Disa Technologies, Inc.
1653 English Ave.
Casper, WY 82601

www.DisaUSA.com
(307) 439-5453
info@disausa.com

20 December 2022

Chair Christopher T. Hanson
Commissioner Jeff Baran
Commissioner David A. Wright
Commissioner Annie Caputo
Commissioner Bradley R. Crowell
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: U.S. Nuclear Regulatory Commission (NRC) Staff Regulatory and Acceptance review of Disa Technologies' License Application for the Use of High-Pressure Slurry Ablation Technology (Docket No. 04038417)

Reference 1: November 29, 2022, Letter from Jane E. Marshall, NRC Director for the Division of Decommissioning, Uranium Recovery, and Waste Programs, to Greyson Buckingham, President and Chief Executive Officer, Disa Technologies, Inc. (ADAMS Accession No. ML22318A006).

Reference 2: Disa Technologies, Inc., Resubmission – License Application for a Performance-Based, Multi-Site License, High-Pressure Slurry Ablation (ADAMS Accession No. ML22213A146)

Reference 3: Public Meeting Summary: Meeting with Disa Technologies, Inc., Regarding the Use of High-Pressure Slurry Ablation Technology on Rock Containing Uranium (ADAMS Accession No. ML22168A207)

Reference 4: Email of October 20, 2022, forwarding the report, "Preliminary Data on Navajo Nation Abandoned Uranium Mine Material" and a link to a video of the Uranium Mine Waste Treatment Demonstration. (https://www.youtube.com/watch?v=KHnJNSN0wAo)

Dear Chair Hanson and Commissioners Baran, Wright, Caputo, and Crowell:

I am writing to respectfully request that the Commission review the NRC Staff's recent determination (**Reference 1**) to deny acceptance of the license application submitted by Disa Technologies, Inc. (Disa) for its High-Pressure Slurry Ablation (HPSA) technology. As the Commission has been open about its concern regarding the need to address historic contamination at former mining sites, particularly those that occurred on the lands of Tribal Nations, the development of this technology is particularly timely. Indeed, both the Navajo Nation and the U.S. Environmental Protection Agency are supportive of deploying Disa's HPSA technology to address this longstanding matter of environmental justice.

Unfortunately, the Staff's policy determination to not accept Disa's HPSA application is based on what our legal advisors conclude is an unnecessarily conservative interpretation of the definition

of byproduct material, and what it means to engage in uranium milling. Because this is a matter of Commission policy, Disa understands that the Commission has the authority to review this important matter and direct the Staff to adopt a more reasonable position regarding byproduct material and uranium milling by considering the actual characteristics of the materials resulting from HPSA. Specifically, if the materials that remain onsite post-HPSA treatment do not exhibit radiological or non-radiological hazards, then the purpose and intent of the uranium milling regulations are not fulfilled and these regulations should not apply. Instead, source material regulations would be the appropriate regulatory regime.

On August 1, 2022, Disa resubmitted its license application (**Reference 2**) for its HPSA technology. Disa sought a source material license under 10 C.F.R. Part 40. Disa's proposed activities are not uranium milling, and thus Disa's application did not seek a license under Part 40 Appendix A, which pertains to uranium milling. As explained in the application, DISA sought a multi-site license to use its HPSA technology to remediate uranium mine waste rock piles that are scattered across the Western United States. Indeed, as Disa explained in a May 23, 2022 public meeting with the NRC Staff (**Reference 3**), approximately 15,000 abandoned uranium mines exist with waste rock piles in the Western United States, many of which occur on or near tribal locations. These waste rock piles were created decades ago, sit on the land surface where the uranium, radium 226, and other minerals (including hazardous materials) may have oxidized, which limits the beneficial use of the land and may cause dose and contamination issues.

In brief summary, the Part 40 source material license sought by Disa would allow Disa to mobilize its temporary HPSA equipment to an abandoned uranium mine site, treat the waste rock or other contaminated materials, transport isolated source material offsite for disposal or for use as alternate feed at a licensed uranium mill, produce a "clean coarse fraction" of material for reuse in reclamation at the site, and demobilize the equipment for use at other sites. The clean coarse fraction is essentially the waste rock material with the vast bulk of the source material and other constituents of concern separated from the waste rock. As testing has demonstrated **(Reference 4**), the HPSA process removes the overwhelming majority of source material and other constituents of concern from the waste rock as well as significantly reduces the source term exposure for individuals who work and live near the site. With these materials removed, the previously abandoned site could be put to beneficial reuse and the radiation risk to the public would be essentially eliminated.

The NRC Staff, however, did not accept Disa's application because it determined that the HPSA technology is conventional uranium milling, and thus determined that Disa must file an application for a milling license under 10 C.F.R. Part 40, Appendix A. This decision was based on the staff's determination that use of the HPSA technology in the manner proposed by Disa "produces Atomic Energy Act of 1954, as amended (AEA) 11e.(2) byproduct material, and is thus subject to 10 CFR Part 40, including Appendix A." **Reference 1** at p. 2. The Staff explained that (1) the NRC's regulations define uranium milling as "'any activity that results in the production of byproduct material as defined in [10 CFR Part 40]'"; and (2) Section 40.4 defines "byproduct material" as "'the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content,'" which definition "originat[es] from the definition of byproduct material in Section 11e.(2) of the AEA."

The Staff's determinations are in error, and prohibits the use of technology that can return unusable and contaminated land to beneficial reuse and will protect the public and the environment from potential releases from untreated waste rock. The Staff, in its denial letter (**Reference 1)** states that waste rock is ore, as defined in RIS-2000-23, "Recent Changes to Uranium Recovery Policy." Therefore, in the Staff's opinion, if ore is being processed, then milling is occurring. However, the Staff's logic here is completely circular. The definition of ore in RIS-2000-23 is, as follows:

> Ore is a natural or native matter that may be mined and treated for the extraction of any of its constituents or any other matter from which source material is extracted in a licensed uranium or thorium mill.

RIS-2000-23 is a policy allowing uranium mills to process materials other than ore to extract the source material. For the Staff to rely on this definition, it must first assume that Disa's HPSA is a uranium mill, then make the judgement that the waste rock is ore. Again, this argument is circular and illogical.

Disa's HPSA technology does not produce AEA 11e.(2) byproduct material, nor do its operations remotely resemble conventional milling operations. AEA 11e.(2) defines byproduct material as "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."[1] Over twenty years ago in the Commission's International Uranium (USA) Corporation[2] decision, the Commission exercised its inherent authority and further explained what it means to engage in milling that produces byproduct material. The Commission stated that Congress enacted the AEA 11e.(2) definition of byproduct material "[t]o prevent future abandoned and unregulated [uranium] tailings piles."[3] This was because milling operations had "resulted in dozens of abandoned or 'orphaned' mill tailings piles" once operations ceased at a uranium mill.[4] The Commission further explained that, prior to the enactment of AEA 11e.(2), the NRC exercised limited control over tailings piles.[5] Following its enactment, AEA 11e.(2) "expressly declared mill tailings to be a form of byproduct material" and "tailings generated during uranium milling operations would 'formally be byproducts rather than waste.'"[6]

The Staff's determination that Disa's HPSA is uranium milling, and thus should be regulated under Part 40 Appendix A, results from its unnecessarily conservative application of the byproduct material definition and essentially makes the technology cost-prohibitive if such requirements are imposed. It is clear from the Commission's statements in International Uranium (USA) Corporation that Congress enacted the AEA 11e.(2) definition to extend the Commission's jurisdiction to include uranium milling wastes (i.e., uranium tailings piles). In other words, uranium milling had already occurred, resulting in the production of hazardous wastes, which

---

[1] 42 U.S.C. 2014(e)(2).

[2] International Uranium Corporation (Request for Materials License Amendment), CLI-00-01, 51 N.R.C. 9 (Feb. 10, 2000).

[3] CLI-00-01, 51 N.R.C. at 16.

[4] Id.

[5] Id.

[6] Id.

wastes needed to be regulated (and now are under Part 40 Appendix A). But in its review of Disa's application, the Staff has done the reverse. Similar to the circular argument regarding RIS-2000-23, the Staff has used the 11e.(2) byproduct material definition to look backwards and deem an activity is "milling" where no milling has occurred, and where no hazardous "byproduct material" has been produced, as that term was defined by the Commission in International Uranium (USA) Corporation. The clean coarse fraction of material that results from use of Disa's HPSA technology is not akin to uranium mill tailings that need to be stored in a tailings impoundment. Indeed, the application of Disa's technology results in removing the underlying contamination and allowing for the beneficial reuse of the areas subject to the remediation.

The Staff's policy determination is not justified for Disa's HPSA technology. In conventional milling, truckloads of uranium bearing ore are transported to a stationary, fixed facility for processing (i.e., milling) that results in a waste stream (uranium tailings) and is managed on site in tailings impoundments. These tailings contain various hazardous and radiological constituents of concern and must be managed carefully to prevent contamination to the environment and impacts to public health. That is not what Disa proposes to do. Disa would take its temporary equipment to a site where uranium waste rock piles already exist, treat the waste rock piles without chemicals, remove the vast majority of uranium and other constituents of concern from the waste rock, and leave behind on the surface a "clean coarse fraction" of material that is demonstrated to be devoid of the radiological and nonradiological hazards that forms the basis of UMTRCA. HPSA not only removes uranium but also removes radium and thorium, which results in a dramatic reduction in exposure to radon and its progeny from the waste materials.

The reality is that the Staff's unnecessarily conservative interpretation of "byproduct material" is contrary to public health and safety and protection of the environment in this case. As a consequence of the Staff's actions, greater exposures to the public may occur from the inability to conduct the remediation proposed, than would be the case should Disa be allowed to use its technology for this beneficial cleanup activity. Furthermore, materials abandoned at 15,000 uranium mines across the Western United States will continue to remain abandoned and serve as potential sources of dose and contamination. The only other conceivable means to address the problems posed by the waste rock piles would be to transport the materials—millions of tons of rock and other material—to an existing mill site for processing, or to a disposal site. The amount of time, money, and resources needed for such endeavors is astronomical, and will unnecessarily delay the ability of Tribal Nations to resolve these issues. Moreover, public safety impacts of the sheer volume of materials to be transported by road and rail could result in quantifiable traffic deaths if HPSA cannot be used to treat waste rock. Finally, we would note that currently, there does not appear to be anywhere near enough processing or disposal capacity available to address the waste rock piles.

Disa concludes that the Staff's policy determination is also inconsistent with other determinations the Commission has made, which have carved out certain activities from being regulated under Part 40 Appendix A. Disa's HPSA technology should be treated in the same manner as those carved out activities. For example, mine operators may use ion exchange to treat contaminated groundwater and may transport the uranium-loaded resin to a uranium mill for processing. The Commission has determined that concentrating uranium or thorium during these types of remedial actions is not milling. Disa's HPSA proposal is the soil functional equivalent to groundwater

remediation; uranium is being isolated, the isolated uranium may be sent to mill for processing, and no hazardous materials remain at the mine site. Furthermore, other resource mining operations use chemical processes to concentrate the non-uranium and non-thorium minerals, but at the same time liberate and concentrate uranium or thorium. Because these operations are incidentally concentrating uranium or thorium, the Commission has essentially carved out an exemption to 10 CFR Part 40, Appendix A. Disa's HPSA proposal uses no chemicals to treat waste rock; thus, no hazardous materials/wastes are generated. Therefore, a carve out for Disa's HPSA is entirely appropriate.

The Staff's policy determination also suggests that Disa could submit an application under Part 40 Appendix A that seeks exemptions from the Appendix A requirements or proposes alternate standards for those requirements. **Reference 1** at p. 2. The Staff further suggests that appropriate guidance for such a submittal could be found in NUREG-2126, the Staff's guidance for an application seeking authorization for a conventional milling process. Id.

These suggestions are misplaced for multiple reasons. As previously explained, Disa is not seeking to undertake conventional milling activities. Far from it. The Staff's determination that Disa might suggest alternative standards puts an unduly onerous burden on Disa, which is a small start-up company with limited resources. This is especially true because the Staff cannot guarantee that any alternative standard request would be granted. In other words, Disa would be forced to spend significant time and resources developing an alternative approach to apply for a conventional milling license when Disa has no plans to undertake conventional milling. Disa would then need to wait months hoping for a positive determination from the Staff that is far from assured. This is a significant imposition of regulatory burden that is contrary to the purpose of protecting public health and safety and will only frustrate the Commission's own priority to encourage the prompt remediation of mining wastes adjacent or on Tribal lands.

In addition, the Staff's suggestion that it might approve an application with exemptions from the Part 40 Appendix A requirements only proves Disa's point: The Part 40 Appendix A framework is not appropriate for the activities Disa proposes to undertake. Part 40 Appendix A "establishes technical, financial, ownership, and long-term site surveillance criteria relating to the siting, operation, decontamination, decommissioning, and reclamation of mills and tailings or waste systems and sites at which such mills and systems are located."[7] Very few, if any, of the Appendix A criteria should apply to Disa's temporary location of mobile structures to remediate waste rock at abandoned uranium mines (i.e., materials that have never been through a conventional mill). The materials left behind in the clean coarse fraction will have far less radiological and non-radiological hazards than are present at the abandoned waste rock piles that exist today.

Further, if the Staff were to determine that certain Appendix A criteria would apply to Disa's HPSA, then complying with those criteria would be cost prohibitive. For example, criteria related to tailings impoundments (e.g., Part 40 Appendix A Criteria 4, 5A, 5E, 5G, 6(1) – 6(6)) are not applicable because the clean coarse fraction is not akin to uranium mill tailings. But if the NRC deemed these criteria to apply, the construction of such tailings impoundments would render the whole enterprise uneconomical and cost prohibitive and would result in continued inaction on the

[7] 10 C.F.R. Part 40, Appendix A, Introduction.

remediation of these sites. Frankly, the lead federal agency responsible for overseeing the remediation of contaminated non-federal sites, the U.S. Environmental Protection Agency (EPA), wishes to use HPSA to accomplish this task, and the NRC staff action is unnecessarily hindering the efforts of its fellow federal regulator.

Finally, the requirements for a source material license, for which Disa seeks a license, are more than protective of the public health and environment. The applicable Part 40 and Part 20 requirements address such items as decommissioning and financial assurance (10 C.F.R. § 40.36), transfer of source material (10 C.F.R. § 40.51), reporting requirements (10 C.F.R. § 40.60), radiation protection program (10 C.F.R. Part 20 Subpart B), occupational and public dose limits (10 C.F.R. Part 20 Subparts C and D), radiological criteria for license termination (10 C.F.R. Part 20 Subpart E), storage and control of licensed material (10 C.F.R. Part 20 Subpart L), and waste disposal (10 C.F.R. Part 20 Subpart K). With these protective requirements, there simply is no need to deem an activity milling when it is not milling, and proceed to license that activity under milling criteria, many of which would require exemptions. Such an outcome would result in the needless imposition of costs, both to the applicant and other federal agencies engaged in remediation, yet would also leave significant uncertainty regarding how the NRC staff will respond to such a submission.

For all of these reasons, Disa respectfully requests that the Commission exercise its authority—just as it did in International Uranium (USA) Corporation—and establish a more reasonable interpretation of byproduct material and uranium milling as a matter of policy and permit the Staff to review Disa's application as a Part 40 source material license application. To do otherwise would be contrary to the Commission's stated goals to enable the prompt cleanup of these materials and resolve these longstanding environmental justice concerns.

Respectfully submitted,

Greyson Buckingham

cc:
Daniel Dorman, NRC, Executive Director for Operations
Marian Zobler, NRC, General Counsel
John Lubinski, NRC, Director, Office of Nuclear Materials, Safety and Safeguards
Jane Marshall, NRC, Director, Division of Decommissioning, Uranium Recovery, and Waste Programs
Jeffrey Merrifield, Pillsbury Winthrop Shaw Pittman, LLP
Timothy Walsh, Pillsbury Winthrop Shaw Pittman, LLP