SUPERFUND

SITE UPDATE

Nuclear Metals, Inc. Superfund Site
Concord, MA

U.S. EPA | HAZARDOUS WASTE PROGRAM AT EPA NEW ENGLAND

THE SUPERFUND PROGRAM protects human health and the environment by investigating and cleaning up often-abandoned hazardous waste sites and engaging communities throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for cleanup costs. EPA strives to return previously contaminated land and groundwater to productive use.

BACKGROUND:

The Nuclear Metals, Inc. (NMI) site – also known as the Starmet Corporation site – is located on a 46-acre parcel in Concord, Massachusetts. Nuclear Metals was originally a specialty metal research and development facility that was licensed to possess low-level radioactive substances including depleted uranium (DU). The Site was added to the National Priorities List in 2001 and following short-term actions to protect human health and the environment, the site's long-term cleanup is ongoing.

The remedy for the site, as outlined in the 2015 Record of Decision, includes the following:

- Excavation and off-site disposal of contaminated soils and sediments in various areas of the Site, approximately 85,000 cubic yards of material;
- Treatment of DU contaminated soils in the Holding Basin via injection using a stabilization agent to prevent leaching of contaminants to groundwater;
- Containment of Holding Basin stabilized soils with a low-permeability vertical wall and cover to isolate the stabilized soils and further limit mobility of contaminants by removing the flow of groundwater;
- Extraction and ex-situ treatment of VOCs and 1,4-dioxane in overburden and bedrock aquifers, and in-situ treatment of DU in overburden aquifer and natural uranium in bedrock aquifer;
- Long-term monitoring for effectiveness of in- and ex-situ treatment;
- Institutional Controls.

Four Remedial Design Reports are complete and approved by EPA. The *100% Design–Site-Wide Soil and Sediment in Areas of Interest [AOI] 8 and 9* and the *100% Remedial Design Knox Trail Groundwater Extraction System Expansion* reports were approved by EPA by September 2022. The *100% Design–Sitewide Sediment and Soils Phase 1* was approved by EPA in September 2023.

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Most recently, the *100% Remedial Design Report In-Situ Sequestration of Uranium in Overburden Within the Holding Basin* was approved by EPA in December 2024. Remedial Design Reports can be reviewed on the NMI site webpage. Remedial Designs for other areas of the site are underway and are expected to be completed in 2025 to 2027.

EXPLANATION OF SIGNIFICANT DIFFERENCES/CHANGES TO CLEAN-UP PLAN:

On March 11, 2025, EPA released a change to the cleanup plan described in the 2015 Record of Decision (2015 ROD). The change to the plan is referred to as an Explanation of Significant Differences or ESD. The changes do not include a new cleanup plan or a fundamental change to the original 2015 ROD. The change is the addition of regulations related to the management of asbestos at the Nuclear Metals Site. Asbestos containing material (ACM), specifically intact pieces of asbestos transite piping that were part of the sanitary wastewater drain line system, were uncovered during soil excavation work at the Site. While asbestos containing materials were planned for during the building demolition in 2017, asbestos was not assumed to be on-site below the ground surface and removal of asbestos was not included in the 2015 ROD .

The removal of the asbestos piping has been and will continue to be completed in accordance with the requirements provided in the 2025 ESD. Approximately 980 linear feet of asbestos transite piping were removed between August 2023 and December 2024, and EPA expects approximately 800 additional linear feet to be removed during future remedial action work. All asbestos piping that is removed is being disposed of off-site at a licensed disposal facility, and no impacts to the community have been observed or are expected.

The March 2025 ESD can be downloaded from the Nuclear Metals Superfund Site webpage: www.epa.gov/superfund/nmi

Asbestos transite pipe uncovered at Site

REMEDIAL ACTION UPDATE #3:

In-Situ Sequestration Within the Holding Basin Area

The Remedial Action is underway for In-Situ Sequestration of Uranium in Overburden Within the Holding Basin. In-Situ Sequestration, or ISS, is the injection of microscale zero-valent iron (mZVI) into the ground. The iron particles immobilize the uranium present in the groundwater, which will limit the movement of the uranium contaminated groundwater plume under the former Holding Basin area on the Nuclear Metals/Starmet property. The image at right, shows the microscale zero-valent iron particles. These mZVI particles are being held in place by a magnet on the backside of the jar lid.

Injections of the microscale zero-valent iron started in December 2024 and are expected to continue until summer 2025. Drill rigs are used to inject the mZVI into the subsurface at the locations as shown in the image at right.

Drill rig set-up for microscale zero-valent iron injections

Microscale zero-valent iron (mZVI) particles present on jar lid

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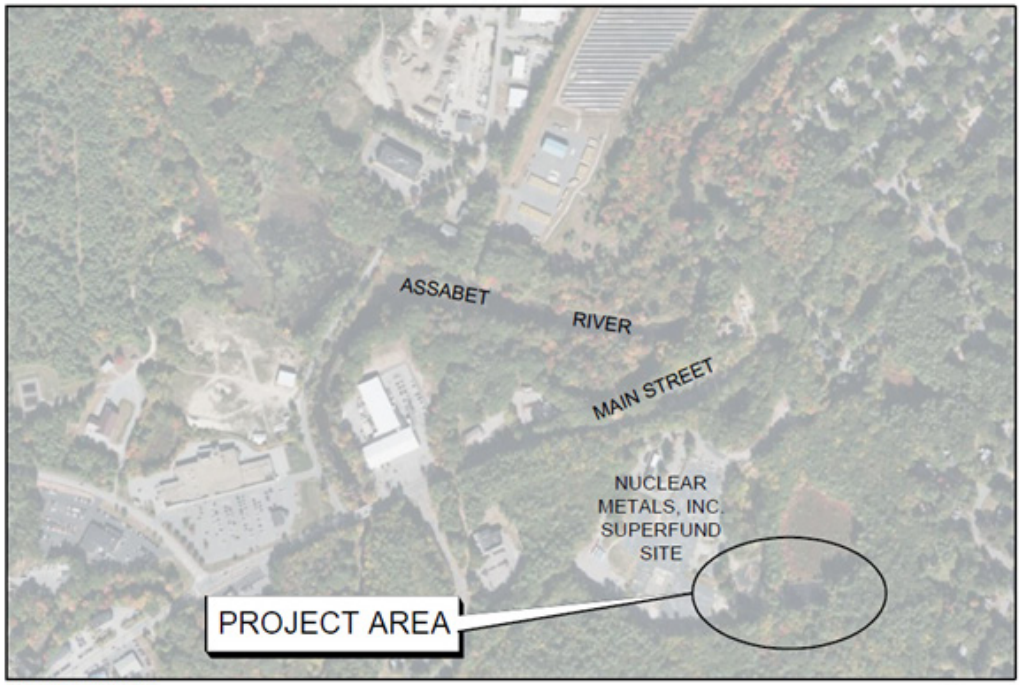


The injection locations are approximately 30-feet apart from each other and are within the Holding Basin area, as shown on Figure 2 (at the end of the fact sheet). After mZVI has been injected at all intervals at all locations, temporary monitoring wells will be installed to allow collection of groundwater from within the treatment area. A future remedial design will cover the injection of additional iron in areas downgradient of the Holding Basin.

Excavation of the former Courtyard area

Phase 1 Site-Wide Sediments and Soil Update

The Phase 1 Site-Wide Sediments and Soils remedial action is underway, with the soil excavations of the Courtyard and Building E areas being completed between May 2024 to November 2024. Over 58,500 tons (approximately 36,350 cubic yards) of soil have been excavated from the Courtyard and Building E areas and disposed of off-site. Soils were excavated to a maximum depth of 10 feet below the ground surface. Soil samples were collected at the bottom of the excavation to assess whether future restrictions on digging in those areas will be necessary. The Courtyard and Building E areas have been backfilled with clean material to create a temporary roadway, which will allow equipment and trucks to access the Holding Basin area of the Site. Since Remedial Action work began on-site in 2022 over 71,600 tons (approximately 44,900 cubic yards) of soil have been excavated and disposed of off-site. The map at the end of the fact sheet, Figure 1, shows a summary of soils excavated to date, remaining soils to be excavated, and areas undergoing further investigation. The remaining Phase 1 Site-Wide Sediment and Soils areas include the Landfill, Sphagnum Bog, and Cooling Pond areas, which are expected to be excavated in 2027 to 2029, following the construction of the Holding Basin vertical barrier wall and cap.

Off-Property Groundwater Update

Construction of the Knox Trail groundwater treatment system expansion is complete and the system is operating as designed. The Knox Trail groundwater treatment system expansion construction was completed in December 2023 and the final *Remedial Action*

Report for the Knox Trail Groundwater Extraction System Expansion was issued and approved by EPA in August 2024. The system will continue to operate by intercepting contaminated groundwater from both sides of the Assabet river, pumping the groundwater to the treatment system located on Knox Trail, treating the water, and then discharging the treated water to the Assabet River.

WHAT TO EXPECT:

Injections microscale zero-valent iron (mZVI) started in December 2024 and will continue until Summer 2025. The mZVI was delivered to the Site in November 2024. Minimal off-site transportation of contaminated soil is expected while the ISS injections are underway; approximately 0 to 5 trucks per day in lined and covered trucks to the off-site disposal facility. All wastes will be transported via truck and rail and be disposed of at an EPA approved facility. Regular truck traffic (deliveries, clean soil backfill material, etc.) will be, on average 10 to 20 trucks per day. The Site contractors are coordinating with the Town in selecting the safest traffic truck routes that also help to alleviate a potential increase in traffic.

As cleanup work continues, residents should expect to see personnel and heavy equipment working on or about the Site. Normal working hours will be between 7:00 AM to 5:00 PM, Monday to Friday. While injection and/or soil excavation are occuring, air monitoring and dust control and suppression will be performed (as needed) for worker protection and public health.

NEXT STEPS:

The injections of microscale zero-valent iron (mZVI) will continue into Summer 2025. The 100% Phase 2 Site-Wide Sediments and Soils Remedial Design is currently under EPA review. Phase 1 and Phase 2 excavations are scheduled to re-start Spring/Summer 2025. The Holding Basin Remedial Design is underway and the final design is anticipated to completed in Summer/Fall 2025. The Holding Basin design includes the plans for the construction of the below ground vertical containment wall and Holding Basin surface cap.

GLOSSARY OF TERMS:

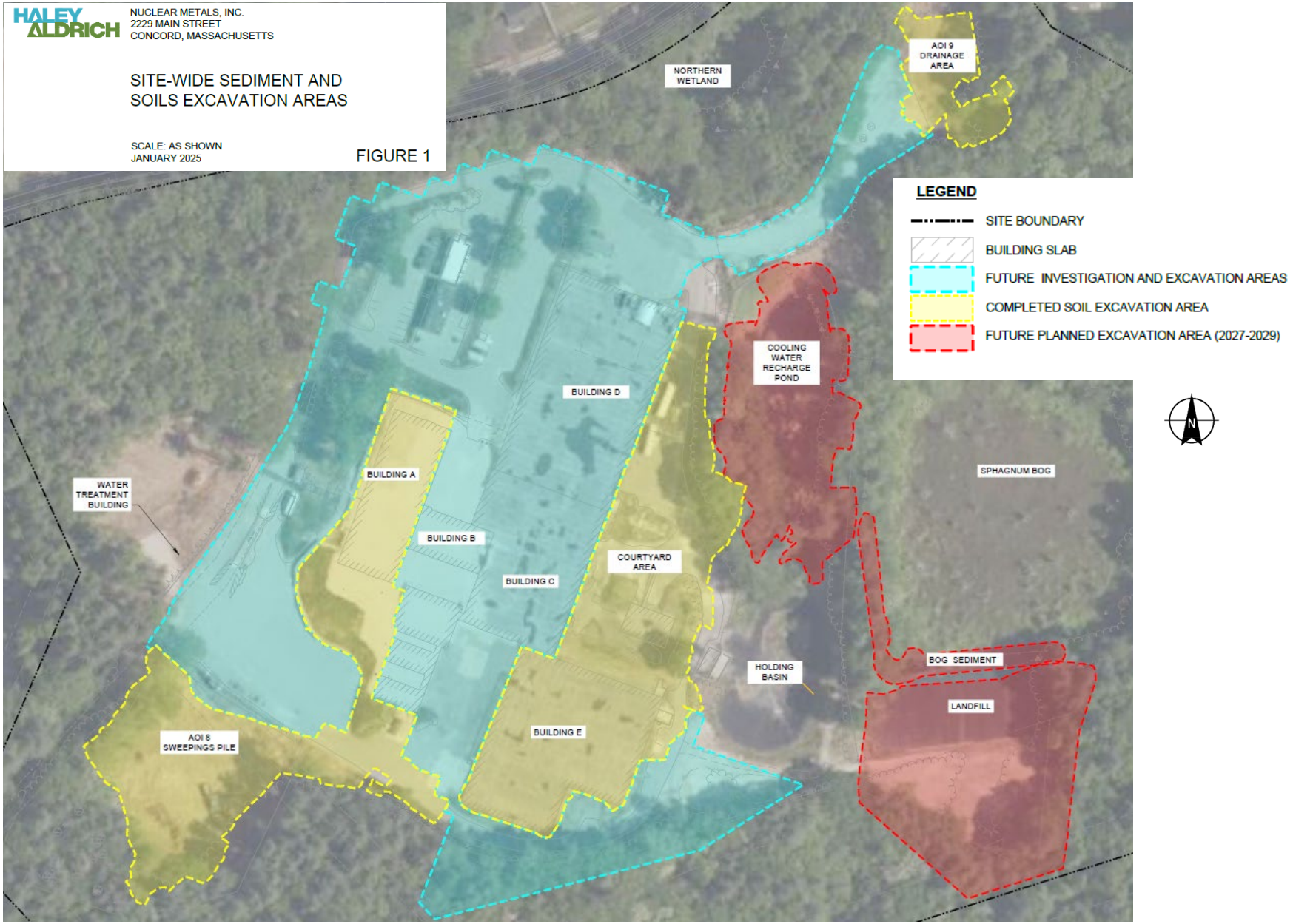
In-situ treatment.....treatment methods that are done in place without moving the treatment media/waste (e.g., injections of microscale zero-valent iron for in place treatment)

Ex-situ treatment.....treatment actions that are done when media/waste are taken from their original location and treated elsewhere (e.g., groundwater extraction and treatment)

Overburden.....soil that overlays bedrock

Remedial Design (RD) .....the phase in Superfund site cleanup where the technical specifications for cleanup remedies and technologies are designed.

Remedial action (RA).....follows the remedial design phase. It involves the actual construction or implementation phase of Superfund site cleanup.



Extent of soil excavation completed to date, future investigation and excavation areas, and future planned excavation areas.

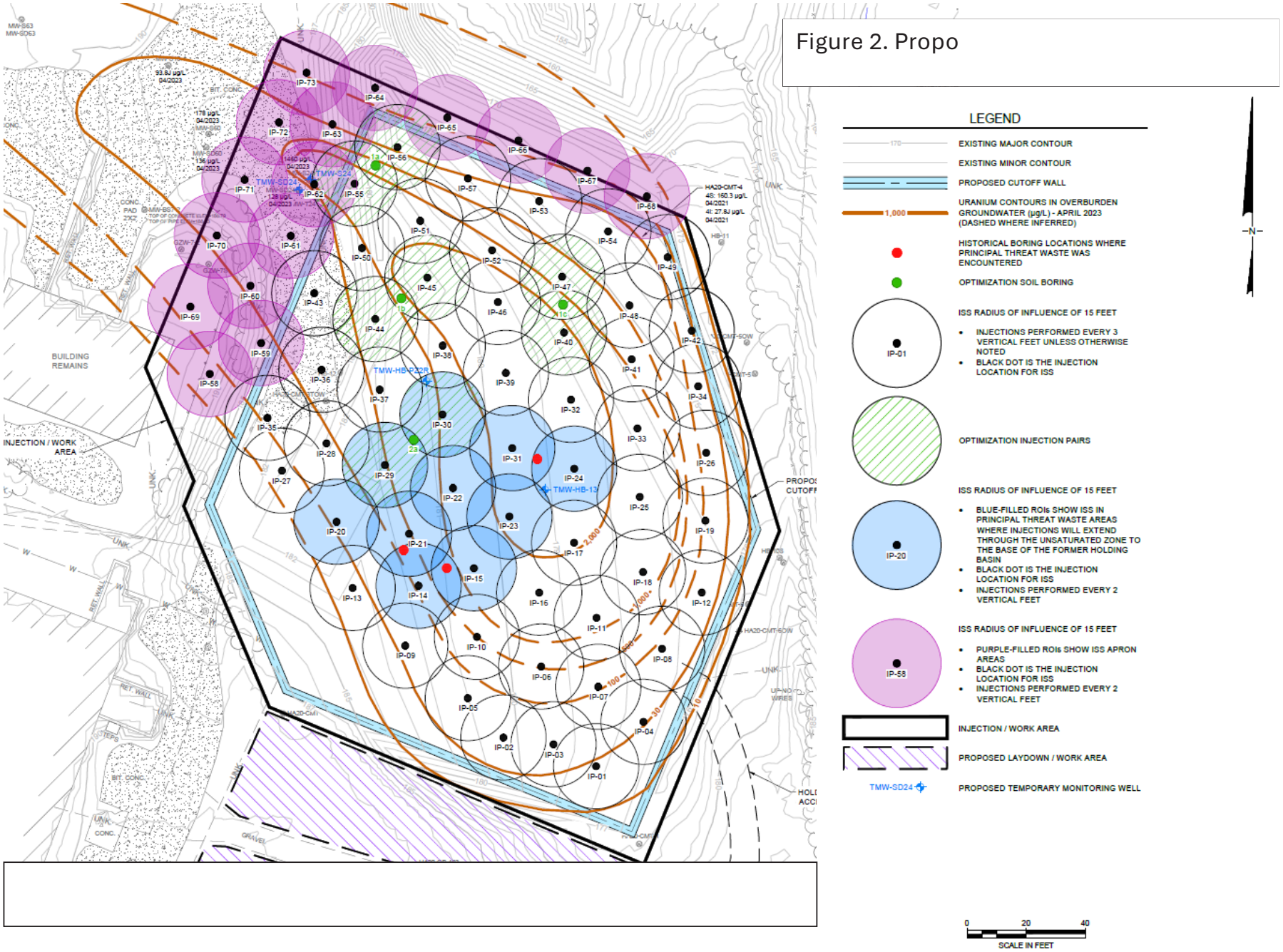


Figure 2. Propo