

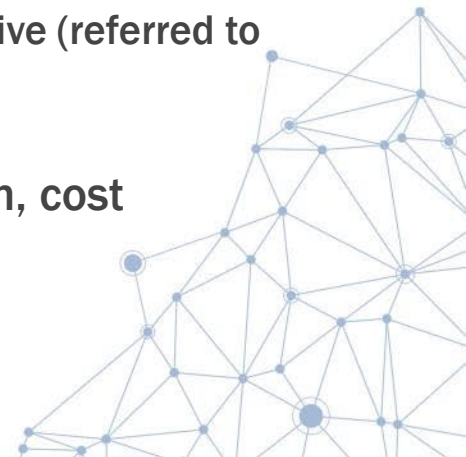


MCP Phase III Remedial Action Plan (RAP)

Update on Recent Site Activities

Revised Phase III Remedial Action Plan (RAP)

- The Phase III RAP included:
 - Site-wide and area-specific Remedial Objectives
 - Chemical-specific Remedial Goals developed to eliminate or reduce the potential human health and environmental risks
 - A set of remedial alternatives for the clean-up of the contaminated sediment, soil, and groundwater
 - Justification for a recommended comprehensive remedial alternative (referred to as the “Final Remedy”)
- Included a conceptual remedial design and technical approach, cost estimate, and schedule

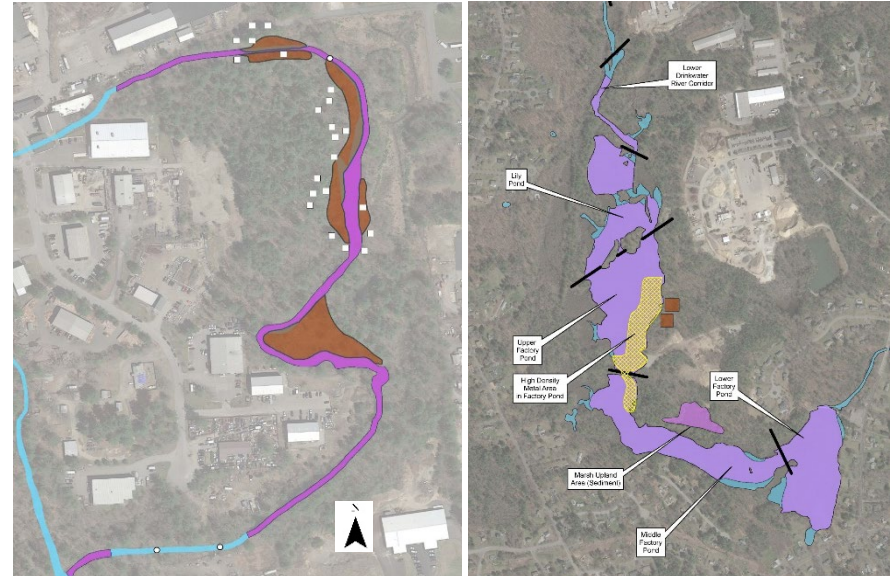


Revised Phase III RAP

- MassDEP - conditionally approved (6/24/2021) Revised Phase III RAP can be accessed at:
<https://www.hanover-ma.gov/former-national-fireworks-site/pages/phase-iii-remedial-action-plan-rap>
- Important Notes:
 - The “Final Remedy” assumes:
 - The current munitions response being undertaken to address the explosive munitions will be complete before the Final Remedy is implemented
 - Current and future use of the area will be for passive recreation
 - That work includes the former test range and the disposal and historical testing areas that are now owned by the Town of Hanover and managed by the Conservation Commission
 - When explosive items were encountered in Factory Pond in June 2018:
 - Use of Factory Pond was restricted
 - The remediation of the “High Metal Density Area” was shifted from the Final Remedy into the IRA munitions response

Scope of the Final Remedy

- “Final Remedy” addresses removal of mercury, lead and other chemical contamination to protect:
 - current and future Site users and
 - local aquatic and terrestrial species



- After incorporating technical refinements, additional sampling data, and considering public comments on the 2019 Draft RAP, two viable alternatives remained for achieving a Permanent Solution under the MCP:
 - **Alternative 2: Clean-Up to Achieve Project-Specific Remedial Objectives / Remedial Goals**
 - **Alternative 3: Clean-Up to Achieve or Approach Background**

Evaluation of the Alternatives

- **Phase III RAP Conclusions:**

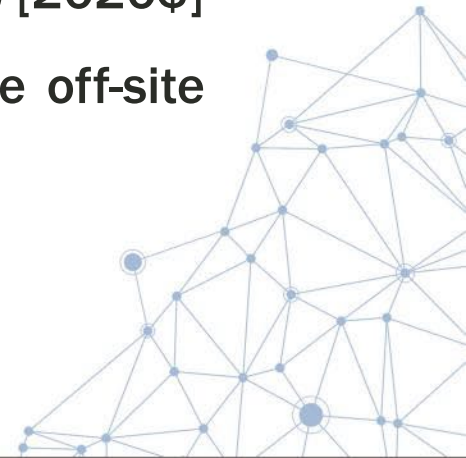
- Alternative 2 rated best for criteria of Difficulty of Implementation, Costs, Risks and Impacts on Non-Pecuniary (aesthetics) Interests; It will also take somewhat less time for remedial actions and site restoration
- Alternatives 2 and 3 rated the same for Effectiveness, Short & Long-term Reliability, Benefits and Timeliness
- Alternatives 2 and 3 would be equally protective of ecological species in sediment; Alternative 3 is protective of more terrestrial ecological species in soil
- Alternative 2 approaches background for soil, very near background for sediment
- Feasibility and Cost analysis supports selection of Alternative 2

- Alternative 2 was recommended and later approved by MassDEP as the selected alternative



Summary of Alternative 2

- ✓ Removal of ~36,500 CY of contaminated sediment and 2,300 CY of contaminated soil
- ✓ Restoration of disturbed areas and habitats
- ✓ Estimated cost was \$76.1 million, with a range of \$64.7 million to \$95.1 million (-15%/+25%) [2020\$]
- ✓ MassDEP estimated the cost will be \$85.3 million, with a range of \$72.5 million to \$106.5 million (-15%/+25%) [2020\$]
- ✓ Approximately 75% of the cost is associated with the off-site disposal of sediment and soil
- ✓ Implementation over two years



Chronology of the Munitions Response

- Began in May 2017 as a voluntary Release Abatement Measure focused on the Former Test Range Berm and the 1 known disposal area
- A mandatory Immediate Response Action (IRA) was initiated in June 2017 to address the incendiary and explosive items found on the ground surface in another area
- Several thousand explosive items were found in June/July 2017 in several disposal pits
- MassDEP then required all subsequent munitions response work to be performed as an expanded IRA
- IRA was extended into Factory Pond in June 2018 when munitions items were found near the Greenway footbridge; Access to the pond was restricted
- The munitions response work has been ongoing without interruption since 2017 despite the COVID pandemic

Extent and Status of the Munitions Response

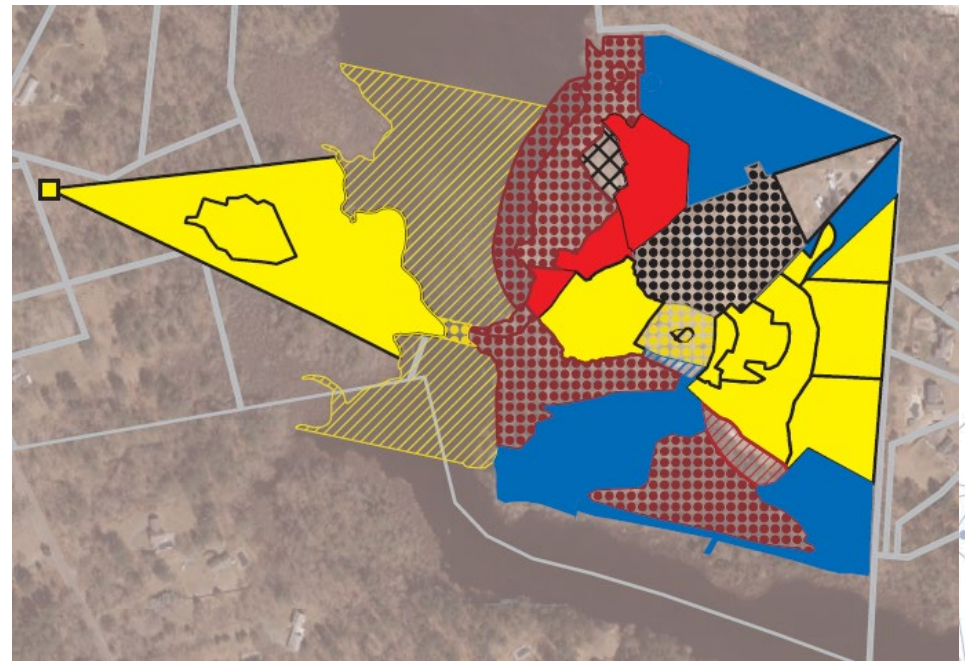
Extent of Munitions Contamination

- Upland Area 33.9 acres
- Ponds/Wetlands 11.1 acres

Breakdown of Munitions Sites

- **13 Former Test Range Areas**
- **12 Disposal Areas**
- **5 Historical Low Use Areas**
- **2 Current Operations**

Solid Color – Complete	54.5%
Cross-Hatch Color – Field Work Complete	1.3%
Dotted Color – Field Work Ongoing	42.2%
Transparent - Not Started	2.0%



Update on Munitions Response Quantities As of 1/14/2022

Number of Explosive Munitions Items Destroyed	17,453
Number of MA State Police Disposal Shots	537
Number of Inert Munitions Debris Items Recovered	153,751
Weight of Inert Munitions Debris Items Recovered	16.3 tons
De-Energized Munitions Metal Demilitarized	19 Tons (estimated)
Soil Transported and Disposed Off-Site	10,530 Tons
Soil Screened, Tested and Re-Used Onsite	36,550 Tons
Soil Containing Asbestos On-Site to Be Processed	4,500 Tons
Concrete Debris Recycled	100 Tons (estimated)
Steel Plates Sent to DPW for Recycling	48 Tons
Trash, Garbage and Junk Metal*	Very Large Amount

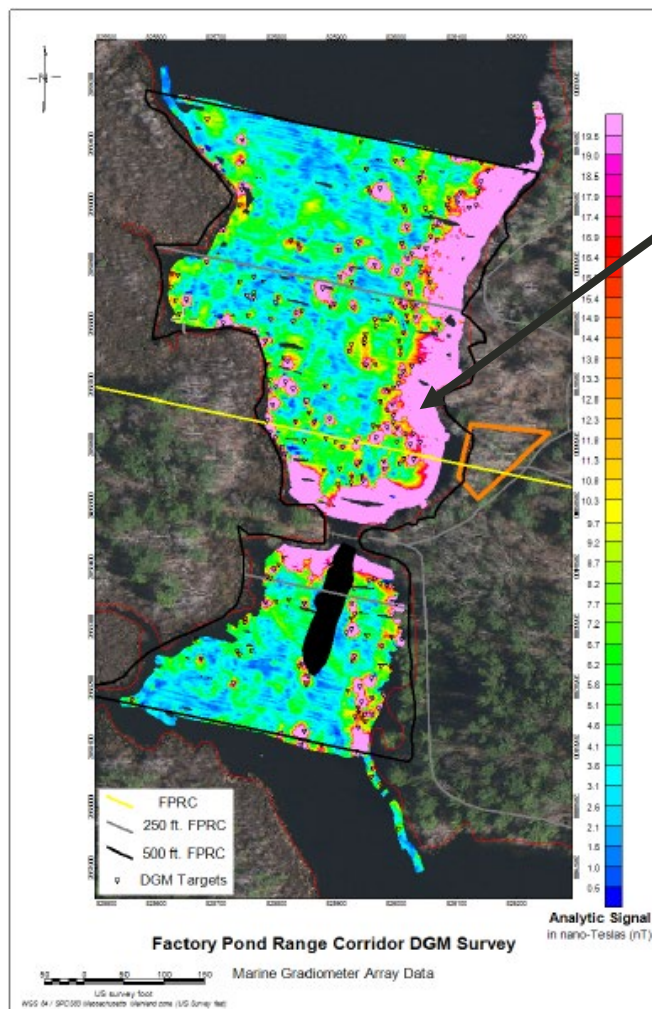
* Explosive munitions items are co-located with scrap metal and metallic debris (e.g., nails, wire, cans, brackets) that are detected by our systems, which requires that these inert items be uncovered and inspected to make certain they are not explosive

Munitions Response Work in 2022 – Upland Areas

1. Backfilling the Northeastern Remainder Area West – High Density Area
2. Completing the Southern Remainder Area West – High Density Area
3. Continued work in Operations Area 1



Munitions Response Work in 2022 – High Metal Density Area (HMDA) of Factory Pond



Pink indicates a high concentration of metal buried in the sediment

Sampling confirmed co-mingled metallic debris and hazardous munitions in the pink area sediment



Use of a PortaDam in the HMDA



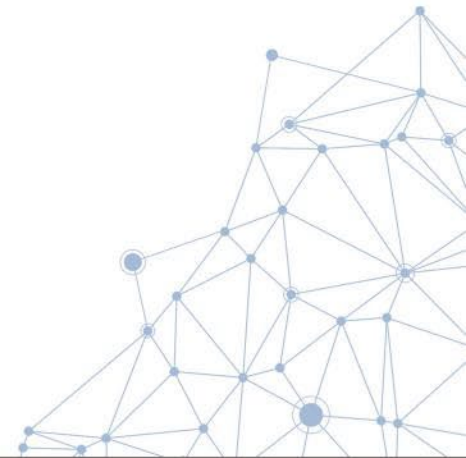
Example Site – Not Fireworks

Work Includes:

- PortaDam Installation and dewatering behind the PortaDam
- Ambient Air Monitoring
- Surface Water Turbidity Monitoring
- Sediment Removal
- Sheet Pile Installation and Refilling
- Backfilling and Restoration
- Excavated Sediment Processing
- Separated Water Treatment
- Off-Site Disposal of Contaminated Materials

HMDA Permitting Requirements and Schedule

- Start of field work planned for March, contingent on:
 - **Massachusetts Environmental Policy Act (MEPA) Office - COMPLETE**
Expanded Environmental Notification Form and Request for Phase I Waiver
(Certificate/Record of Decision received September 2021)
 - **MassDEP**
Chapter 91 / Section 401 Water Quality Certification Application
(Filed with MassDEP November 2021)
 - **Town of Hanover Conservation Commission Notice of Intent - COMPLETE**
(Order of Conditions received December 2021)
 - **U.S. Army Corps of Engineers**
Section 404 Massachusetts General Permit #17
(Filed with the U.S. Army Corps of Engineers January 2022)
- 6 to 8 months field duration





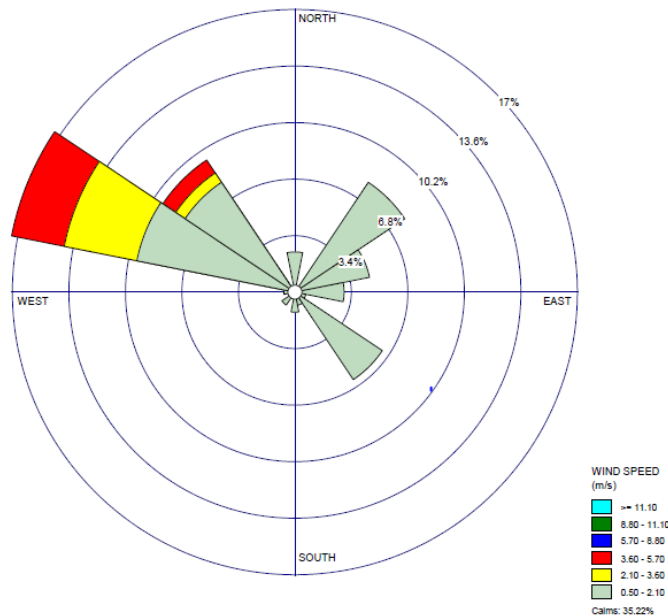
Wind Direction Determined from On-Site Meteorological Station

Site-Specific Wind Measurements from On-Site Meteorological Station

May 2021 Data

Figure 3A
Fireworks Wind Rose - May 2021
Hanover, MA

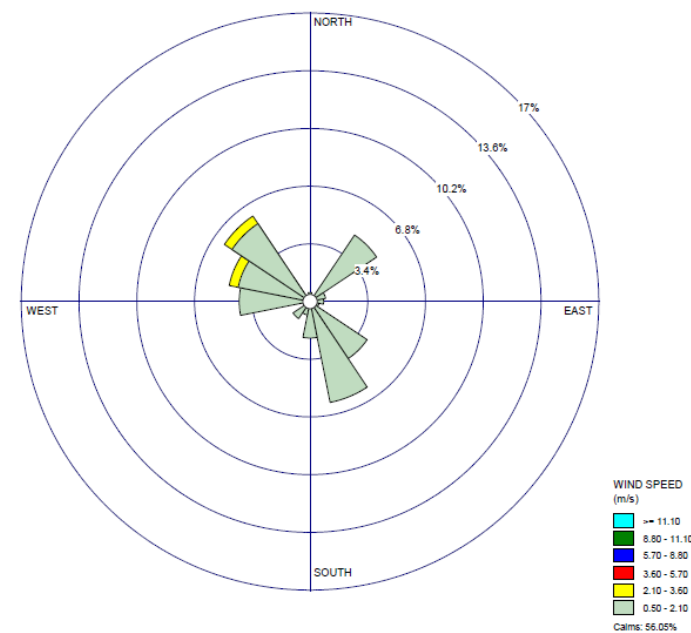
DISPLAY:
Wind Speed
Direction (blowing from)



August 2021 Data

Figure 3D
Fireworks Wind Rose - August 2021
Hanover, MA

DISPLAY:
Wind Speed
Direction (blowing from)



Munitions Response Work After 2022

- **Scheduled for 2023**

1. Shoreline Disposal Area / Northern Disposal Pits
2. MUA Sediment Area



- **Scheduled for 2024**

- Open Space Disposal Area and Asbestos-Containing Material
- 3. Greenway Footbridge Area
- Operations Area 1