January 22, 2008

Mr. Chris Korleski, Director
State of Ohio Environmental
Protection Agency
P.O. Box 1049
Columbus, OH 43216-4352

SUBJECT: NRC AND OEPA CONSULTATION REGARDING THE TERMINATION OF THE BATTELLE MEMORIAL INSTITUTE NRC LICENSE SNM-00007

Dear Director Korleski:

This letter is in response to your letter dated August 29, 2007, addressed to Mr. Patrick Louden, Chief, Decommissioning Branch, Region III, regarding the former Battelle Memorial Institute North Nuclear Sciences site, located in West Jefferson, Ohio. Your letter was sent to the NRC in response to a consultation that the NRC engaged in with the U.S. Environmental Protection Agency (USEPA). The USEPA advised the NRC to consult with your office regarding the ground water use determinations for the Battelle West Jefferson site.

To that end, NRC and Ohio EPA (OEPA) staff and management met on several occasions from June to November 2007 discussing questions, concerns, and the recommendations that your staff had regarding the Battelle site and the planned termination of the site's NRC license. Your August 29, 2007, letter outlined four recommendations regarding various aspects of Battelle's decommissioning activities, and requested that the NRC consider the OEPA's recommendations prior to holding a public meeting regarding the NRC's intent to terminate Battelle's license. Regarding the four specific recommendations outlined in your August letter, we address your recommendations as follows:

[Recommendation #1 regarding ground water and surface contamination data using the 95 percent upper confidence level of the mean as a source term for dose modeling]

My staff reviewed the Battelle site dose modeling information and concluded that the evaluation was a conservative assessment. Our conclusion was based on the fact that all Battelle soil sample results used in the dose model met two criteria, first the samples were analyzed in the laboratory at 95 percent confidence level per Battelle's decommissioning requirements, and second that Battelle used the maximum soil average by grid result per assessed area rather than averaging over the entire site, which represented a substantial conservatism.

[Recommendation #2 regarding considering the Bog Area a source of contamination and risk to be factored into the dose assessment model]

During the September 25, 2007, meeting, the NRC's hydrogeologist discussed the technical evaluation, using USEPA guidelines, performed to determine sustainable yield analysis of the water-bearing unit referred to as the Bog Area at Battelle's West Jefferson Facility. The analysis indicates that the water-bearing unit associated with Well 168 and nearby Wells 150, 155, and 172 would not have the capacity to sustain a household well, nor the ability to communicate with

other water supplies, and as such would not impact the drinking water supply. Furthermore, the dose consequence of strontium 90 in water was considered in Battelle's Site-Wide Dose Assessment, pages 13-15. Since the strontium-90 concentration evaluated in the Site-Wide Dose Model was 22 pico-curies/litre (pC/l), and the highest value measured in a well sample from the Bog Area was 29 pCi/l, the licensee performed an evaluation of the impact of drinking water at the higher strontium-90 level. The resultant dose was not substantially different from the first assessment, specifically, 2.433 versus 3.208 millirem per year (mrem/yr) all path ways. This value is still below the unrestricted use criteria of 25 mrem/yr.

[Recommendation #3 regarding assessing leaching potential and observed inconsistencies in sample results for lower water bearing units]

The NRC requested Battelle to compile a comprehensive assessment report regarding the ground water analyses collected at the West Jefferson Site between 1998 and 2006. The purpose of this assessment was to address OEPA questions identified during your staff's review of past Site Environmental Reports. These reports listed data which could be inferred that some sample results were either in excess of the USEPA's Maximum Concentration Limits or radio nuclides were present in the samples. The assessment report identified each anomalous result, and provided clarification about the validity of each result. The Battelle assessment did not change the NRC's finding, that the site's potable ground waters are not impacted by Battelle's past use of licensed materials. It should be noted that the NRC's confidence in this position is based in part, on Battelle's QA/QC program and NRC inspection oversight during the Battelle's decommissioning, as well as the use of Oak Ridge Associated Universities for independent verification of radiological sampling and surveys. Specifically, Battelle's Radioanalytical Laboratory, which was located at the West Jefferson North site, was accredited by the National Environmental Laboratory Accreditation Conference (NELAC) during its operational period. Additionally, Battelle's Radioanalytical Laboratory also participated in the US DOE Environmental Measurements Laboratory (EML) Quality Assurance Program (QAP) including the proficiency test sample program. The Laboratory maintained a high efficiency rate of performance with the test sample program over a number of years while operational. During the November 27, 2007, meeting between OEPA management and Mr. Patrick Louden, of Region III, Mr. Louden provided copies of the Battelle reports, and discussed Battelle's review of these ground water analyses.

[Recommendation #4 regarding other potential users, and whether or not the dose modeling considered the most sensitive receptor]

During the September 25, 2007, meeting OEPA and NRC staff discussed in detail the West Jefferson Site hydrogeology. The NRC's hydrogeologist provided an overview of the NRC's technical review of the site geology, and the basis for the NRC's conclusion, that existing conditions at the site pose no threat to the site's ground waters. Copies of the NRC technical review were provided to your staff during the meeting. Also, during the meeting your staff expressed their belief that the West Jefferson Site aquifers' leaching potentials are not consistent with reported radionuclide detections in lower water bearing units, and recommended that the dose assessment model use the most appropriate hydrologic settings and transport input parameters.

Battelle performed a further assessment of the West Jefferson Site in response to these concerns. Battelle's assessment indicates that there may be a water-bearing unit (855 layer) which may be laterally continuous, extending from beneath the area that was formerly occupied by site buildings to Big Darby Creek; thus, providing a potential conduit for ground water to flow from beneath the site to the creek. However, the amount of ground water that infiltrates through the upper glacial overburden and reaches the middle water-bearing unit (855 layer), where it may move laterally, has not been quantified.

Based upon this new assessment, Battelle elected to perform additional dose modeling to evaluate the potential impact of site-generated radionuclides in this middle water-bearing unit (855 layer) on the site dose. Battelle provided to the NRC a revised dose model, "West Jefferson North Site Dose Assessment, Revision 1, December 2007." The revised RESRAD computer model dose assessment was based on a resident farmer scenario, with all exposure pathways active, and used site specific soil and hydrogeological parameters and maximum radionuclide concentrations. The revised RESRAD computer model yielded a radiation dose of 9.6 mrem/yr, which is lower than the original dose assessment, due to the use of site specific instead of generic parameters for the revised modeling. Both dose assessment findings are below Title 10, Code of Federal Regulations, Part 20, 25 mrem/yr unrestricted use criteria. The licensee also noted that modeling of average soil concentrations reduced the radiation doses to about 1 mrem/yr.

Additionally, The OEPA staff indicated that dose modeling information for persons near the site, such as individuals who might swim in the stream along the Battelle site, or who might be engaged in other recreational activities should be available, even if the site-wide dose results are less than the NRC unrestricted release criteria. The OEPA staff believed this information would be useful when addressing inquiries from the public or special interest groups. The NRC and Battelle agreed with this sentiment, and performed additional dose assessments to address this issue. This information was provided to your staff during the November 27th meeting with Mr. Louden. The Battelle assessments, "Recreational and Contaminated Wound Scenarios" are attachments to the revised Site-wide Dose Assessment. Battelle selected the Ken Jockety Girl Scout Camp as the most sensitive off-site receptor. This was done to provide a conservative estimate of the radiation dose from radioactive material that might be blown from the West Jefferson North Site and expose people at the Ken Jockety Girl Scout Camp. Specifically, the exposure assessment used model input values for the external exposure, soil ingestion exposure, and inhalation exposure, based on an individual standing on the West Jefferson North Site for one week. The assessments resulted in findings that the individual doses would be fractions of 1 mrem/yr, which is significantly below the NRC's license termination criteria of 25 mrem/yr. The NRC conducted dose modeling for similar types of scenarios and obtained similar results. With the offsite potential doses being so small, the NRC maintains that the original dose calculations using onsite dose pathways represented the most sensitive and most conservative dose receptor.

I want to thank you and your staff for their cooperation and the professional evaluations and input provided to the NRC. Based on the many meetings and questions and our answers, this completes our consultation activities pursuant to the initial USEPA consultation letter. We are currently planning to hold an informational public meeting on February 20, 2008, to discuss the Battelle license termination. If you have any further questions regarding this matter, please do not hesitate to contact me at (630) 829-9800 or Mr. Patrick Louden, at (630) 829-9627.

Sincerely,

***/RA/***

Steven A. Reynolds, Director
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