

## **Discussion of Revised Breckenridge DCGLs in Regard to EPA MOU**

**February 22, 2011**

On February 6, 2009, Region III requested that the Office of Federal and State Materials and Environmental Management review and formally approve proposed Derived Concentration Guideline Limits (DCGLs) for residual radioactivity in the surface and subsurface at the Breckenridge Disposal Site, St. Louis, Michigan. The DCGLs, which had been previously proposed by the decommissioning contractor ENVIRON, appeared to have been tacitly approved based on a October 26, 2006, letter to ENVIRON where Region III stated "we acknowledge that ENVIRON's plan will be used to further characterize the former Disposal Site, and dose modeling will be used to project public dose after the residual contamination has been remediated." However, the DCGLs had never been explicitly approved by the NRC. Because the Region III technical staff was not familiar with the use of a combination of surface and subsurface DCGLs, the Region believed it was appropriate for the Division of Waste Management Program technical staff to review and formally approve the proposed DCGLs.

The Division of Waste Management and Environmental Protection (DWMEP) DWM responded to the February 6 technical assistance request by letter dated February 23, 2009, stating that their staff had reviewed the proposed DCGLs for both surface and subsurface cleanup and found them acceptable technically. However, DWMEP staff noted that the proposed subsurface soil cleanup values for thorium-232 (Th-232) and radium-226 (Ra-226) triggered the need for a Level 1 consultation with the U.S. Environmental Protection Agency (EPA).

By letter dated March 23, 2009, the NRC notified EPA that the Breckenridge site had triggered a NRC consultation with EPA in accordance with the 2002 Memorandum of Understanding (MOU) entitled: "Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites" (OSWER No. 9295.8-06, signed by EPA on September 6, 2002, and NRC on October 9, 2002). The March 23 letter constituted a Level 1 consultation as specified in the MOU because the consultation involved proposed DCGLs for certain radionuclides in the Supplemental Site Characterization Report (SSCR) which exceed soil concentration values in Table I of the MOU for residential use.

By letter dated June 12, 2009, the EPA responded to the NRC's request, stating that it was EPA's view that, "if NRC is unable to meet the 5 pCi/g Table I value for thorium-232 and radium-226, NRC should consider the use of supplemental standards. The use of supplemental standards would not alter NRC's obligation to possibly trigger a future Level 2 consultation, if Table I soil values were found to be exceeded after the Final Status Survey (FSS)."

In a July 14, 2009 letter responding to the EPA, the NRC thanked the EPA for their response stating that the NRC staff concluded that the proposed DCGLs were consistent with Title 10 of the Code of Federal Regulations (CFR), Part 20, Subpart E. Specifically, the Breckenridge Custodial Trust proposed to decontaminate the site to meet the requirements in 10 CFR Part 20.1402 for unrestricted use, using site-specific DCGLs based on the resident farmer scenario. As such, the doses to the average member of the critical group at the Breckenridge site complied with NRC's criteria in Part 20, Subpart E, which stipulates an all pathways dose criteria of 0.25 millisieverts per year (25 millirem per year) and that doses be as low as is reasonably achievable. Thus, the EPA's June 12, 2009, recommendation involving the use of supplemental standards would not be adopted. The letter also stated that following site remediation activities, NRC staff would review the information in the Final Status Survey (FSS)

reports and compare the levels of residual radioactivity against the MOU trigger levels. If the FSS measurements exceeded the trigger levels in the MOU, the NRC would contact the EPA pursuant to the MOU, and provide additional information on residual concentrations and land use to facilitate EPA offering its views on the decommissioning of this site.

During August 2010, NRC Region III decommissioning staff conducted confirmatory surveys at the Breckenridge Disposal site. As a result of those surveys, elevated levels of thorium-230 (Th-230) were identified in the contaminated soil. Because Th-230 had not been previously identified as a concern there was no site-specific DCGL for its remediation. To address the Th-230, the decommissioning contractor (EnergySolutions) needed to revise the site-specific DCGLs for the Breckenridge site to incorporate a site-specific DCGL for Th-230. However the models that were used in 2006 to derive the existing DCGLs were inflexible in their ability to demonstrate compliance to the total effective dose equivalent (TEDE) limit of 25 millirem per year (mrem/yr). Therefore the DCGLs needed to be re-evaluated using a more current version of the RESRAD model that independently determined the DCGLs for each radionuclide or decay chain corresponding to 25 mrem/yr. The re-evaluation of the DCGLs was conducted and subsequently documented by EnergySolutions in, "Re-Evaluation of Breckenridge DCGLs, Gamma Scan Sensitivity, and Gamma Scan Action Levels and Development of Area Factors", CS-313111-001, Revision 1. All the same input parameters used in the determination of the previous DCGLs were used in the derivation of the re-evaluated DCGLs. Unlike the previous DCGLs, these re-evaluated DCGLs would be used with the unity (sum of fractions) rule to demonstrate release of the site. The NRC Region III decommissioning staff have reviewed the re-evaluated DCGLs and determined that they are acceptable. The revised DCGLs and the pertinent EPA MOU trigger value are listed below.

#### Breckenridge Re-Evaluated DCGLs

Radionuclide	DCGL (pCi/g)		EPA MOU Value (pCi/g)
	Surface	Subsurface	
Th-232+C	5.0	65.9	5
U-238+D	442.4	8,658	74
U-234	2,729	6,113	401
Th-230	276.9	97.9	n/a
Ra-226+C	6.2	51.2	5

For the previously approved DCGLs, only the subsurface soil cleanup values for Th-232 and Ra-226 had triggered the need for a Level 1 consultation with the EPA. While Th-230 is not applicable (n/a) in that it is not included in the EPA MOU, as can be seen in the above list most of the other isotopes now exceed the EPA MOU values for both the surface and subsurface DCGLs.

Due to these additional DCGLs exceeding the EPA MOU trigger level, the question was raised as to whether an additional Level 1 consultation was warranted with the EPA. The answer is probably not.

Because a Level 1 consultation has already been conducted with EPA, an additional consultation at this time would only perform the administrative role of informing the EPA that there were additional isotopes that exceeded the MOU values. However, no other action would potentially be required until the completion of the decommissioning project, the same as it is now. At that time a Level 2 consultation may be necessary, as previously stated in the NRC's July 14, 2009 letter to EPA. The reason for a Level 2 consultation is to notify the EPA that

based on the FSSs, a site contains contamination in excess of the EPA MOU trigger values. To make that determination the NRC compares a remediated site's as-left radionuclide concentration levels, averaged over each individual survey unit, with the EPA MOU trigger values. For the Breckenridge Disposal site, these values won't be known until the FSS Reports (FSSR) are proved by EnergySolutions at the end of the decommissioning project.

The Breckenridge site is divided into three survey units, Survey Units 1, 2 and 3. A draft of the FSSR for Survey Unit 3 has been provided to the NRC. Based on a review of that data, none of the average concentrations for any of the isotopes exceed the EPA MOU trigger levels for Survey Unit 3. At the conclusion of the project, if none of the average concentrations from any of the isotopes exceed the EPA MOU trigger levels for any of the Survey Units, no Level 2 consultation would be required. At that time the NRC can make the decision whether to inform the EPA that Th-230 had been identified during the remediation of the site, and that new DCGLs had been derived that exceeded the MOU levels, but the as-left conditions were all below the MOU levels. Conversely, if any of the as-left conditions exceed the EPA MOU trigger levels, a Level 2 consultation would be necessary and the EPA would subsequently be informed of the re-evaluated DCGLs at that time.

In summary, any follow-up Level 1 consultation with EPA at this point in time would only be administrative in nature, and would not impact any potential future actions by the NRC. As such, it does not appear any additional consultation is currently warranted.

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