Dawn Mining Company Uranium Millsite

TECHNICAL EVALUATION REPORT

License Amendment Request to Extend Midnite Mine Sludge Disposal into Tailings Disposal Area 4 (TDA-4)

July 2011

INTRODUCTION

Dawn Mining Company (DMC) submitted an application for a radioactive materials license amendment on February 14, 2011, for their Ford, Washington uranium millsite. Following Washington State Department of Health's (DOH) completeness review of their February request, DMC submitted a revised license amendment request on July 5, 2011. The license amendment request is to extend authorization for disposing Midnite Mine water treatment plant (MMWTP) sludge (source material) into Tailings Disposal Area 4 (TDA-4) for as long as TDA-4 remains open for disposal. As stated in the application, current information regarding the length of time that TDA-4 will be available for disposal is that "TDA-4 will remain available for MMWTP solids disposal through at least 2013."[1]

The initial authorization for MMWTP sludge disposal was granted by the department in 2001, after detailed human health risk and environmental review (***Addendum to Environmental Documents***, June 2000). Authorization was granted after concurrence from the U.S. Nuclear Regulatory Commission (NRC), the U.S. Dept of Energy (DOE), and the Northwest Regional Low-Level Radioactive Waste Compact (NW Compact). In 2008 DMC applied for an extension, DOH reviewed the application (summarized in the ***Technical Evaluation Report*** dated January 2009) and, with concurrence from DOE, NRC and the NW Compact (letters attached), granted a two-year extension of MMWTP sludge disposal into TDA-4. The authorization for extension expired December 31, 2010.

DOH has evaluated DMC's license amendment request for further extension of MMWTP sludge disposal for compliance with NRC's *Final Revised Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11.e(2) Byproduct Material In Tailings Impoundments,* applicable state radiation protections laws and regulations, and the State Environmental Policy Act (SEPA). This evaluation is summarized below.

NRC FINAL GUIDANCE

The direct disposal of MMWTP sludge into TDA-4 is subject to the ten criteria found in the Nuclear Regulatory Commission's ***Final Revised Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11.e(2) Byproduct Material In Tailings Impoundments*** (September 22, 1995 Federal Register). After detailed review, DOH has determined that extending sludge

[1] DMC refers to MMWTP sludge as MMWTP solids in their application. The MMWTP solid material described in their 2011 application is the same material referred to as sludge in DMC's 2000 and 2009 applications.

disposal continues to meet the substantive criteria required by NRC guidance, and will not delay construction of the final cover.

STATE ENVIRONMENTAL POLICY ACT

The department's review of DMC's license amendment request also considers whether, under the State Environmental Policy Act (SEPA), changes to the approved proposal are substantial and/or involve new information indicating probable significant adverse environmental impacts not adequately evaluated in the existing environmental documents. As discussed below, the volume of sludge disposed into TDA-4 (from 2001 through 2010) is only about 39 percent of the volume of MMWTP sludge initially evaluated in the June 2000 SEPA Addendum, with only about 50 percent of the radioactivity projected for disposal. In addition, there are no substantial technical changes to the disposal plan. All of the potential adverse impacts for direct disposal of MMWTP sludge were adequately evaluated in the June 2000 SEPA Addendum and January 2009 SEPA review.

The following discussion provides additional information regarding the technical acceptability of extending MMWTP sludge disposal into TDA-4.

TDA-4 SLUDGE DISPOSAL PLAN

Volume

The June 2000 SEPA Addendum evaluated a total anticipated MMWTP sludge volume of 753,500 cubic feet for placement into TDA-4. From 2001 through 2010, approximately 294,000 cubic feet of MMWTP sludge have been disposed in TDA-4. The maximum additional sludge volume that would be disposed in TDA-4 (if MMWTP sludge is placed for three years through 2013 at 45,000 cubic feet per year) results in 135,000 cubic feet. The addition of three more years of MMWTP sludge would bring the total volume of MMWTP sludge disposed in TDA-4 to about 57% of the total volume initially analyzed and approved.

Geotechnical Stability

The MMWTP process removes all free-standing liquids from the sludge prior to transport offsite, and the sludge is placed in TDA-4 in lifts less than 3 feet deep. Following placement, the sludge is also exposed to air as much as practicable (allowing further drying and increasing solidification prior to covering), and the operational cover system utilizes soil and reinforced polyethylene (RPE) liners to minimize potential rehydration of the sludge from precipitation. These measures greatly reduce the potential for geotechnical instability resulting from consolidation. Further, the anticipated total volume of MMWTP sludge disposal (if approved to continue) is a small percentage of the total volume of fill to be placed in TDA-4 prior to constructing the final cover system. Therefore, consolidation of the MMWTP sludge disposal as a contribution to overall consolidation and settlement within TDA-4 is not significant, although settlement monitoring of TDA-4 will continue as an operational requirement.

Geochemistry

The MMWTP sludge is relatively insoluble and immobile oxyhydroxides from a lime neutralization water treatment plant. Table 1, in Section 3 of the application presents nine consecutive years of analytical results from Toxic Characteristic Leaching Procedure (TCLP) extraction procedures. In all cases no detectable constituents leached from the treatment plant

sludge. The geochemistry of the MMWTP sludge has not changed since DOH's previous reviews. Based on the geochemical characteristics of the sludge and operational controls that will be implemented, it is unlikely that the sludge will chemically alter and produce adverse impacts.

Radioactive Materials

In the June 2000 Addendum to other SEPA documents, the calculated total radioactivity values (uranium, radium, and thorium) for mill demolition debris, site soil cleanup, processed sludge, and direct disposal of unprocessed MMWTP sludge, totaled approximately 290 curies. In the year 2000, a volume of 753,500 cubic feet of sludge with an estimated radioactivity of 30 curies was approved for disposal in TDA-4. Approximately one third of that anticipated activity has actually been placed in TDA-4 between 2001 and 2010. If the three year extension is approved, the total radioactivity will be less than 50% of what was originally approved for MMWTP sludge disposal into TDA-4.

Transportation Logistics

Transportation of water treatment plant sludge into TDA-4 would not adversely affect other closure activities or jeopardize the safety of workers. The number of sludge shipments would be approximately one truck per day.

Water Management

Disposal of additional MMWTP sludge in TDA-4 would not affect water management plans. As discussed above, the sludge will be placed on existing or newly filled and stabilized areas and will not be in contact with standing water. Operational placement of the sludge in TDA-4 also utilizes soil berms, soil cover, and RPE liners to mitigate potential storm water impacts.

CONCLUSION

Dawn Mining Company's license amendment request, to extend direct disposal of Midnite Mine water treatment plant sludge into TDA-4, meets all applicable requirements. The request does not increase the volume or activity of the sludge from what was previously analyzed and approved in the 2000 Addendum. If the extension until 2013 is approved, the total maximum volume would be about 57% of what was originally approved and the total activity of MMWTP sludge disposed in TDA-4 will be less than 50% of the originally approved radioactivity. Furthermore, the extension of MMWTP sludge (source material) disposal into TDA-4 will not interfere with the timing of closure activities and construction of the final radon barrier. In addition, DMC's amendment request does not involve substantial changes or new information indicating probable significant adverse environmental impacts that have not already been adequately evaluated in existing environmental documents. Therefore, the department recommends approval of the license amendment request through 2013.