UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 30, 2022

MEMORANDUM TO: R. William von Till, Chief
Uranium Recovery and Materials
Decommissioning Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

FROM: Douglas T. Mandeville, Senior PM
Uranium Recovery and Materials
Decommissioning Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
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Signed by Mandeville, Douglas
on 06/30/22

SUBJECT: PUBLIC MEETING SUMMARY: MEETING WITH DISA TECHNOLOGIES, INC., REGARDING THE USE OF HIGH-PRESSURE SLURRY ABLATION TECHNOLOGY ON ROCK CONTAINING URANIUM

On May 23, 2022, the U.S. Nuclear Regulatory Commission (NRC) staff held a public meeting with representatives of Disa Technologies, Inc. (Disa). The NRC provided notice of the meeting on May 10, 2022, on its public website. In addition to representatives of Disa, staff from several Agreement States with uranium recovery programs and several members of the public were also present for the meeting. Consistent with the guidance in NRC Management Directive 3.5, "Attendance at NRC Staff-Sponsored Meetings," this meeting was considered an observation meeting. In an observation meeting, the primary discussion is between the NRC staff and a licensee, applicant, potential applicant, or industry group. Members of the public are welcome to attend and observe the proceedings of observation meetings. A full list of participants present for the meeting is provided in Enclosure 1.

The purpose of this meeting was to discuss technical and regulatory issues related to Disa's proposed use of the High-Pressure Slurry Ablation (HPSA) technology to remediate existing waste piles containing uranium at various sites in the western United States (e.g., closed uranium mines). The NRC staff began the meeting by reading an opening statement and identifying those present in the room and those participating remotely. After the introductions,

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representatives from Disa made opening remarks and then gave a presentation on Disa's proposed approach to apply its HPSA technology, including its views on potential NRC licensing of Disa's HPSA activities. Disa's presentation can be found in Enclosure 2.

At the conclusion of Disa's presentation, the NRC staff and Disa discussed several technical and regulatory issues related to Disa's proposed use of the HPSA technology. A paraphrased summary of the discussion follows:

- In response to an NRC staff question as to whether the use of the HPSA technology required resizing of material, Disa explained that the HPSA technology can be used on a maximum particle size of ¼-inch. Disa envisions using a wet process to resize material to separate the uranium from the waste rock by bringing water in from off-site and reusing the water in the process. The use of the HPSA technology will result in a uranium bearing product stream, which will be removed from the site, and a post-HPSA mineral fraction, which will remain on site. Non-radioactive hazardous constituents regulated under the Resource Conservation and Recovery Act, such as arsenic and lead, will be present in the post-HPSA mineral fraction.

- Disa stated that it has participated in a treatability study on remediation of closed or abandoned uranium mine sites with the U.S. Environmental Protection Agency. Disa acknowledged that it will have additional data from this treatability study later this year.

- In response to an NRC staff question, Disa explained that the HPSA technology can be used to recover minerals other than uranium (e.g., vanadium).

- Disa stated its intent to seek a multi-site source material service provider license from the NRC authorizing the use of its HPSA technology for remediation of waste piles. Disa stated that its intended use of its HPSA technology should not be considered a form of uranium milling (regulated by the NRC regulations at Title 10 of the *Code of Federal Regulations* (10 CFR) Part 40, Appendix A, "Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content.") The NRC staff sought Disa's views on what requirements in 10 CFR Part 40, Appendix A might apply to the HPSA technology. While Disa does not view the HPSA technology as uranium milling, its review of the Appendix A requirements did identify a few criteria related to ore stockpiling and pre-operational monitoring that might apply if the NRC does consider the use of HPSA technology a form of uranium milling.

- Disa indicated that it could have an application ready for submission to the NRC in less than 6 months, potentially as soon as 1 to 2 months.

- NRC staff asked about the dose assessment that Disa developed for the post-HPSA mineral fraction (also referred to as the clean coarse fraction) that will remain on-site. Disa explained that it used Microshield (a computer code used for dose assessment) and MILDOS (a computer code used to estimate the radiological impacts from airborne emissions from uranium sources) with an assumption that the land would be used for recreation in the future, with no structures existing on-site.

- The NRC staff explained that it does not regulate Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) and asked Disa how that would be addressed from a regulatory standpoint. Disa recognized that TENORM is addressed on a State-by-State basis.

At approximately 11:10 AM, the NRC staff and Disa finished their discussion, and an opportunity was provided for external attendees to speak and ask questions of the NRC staff. There were no direct questions for the NRC staff. External participants shared their views on Disa's proposed use of the HPSA technology, including its use for purposes of waste pile remediation, and potential ways the NRC should regulate this activity. A summary of the points made by the external participants follows:

- The HPSA process appears to result in the removal or concentration of uranium.

- Use of the HPSA technology may require coordination and approval by other government agencies. For example, the Bureau of Land Management (BLM) may require a public notice and comment process for activities on BLM controlled land.

- Use of the HPSA technology could help address remediation of closed or abandoned uranium mines for a fraction of the cost.

- The use of the HPSA technology could also bring economic development benefits to areas where uranium mining occurred.

- Application of the HPSA technology on waste piles containing uranium appears to result in the generation of Atomic Energy Act section 11e.(2) byproduct material. Not all the information is in place for the NRC staff to be able to make a decision on the appropriate way to license the HPSA technology.

- It is uncertain how contaminants of concern are stabilized, particularly in the post-HPSA mineral or clean course fraction.

- Disa's proposed use of the HPSA technology appears to be a water intensive process; it is not clear how disposal of contaminated water used in HPSA will be addressed.

Action Items

Three action items were identified during the meeting:

1. NRC staff will complete the meeting summary within 30 working days.

2. Disa will provide current research results on use of the HPSA technology once the project is complete.

3. Disa will provide more information on the timing of its application submittal to the NRC.

The meeting ended at approximately 12:15 PM eastern time.

Enclosures:
As stated

Summary of May 23, 2022 Meeting with Disa Technologies re High-Pressure Slurry Ablation DATE June 30, 2022

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