vol. 62, No. 139, 7/21/97 and Vol. 48, No. 3, January 5, 1983). Realistically, no one can say with certainty what land uses will likely be as few as 100 years into the future. An examination of land uses 100 years ago as compared to today will provide testimony to this reality. For example, most major U.S. cities didn't exist more than 200 years ago.

There are several examples of Federal guidance which embody this key principle as it applies to radiological risk-assessment. Consider the language from EPA's 1996 proposed Radiation Site Cleanup Regulation [40 CFR 196.23(c)]. It explained that, to ensure compliance with the proposed annual radiation dose limit, the implementing agency should not assume catastrophic events, but rather should "...assume that the current physical characteristics (i.e., important surface features, soils, geology, hydrogeology, meteorology, and ecology) will exist at the site for the next 1,000 years...".

NRC guidance also addresses future land use assumptions. "Site-specific scenarios to calculate doses from residual radioactivity in soil should describe the reasonable land uses and human activities for the future following license termination. It is reasonable to assume that current land uses in the area will continue for the period of the dose assessment (1,000 years)" (DG-4006). The NRC regulations regarding the 1000-year outlook criteria speak to the need to select a remedy (and the related DCGL) that will be protective of annual radiation dose to future receptors (for 1000 years), in consideration of fate and transport of the radionuclides under evaluation (FR Vol. 62, No. 139, 7/21/97). It is the remedy that must meet the longevity criteria, not the assumptions of future land use or other parameters used to quantify the fate and transport of the radionuclides. Protection should be based on current land uses and future ones that are reasonable based on historic trends or anticipated demographics for the local region.

Current land uses are limited due to the physical characteristics of the area. The site is located in the Tobico March State Game Area. This area essentially consists of freshwater wetlands and marshes. Based on site hydrology, MDEQ has determined that this site is underlain by "groundwater not in an aquifer". The potential for groundwater to be used as potable drinking water is not credible. The National Cooperative Soil Survey (United States Department of Agriculture and Michigan Agricultural Experiment Station) has designated the soil surrounding the site as "Belleville loamy sand, ponded". As defined, "It has fair potential for the development of habitat for wetland wildlife. It has poor potential for other uses unless it is artificially drained and dikes are constructed, but dikes and drainage generally are not economically feasible or practical." The lack of economic growth would definitely make dikes and drainage unfeasible and impractical. In addition to the physical conditions of the site, there are multiple layers of governmental regulations that would assist in protecting potential future receptors from modeled hypothetical annual radiation dose.

Page 2, NRC Staff Issues, First Paragraph: At the end of the first paragraph, the NRC indicates that the Tobico Marsh State Game Area Site is "designated as a toxic chemical landfill owned by the MDNR and regulated by the Michigan Department of Environmental Quality (MDEQ) since the 1980's. The site was listed as a Michigan Superfund Site No. 09000015 (US EPA #MIE 000605956)." It should be noted that this topic was not discussed at the April 9, 2002 meeting. In addition, portions of this statement are inaccurate and outdated.

The MDNR verified with the MDEQ, that the site is not a Michigan Superfund Site. In fact, the MDEQ does not have any record of the Michigan Superfund Site Number referenced by the NRC. The US EPA number that the NRC referenced is presumably MID 000605956 and is an inactive EPA ID number for the entire Hartley & Hartley landfill. The current, but inactive, EPA ID number for the MDNR owned site is MIR 000006676. It should be noted that just because a site has an EPA ID number does not inherently mean that the associated waste disposal activities were conducted in an improper manner.

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As for the site's Superfund status, the entire Hartley & Hartley landfill was originally identified by the EPA in 1979. Based on the EPA's preliminary assessment and site inspection, the site was removed and archived from the EPA's inventory of Superfund sites in 1983. The fact that the site has been archived indicates that the EPA has completed its assessment of the site, and has determined that no further steps will be taken to list the site on the National Priorities List. As a result, it is incorrect to indicate that this site is a Superfund site. In addition, the term "toxic chemical landfill" is archaic and no longer in use.

The correct designation of the site is that it is a "facility", as defined in Part 201 of Michigan's Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451. A "facility" is defined as any area, place, or property where a hazardous substance exists in excess of the cleanup criteria for unrestricted residential use or the protection of the public health, safety, and welfare, and the environment. This includes, but is not limited to, the protection of surface water quality and consideration of ecological risks.

Page 2, NRC Staff Issues, Second and Third Paragraphs: It appears from the wording in these paragraphs that the NRC does not fully understand the MDNR position and statements regarding the presence of hazardous materials at the site. The MDNR understands that any action or non-action (remedy) approved by the NRC must take into account the impacts to worker health and environmental damage from both hazardous and non-hazardous materials. The point to be stressed is that the NRC, as we understand it, only has authority to regulate the residual radioactivity. It is in the course of their exercise of authority over these radioactive materials that collateral concerns for impact to human health and the environment become relevant to the decommissioning plan. For example, if future site work called for further invasive sampling of subsurface soils to assess their radioactive content or makeup, a sampling plan approved by the NRC would necessarily require detail as to measures adequate to protect the health of workers and to preclude undue environmental harm. If a no-action remedy is justified in managing the future risks associated with residual radioactive materials at the site, the NRC would have no jurisdiction or responsibility for regulating non-radioactive materials that might be collocated at the site.

In the third paragraph, the NRC asserts that the MDNR site contains "mixed wastes." As we have recounted on many occasions in the past (including this April 9, 2002 meeting) there is no indication that the materials present in the MDNR Site are classified as hazardous wastes under RCRA as specified in 40 CFR Part 261. In order for a site's materials to be classified as "mixed wastes", a portion of the non-radiological wastes must be (by definition), RCRA hazardous wastes. Since the materials at the MDNR site are not RCRA hazardous wastes, they cannot be classified as mixed wastes. We would appreciate the NRC acknowledging this definitional difference and refrain from reiterating this erroneous statement in the future.

Page 3, Radiological Survey and Characterization Issues, Second Paragraph: One NRC staff member continues to mention that Geoprobe® sampling performed by MDNR at the site "may have created conduits for contamination to spread." Prior to commencing the work, MDNR reviewed the work plan with the NRC, and the one NRC staff member voiced opposition at that time, but did not offer a viable alternative to this sampling method. Other NRC staff members consented to proceeding with the work as planned. At subsequent meetings with the NRC, the MDNR has had to re-address and refute the NRC staff member's opinion. Unless NRC has evidence to prove that drums were buried intact, and have survived intact more than 30 years in the landfill; and if released, the contents would increase chemical concentrations in the landfill leachate, we would like to call a truce on this as a non-issue. MDNR would like to request that the NRC refrain from reiterating this unsubstantiated claim. For the record, this is not an issue with the Michigan Department of Environmental Quality (MDEQ)—the agency overseeing the chemical issues at the site.

NRC Staff questioned whether contamination was leaching out of the waste layer and whether MDNR had any data to substantiate their opinion. MDNR's response was not that "it is unknown whether any material or contaminants were leaching out" in the general sense, but that the specific measurements queried by the NRC Staff have not been made. It was offered to the NRC staff, that past verifiable measurements of near surface groundwater in the immediate vicinity of the disposal cell do not suggest that thorium-based materials are present. This could mean that either the thorium is not leaching from the waste layer, or that leachate is not migrating horizontally across the cell walls and impacting the surrounding environs. MDNR plans to collect additional data to assess whether radioactive constituents are leaching from the waste layer.

Page 3, Groundwater and Pathway Related Issues, Second Bullet: The gross beta activity measurements commented on here are samples from the near surface groundwater at the site. This groundwater has been determined by the State's hydrogeologist to be "groundwater not in an aquifer", as was reported at the meeting. As such, there is no credible potential for this water to be used as potable drinking water, negating the applicability of the cited EPA drinking water standard. Additionally, it should be noted that dispute over the logic of a pathway-specific limit (such as the EPA's drinking water MCL) was the principle point of contention leading to the abolition of the proposed national radiation site clean-up standard (40 CFR 196) and the publication of the current NRC decommissioning standards. The NRC standards state that the criterion for release of a site with residual radioactivity is 25 mrem/y from all pathways, without regard to the contribution from any single pathway (FR Vol. 62, No. 139, 7/21/97). MDNR agrees that 200 pCi/L gross beta activity data point is higher than would be expected in typical groundwater and plans to resolve the source of the reported readings.

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Page 3, Groundwater and Pathway Related Issues, Third Bullet: With regard to the longevity of local, State, and Federal restrictions on the potential future land uses at the MDNR site, the NRC staff seem to assert that the MDNR is relying upon such restrictions to limit the future uses of the land and thereby assure protectiveness. MDNR has made no such claim. On the contrary, MDNR presented an entire suite of logical arguments describing conditions that would seriously impede the future development of the site for other than recreational (or comparable) uses. We presented arguments based upon current and trending demographics, agricultural land uses in the near vicinity, the suitability of the site's land relative to readily available surrounding land, the soil type present, the supersaturated marsh conditions prevailing in the area, the lack of infrastructure required to support substantial development, and the existing institutionally-based impediments to future development. Our presentation to the NRC staff directly addressed and acknowledged that no one factor, in and of itself, serves as sufficient cause to dismiss a scenario that would require development to be realized. Nevertheless, the overwhelming set of circumstances present at this site (physical, socio-economic, and administrative), including the remarkable number of institutional restrictions imposed by multiple layers of governmental bodies, leave one with little choice but to rule out scenarios involving land development as prohibitively unlikely, and thus unreasonable for consideration in development of the site-specific DCGL. MDNR believes that even in the absence of any discrete restriction imposed by a governmental body, the future land use would still not be likely to change given the current and foreseeable physical conditions existing in and around the site.

Page 4, Groundwater and Pathway Related Issues, Sixth Bullet: MDNR's consultant contacted the developers of the RESRAD modeling code (Argonne National Laboratory) to discuss potential problems associated with the use of the codes' probabilistic module in a "back calculation" manner to arrive at the appropriate DCGL for the site. According to the model developer, a problem might exist in a circumstance involving multiple radionuclides in which the isotopic ratios between those radionuclides is not known and varies across the site, and where the dose is modeled with individual isotopes (with the intent of applying the sum of the fractions rule to individual sample locations/measurements to determine compliance with the DCGL). In such a case, it is possible that one isotope is more potent as a dose producer than another in a given pathway, such that a simple linear relationship between concentration and resulting dose is not present. However, MDNR did not propose the derivation of single-isotope DCGLs upon which the sum of fractions rule would then be applied. At both the April 9, 2002 and the December 14, 2001 meetings, MDNR proposed the use of a multi-nuclide source term derived from isotopic analyses of the residual radioactivity in the disposal cell to model the dose. While there is some variability in the relative concentrations of Th-230 and Th-232, their daughters are in transient equilibrium. To accommodate the uncertainty in the 230:232 ratio, MDNR has consistently proposed the assignment of a conservative ratio when defining the source term used in the RESRAD modeling.

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Given these conditions, it seems appropriate and logically consistent to use the probabilistic module to derive the DCGLs on the front end and to demonstrate compliance by calculating dose on the back end. If this does not adequately address the general concern raised by the NRC at the April 9, 2002 meeting, the MDNR requests that the NRC provide a detailed written description of their concern regarding the use of probabilistic modeling to derive DCGLs, so that the MDNR can address the NRC's concerns.

Page 4, ACTION ITEMS:

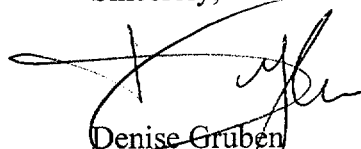
- #1. MDNR has no recollection or notes indicating that an additional characterization report would be submitted along with submittal of the DCGLs.
- #2. There was no discussion or commitment to action on the part of the MDNR relative to the EPA's drinking water MCLs. We believe that the issue is sufficiently addressed in this letter in a previous section.
- #3. MDNR did not request that the NRC provide its position with respect to accepting State, Federal, or local government restrictions on land use as a limiting factor for potential scenarios as is indicated. Rather, the MDNR asked the NRC to consider the entire body of evidence presented by the MDNR and provide feedback on whether the NRC staff were inclined to agree with the State of Michigan that the reasonable potential future uses at this site consist of recreational uses, such as those proposed, and that it is unlikely that future uses beyond these might be realized. Again, our position is that the recreational use scenario does not rely on the longevity of any one institutional control or restriction, but rather is bolstered by a suite of in-place, multi-agency impediments and physical site characteristics—both of which are impediments to future development.
- #4. MDNR has no recollection or notes on issues concerning the neighboring site. However, it is the responsibility of the owner of the chemical wastes at both sites to maintain the clay cap and protective fencing.

At this juncture, the MDNR is eagerly awaiting the NRC's promised feedback on our scenario proposals. On June 4, 2002, you indicated to me that you were still developing a response with other team members. We understand that this takes time and we encourage careful consideration of the materials presented. However, our August deadline for submission of the Decommissioning Plan draws near, and I will be requesting a date extension for the submittal, based on a scaled timeframe from receipt of NRC's feedback.

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Please consider this a formal request to have this letter included with the other publicly available documents related to Docket Number 40-9015, License Number SUC-1581.

Sincerely,

A handwritten signature in black ink, appearing to read "Denise Gruben", written over a circular stamp or seal.

Denise Gruben
Program Manager
Office of Property Management
517-335-4036

cc: Tim Bertram, MDEQ
Bob Skowronek, MDEQ
Claudia Craig, NRC
Ed Kulzer, NRC
Phil Mazor, WMI
Rick Dunkin, HESE
Kelli Sobel, MDNR
Lois Hinkle-Klender, MDNR