

**FOURTH FIVE-YEAR REVIEW REPORT FOR
ATLAS TACK CORP SUPERFUND SITE
BRISTOL COUNTY, MA**



Prepared by

**U.S. Environmental Protection Agency
Region 1
BOSTON, MA**

BRYAN OLSON

Digitally signed by BRYAN
OLSON
Date: 2025.07.21 16:40:32
-04'00'

**Bryan Olson, Division Director
Superfund & Emergency Management Division**

Date

Table of Contents

LIST OF ABBREVIATIONS & ACRONYMS	2
I. INTRODUCTION	4
FIVE-YEAR REVIEW SUMMARY FORM.....	5
II. RESPONSE ACTION SUMMARY	5
Basis for Taking Action	5
Response Actions.....	6
Status of Implementation	8
Operation & Maintenance.....	9
III. PROGRESS SINCE THE LAST REVIEW	11
IV. FIVE-YEAR REVIEW PROCESS	11
Community Notification, Involvement & Site Interviews.....	11
Data Review	12
Site Inspection.....	16
V. TECHNICAL ASSESSMENT	16
QUESTION A: Is the remedy functioning as intended by the decision documents?.....	16
QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?	17
QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?.....	20
VI. ISSUES/RECOMMENDATIONS	21
OTHER FINDINGS.....	21
VIII. NEXT REVIEW	21
APPENDIX A -REFERENCE LIST	
APPENDIX B - FIGURES	
APPENDIX C - INTERVIEW RECORDS	
APPENDIX D - SITE INSPECTION PHOTOGRAPHS	
APPENDIX E - LEAD RESIDENTIAL CHECKLIST	
APPENDIX F - 2025 UPDATE OF CLAM INGESTION RISK FOR TRESPASSERS	

LIST OF ABBREVIATIONS & ACRONYMS

ALM	Adult Lead Methodology
ARAR	Applicable or Relevant and Appropriate Requirement
BLL	Blood lead level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
ERM-Q	Effects Range Median – Quotient
ESD	Explanation of Significant Difference
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
GERE	Grant of Environmental Restriction and Easement
IEUBK	Integrated Exposure Uptake Biokinetic Model
ICs	Institutional Controls
LTGM	Long-Term Groundwater Monitoring
LTM	Long-Term Groundwater Monitoring
LTRA	Long-Term Response Action
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MCP	Massachusetts Contingency Plan
mg/kg	milligrams per kilogram
MNA	Monitored Natural Attenuation
MW	Monitoring Well
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NOAA	National Oceanic and Atmospheric Administration
NOB	North of Hurricane Barrier
NRWQC	National Recommended Water Quality Criteria
O&M	Operation and Maintenance
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbon
PCBs	Polychlorinated biphenyls
PFAS	Per- and polyfluoroalkyl substances
PFBS	Perfluorobutanesulfonic acid
PFHxS	perfluorohexane sulfonic acid
PFHpA	perfluoroheptanoic acid
PFNA	perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PQL	Practical Quantitation Limits
PRP	Potentially Responsible Party
PPRTV	Provisional Peer Reviewed Toxicity Value
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objectives
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Levels
SOB	South of Hurricane Barrier
SWDA	Solid Waste Debris Area
SVOC	Semi-Volatile Organic Compound

TBC	To be considered
µg/L (ug/L)	micrograms per liter
UCL	Upper Concentration Limit
UST	Underground storage tank
UU/UE	Unlimited Use/Unrestricted Exposure
VI	Vapor Intrusion
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound

I. INTRODUCTION

The Purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the fourth FYR for the Atlas Tack Superfund site. The triggering action for this **statutory** review is the completion date of the previous FYR. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The site consists of one Operable Unit (OU), which will be addressed in this FYR. The remedy was completed in accordance with the requirements of the March 2000 Record of Decision (ROD) for the Site, as modified by September 2009 Explanation of Significant Difference (ESD).

The Atlas Tack Superfund Site Five-Year Review was led by Sam Pham, the EPA Remedial Project Manager. Participants included Aaron Shaheen, the Community Involvement Coordinator (CIC); TaChalla Gibeau, Ecological Risk Assessor; Paulina Do, Human Health Risk Assessor; Megan Edwards, Attorney; and Paul Craffey, representative for the support agency, Massachusetts Department of Environmental Protection (MassDEP). The attorney for Atlas Tack Corporation, Paul Leikhim, was notified of the five-year review. The review began on 11/24/2024.

Site Background

The Site is approximately 48 acres and is located about 0.5 mile from Fairhaven Center (Figure 1) in a predominantly residential area. It is bounded by a bicycle path, residences and a few commercial/light industrial businesses to the north, a tidal marsh to the east and south, a former elementary school about 200 feet to the northwest and residences immediately to the south. The Site includes the entire Atlas Tack Corp. (Atlas Tack) property, an adjacent property owned by Hathaway-Braleley Wharf Company, Inc., and portions of Boys Creek and the adjacent saltwater tidal marsh extending to Buzzards Bay. A hurricane dike (also referred to as “barrier”), built in the early 1960s, runs northeasterly through the marsh area of the Site. The hurricane dike is on land owned by the Town of Fairhaven and is managed by the U.S. Army Corps of Engineers.

The historic use of the Atlas Tack property involved the manufacture of a variety of metal products including wire tacks, steel nails, rivets, bolts, shoe eyelets. From the 1940s until the late 1970s or 1980s, wastes from these operations (solid and liquid) were disposed of at the Site. The Hathaway-Braleley property was undeveloped land that was utilized for storage of commercial fishing equipment and waste disposal.

The current land use for the area surrounding the Site is residential, industrial and commercial. The Atlas Tack property is currently zoned industrial but remains vacant. A dilapidated two-story brick building currently remains on the western portion of the property. As of January 2025, the majority of the roof has collapsed into the two-story building. A small metal shed is located along the southern boundary of the Commercial Area. The Hathaway-Braleley property is currently zoned for residential use, but the property is predominantly wetland. Boys Creek and the associated wetlands and saltwater marsh are habitats for plants, fish, and wildlife. The area is mapped as a rare species habitat by the Massachusetts National Heritage Program. The groundwater underlying the Site is not currently used as a drinking water source, but does ultimately discharge to Boys Creek.

FIVE-YEAR REVIEW SUMMARY FORM

Site Name: Atlas Tack Corporation Superfund Site		
EPA ID: MAD001026319		
Region: 1	State: MA	City/County: Fairhaven, Bristol County
NPL Status: Final		
Multiple OUs? No	Has the site achieved construction completion? Yes	
Lead agency: EPA <i>[If "Other Federal Agency", enter Agency name]:</i>		
Author name (Federal or State Project Manager): Sam Pham		
Author affiliation: EPA		
Review period: 11/30/2024 – 7/20/2025		
Date of site inspection: 1/16/2025		
Type of review: Statutory		
Review number: 4		
Triggering action date: 7/21/2020		
Due date (five years after triggering action date): 7/21/2025		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The baseline human health risk assessment (as updated in 1998) identified concentrations of arsenic, polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and lead, which posed unacceptable carcinogenic and non-carcinogenic risk in soils and sediments in the Commercial Area and Boys Creek. Given the anticipated future use of the Site, commercial/industrial use, worker exposure to contaminated soil in the Commercial Area was considered the principal human health threat at the Site. Human health risks were also posed by ingestion of contaminated shellfish from Boys Creek.

Neither Boys Creek nor the groundwater beneath and in the vicinity of the Site is currently or expected to be used for drinking water because the water is brackish due to its proximity to the ocean. As documented in a March 1998 Memorandum of Agreement between EPA and the Commonwealth, the Groundwater Use and Value Determination for the Site is deemed "low."

Contaminant levels in soils and sediments throughout Boys Creek and the surrounding marsh area (including the tidal creek proper and the tidal marsh surface) and adjacent upland areas were sufficiently elevated to pose a

substantial risk to invertebrates, fish and wildlife through direct contact and dietary exposure to a variety of organic chemicals and metals. Results of the baseline ecological risk assessment identified concentrations of copper, lead, mercury, nickel, silver, zinc and cyanide in surface waters throughout the site that frequently exceeded unacceptable risk levels. The risk to aquatic organisms in the surface waters and associated wetlands from exposure to these chemicals was of ecological concern.

Response Actions

The ROD for the Site was signed on March 10, 2000. Remedial Action Objectives (RAOs) were developed as a result of data collected during the Remedial Investigation to aid in the development and screening of remedial alternatives to be considered for the ROD. They are:

1. Attain Commercial Area surface (0 to 2 feet) soil/sludge contaminant concentrations which are protective of human health, assuming commercial exposure for human receptors.
2. Attain Solid Waste and Debris Area surface (0 to 2 feet) soil and sediment contaminant concentrations which are protective of aquatic and terrestrial organisms.
3. Attain Marsh and Creek Bed Area surface (0 to 2 feet) soil and sediment contaminant concentrations which are protective of human health (shellfish ingestion) and aquatic and terrestrial organisms.
4. Attain surface water contaminant concentrations which are protective of human health and aquatic and terrestrial receptors.
5. Protect surface water and sediments from contaminant migration from Commercial Area, SWD Area, and Marsh and Creek Bed Area soils and sediments.
6. Prevent unacceptable risk to humans due to exposure to contaminants that may migrate from the groundwater via vapor intrusion into buildings.
7. Protect the surface water in Boys Creek and its tributaries from contaminant migration from groundwater.
8. Comply with applicable chemical-, location-, and action-specific ARARs.

The major components of the selected remedy included the excavation, treatment, and off-site disposal of contaminated soil, debris and sediment, demolition of contaminated buildings, marsh mitigation, and restoration of the affected areas. Monitored natural attenuation (MNA), with phytoremediation (planting of specific types of trees to lower the level of residually contaminated groundwater) as an enhancement component, was chosen to address the groundwater beneath the Site. However, the 2009 ESD eliminated the phytoremediation component of the remedy because EPA determined that lowering the groundwater table would not allow for enough groundwater flow into the freshwater wetland area, which would substantially inhibit a key feature in the design of the wetland. The 2009 ESD also required that rather than restoring the freshwater wetland and saltwater marsh areas to the precise contours that existed in 1901, the area of saltwater marsh north of the hurricane dike would be designed with a smaller footprint because the maximum tidal flow through the dike was believed to be insufficient to sustain a larger area of saltwater marsh. The major contaminants of Concern (COCs) are presented below in Table 1.

Table 1: Major Contaminantes of Concern (COCs) by Media

COC	Subsurface Soil/Sediment	Groundwater
Pesticides	X	X
Volatile Organic Compounds (VOCs)	X	X
Semi-Volatile Organic Compounds (SVOCs)	X	X

COC	Subsurface Soil/Sediment	Groundwater
Polycyclic Aromatic Hydrocarbons (PAHs)	X	X
3,3-dichloribenzidene	X	--
Polychlorinated biphenyls (PCBs)	X	X
Arsenic	X	X
Lead	X	--
Copper	X	X
Chromium (hexavalent)	X	X
Cadmium	X	X
Mercury	X	--
Nickle	X	X
Silver	X	--
Zinc	X	X
Cyanide	X	X
Toluene	--	X

Notes:
X = is a COC in media.
-- = is not a COC in media.

The groundwater cleanup levels established in the 2000 ROD are ecologically based; four out of the five Interim Groundwater Cleanup Levels (IGCL) parameters, copper, nickel, zinc, and cyanide, were based on the Ambient Water Quality Criteria [now the National Recommended Water Quality Criteria (NRWQC)] subject to a dilution factor, however the Massachusetts Contingency Plan (MCP), Upper Concentration Limit (UCL) was used for toluene, since there is no NRWQC standard for toluene. The groundwater clean-up levels are provided in Table 2 based off the 2000 ROD and shown below.

Table 2: Interim Groundwater Cleanup Levels Expected to Provide Protection of Ecological Receptors

Interim Groundwater Cleanup Levels Expected to Provide Protection of Ecological Receptors					
Habitat Type/ Name	Groundwater to Surface Water	COC	Protective Level (ug/L)	Basis	Assessment Endpoint
Boys Creek	Groundwater to Surface Water	Copper	31	AWQC x DF	Survival, reproduction and growth of benthic invertebrate community
		Nickel	82	AWQC x DF	
		Zinc	810	AWQC x DF	
		Cyanide	10	AWQC x DF	
		Toluene	100,000	MA UCL	

The ROD required that a more extensive bioavailability study be performed to determine the extent of sediment removal in the marsh area. Cleanup levels were developed based on the correlation between the level of contamination (principally metals) and associated toxicity data for each sampling location (USEPA, 2009; Weston, 2009a).

Institutional controls (ICs) are required on the Atlas Tack property north of the hurricane dike and on the Hathaway-Braley property. These are required to limit uses of the Site property by all future owners to those uses that are consistent with the risk assessment. Specifically, on the Atlas Tack property the ICs prohibit withdrawal, consumption, exposure or utilization of groundwater for any purpose and cultivation of plants or crops for human consumption. Activities such as excavation and drilling that might disturb the soil are also restricted. The ROD contemplated that ICs would include restricting the types of use and construction within portions of the Commercial Area to only commercial and industrial uses (i.e., no residential use). Institutional controls are required in the Non-Commercial Area to limit the use of that area to certain recreational uses consistent with the risk assessment and with the response actions conducted in that area. The Hathaway-Braley property is predominantly wetland and in a settlement with the Natural Resource Damage Trustees, Hathaway-Braley has agreed to keep the property undeveloped by means of a Conservation Restriction (easement) to maintain the property in its “natural, scenic, and open condition; to protect and conserve wetland and upland areas of the Property; and to preserve the property as habitat for those species known to occur in such ecosystems in Bristol County, Massachusetts, in perpetuity.”

Status of Implementation

Remedial cleanup activities were conducted in three phases from June 2005 – September 2007 and are complete. Phase I was initiated in June 2005 and included: the on-site demolition of commercial buildings in the Commercial Area; and excavation and off-site disposal of contaminated soil, sludge and debris. 5,480 cy of contaminated soil and 775 cy of plating sludge (RCRA listed waste F009) were excavated and disposed of at appropriate off-site licensed landfills. Following demolition and excavation, the area was backfilled and graded to facilitate proper site drainage. This phase was completed in March 2006 and Phase II was initiated. Phase II involved excavation and off-site disposal of 36,600 cy of contaminated soil and debris from the solid waste disposal (fill) areas on the Atlas Tack property and the Former Lagoon Area (east of the Commercial Area), and a Commercial and Industrial Debris Area located on the Hathaway-Braley property. Most of the fill areas remediated in this phase were originally wetland. As the remedy called for these areas to be restored as wetland, restoration of this area, including final grading, occurred in conjunction with the marsh restoration activities during Phase III, which was initiated in January 2007. During Phase III, 36,430 cy of marsh and creek bed sediment was removed. Site restoration activities included: installation of a security fence and boulder barricade; regrading, placement of loam, and seeding; planting of salt marsh vegetation; installation of coir fiber logs and biodegradable erosion control blankets along Boys Creek to prevent erosion; treatment of invasive species near the restored area; the adjacent upland areas were planted with trees and shrubs and seeded with native plant seed mixes planting. The wetlands restoration also included re-creation of a fresh and saltwater wetland environment (approximately 5.5 acres). All components of the remedy were performed in accordance with the plans and specifications approved by EPA. The Site achieved construction completion status in September 2007. Once the Site was considered Operation & Functional, in September 2008, the Massachusetts Department of Environmental Protection (MassDEP) assumed responsibility for monitoring of restoration areas.

Groundwater beneath and in the vicinity of the Site remains contaminated, but groundwater is not used as a drinking water supply and interim groundwater cleanup goals are ecologically based. Since 2007, concentrations of several contaminants of concern have been monitored under an established long-term groundwater monitoring (LTGM) plan associated with monitored natural attenuation and will continue until interim ecological cleanup goals are attained.

Institutional Controls are in place and are presented in Table 3.

Table 3: Summary of Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater, soils, sediments	Yes	Yes	Atlas Tack Corp Property, Fairhaven, MA	Prohibit withdrawal, consumption, exposure or utilization of groundwater for any purpose and cultivation of plants or crops for human consumption	Notice of Activity and Use Limitation, 12/15/17 (Bristol South Registry, Bk 12306 Pg 17)
Groundwater, soils, sediments	Yes	Yes	Hathaway-Braley Wharf Co., Inc Property, on Church St, Fairhaven, MA	Conservation restriction (easement) to maintain the property in its natural, scenic, and open condition; to protect and conserve wetland and upland areas of the Property; and to preserve the Property as habitat for those species known to occur in such ecosystems	Grant of Environmental Restriction and Easement, 02/08/2017 (Bristol South Registry, Bk: 11982 Pg: 300)

Operation & Maintenance

The Final Operation and Maintenance Plan dated April 2009 (Weston, 2009b), describes the short and long-term O&M monitoring goals for groundwater, surface water, and sediment monitoring. The primary O&M activities include:

- Groundwater monitoring on an annual basis.
- Surface water and sediment sampling to monitor the effectiveness of the source removal remedy, and in conjunction with the results of the groundwater monitoring program to assess the effectiveness of the natural attenuation remedy. Sampling occurs every five years.
- A Wetlands “adaptive management” program including qualitative assessments during the growing seasons, quantitative vegetative monitoring, and invasive species control, as needed, and periodic inspections of the perimeter fence and gates for integrity, and of ditches, swales, dikes, spillways, slopes and banks for hydrologic conditions, erosion and sedimentation.

In 2016, the 15 existing site monitoring wells (AT-5, AT-8, MW-2, MW-3, MW-4R, MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15R, MW-16, and #519) were inspected, redeveloped and, as needed, repaired or replaced (KGS, 2016a). Monitoring well #519 was the only well that could not be redeveloped because it contained too little water. Monitoring well MW-15 was abandoned because it was compromised, but it was subsequently replaced with MW-15R in June 2016.

Responsibilities for the groundwater sampling were transferred from EPA to MassDEP in September 2018 (USEPA, 2018). (Other long-term monitoring activities, sediment and surface water sampling and wetland monitoring, are currently being conducted by MassDEP.) The transfer letter served as an agreement by the agencies to modify the frequency and the locations of the compounds to be sampled, which was also documented in the 2018 Quality Assurance Project Plan (AMEC, 2019b). Those modifications included analyzing all groundwater samples for volatile organic compounds (VOCs), total and dissolved select metals (copper, nickel and zinc), total cyanide, chloride, total suspended (TSS), and total dissolved solids (TDS) at all site monitoring wells & 1 pore water location, PW-1, every 5 years. The agreement also included reassessing the monitoring program as part of the five-year review. Below is a summary of the updates in Table 4:

Table 4: Updated Analytes Sampled in 2024

Analyte	Annual Locations	Annual Locations until 2024
cyanide	-	MW-2, MW-3 MW-4R, MW-7, MW-9 thru MW-14, AT-5 & AT-8; and PW-1
chloride	-	
pH, TDS, TSS	all locations sampled	all locations sampled
VOCs	MW-2, MW-15R	519
Copper	MW-7, AT-8	MW-9, MW-12, MW-14, 519
Zinc	AT-8	519
Nickel	MW-3, AT-8	MW-7, 519

Note: all groundwater samples will be analyzed for volatile organic compounds (VOCs), total and dissolved select metals (copper, nickel and zinc), total cyanide, chloride, total suspended (TSS), and total dissolved solids (TDS) at all site monitoring wells & 1 pore water location, PW-1, every 5 years. The monitoring program will also be reassessed as part of the five-year review.

Modifications to the Long-Term Groundwater Monitoring (LTGM) program have occurred several times throughout the monitoring program since the Final Operation and Maintenance Plan dated April 2009 (Weston, 2009b). Prior to the October 2016 LTGM event, modifications were made to the monitoring program to better determine the effectiveness of the ongoing MNA RA being conducted at the site. These modifications were discussed in the KGS QAPP (KGS, 2016b) and included:

1. Additional analytical parameters were added to the LTGM program in Year 9 (2016) to assess whether aquifer conditions are conducive to MNA of inorganic and organic ground water and pore samples collected from the Site:¹
 - Total Iron
 - Ferrous iron (Field Test)
 - Nitrate/nitrate
 - Sulfate
 - Sulfide
 - Total Organic Carbon (TOC)

In accordance with the QAPP, these supplement MNA analysis were also collected in the 5-year events (2019 and 2024) from wells with PAL exceedances.

2. One pore water sampling location (PW-1) adjacent to Boys Creek, downgradient from monitoring well location MW-3, was added to the LTGM program during Year 9 to assess whether ground water contaminant concentrations in the vicinity of MW-3 are impacting the creek. The pore water sample was collected east of MW-3 in Boys Creek (Figure 2) using a push-point pore water sampling device. The pore water sample was analyzed for all the parameters analyzed under the LTGM program. Field parameters were also collected from this location during the subsequent May 2017, April 2018, April 2019, May 2020, May 2021, April 2022, June 2023, and April 2024 LTGM events.
3. Monitoring wells MW-2 and MW-15R, which have historically contained tetrachloroethene, were analyzed for vinyl chloride using Method 8260 Sim to obtain a lower detection limit below the Project Action Limit (PAL). Vinyl chloride was analysis of groundwater from MW-2 and MW-15R using Method 8260 SIM was also performed during the subsequent LTGM events.
4. The additional data collected during the Year 9 event were used in conjunction with historical data to update the Remedy Evaluation technical Memorandum (KGS, 2017).

Modifications to the LTGM program were also made prior to the April 2019 LTGM event. The following supplemental monitoring requirements were completed as part of the transfer of the responsibility of the Site from USEPA to the MassDEP. These modifications were discussed in the AMEC QUAPP (AMEC, 2019) and included:

1. The 8260 analyte list was modified to be consistent with the Massachusetts Contingency Plan (MCP) compendium of Analytical Methods (CAM) analyte list.
2. Vinyl chloride was reported from the standard 8260 analysis and not the Selective Ion Method (SIM) as the laboratory’s method detection limit (MDL) supported the Project Action Limit (PAL for Vinyl chloride, SIM was therefore not required.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last five-year review in 2020 as well as the recommendations and the current status of those recommendations.

Table 5: Protectiveness Determinations/Statements from the 2020 FYR

OU #	Protectiveness Determination	Protectiveness Statement
Sitewide	Protective	The remedy at the Site is protective of human health and the environment because soil and sediment at the Site no longer present an unacceptable risk to environmental receptors via ingestion of contaminated vegetation or biota, or incidental ingestion of contaminated soil and sediment. Additionally, institutional controls are in place that limit the current Site property owners’ uses of the property to those that are consistent with the risk assessment, and specifically prohibit withdrawal, consumption, exposure or utilization of groundwater for any purpose and cultivation of plants or crops for human consumption. Similarly, activities such as excavation and drilling restrict the disturbance of remaining contaminated soils.

There were no issues or recommendations in the last FYR.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A Public notice was made available by EPA press release titled “EPA to Review Cleanups at Ten Massachusetts Superfund Sites this Year”, issued February 12, 2025, stating that there was a five-year review and inviting the public to submit any comments to the U.S. EPA. The results of the review and report will be made available at the Site information repository located at www.epa.gov/superfund/atlas and from U.S. EPA, Records and Information Center located at 5 Post Office Square, Suite 100, 1st Floor, Boston, MA 02109-3912.

As part of the FYR process, interviews are conducted to document any perceived problems or success with the remedy that has been implemented to date. The following persons were contacted for interviews: Paul Craffey, MassDEP Project Manager, Josh Crabb, Town of Fairhaven, and Carolyn Longworth, Community Stakeholder. Interview responses were received from MassDEP, Town of Fairhaven, and Ms. Longworth, and are summarized below; a copy of the complete interview records are included in **Appendix C**.

The overall sentiment of those responding was that they are pleased with the value of the scenery and the presence of wildlife and many other birds, reptiles, fish, and otters. Ms. Longworth noted observing the endangered Pied-billed Grebes and Clapper Rails, however the Clapper Rails were not observed this past year. MassDEP indicated that the growth of the marsh and wetlands continues to flourish, but at a slower rate than projected. O&M activities related to groundwater and wetland monitoring continue to be conducted and recommend that it continue. MassDEP also noted that the monitoring for the Monitored Natural Attenuation (MNA) remedy continues to show general declining or stable contaminant concentration trends since soil source area removal actions were completed.

Data Review

From 2020 to 2024 ground water samples were collected on an annual basis.

The 2024 Long-Term Monitoring (LTM) event was performed in April 2024 and was reported in the Final Long-Term Annual Summary Report (WSP, 2024). The sampling included groundwater samples from 15 monitoring wells, and one pore water location. The groundwater sampling included sampling for the following analytes: VOC, cyanide, chloride, total suspended solids, total dissolved solids, and total and dissolved copper, iron, nickel, and zinc at all locations. Additional MNA parameters, nitrate, nitrite, sulfate, sulfide, and TOC, were collected during the Year 17 LTGM event at wells MW-2, MW-3, MW-7, MW-13, MW-15R, AT-8, and PW-1. The Final Long-Term Monitoring (LTM) 2024 Annual summary Report provides summary tables of the groundwater data collected from 2007 through 2024. Table 1 is a summary of the groundwater elevation; Table 2 provides the groundwater quality conditions to evaluate MNA (pH, specific conductivity, dissolved oxygen, oxidation-reduction potential and turbidity); and Table 4 provides a summary of the groundwater analytical for the Site COCs: copper, nickel, zinc, cyanide and toluene. A summary of all groundwater analytical results for a given year are provided in Table 3 of the respective annual report. Analytical monitoring results presented in Tables 3 & 4 of the annual reports have been compared to the appropriate PALs, which, for metals and cyanide, are based on the Interim Groundwater Cleanup Levels (IGCLs) prescribed in the ROD (USEPA, 2000), and, for VOCs, is the most conservative value presented in OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) or Risk-Based Vapor Intrusion Target Concentrations in Groundwater for Chemicals with Maximum Contaminant Levels - Truncated VI Screening Table (3.24.11) (USEPA 2020). Appendix C of the 2019 report also provides Trend Graphs for the site COCs (Total Copper, Total Nickel, Total Zinc, Cyanide, Toluene, PCE) for the data since 2007.

Below is a Summary of the findings since last five-year review. No deviations from the QAPP (WSP, 2023) were noted during the 2024 LTGM event.

Groundwater Elevations

Groundwater elevations maps reflecting the overburden flow regime have remained consistent over the past five years of monitoring. Groundwater generally flows from the western portion of the Site toward the northeast, ultimately discharging into Boys Creek, and observation that aligns with previous monitoring events. Although groundwater elevations at site wells are influenced by tides, since 2015, samples have been consistently collected during the spring high tide to increase the likelihood of encountering water in wells and to more effectively assess any significant changes. The 2024 LTM annual report noted that groundwater elevation in April 2024 were generally higher than recorded during the June 2023 event.

Groundwater VOC Results

Tetrachloroethene (PCE) was the only volatile organic compound (VOC) detected above its PAL of 0.55 micrograms per liter ($\mu\text{g/L}$) in any of the wells sampled for VOCs. PCE was found at MW-2 at a concentration of 3.8 $\mu\text{g/L}$ and at MW-15R at 1.7 $\mu\text{g/L}$. The concentration at MW-2 increased compared to June 2023 (2.8 $\mu\text{g/L}$) but remains below the historical maximum of 13.6 $\mu\text{g/L}$ recorded in April 2010. Similarly, the PCE concentration at MW-15R rose from 1.2 $\mu\text{g/L}$ in June 2023 but is still well below the highest concentration recorded at this location, 6.4 $\mu\text{g/L}$ in April 2008. PCE was also detected at PW-1 at a concentration of 2.1 $\mu\text{g/L}$.

Three additional VOCs, cis-1,2-Dichloroethene (cis-1,2-DCE), Chloroform, and Trichloroethene (TCE)—were detected at MW-2, all at concentrations below their respective PALs. Although PCE levels in groundwater exceeded the PAL and have increased relative to past measurements, the presence of TCE and cis-1,2-DCE, along with dissolved oxygen data, suggests that anaerobic dehalogenation of PCE (natural attenuation) is occurring at MW-2. Vinyl chloride was not detected at any location during either the June 2023 or April 2024 LTGM sampling events. The lack of strongly reducing conditions may be limiting the rate of biodegradation for compounds like PCE, which could explain the slow decline in residual concentrations observed in groundwater (KGS, 2017). One additional VOC, TCE, was also detected at MW-15R at a concentration of 0.78 J µg/L, which is below its PAL.

Only one VOC was detected in the pore water sample from PW-1: TCE at a concentration of 0.61 J µg/L, also below the PAL of 2.89 µg/L. Continued sampling of pore water at PW-1 is recommended to monitor potential impacts of contaminants of concern (COCs) on the Creek to continue to monitor the long-term effects of the remedy.

Groundwater Metal Results

Copper was detected above the project action limit (PAL) of 31 µg/L at two locations: MW-7 and AT-8. At MW-7, total copper was 196 µg/L and dissolved copper was 183 µg/L. These concentrations are consistent with historical data for this well dating back to April 2010 and remain well below the site maximum of 1,350 µg/L recorded in December 2007 following source area remediation. At AT-8, total copper was 73.2 µg/L and dissolved copper was 55.6 µg/L, also consistent with historical data and below the peak concentration of 462 µg/L measured in April 2010. Both MW-7 and AT-8 showed lower total and dissolved copper concentrations compared to the April 2022 sampling round.

At PW-1, total copper was detected at 5.4 µg/L, consistent with concentrations observed at this location since 2020. Total copper was not detected at AT-5, and dissolved copper was not detected in either PW-1 or AT-5 in April 2024. Notably, while the total copper concentration in PW-1 was higher than the values reported in the 2020, 2021, and 2023 LTM Annual Summary Reports, the nondetect result for dissolved copper (0.02 U µg/L) suggests the total copper may have originated from sediment within the pore water sample.

Dissolved nickel was detected above the PAL of 82 µg/L at MW-3, with a concentration of 88.8 µg/L (total nickel at this location was 79.6 µg/L). This result suggests that all nickel present was in the dissolved phase, as the dissolved concentration slightly exceeded the total. The discrepancy may be due to variability in groundwater sampling or laboratory analysis. Total nickel was detected below the PAL at MW-3, MW-4R, MW-7, AT-8, and PW-1. These concentrations are generally consistent with past data, which have fluctuated near the PAL since January 2009, and remain well below the historical maximum of 496 µg/L observed in December 2007. Total zinc exceeded the PAL of 810 µg/L only at AT-8, where it was measured at 1,010 µg/L (dissolved zinc was 715 µg/L). This remains below the site maximum of 1,760 µg/L, recorded at the same location in December 2007. Total zinc was below the PAL at all other locations except MW-13 and MW-16, while dissolved zinc was detected at all locations except MW-11, MW-13, and MW-16.

Iron was detected in both total and dissolved forms at all sampled locations, except at well location #519 for dissolved iron.

Other Groundwater Sampling Results

Cyanide was detected above the project action limit (PAL) of 10 µg/L at MW-13, with a concentration of 16 µg/L. This result is within the historical range for this well and remains below the maximum concentration of 41.6 µg/L recorded in October 2009. Cyanide concentrations at MW-13 have exceeded the PAL for the past six sampling events (2018–2023), indicating a relatively stable trend over time. In contrast, cyanide was not detected above the laboratory detection limit of 5 µg/L at the pore water location or at AT-5 during the April 2024 sampling event.

Chloride was detected at all sampled locations in April 2024, with concentrations ranging from 10,000 µg/L at AT-5 to 310,000 µg/L at MW-15R. There is no PAL established for chloride.

The updated Remedy Evaluation conducted by KGS in 2019, following the October 2018 LTGM event, concluded the following:

- Statistical analysis indicates that contaminants of concern (COCs) above their respective PALs are generally showing stable or declining trends.
- Monitoring data support that the shallow groundwater conditions at the Atlas Tack Site are favorable for metals precipitation, a key mechanism in monitored natural attenuation (MNA).
- Based on April 2018 data, the estimated timeframes to achieve PALs or remedial goals range from 11.3 years for copper at AT-8 to 14.8 years for copper at MW-7.
- A projected timeframe for tetrachloroethene (PCE) to meet PALs at MW-2 and MW-15R could not be determined, as no statistically significant decreasing trend was observed at those wells.

The findings from the 2024 LTGM sampling event continue to support the conclusions of the 2018 updated Remedy Evaluation.

Surface Water and Sediment Monitoring

Surface water and sediment sampling are collected every five years to evaluate the effectiveness of the source removal remedy, and in conjunction with the results of the ground water monitoring program to assess the effectiveness of natural attenuation remedy. In 2022, six surface water samples and thirteen sediment samples (top twelve inches of sediment) were collected from locations North of the Barrier and South of the Barrier shown on Figures 3 and 4, respectively. Surface water and sediment samples were submitted for laboratory analysis of cyanide and total metals (cadmium, chromium, copper, lead, nickel, and zinc). Surface water sampling results for saltwater and freshwater location are presented in Tables 1 and 2 of the 2022 Surface Water and Sediment Sampling Report (Wood, 2022) found in the Appendix. The results are compared to criteria developed and identified in Table 1-1 of the Final Sampling and Analysis Plan Addendum No. 006 Surface Water and Sediment monitoring (Weston 2009a). The NRWQC were selected as the primary criteria for data evaluation purposes. However, in cases where NRWQC was not available for a constituent, the following published criteria were used as a basis for comparison to monitoring data: (i) Remediation General Permit (RGP) Appendix III Effluent Limitations, (ii) RGP Appendix VI Minimum Levels and Test Methods, (iii) MassDEP Surface Water Environmental Toxicity Values (Chronic) found in 310 Code of Massachusetts Regulations 40.1516(1), and (iv) MCP Method 1 GW-3 Groundwater Standards.)

A review of the surface water results from 2022 indicates that copper was detected above the PAL of .0031 mg/l in all four saltwater surface samples (SW-01, SW-02, SW-03, and SW-04) with concentrations that ranged from 0.004 mg/l to 0.009 mg/l. Total cyanide was not detected in saltwater or freshwater surface water samples. In the remaining saltwater and freshwater samples, analytes (including cyanide) were not detected or were detected below the applicable monitoring criteria. Surface water results collected in October 2022 were similar those collected in April 2022 although there were fewer PAL exceedances in the October Results.

Table 3 of the of the 2022 Surface Water and Sediment Report presents the sediment sampling results and the calculated Effects and Range Median Quotient (ERM-Q) for each sediment sampling location. The Effects and Range Median Quotient (ERM-Q) are reported in Table 9 of the “Final Long-Term Monitoring 2022 Annual Summary Report” dated December 7, 2022 and Table 4 of “October 2022 Surface Water and Sediment Sampling Results Technical Memorandum” dated December 15, 2022. The ERM-Q for a particular sample is the average of the sum of metal concentrations (cadmium, copper, lead, nickel, and zinc), divided by their respective NOAA’s Effects Range-Median (ERM) screen value. In general, ERM-Q values greater than 1.0 could display toxicity and values below 1.0 could display no toxicity. Therefore, in accordance with the O&M plan and the QAPP, samples are analyzed for toxicity at location with an ERM-Q above 1.0. ERM-Q values are all less than 1 except for location BC-02 which had an ERM-Q of 1.415 as reported in the October 2022 Technical Memo. Per the QAPP, any sediment location with an ERM-Q value greater than 1 should be submitted for toxicity testing.

A review of the 2022 sediment results collected in October 2022 was similar to those collected in April 2022 with the exception of location BC-02, which had exceedances of the metals and cyanide PALs. In addition, the ERM-Q

value at location BC-02 is greater than 1, which is an indication the potential for sediment toxicity. At this time, it is not recommended that toxicity sampling and testing be conducted as the result would not change the Monitored Natural Attenuation currently being conducted at the Site. If, during the next sampling round, BC-02 has an exceedance of the EQR-M guidance, then the necessity of the sediment toxicity testing should be evaluated. Also, during the next sampling round, any location with petroleum sheens or odors will be noted. If there is visual evidence of petroleum in sediments, a sample will be collected for analysis.

Wetland Monitoring

A site inspection was conducted on September 9, 2022, under the SARSS VI contract and in accordance with the Site Operation and Maintenance (O&M) Plan. The objectives of this site inspection were to: (1) qualitatively evaluate plant success in the restored tidal marsh north of the hurricane barrier (NOB), and (2) conduct a visual assessment of conditions site wide. Figure 5 in the Appendix B shows a restored Tidal Marsh vegetated cover. The performance standards for which success of the marsh restoration include:

- Erosion Protection
- Invasive Species Management
- Restoration of Salt Marsh Functions and Values
- 85% Herbaceous Vegetated Cover

Operation and maintenance goals established in the ROD, the objectives of the inspection were to: (1) qualitatively evaluate plant success in the restored tidal marsh north of the hurricane barrier (NOB), and (2) conduct a visual assessment of conditions site wide. The performance standards and results for the 2022 tidal marsh inspection are provided below:

1. “Erosion protection to prevent bank scouring and erosion, and site sediment and soil stabilization. The two spillway outlet channels must be maintained at an elevation of 3.5 ft. to provide deep water habitat resistant to colonization by common reed in the freshwater wetland.”

This standard has been met. No undue erosion was observed in the restored tidal marsh, including the tidal creek bed and bank and marsh sediment.

2. “Invasive species management (primarily control of common reed). The goal is zero tolerance of common reed, Japanese knotweed, and purple loosestrife in the restored areas was required during the initial 5-year period of performance (2008-2012). At the end of the 5-year period of performance, the need for continued invasive species monitoring and control will be evaluated.”

This standard has been met. Annual herbicide applications have served to decrease the abundance of all invasive plant species in the treatment area, but some occurrences of phragmites, knotweed, loosestrife, honeysuckle, multiflora rose, autumn olive, oriental bittersweet, and swallowwort were still observed in 2022. Consultation with the herbicide applicators suggested that invasive species management (herbicide applications) are required annually to limit the introduction of the invasive species to the salt marsh. We recommend the State evaluate continued support of these activities. It is likely that cessation of annual herbicide application in the tidal marsh would result in the eventual takeover by invasives due to the presence of invasive plant species in habitats that border the restored tidal marsh. The purpose of the Atlas Tack Site remediation is to eliminate/control the chemical concentration. The control of invasive plant species is expected until the remedial standard for wetland restoration is achieved. Further invasive plant species control will be determined by the MassDEP in consultation with EPA.

3. “To the extent practicable, restoration of salt marsh and other areas consistent with anticipated future use of the Site, and providing an equal ecologically valued land use, when compared to pre-1901 site characteristics.”

This standard has been met. Wetland functions and values have been restored. The vegetation that has populated the tidal marsh is consistent with a typical salt marsh. Wildlife use of the site corroborates restored functions and values. Wading birds and waterfowl as well as marine invertebrates (fiddler crabs) were observed in the unvegetated areas. In addition, we saw several people “observing wildlife” (i.e., birding) at the restored salt marsh.

4. “Performance standards for the restoration areas will likely include the establishment of a self-propagating and sustaining native vegetation community. For herbaceous vegetation 85% cover is a recommended goal over a 5-year monitoring period for most habitat types. In addition, an 85% survival of planted trees and shrubs is the goal over a 5-year monitoring period.”

This standard has been met. The calculated percent cover for the restored tidal marsh is 97.6% based on direct measurement of non-vegetated areas compared to the total area of restored tidal marsh.

Prior to 2022, annual inspections were conducted of the restored saltwater and freshwater marsh areas. However, the conclusion from the 2022 Restoration Wetland Monitoring Report indicated that the performance standards have been met. Despite meeting the performance standards, the MassDEP will consult with the EPA regarding the January 2023 need for future wetland inspections and herbicide applications. It is likely that cessation of annual herbicide treatments will allow invasive species to pioneer in the tidal marsh and eventually become established. This is based on observed populations of invasives in marsh habitat adjacent to the site, which are likely the seed source for invasives that pop up annually at the site.

Site Inspection

The inspection of the Site was conducted on 1/16/2025. In attendance were Sam Pham, Megan Edwards, and TaChalla Gibeau of the EPA, and Paul Craffey of the MassDEP. The purpose of the inspection was to assess the protectiveness of the remedy.

During the inspection, the former source areas, fencing, on-site building and ground water monitoring wells were visually inspected. The on-site building had several broken windows and a collapsed roof which has partially collapsed part of the second floor, and appeared to be accessible, however, it was not subject to the cleanup activity or to institutional controls. At the time of this five-year review, EPA was not aware of any plans for removing or otherwise using the building or the upland area. EPA is currently awaiting the property owner’s appraisal to assess and determine the most suitable course of action concerning the building on the property, and/or the property’s potential redevelopment or sale. The upland areas generally appear to be in good condition and the wetland and marsh areas seemed to have vegetation cover in most areas, with minimal bare area. The location of the closed underground storage tank (UST) appeared to be in good condition and stable after the closure and work completed in September 2024. Generally, the fencing around the Site was upright and secured. However, downed fencing was observed near the Hathaway Braley Property. The site wells were individually inspected and appeared to be good condition and were secured with a lock. Some animal burrows were observed in the berm of the freshwater marsh, however the berm appeared well established overall. Drainage from the wetland or openings were not observed. MassDEP’s annual sampling and inspection conducted between April 15 and 17 2024 also confirmed that there is no evidence of any breach in the pond’s berm.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

YES. A review of documents, ARARs, risk assumptions and site inspection results indicate that the remedy has been constructed as intended by the ROD, as modified by the ESDs. Groundwater contaminants are generally decreasing and given that there are no known consumers of the groundwater for drinking, the cleanup goals for groundwater remain reasonable. The restored tidal marsh NOB continues to be stable and function as such, and

vegetation cover continues to increase, although some assessment areas and the salt marsh area overall have not yet met the 85% vegetation cover goal. With the groundwater generally decreasing and the vegetation in the saltmarsh continuing to flourish, the remedy is functioning as intended by the decision documents and continues to protect human health and ecological life. Institutional controls have been implemented in the form of a Grant of Environmental Restrictions and Easement (GERE) for the Hathaway-Braley Property and Notice of Activity and Use Limitations on the Atlas Tack property. These ICs limit the Site properties to those uses that are consistent with the risk assessment.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Question B Summary:

NO. There have been changes in toxicity values and methods of evaluating risk and potential standards since the 2000 ROD was issued as discussed below. The changes as described below are not expected to alter the protectiveness of the remedy because the human health RAOs have been achieved, namely prevention of contact with contaminated soil and groundwater, determination that vapor intrusion is not a potential exposure pathway, and elimination of shellfish risk by excavation of contaminated sediment. With respect to ecological risk, there are no newly promulgated standards relevant to the Site, which bear on the protectiveness of the remedy. There are no major changes in site conditions or exposure assumptions upon which the ecological risk assessment was based that would result in increased exposure or risk. The overall conclusion is that the remedy, as implemented, is protective of human health and the environment.

Changes in Standards and TBCs

New standards (federal or state statutes and/or regulations), as well as new TBC guidances, should be considered during the five-year review process as part of the protectiveness determination. Under the National Contingency Plan (NCP), if a new federal or state statute and/or regulation is promulgated or a new TBC guidance is issued after the ROD is signed, and, as part of the five-year review process, it is determined that the standard needs to be attained or new guidance procedures followed to ensure that the remedy is protective of human health and the environment, then the five-year review should recommend that a future decision document be issued that adds the new standard as an ARAR or guidance as a TBC to the remedy.

A summary of contaminants with new standards not previously considered and/or discussed in the last five-year review are presented below.

Summary of Site PFAS Activities

Groundwater at the site is not a drinking water source due to salinity. ICs in place prohibit withdrawal, consumption, exposure or utilization of groundwater for any purpose and cultivation of plants or crops for human consumption therefore, this exposure pathway is not likely and PFAS have not been sampled at the Site. PFAS has not been sampled at the site due to the groundwater not likely to be drinking water source because of the salinity. PFAS were not sampled in soil, sediment, or surface water/porewater at this Site. Hence, data relevant to assessing PFAS risk to ecological receptors has not been collected and therefore risk has not been determined.

Federal Floodplain Management

Federal regulations at 40 CFR Part 6, identified in Table 18 in the ROD, were withdrawn. Furthermore, these regulations, and therefore the current CERCLA remedy, only addressed potential floodplain impacts up to the 100-year flood elevation. Current federal floodplain regulations at 40 CFR Part 9 require a greater assessment of potential floodplain impacts, including preventing the release of contamination from waste management units and other remedial infrastructure up to the 500-year floodplain elevation. EPA has assessed potential floodplain impacts from a 500-year flood event on the restored wetlands. Because EPA has not identified any protectiveness issues at this time, we do not include a recommendation to add this requirement as an ARAR in a future determination.

Changes in Toxicity and Other Contaminant Characteristics

Since the last five-year review in 2020, there have been changes in toxicity values and other contaminant characteristics for chemicals of concern identified in the 2000 ROD. Below is a summary of the changes in the chemical cancer slope factors and reference dose factors that were reviewed and site-specific information pertaining to the listed chemical.

- **2025 Arsenic cancer and non-cancer toxicity values**

In January 2025, EPA released a new oral cancer slope factor (CSF) of $32 \text{ [mg/kg/day]}^{-1}$ based on a new IRIS value. Additionally, EPA released a new non-cancer reference dose (RfD) of $6.0 \times 10^{-5} \text{ (mg/kg/day)}$ based on a new IRIS value. The updated values are more conservative than the previous values, which indicates that risk would be increased for cancer and non-cancer effects.

The change in the toxicity values for arsenic results in changes to the risk calculations for clam ingestion (Appendix F). The clam beds were remediated as part of the extensive excavation, re-grading with clean fill and marsh restoration effort. The Massachusetts Division of Marine Fisheries² classifies the area around the site as “Prohibited” for shellfish harvesting. The classification determines whether or not shellfish in the area can be harvested for human consumption; a “Prohibited” classification indicates the area is closed to the harvest of shellfish under all conditions.

Although the change in toxicity values for arsenic increases the risk for clam ingestion at the site, given the State of MA has classified the area as “Prohibited” for shellfish harvesting and advises permit holders to review the classification information prior to harvesting, and the clam bed being remediated as part of the excavation and marsh restoration effort, these together reduce the potential exposure to an adult trespasser.

- **2024 Hexavalent Chromium cancer and non-cancer toxicity values**

In August 2024, EPA finalized a non-cancer oral reference dose (RfD) and a non-cancer inhalation reference concentration (RfC) for hexavalent chromium (Cr(VI)) based on new IRIS toxicity values. Additionally, EPA finalized a new oral slope factor and inhalation risk unit for Cr(VI) based on new IRIS cancer toxicity values.

The new IRIS values for oral slope factor and inhalation unit risk indicate that hexavalent chromium is less toxic from cancer effects compared to previous values. The oral cancer slope factor, previously $5.0 \times 10^1 \text{ [mg/kg/day]}^{-1}$, now is $1.6 \times 10^1 \text{ [mg/kg/day]}^{-1}$. The carcinogenic inhalation unit, risk previously $8.4 \times 10^{-2} \text{ [}\mu\text{g/m}^3\text{]}^{-1}$, now is $1.1 \times 10^{-2} \text{ [}\mu\text{g/m}^3\text{]}^{-1}$. These toxicity changes would result in a decreased cancer risk from exposure to hexavalent chromium.

The new IRIS values for non-cancer indicate that hexavalent chromium is more toxic from non-cancer effects compared to previous values. Previously, the oral RfD was $3.0 \times 10^{-3} \text{ (mg/kg/day)}$ and now is $9.0 \times 10^{-4} \text{ (mg/kg/day)}$. The inhalation RfC, previously $1.0 \times 10^{-4} \text{ (mg/m}^3\text{)}$, now is $3.0 \times 10^{-5} \text{ (mg/m}^3\text{)}$. These toxicity changes would result in increased non-cancer risk from exposure to hexavalent chromium.

The change in the toxicity values for hexavalent chromium results in changes to the risk calculations for clam ingestion (Appendix F). However, this toxicity change does not affect the current protectiveness of the remedy because the remedy is complete and functioning as intended. The remedy included excavation and off-site disposal of contaminated soil and sediment and remediation of the clam beds as part of the excavation and marsh restoration effort. Institutional controls are in place and are enforced to prevent unauthorized use of the Site restricting the use of groundwater and activities such as excavation and drilling that might disturb the soil on the Atlas Tack property. Additionally, there is fencing at the site. Taken together, these reduce potential exposure to workers and trespassers.

Lead in Soil Cleanups

² <https://www.mass.gov/info-details/shellfish-classification-areas>.

On January 17, 2024, EPA OLEM released the “Updated Residential Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities” (2024 Updated Soil Lead Guidance), which updates the residential soil lead screening level (RSL) and removal management level (RML) for the CERCLA and RCRA programs and provides additional guidance for setting residential lead preliminary remediation goals (PRGs) and cleanup levels. The 2024 Updated Soil Lead Guidance recommends that regions use the most current version of the *Integrated Exposure Uptake Biokinetic (IEUBK)* model, with 5 µg/dL as the 95th percentile target blood lead level and Site-specific environmental data (e.g., lead concentrations in various media and bioavailability) to develop PRGs and cleanup levels for residential land use. If an additional source of lead (e.g., lead water service lines, lead-based paint, non-attainment areas where the lead concentrations exceed NAAQS) is identified, the 2024 Updated Soil Lead Guidance recommends 3.5 µg/dL as the 95th percentile target blood lead level. The 2024 Updated Soil Lead Guidance also recommends that the EPA regions adjust PRGs and cleanup levels to account for uncertainty, technical limitations (i.e., detection/quantification limits), and Site-specific soil lead background.

The 2024 Updated Soil Lead Guidance defines Residential properties as any area with high or unrestricted accessibility to sensitive populations (e.g., young children) and includes, but is not limited to, properties containing single- and multi-family dwellings, apartment complexes, vacant lots in residential areas, schools, day-care centers, community centers, playgrounds, parks, greenways, and other recreational areas. As noted in the 2024 Updated Soil Lead Guidance, the RSL is not a default cleanup level and should not be used as such. The RSL is a tool used to identify properties that may warrant additional evaluation.

It is noted that the updates in the OLEM Memo pertain to residential Sites only. For commercial/industrial Sites, a screening level of 1,000 ppm is calculated for soil using the adult lead methodology with a target blood lead level of 5 µg/dL and default parameters. This approach is consistent with a risk goal of limiting exposure to soil/dust such that there is no more than 5% probability of fetal blood lead exceeding 5 µg/dL for the exposed population.

The site boundaries include the Atlas Tack property, and an adjacent property owned by Hathaway-Bradly Wharf Company. The Atlas Tack property is currently zoned industrial but remains vacant and the Hathaway-Bradley property is currently zoned for residential but is predominantly wetland.

Because the site is surrounded and abutted by residential properties (Figure 2), an updated assessment for lead was performed to determine a residential lead screening level for the Site (Appendix F). The “[Supplemental Framework: Selecting a Remedial Screening Level for Residential Soil Lead](#)” and the associated “[Residential Lead Screening Level Checklist](#)” are intended to guide remedial Site teams through the selection and documentation of the screening level by evaluating lines of evidence available in a variety of national data sets as well as local and/or Site-specific information. A review of Site information indicates that a Regional Screening Level (RSL) for lead in residential soil of 200 ppm is appropriate for the Site.

The maximum residual soil concentration of lead at the Site is 650 ppm at 2-feet below ground surface in the Solid Waste and Disposal Areas (SWDA) (Weston, 2008a). This concentration is less than 1,000 ppm commercial/industrial screening level, but higher than the residential SL of 200 ppm. The remedy remains protective because soils in the SWDA received a 2-foot cover of clean fill and institutional controls are in place to prevent exposure to these subsurface soils.

Changes in Exposure Pathways

The two exposure scenarios used to develop the Human Health Risk Assessment included (1) the future maintenance worker in the Commercial Area and (2) the adult trespasser. For the maintenance worker, the exposure pathways evaluated were ingestion and dermal contact with commercial area soils. For the adult trespasser, the evaluated exposure pathways were (1) ingestion and dermal contact with commercial area soils; (2) ingestion and dermal contact with Boys’ Creek sediments; and (3) ingestion of hard-shelled clams. Since residential development of the Site was not planned, residential exposure scenarios, initially considered in 1995, were not updated in the April 23, 1998, “Update of Baseline Human Health Risk Assessment and Development of Risk-Based Cleanup Levels” (Weston, 1998). The 2000 ROD also documented that the VOCs, specifically

toluene, migration from groundwater to indoor air was not a potential future threat to human health. There have been no changes in land use since the last five-year review. Current and future planned uses are still commercial/industrial in nature within the Site boundaries.

In the 2015 five year review, it was concluded that the risk of clam ingestion was much lower than estimated previously based on the likely percentage of inorganic arsenic and the likelihood that the clam beds were remediated as part of the extensive excavation, re-grading with clean fill, and marsh restoration efforts. Due to recent changes in toxicity values as discussed in the Changes in Toxicity and Other Contaminant Characteristics section above, a recent evaluation of the clam ingestion risk was conducted as part of this 2025 five-year review (Appendix F).

The risks to clam ingestion for a trespasser under new toxicity factors was found to be unacceptable. It is uncertain if the arsenic risk in the shellfish is naturally occurring, due to anthropogenic background, or related to the site. The Massachusetts Division of Marine Fisheries³ classifies the area around the site as “Prohibited” for shellfish harvesting and advises permit holders to review the classification information prior to harvesting. Although the change in toxicity values for arsenic increases the risk for clam ingestion among adult trespassers, the State of MA has classified the area as “Prohibited” and the area is closed to the harvesting of shellfish (including clams) under all conditions.

Ecological Risk Considerations

After the remedial cleanup activities were completed, as of September 2007, concentrations of several contaminants of concern have been monitored under an established long-term groundwater monitoring (LTGM) plan associated with monitored natural attenuation and will continue until interim ecological cleanup goals are attained. There are no newly promulgated standards relevant to the site, which bear on the evaluation of ecological risk or the protectiveness of the remedy. There are no major changes in site conditions or exposure assumptions upon which the ecological risk assessment was based that would result in increased exposure or risk.

Expected Progress Towards Meeting RAOs

The remedial action is complete and has limited the negative impacts to environmental receptors by removing contaminated vegetation or biota and eliminating incidental ingestion of contaminated soils or sediments. While some residual contamination remains in the wetland, contaminants no longer act as a source of surface water and sediment contamination and residual ecological risks has been determined to be low. The wetland continues to flourish, and the majority of the areas have achieved the 85% cover goal. The 2022 Restoration Wetland Monitoring Report indicated the calculated percent cover for the tidal marsh was 97.6%. Monitored natural attenuation (MNA) continues to indicate a reduction in the COCs in groundwater.

QUESTION C: Has any **other** information come to light that could call into question the protectiveness of the remedy?

NO, no other information has come to light that could call into question the protectiveness of the remedy.

³ <https://www.mass.gov/info-details/shellfish-classification-areas>

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
<i>Sitewide</i>

OTHER FINDINGS

EPA would like to investigate the building on the property for any release of a hazardous substance that may cause a negative impact on human health and the environment. The roof of the building has collapsed, and the building is unstable. EPA recommends evaluating the building’s structure and the potential threat of a future release. Property fencing should be evaluated for need of repair. EPA plans to work with the property owner, and town to redevelop the property and potentially take down the condemned building.

Sitewide Protectiveness Statement		
<i>Operable Unit:</i> Site	<i>Protectiveness Determination:</i> Protective	<i>Planned Addendum Completion Date:</i> Click here to enter a date
<p><i>Protectiveness Statement:</i> The remedy at the Site is protective of human health and the environment because soil and sediment at the Site no longer present an unacceptable risk to environmental receptors via ingestion of contaminated vegetation or biota, or incidental ingestion of contaminated soil and sediment. Additionally, institutional controls are in place that limit the current Site property owners’ uses of the property to those that are consistent with the risk assessment, and specifically prohibit withdrawal, consumption, exposure or utilization of groundwater for any purpose and cultivation of plants or crops for human consumption. Similarly, activities such as excavation and drilling restrict the disturbance of remaining contaminated soils.</p>		

VIII. NEXT REVIEW

The next five-year review report for the Atlas Tack Superfund Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

- AMEC, 2019b. *Final Quality Assurance Project Plan*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- H&S, 2015. *Draft Technical Memorandum Revision 01, Groundwater Remedy Evaluation, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.*
- KOMAN Government Solutions LLC (KGS), 2016a. *Completion Report Monitoring Well Redevelopment, Repair, and Replacement for the Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.*
- KGS, 2016b. *Final Quality Assurance Project Plan for the Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.*
- KGS, 2018. *Final Quality Assurance Project Plan Groundwater Long-Term Monitoring*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- KGS, 2019. *Final Technical Memorandum, Groundwater Remedy Evaluation Update*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA), 2003. *Preliminary Remediation Goal Development for The Tidal Wetlands*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA), 2000. *Record of Decision*. Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- USEPA. 2001. *Comprehensive Five-Year Review Guidance*. EPA-540-R-01-007, . Washington DC: Office of Emergency and Remedial Response, EPA.
- USEPA, 2009. *Explanation of Significant Differences*,. Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- USEPA, 2014. *Provisional Peer-Reviewed Toxicity Values (PPRTVs)* <https://www.epa.gov/pprtv>
- USEPA, 2016. *Drinking Water Health Advisories for PFOA and PFOS*. <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>
- USEPA, 2015. *Second Five-Year Review Report*. Atlas Tack Corporation Superfund Site, Fairhaven, MA.
- USEPA, 2015. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, June 2015
- USEPA, 2018. Letter Re: *Transfer of Operation and Maintenance (O&M) responsibilities for Atlas Tack Superfund Site in Fairhaven, Massachusetts to Massachusetts Department of Environmental Protection*, September 19, 2018.
- USEPA, 2020. VISL program downloaded from this site May 2020 <https://www.epa.gov/vaporintrusion>
- ROY F. WESTON, INC. (WESTON), 1998. Update of Baseline Human Health Risk Assessment and Development of Risk-Based Cleanup Goals-Atlas Tack Corporation, Fairhaven, Massachusetts. April 23, 1998.
- TETRATECH, 2016. Letter Re: *Tier Classification Extension*, 83 Pleasant Street, Fairhaven, Massachusetts RTN 4-17321
- Weston Solutions, Inc. (Weston), 2006. *Final Quality Assurance Project Plan, Phase II Remedial Action*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- WESTON, 2008a. *Final Interim Remedial Action Report for Phases I & II*. Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- WESTON, 2008b. *Final Interim Remedial Action Report (O&F Completion Report) for Phases II and III*. Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- WESTON, 2009a. *Final Sampling and Analysis Plan, Addendum No. 006, Surface Water and Sediment Monitoring*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- WESTON, 2009b. *Final Operation and Maintenance Plan*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts
- WOOD MASSACHUSETTS, INC. (WOOD), 2022. *Final Long-Term Monitoring 2022 Annual Summary Report*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- WOOD MASSACHUSETTS, INC. (WOOD), 2022. *Final Long-Term Groundwater Monitoring 2021 Annual Summary Report*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.
- WOOD MASSACHUSETTS, INC. (WOOD), 2021. *Final Long-Term Groundwater Monitoring 2020 Annual Summary Report*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.

WOOD MASSACHUSETTS, INC. (WOOD), 2022. *October 2022 Limited Inspection Report, Long Term Wetlands Monitoring Report*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.

WOOD MASSACHUSETTS, INC. (WOOD), 2020. *2019 Limited Inspection Report, Long Term Wetlands Monitoring Report*, Atlas Tack Corporation Superfund Site, Fairhaven, Massachusetts.

WSP USA ENVIRONMENTAL & INFRASTRUCTURE INC. (WSP), 2024. *Final Long-Term Monitoring 2023 Annual Report*, Atlas Tack Superfund Site, Fairhaven, Massachusetts.

WSP USA ENVIRONMENTAL & INFRASTRUCTURE INC. (WSP), 2023. *Final Long-Term Monitoring 2023 Annual Report*, Atlas Tack Superfund Site, Fairhaven, Massachusetts.

WSP USA ENVIRONMENTAL & INFRASTRUCTURE INC. (WSP), 2023. *Final Quality Assurance Project Plan, Revision 1*, Atlas Tack Superfund Site, Fairhaven, Massachusetts.

WSP USA ENVIRONMENTAL & INFRASTRUCTURE INC. (WSP), 2023. *2022 Restoration Wetland Monitoring Report*, Atlas Tack Superfund Site, Fairhaven, Massachusetts.

APPENDIX B – FIGURES



Copyright © 2013 National Geographic Society, i-cubed



SITE LOCATION MAP

Atlas Tack Superfund Site

83 Pleasant Street
Fairhaven, Massachusetts

Notes & Sources

0 1,000 2,000 Feet

N

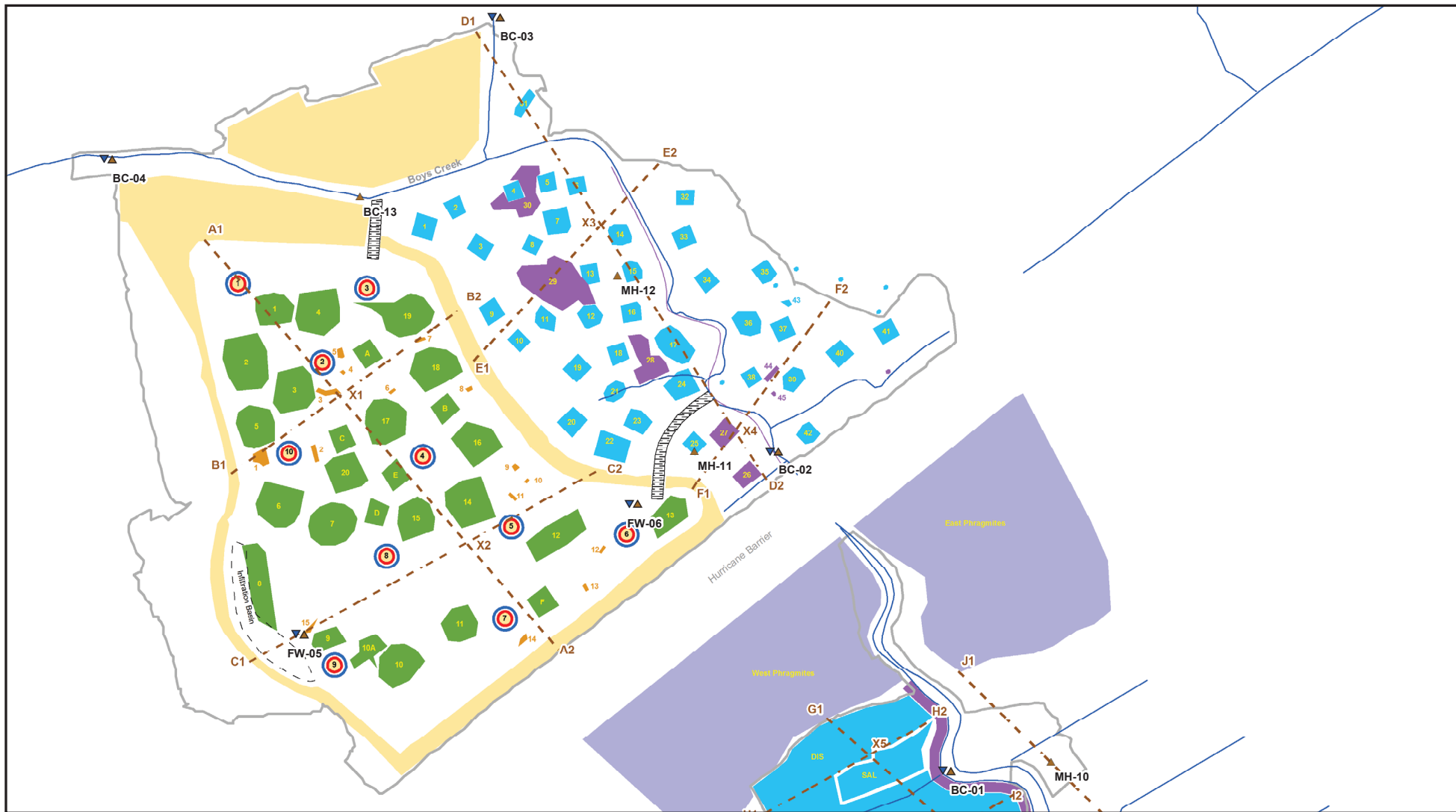
wsp

WSP USA, Inc.
 100 Apollo Drive, Suite 302
 Chelmsford, MA 01824

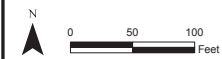
FIGURE

1





Notes:
 1. Basemap obtained from Weston Solutions.
 2. Horizontal Control: Massachusetts State Plane NAD83, Feet

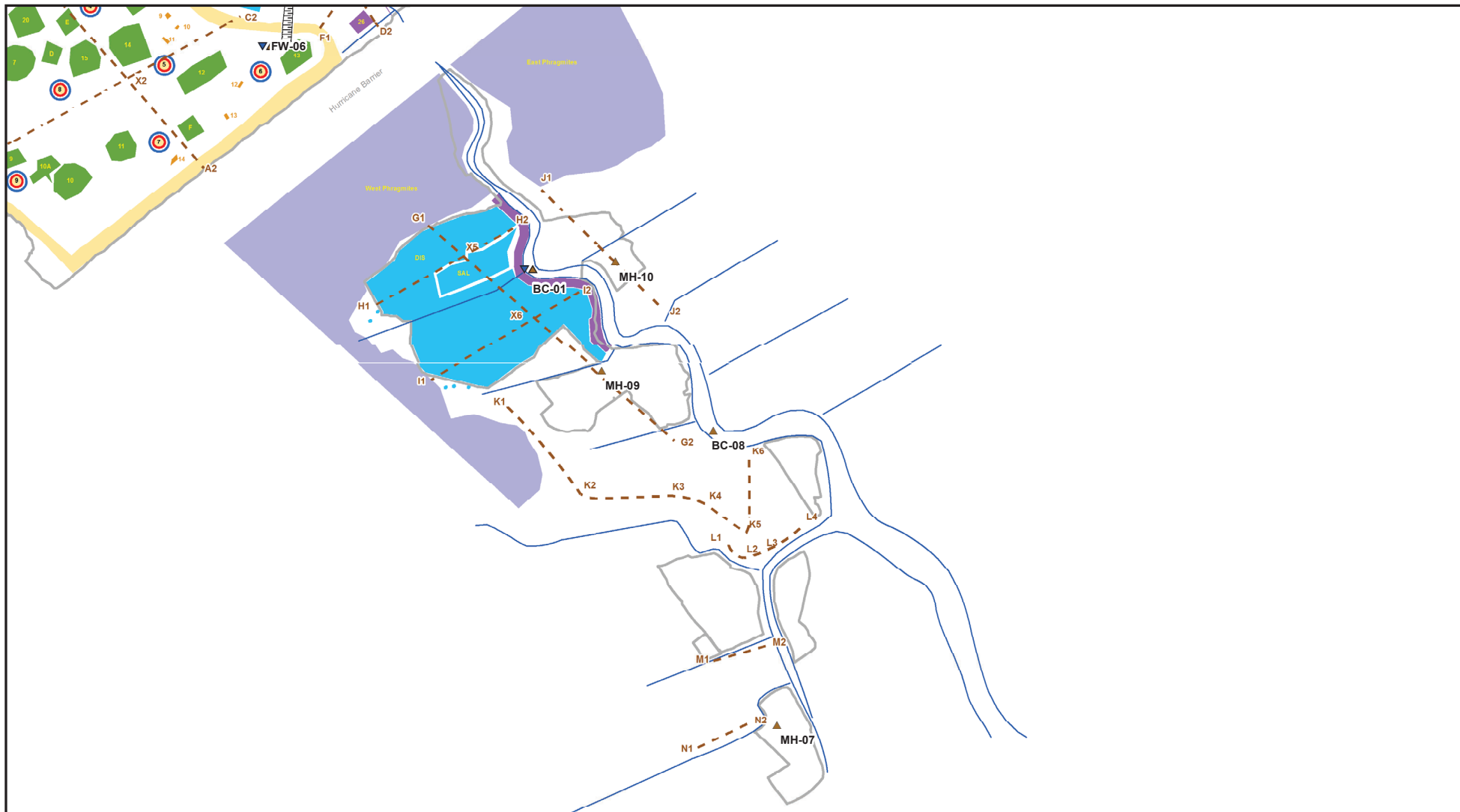


Legend

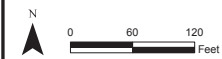
- ▲ Surface Water and Sediment Sampling Location
- ▲ Sediment Sampling Location
- Creek/Tributaries
- - - Approximate Vegetation Monitoring Transect
- ① Island
- Limit of Excavation
- ▤ Spillway
- Low Marsh Planting
- High Marsh Planting
- Freshwater Deepwater Planting

Figure 3
 Surface Water and Sediment
 Sampling Location - NOB
 Atlas Tack Superfund Site
 Fairhaven, Massachusetts

wood.
 Wood Massachusetts
 100 Apollo Drive, Suite 302
 Chelmsford, MA 01824



Notes:
 1. Basemap obtained from Weston Solutions.
 2. Horizontal Control: Massachusetts State Plane NAD83, Feet



- Legend**
- ▲ Surface Water and Sediment Sampling Location
 - ▲ Sediment Sampling Location
 - Creek/Tributaries
 - - - Approximate Vegetation Monitoring Transect
 - ① Island
 - Limit of Excavation
 - ▨ Spillway
 - Low Marsh Planting
 - High Marsh Planting
 - Freshwater Deepwater Planting

Figure 4
 Surface Water and Sediment
 Sampling Location - SOB
 Atlas Tack Superfund Site
 Fairhaven, Massachusetts



Document: P:\Projects\Atlas Tack\Atlas Tack\GIS\Map\Documents\Photo_Locations_2024_11\17LS.mxd PDF: P:\Projects\Atlas Tack\Atlas Tack\Map\GIS\Figures\Figure 2_Photos 2022.pdf 11-14-2022 10:21 AM brian.roberts



RESTORED TIDAL MARSH NORTH OF BARRIER

Atlas Tack Superfund Site
Fairhaven, Massachusetts

Legend

- Assessment Areas
- Spillway
- High Marsh Vegetation Plots
- Low Marsh Vegetation Plots
- Woody Species
- Stream
- Photo Direction
- Photo Number Corresponding with Photograph Log

Location of Site



Notes & Sources

Source: Base map from O&M Plan prepared by Weston Solutions. Massachusetts 2019 USGS Color Ortho Imagery provided by MassGIS.



WSP USA
100 Apollo Drive, Suite 302
Chelmsford, MA 01824
(978) 692-9090

FIGURE

5

APPENDIX C – INTERVIEW RECORDS

**ATLAS TACK SUPERFUND SITE
FIVE-YEAR REVIEW INTERVIEW FORM**

Site Name: Atlas Tack Corp.	
EPA ID: MA001026319	
Interviewer name: Aaron Shaheen	Interviewer affiliation: U.S.EPA
Subject name: Paul Craffey	Subject affiliation: MassDEP
Subject contact information: paul.craffey@mass.gov	
Interview date: 1/22/25	Interview time: 9:00 to 10:30 AM
Interview location: Home	
Interview format (circle one): In Person Phone Mail Email XX Other:	
Interview category: State Agency	

1. What is your overall impression of the project, including cleanup, maintenance and potential reuse activities? - The Remedial Action has achieved the goal of being protective of human health and has provided significant reduction in ecological risk. There is no active maintenance of the remedy at this Site. The O&M monitoring is continued to be performed by the MassDEP. The Site has potential reuse.
2. What is your assessment of the current performance of the remedy in place at the Site? What is your assessment of the long-term monitoring and maintenance activities? - The source removal and Monitored Attenuation Remedy continues to be effective. The long-term monitoring should continue. There is no active maintenance required at this Site.
3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site? - The monitoring for the Monitored Natural Attenuation (MNA) remedy continues to show “general declining or stable contaminant concentration trends since soil source area removal actions were completed” (2024 LTM Report).
4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence. – There is no continuous on-site O&M presence. Since 2019, MassDEP continues to perform the annual monitoring required by the O&M Plan. MassDEP does conduct additional site inspections at least 2 times per year.
5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts. – Each five years (for the Five-Year Review) all fifteen groundwater wells are monitored. For the other years, only the wells that have had contaminants detected are monitored (5 wells and 1 upgradient well). The MNA parameters (iron, nitrate, nitrite, sulfate, sulfide, and TOC) are also monitored. Reduction in the number of wells sampled does not impact the protectiveness or effectiveness of the remedy.
6. Have there been unexpected O&M difficulties or costs at the Site since start-up or in the last five years? If so, please provide details. - No unexpected O&M difficulties at the Site since the MassDEP started to perform the O&M.

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies. – See response in No.5. Some cost saving in reduction of number of wells sampled.
8. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? - I am not aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years. However, Fairhaven Town Officials are concerned that the unoccupied building on the property, which is in a state of disrepair with most of the roof missing, is an attractive nuisance to trespassers. The Fairhaven Fire Department has standing orders not to enter the building in the event of a fire.
9. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities. - The MassDEP and EPA has been in communications with the Town regarding redevelopment of the property. The agencies are investigating if the property can qualify for a Brownfields grant.
10. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? No.
11. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues? - Yes.
12. Are you aware of any changes in projected land use(s) at the Site? - No.
13. Do you have any comments, suggestions or recommendations regarding the long-term monitoring and maintenance activities at the Site? - I have no comments related to the long-term monitoring. However, I would suggest that EPA investigate if the Site could be Delisted. This may help in the potential redevelopment of the Site.

**ATLAS TACK SUPERFUND SITE
FIVE-YEAR REVIEW INTERVIEW FORM**

Site Name: Atlas Tack

EPA ID:

Interviewer name:

Interviewer affiliation:

Subject name: Carolyn Longworth

Subject affiliation:

Subject contact information: bvm1290@gmail.com

Interview date:

Interview time:

Interview location:

Interview format (circle one): In Person Phone Mail Email Other:

Interview category: Resident

- Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? **Yes!!! Lots of information online at the EPA website**
- What is your overall impression of the project, including cleanup, maintenance and the marsh restoration? **As someone who walked past it for many years, I know there is a big difference in the health of the marsh and its value to the community.**
- What have been the effects of this Site on the surrounding community, if any? Has the marsh restoration impacted the public perception of the Site? **The site was formerly considered a dangerous wasteland and now, with the restoration and also the town bike path, people seem to have more interest in it.**
- Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing? **In the past there has been some vandalism, mostly graffiti. The town paints over and sandblasts the naughty words and drawings on the dike and recently the graffiti people have switched to chalk which is vastly superior to paint and easily erased. In the past there has been illegal dumping and also ATV and motorbike riding in the marshes on the south side of the dike and mostly have left the fenced side alone. I think the fence is very important to preserve the area. It seems the people in the immediate area too have developed a pride and almost a stewardship of the site and have been very friendly to visitors. (Hope I'm not jinxing it!) The response to repairs of downed and broken fencing is very quick. (Thanks!)**
- Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future? **Sometimes I can find information on the Town website and local small papers. I think posting on the Hometown Fairhaven Facebook page and other social media would help as well. The planned signage sounds good too.**
- How has the marsh restoration impacted the birding populations at the Site? **It's been fantastic. If you mention Fairhaven to any birder in the state, they will say "Clapper Rail." These are secretive birds which are easily seen from the hurricane dike and lots of people visit. The County's first record of Gadwall breeding. State-endangered Pied-Billed Grebes have bred for years here although the vegetation has changed (higher/saltier water level???) and they didn't come last year. Rare birds like Wood Stork, Little Blue Heron, Cattle Egret pass by and there are many species of ducks and herons. Also Gray and Red Foxes, Mink, Otter, Muskrat, etc. visit too.**
- Do you have any comments, suggestions or recommendations regarding any aspects of the project?

I hope the site continues to be monitored and also that whatever is done to the old Tack building will not impact the wetlands. I'm not sure about the wooded area to the west of the site....it would be nice if that remained undeveloped since we suspect Wood Ducks may nest there.

I'm not sure if the old plastic fencing that held down the original plantings has been removed. We don't see it in winter but in the rest of the year it floats up and can be pretty obtrusive and maybe even dangerous to the wildlife.

Thanks to all involved in the project ... everyone from the state, local and federal agencies has always been very responsive to concerns.

APPENDIX D – SITE INSPECTION PHOTOGRAPHS

Inspection date: January 16, 2025

Time: 10:00 AM to 12:30 PM

Weather: Sunny and 28 F



Front of Building



Front of Building



Left side of Building



Right side of Building



Back of Building – Note roof missing



Back of Building



Fence down near Hathaway Braley Property



New Culvert under Bike Path



Former Building Area



Former UST area



Pond



Pond



Saltmarsh



Saltmarsh some bare area



Inside Metal Shed



Inside road next to former building



Boys Creek inside hurricane barrier



Boys Creek North inside hurricane barrier



Marsh inside hurricane barrier



Pond from hurricane barrier



Well AT-5
Location: Front of building near Pleasant St.



Well AT-8
Location: Near entrance on Tripp St.



Well MW-2
Location: Next to Boys Creek- west side



Well MW-3
Location: Between Boys Creek (west side) and pond



Well MW-4R
Location: Between Boys Creek (west side) and pond



Well MW-10
Location: South of bike path and north of the back of the former building



Well MW-12
Location: In the pond



Well 519
Location: Front of property near Church St.

APPENDIX E – LEAD RESIDENTIAL CHECK LIST

Residential Lead Screening Level Checklist

Site Information			
Site or study area name	ATLAS TACK		
Location (City/County, State, Zip)	FAIRHAVEN, MA	SEMS EPA ID	MAD001026319
Current remedial pipeline phase	POST-CONSTRUCTION	Does a site boundary exist in SEMs?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Briefly describe any removal or remedial work completed to date, including previous screening levels	<p>From 2020 Five Year Review Report: Following the completion of the remedial action, the maximum residual soil concentration of lead at the Site is 650 ppm at 2-feet below ground surface in the Solid Waste and Disposal Areas (SWDA) (Weston, 2008a). This concentration is less than EPA’s site-specific lead soil SLs of 1,000 ppm for commercial/industrial exposure, but higher than the residential SL of 200ppm. The maximum lead concentrations on site is also less than the Region 1 Superfund screening level for future commercial land use (1,000 ppm). Soils in the SWDA received a 2-foot cover of clean fill and institutional controls are in place to prevent exposure to these subsurface soils. Therefore, the consideration of updated science related to the evaluation of lead, would not impact the current protectiveness of the remedy.</p>		
Briefly describe the geographic scope of the study area that was considered while completing the checklist	Full site boundary		

Checklist completed by:		
Name	Title and Organization	Date

Table 1: Evaluate Primary Data Sources in “Residential Lead GIS Screening Tool” [****[Ctrl+Click here to access GIS tool](#)****]

Yes	No	?	Question	Data Evaluation Notes	References
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Is the study area in a NAAQS nonattainment zone for lead?	SCREENSHOT ATTACHED	EPA Green Book provides detailed information about NAAQS designations
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Does the EJScreen Lead Paint Index data demonstrate that a majority of the homes in the study area are at or above the 80 th percentile?	EJScreen is no longer available.	

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are you able to you select a screening level based on these primary data sources?	<input checked="" type="checkbox"/> Yes: 200 ppm <input type="checkbox"/> Yes: 100 ppm <input type="checkbox"/> No: continue with checklist <i>If yes, skip to the last page to summarize the weight of evidence and to document approval.</i>
-------------------------------------	--------------------------	--------------------------	-----------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Table 2: Evaluate Secondary Data Sources on Potential Lead Exposures

Yes	No	?	Question	Data Evaluation Notes	References
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are you aware of any potential soil exposures due to deteriorating exterior lead-based paint?		EPA Regional Lead-Based Paint Contacts
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there facilities in the study area with known lead violations?		Search for facilities to assess their compliance Check with state and local contacts for facilities not subject to EPA authorities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are you aware of lead pipes and/or lead service lines in the study area?		Check with the state's drinking water program Check local drinking water quality annual reports
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Among the schools in the study area, are there drinking water reports or testing that indicate lead exposures?		The local public water department may have more information Check local drinking water quality annual reports EPA contacts for voluntary testing in schools
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are you aware of any local cultural practices or community activities that may involve lead? (e.g., ceremonial uses, traditional medicines, pottery/jewelry making)		EPA resources on lead in cultural products
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there reports or data demonstrating elevated blood lead levels (BLL) in children in the study area? (If so, do reports indicate meaningful trends?)		Local Health Department may have more information CDC childhood lead poisoning prevention data and statistics

Table 3: Evaluate Mitigation Efforts

Yes	No	?	Question	Data Evaluation Notes	References
-----	----	---	----------	-----------------------	------------

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the state, tribe, or territory have an EPA-authorized lead-based paint program?		Lead-based paint abatement programs RRP program information Identify authorized professionals EPA Regional Lead-Based Paint Contacts
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the study area covered by a lead ordinance or local lead laws? (e.g., real estate disclosure, dust hazard mitigation, building codes, permits or requirements for renovations)		<p>Check with the state and local government authorities to find out about lead laws and ordinances specific to the area.</p> <p>Learn about federal lead laws and regulations</p> <p>Real estate disclosures about potential lead hazards</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are you aware of whether older homes and/or schools have addressed lead-based paint through mitigation, encapsulation, or renovation?		<p>Check with your regional Lead-Based Paint Coordinator, the local health department, education department, or school district(s) for this information.</p> <p>How to check for lead hazards in schools and childcare facilities</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are you aware of whether lead service lines have been replaced or are scheduled to be replaced?		Check with the local public water department for more information
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have there been other previous initiatives to directly address lead exposures in the study area? <i>(If yes, add notes on the outcome, including successes, challenges and gaps in effectiveness.)</i>		Check with your state or local health department
Additional Notes					

Document any additional findings not addressed by the items specified in the checklist, including any input from key points of contact in other lead programs in the region or other federal, state and local agencies.

Recommended Regional Screening Level

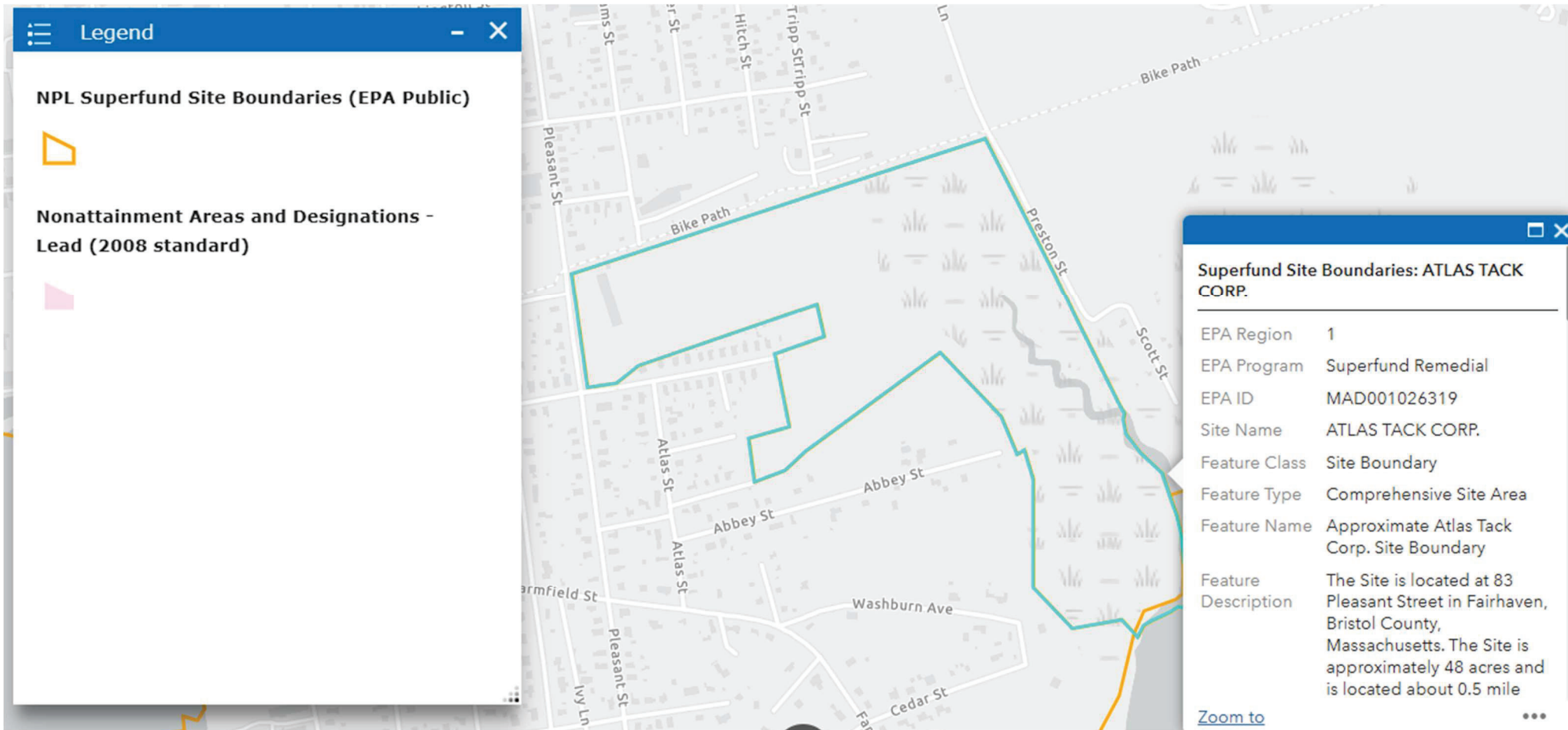
Select the appropriate screening level and summarize the weight of evidence assembled above.

200 ppm

100 ppm

Approved By [Type Name, Title]

Date



APPENDIX F – 2025 Technical Memorandum



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1

5 Post Office Square, Suite 100

BOSTON, MA 02109-3912

Technical Memorandum

To: Sam Pham, Remedial Project Manager
From: Paulina Do, Human Health Risk Assessor
Date: June 5, 2025
RE: 2025 Update of Clam Ingestion Risk for Trespassers at Atlas Tack Superfund Site

Purpose

There have been changes in the toxicity values for several of the contaminants of concern (COC) at the Atlas Tack Superfund Site, notably arsenic and hexavalent chromium. The purpose of this technical memorandum is to update the risk calculations performed in 2015 as part of the Second Five Year Review. This memo re-assesses the risk for clam ingestion for trespassers using the latest toxicity values for arsenic, hexavalent chromium, and other COCs identified for the trespasser scenario including benzo[a]pyrene and pentachlorophenol.

Background

In August 2024, EPA finalized a non-cancer oral reference dose (RfD) for hexavalent chromium (Cr(VI)) based on new toxicity values from the EPA Integrated Risk Information System (IRIS) program. IRIS is the EPA's human health assessment program that evaluates information on health effects related to environmental chemicals the public may be exposed to and provides toxicity values for a number of contaminants. Previously, the oral RfD for CR(VI) was 3.0×10^{-3} (mg/kg/day) and now is 9.0×10^{-4} (mg/kg/day). These toxicity changes would result in increased non-cancer risk from exposure to hexavalent chromium. Additionally, EPA finalized a new oral slope factor for Cr(VI) based on new IRIS cancer toxicity values. The oral cancer slope factor, previously 5.0×10^1 [mg/kg/day]⁻¹, now is 1.6×10^1 [mg/kg/day]⁻¹. This toxicity change would result in a decreased cancer risk from exposure to hexavalent chromium.

In January 2025, EPA released a new arsenic oral cancer slope factor (CSF) of 32 [mg/kg/day]⁻¹ based on a new IRIS value. Additionally, EPA released a new non-cancer oral RfD of 6.0×10^{-5} (mg/kg/day) based on a new IRIS value. The updated toxicity values for arsenic are more conservative than the previous values, which indicates that risk would be increased for cancer and non-cancer effects.

Additionally, since the 2015 Five-Year Review, there have been changes in toxicity values for Site contaminates of concerns (COCs) including benzo[a]pyrene and chemicals with associated relative potency factors in 2017 and pentachlorophenol in 2022.

Introduction

The purpose of this technical memorandum is to update the risk calculations performed in the 2015 “Update of clam ingestion risk for trespassers at Atlas Tack Superfund Site” with the latest toxicity values for arsenic along with the other site COCs mentioned above. This re-evaluation assumes no change in contaminant concentrations when they were measured prior to remediation, representing a conservative estimate of risk.

This memo also updates the risk estimates to factor in the amount of inorganic arsenic found in the edible portions of shellfish as ranging between 1% to 15%. The 1998 risk assessment assumed that 100% of the arsenic in shellfish was in inorganic form because the toxicity factors were based on inorganic arsenic. In 2003, EPA conducted a literature review of arsenic bioaccumulation in aquatic organisms, including shellfish, and confirmed the general assertion that 85% to >90% of arsenic found in edible portions of marine fish and shellfish were primarily organic arsenic in the form of arsenobetaine (US EPA 2003). The 2015 technical memo integrated this information to calculate an updated claim ingestion risk to reflect a more realistic percentage of inorganic arsenic in clam tissue. This memo carries forward that evaluation using the 2025 toxicity data for arsenic.

Method

In order to evaluate whether changes in toxicity factors would result in significant changes to risk estimates, the current 2025, original 1998 and previous 2015 cancer slope factors (CSF) and oral reference doses (RfD) were compiled, and risks were re-calculated based on the most recent toxicity values, as shown in **Table 1**. The toxicity factors were obtained from IRIS for arsenic and Cr(VI) and the latest November 2024 EPA Regional Screening Level (RSL) tables for the other COCs, benzo[a]pyrene and pentachlorophenol (<https://www.epa.gov/risk/regional-screening-levels-rsls>).

The updated cancer risks were calculated by dividing the 2025 CSF by the 1998 CSF to get a ratio that was then multiplied by the original 1998 cancer risk (Incremental Lifetime Cancer Risk, or ILCR) to obtain an adjusted ILCR reflective of current toxicity values. The updated non-cancer risks were calculated by dividing the 1998 RfD by the 2025 RfD, which was then multiplied by the 1998 non-cancer risk (expressed as a Hazard Quotient, or HQ) to generate an updated HQ reflective of current toxicity factors for the COCs.

To update the risk estimates that better reflect the amount of inorganic arsenic found in clam tissue (i.e. 1%-15%), the updated 2025 cancer and non-cancer risks for arsenic were multiplied by 0.01 or 0.15. The risks were summed across the COCs to derive a total ILCR and hazard index (HI).

Hexavalent Chromium (Cr(VI))

At the time of the baseline human health risk assessment in 1998, there was no available cancer toxicity value for Cr(VI) (Appendix H, Weston, 1998). Due to this limitation, the baseline risk assessment was unable to determine the contributing risk of Cr(VI) to the overall cancer risk. Since then, toxicity factors have become available for Cr(VI). In August 2024, EPA finalized a new oral slope factor for Cr(VI) based on new IRIS cancer toxicity value. The new oral cancer slope factor now is 1.6×10^1 [mg/kg/day]⁻¹. The contributing cancer risk from Cr(VI) was evaluated qualitatively in light of new Cr(VI) cancer toxicity data and is discussed in the Results section below.

Results

The Increased Lifetime Cancer Risk (ILCR) is quantified as a probability of developing cancer over a lifetime due to exposures related to the Site. Potential carcinogenic risk is evaluated by averaging exposure over a normal human lifetime, which, based on USEPA guidance (2014), is assumed to be 70 years. The EPA target cancer risk range is 1×10^{-4} (1 in 10,000) to 1×10^{-6} (1 in 1,000,000). An ILCR above 1×10^{-4} (greater than 1 in 10,000) exceeds the EPA target cancer risk range.

Non-cancer risk is quantified as a Hazard Quotient (HQ) which is the ratio of the exposure dose divided by the relevant toxicity value (oral reference dose or inhalation reference concentration). The sum of HQs for individual chemicals is then calculated to get the hazard index (HI). If the total HI exceeds 1, a breakdown by target organ is done to determine if there are organ specific HIs that exceed the target limit of 1. An organ specific HI greater than one indicates a potential adverse risk of non-cancer effects. As shown in **Table 1**, for cancer risk there were toxicity changes in the CSF for arsenic and benzo(a)pyrene resulting in an increased total ILCR of 1.3×10^{-2} compared to the previous 7.3×10^{-4} (1998) and 7.4×10^{-4} (2015) ILCR. The change in CSF for arsenic from $1.5 \text{ mg/kg-day}^{-1}$ to $32 \text{ mg/kg-day}^{-1}$ accounts for this increase in risk.

For non-cancer risk (**Table 2**), changes in the RfD for arsenic and hexavalent chromium resulted in an increased total Hazard Index of 17 (rounded up from 16.8). compared to the previous HI of 3.6 (1998) and 3.7 (2015). Changes in toxicity factors have increased cancer and non-cancer risk, with arsenic being the primary driver.

Table 1. EPA 2025 Updated Toxicity Factors and Shellfish Cancer Risks - Atlas Tack Superfund Site

Cancer Risk						
Contaminant of Concern ^a	SF ((mg/kg-day) ⁻¹)			ILCR		
	1998	2015	2025	1998	2015	2025
Arsenic (inorganic)	1.5	1.5	32	6.2E-04	6.2E-04	1.3E-02
3,3'-Dichlorobenzidine	0.45	0.45	0.45	5.4E-05	5.4E-05	5.4E-05
Benzo(a)pyrene	7.3	7.3	1.0	4.4E-05	4.4E-05	6.0E-06
Benzo(a)anthracene	0.73	0.73	0.10	5.3E-06	5.3E-06	7.3E-07
Benzo(k)fluoranthene	0.073	0.073	0.010	2.8E-06	2.8E-06	3.8E-07
Bis(2-ethylhexyl)phthalate	0.014	0.014	0.014	2.0E-06	2.0E-06	2.0E-06
2,4-Dinitrotoluene	0.68	0.31	0.31	4.5E-06	2.1E-06	2.1E-06
Pentachlorophenol	0.12	0.4	0.40	1.6E-06	5.3E-06	5.3E-06
Total ILCR:				7.3E-04	7.4E-04	1.3E-02
SF = oral Slope Factor RfD = oral Reference Dose ILCR = Incremental Lifetime Cancer Risk 1998 risks are from Table 2-20 (Weston, 1998) 1998 toxicity factors are from Table 2-15 (Weston, 1998) 2015 risks and toxicity factors are from Appendix E, Second Five Year Review (U.S. EPA, 2015) 2025 ILCR = (2025 SF/2015 SF)/(2015 ILCR) ^a Cancer toxicity value for Cr(VI) was not available during the 1998 baseline human health risk assessment. Cr(VI) risk was qualitatively assessed in this 2025 updated evaluation.						

Table 2. EPA 2025 Updated Toxicity Factors and Non-Cancer Shellfish Risks - Atlas Tack Superfund Site

Non-Cancer Risk						
Contaminant of Concern	RfD (mg/kg-day)			HQ		
	1998	2015	2025	1998	2015	2025
Arsenic	3.0E-04	3.0E-04	6.00E-05	3.2	3.2	16
Mercury	3.0E-04	3.0E-04	3.0E-04	0.2	0.2	0.2
Chromium VI	5.0E-03	3.0E-03	9.00E-04	0.1	0.17	0.6
Copper	3.7E-02	4.0E-02	4.0E-02	0.1	0.09	0.09
Total HI:				3.6	3.7	17*
RfD = oral Reference Dose						
HQ = Hazard Quotient						
HI = Hazard Index						
1998 risks are from Table2-20 (Weston, 1998)						
1998 toxicity factors are from Table 2-16 (Weston, 1998)						
2015 risks and toxicity factors are from Appendix E, Second Five Year Review (U.S. EPA, 2015)						
2025 HQ = (2015 RfD/2025 RfD)*(2015 HQ)						
*Total HI calculated to 16.8 but was rounded up to a HI of 17						

Table 3 and **Table 4** below show the total risk across the contaminants under the assumption that there is between 1% to 15% inorganic arsenic present in the edible portions of shellfish. The total ILCR risk ranges between 2.0×10^{-4} at 1% inorganic arsenic to 2.0×10^{-3} at 15% inorganic arsenic, as compared to 1.3×10^{-2} assuming 100% inorganic arsenic.

The non-cancer risk of arsenic has a HI = 1 for 1% inorganic arsenic and HI = 3 for 15% inorganic arsenic compared to HI = 17 assuming 100% inorganic arsenic. Although using more realistic assumptions that better reflect the amount of inorganic arsenic found in clam tissue reduces the overall risks, the risk to trespassers still exceeds the acceptable 1×10^{-4} cancer risk at both the 1% and 15% and acceptable target risk $HI \leq 1$ for non-cancer. Because the total HI exceeds 1, the risk was broken down to assess if there are organ specific HIs that exceed the target risk of 1. Table 4 shows the target organ specific HI for cardiovascular and endocrine effects exceed the target limit of 1 due to arsenic.

Hexavalent Chromium (Cr(VI))

The cancer risk for Cr(VI) could not be quantified during the 1998 baseline risk assessment due to a lack of toxicity data at the time. Because the results above indicate an already unacceptable risk to clam ingestion, the contributing cancer risk was evaluated qualitatively in light of the available cancer toxicity data for Cr(VI). This qualitative assessment evaluates and discusses the likely impact on risk.

The new cancer oral slope factor for Cr(VI) is $1.6 \times 10^1 \text{ [mg/kg/day]}^{-1}$ and would have an additive impact to the re-evaluated cancer risk presented in **Table 1** and **Table 3** and increase the cancer risk. The total cancer risk across the COCs would result in a ILCR greater than 1.3×10^{-2} assuming 100% inorganic arsenic (**Table 1**) and a ILCR greater than either 2.0×10^{-4} at 1% inorganic arsenic or 2.1×10^{-3} at 15% inorganic arsenic (**Table 3**).

Table 3. EPA Updated Toxicity Factors and Shellfish Cancer Risks-Atlas Tack Superfund Site (Assuming 1% to 15% inorganic arsenic (As) in marine shellfish, per EPA, 2003)

Cancer Risk									
Contaminant of Concern ^a	SF ((mg/kg-day) ⁻¹)			ILCR					
	1998	2015	2025	1998	2015	2025	1% inorganic As	15 % inorganic As	
Arsenic	1.5	1.5	32	6.2E-04	6.2E-04	1.3E-02	1.3E-04	2.0E-03	
3,3'-Dichlorobenzidine	0.45	0.45	0.45	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05	
Benzo(a)pyrene	7.3	7.3	1.0	4.4E-05	4.4E-05	6.0E-06	6.0E-06	6.0E-06	
Benzo(a)anthracene	0.73	0.73	0.10	5.3E-06	5.3E-06	7.3E-07	7.3E-07	7.3E-07	
Benzo(k)fluoranthene	0.073	0.073	0.010	2.8E-06	2.8E-06	3.8E-07	3.8E-07	3.8E-07	
Bis(2-ethylhexyl)phthalate	0.014	0.014	0.014	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	
2,4-Dinitrotoluene	0.68	0.31	0.31	4.5E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06	
Pentachlorophenol	0.12	0.4	0.4	1.6E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	
Total									
				ILCR:	7.3E-04	7.4E-04	1.3E-02	2.0E-04	2.1E-03
SF = oral Slope Factor RfD = oral Reference Dose ILCR = Incremental Lifetime Cancer Risk 1998 risks are from Table 2-20 (Weston, 1998) 1998 toxicity factors are from Table 2-15 (Weston, 1998) 2015 risks and toxicity factors are from Appendix E, Second Five Year Review (U.S. EPA, 2015) 2025 ILCR = (2025 SF/2015 SF)*(2015 ILCR) ^a Cancer toxicity value for Cr(VI) was not available during the 1998 baseline human health risk assessment. Cr(VI) risk was qualitatively assessed in this 2025 updated evaluation.									

Table 4. EPA Updated Toxicity Factors and Shellfish Non-Cancer Risks-Atlas Tack Superfund Site (Assuming 1% to 15% inorganic arsenic (As) in marine shellfish, per EPA, 2003)

Non-Cancer Risk										
Contaminant of Concern	RfD (mg/kg-day)			HQ					Chronic RfD Target Organ	
	1998	2015	2025	1998	2015	2025	2025			
							1% inorganic As	15% inorganic As		
Arsenic	3.0E-04	3.0E-04	6.00E-05	3.2	3.20	16		2.4E+00	Cardiovascular, endocrine	
Mercury	3.0E-04	3.0E-04	3.00E-04	0.2	0.20	0.20	2.0E-01	2.0E-01	Nervous system	
Chromium VI	5.0E-03	3.0E-03	9.00E-04		0.17	0.56	5.6E-01	5.6E-01	Gastrointestinal	
Copper	3.7E-02	4.0E-02	4.00E-02	0.1	0.09	0.09	9.3E-02	9.3E-02	n/a	
Total HI:				3.6	3.7	16.8	1.6E-01	1.0	3.2	
<p>RfD = oral Reference Dose HQ = Hazard Quotient HI = Hazard Index 1998 risks are from Table 2-20 (Weston, 1998) 1998 toxicity factors are from Table 2-16 (Weston, 1998) 2015 risks and toxicity factors are from Appendix E, Second Five Year Review (U.S. EPA, 2015) 2025 HQ = (2015 RfD/2025 RfD)*(2015 HQ)</p>										

Conclusion

Results from the updated risk calculations indicate that with the 2025 updated toxicity factors and risk estimates adjusted to reflect a realistic percentage of inorganic arsenic in clam tissue, clam ingestion risk is generally unacceptable. The cancer risk for clam ingestion exceeds the acceptable risk range at both the 1% and 15% inorganic arsenic percentages, as discussed above. The non-cancer risk at 15% inorganic arsenic has a HI =3 exceeding the target risk of $HI \leq 1$.

Overall, it is concluded that the risk of clam ingestion is unacceptable using the most current and available toxicity values for the COCs for clam ingestion even after adjusting for the percentage of inorganic arsenic found in the edible portion of shellfish. These 2025 risk estimates are higher in comparison to the original 1998 risk assessment and subsequent risk evaluation in 2015. Changes in arsenic toxicity values drive the increase in risk observed for the clam ingestion trespasser scenario.

This assessment has identified unacceptable risks for adult trespassers who ingest clam from the site. Although the change in toxicity values for arsenic is driving the increase in unacceptable risk for clam ingestion among adult trespassers, the Massachusetts Division of Marine Fisheries has classified the New Bedford/Fairhaven Harbor as “Prohibited”. This means the area is closed to the harvesting of shellfish (including clams) under all conditions. The state advises permit holders to review classification information prior to harvesting shellfish. Additionally, the clam bed was remediated as part of the excavation and marsh restoration effort, which reduces the potential exposure to adult trespassers.

References

- Roy F. Weston, Inc. 1998. Update of Baseline Human Health Risk Assessment and Development of Risk-Based Cleanup Goals-Atlas Tack Corporation, Fairhaven, Massachusetts. April 23, 1998.
- U. S. Army Corps of Engineers-New England District. 2008. Atlas Tack Corporation Superfund Site. Volume II Final Interim Remedial Action Report (O & F) Completion Report) for Phases II and III. September 2008.
- U. S. EPA. 2003. Technical Summary of Information Available on the Bioaccumulation of Arsenic in Aquatic Organisms. December 2003. EPA-822-R-03-032.
- U.S. EPA. 2015. Second Five-Year Review Report for Atlas Tack Superfund Site, Bristol, County, Massachusetts. Appendix E, Draft Technical Memorandum: 2015 Update of Clam Ingestion Risk for Trespassers at Atlas Tack Superfund Site. SEMS DocID 538699.
- U.S. EPA. 2024. IRIS Toxicological Review of Hexavalent Chromium [Cr(VI)], CASRN: 18540-29-9. August 2024. EPA/635/R-24/164Fc. https://iris.epa.gov/ChemicalLanding/&substance_nمبر=278
- U.S. EPA. 2025. IRIS Toxicological Review of Inorganic Arsenic, CASRN: 7440-38-2. January 2025. EPA/635/R-25/005Fc. https://iris.epa.gov/ChemicalLanding/&substance_nمبر=278