



***Draft* Analysis of Brownfields Cleanup Alternatives (ABCA)**

November 2023

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1.0 Introduction

TRC Environmental Corporation (TRC) prepared this Analysis of Brownfields Cleanup Alternatives (ABCA) report for the Leefort Terrace property located at 1 and 2 Leefort Terrace in Salem, Massachusetts (the "Site") on behalf of the Salem Housing Authority (SHA) and BC Leefort Terrace, LLC c/o Beacon Communities (BC Leefort Terrace LLC) in support of their application for cleanup funding under the Salem/Peabody Brownfield Coalition Revolving Loan Fund Program funded by the United States Environmental Protection Agency (EPA).

1.1 Site Description and History

The Site consists of two contiguous parcels totaling approximately 3.2-acres located at 1 and 2 Leefort Terrace in Salem, Essex County, Massachusetts, within a mixed residential and industrial area. The City of Salem tax assessor describes the Site as Parcel ID# 41-0249-0 and 41-242-0, zoned as residential one family, and currently is used as a Chapter 667 state public housing development owned by the Salem Housing Authority.

The Site is currently occupied by a Massachusetts public housing development made-up of eight (8) buildings including seven (7) single-story ranch style residential buildings including a total of fifty (50) single-bedroom, garden-style, age-restricted apartments for elderly and disable residents and one (1) community building containing a commercial laundry room and management office constructed in 1958. Prior to construction, the land was vacant and undeveloped. According to previous environmental reports, historic aerial photographs depict a portion of the Site as part of the now west-adjacent waterbody, Collins Cove, and being filled between 1938 and 1952.

A Site Location Map is provided as Figure 1. A Site Plan depicting pertinent Site features is provided as Figure 2.

1.2 Surrounding Properties Use and History

The surrounding properties are and have historically been occupied by a mixture of residential and industrial development. To the northwest of the Site, across Szetela Lane, is Collins Cove. The Site is adjoined to the northeast by an open park area and the Bentley School. Adjoining to the northwest and west are residential properties with the Salem Harbor Point power station beyond. Adjoining to the south are several City of Salem owned parcels that are currently utilized as storage/laydown area for a construction company. The south adjoining properties are listed with the Massachusetts Department of Environmental Protection (MassDEP) under Release Tracking Number (RTN) 3-20276, due to the presence of polynuclear aromatic hydrocarbons (PAHs), petroleum hydrocarbons and metals in soil and groundwater at the property related to historical use. The City of Salem-owned parcels had previously been operated as the Crest Brand Leather Company and American Coal Company. Buildings associated with these two businesses were demolished in 1986 and the parcels have been vacant since. The northeast adjoining property, made up of the Bentley School and open park was constructed over a former municipal landfill, which operated from the 1930s through the 1940s. The surrounding area of the Site had historically been tidal flats and was filled between 1938 and 1952.

1.3 Site and Surrounding Resource Areas

TRC reviewed the Massachusetts Geographic Information Systems (MassGIS) Massachusetts Department of Environmental Protection (MassDEP) Priority Resource Map, obtained online, for information regarding the location of drinking water supplies and other resource areas in the vicinity of the Site. According to the map, the Site is not located within designated groundwater protection areas, interim wellhead protection areas, or medium yield productive or potentially productive aquifer and a medium yield non-potential drinking water source area. The Site is located within the FEMA 100-year floodplain and within 500 feet of a solid waste landfill to the north and open water/tidal flat to the north and west. There are no public or private drinking wells within specified distances of the Site. A copy of the Priority Resource Map is included as Figure 3. The surface elevation of the Site is approximately 10 feet above mean sea level with the local topography sloping gradually towards the east. Shallow groundwater is presumed to flow to the west toward Collins Cove.

1.4 Proposed Site Use

The SHA and BC Leefort Terrace LLC intend to redevelop the Site with a single new 4-story building containing 124 units of 100% affordable housing with 1-, 2-, and 3- bedroom energy efficiency apartments. In order to ensure climate resilience, residences will be elevated with the majority of parking areas in the basement beneath the structure. The building is being designed to be all electric and built to achieve Passive House (PHIUS+) certification and strive for net zero energy use with the inclusion of on-site solar energy generation. There will be a private residential courtyard with a grill area, bocce courts and resident garden beds. Additionally, a 1.26 acre publicly accessible open space along western side of the parcel, along Collins Cove, will be developed and available to Leefort Terrace and Salem community residents. The public open space will include pedestrian walkways, benches and picnic tables, and landscaping appropriate to the coastal area.

1.5 Purpose and Scope of Services

The purpose of this ABCA is to evaluate potential remedial action alternatives for the Site based on the Site assessment results and the current proposed future use of the Site (affordable residential housing) and will include the following:

- Evaluate the available remedial alternatives against evaluation criteria as detailed in Section 3.3;
- Select the remedial alternative that best meets the objectives and considerations of the project and proposed end use; and
- Present a general plan for implementation of the selected remedial alternative.

1.6 Objectives

Based on the information collected during previous environmental investigations (described in Section 2.0), remedial options were considered for the Site's proposed reuse and evaluated based on feasibility and ease of implementation, effectiveness and reliability, preliminary cost and

cost effectiveness, and schedule/time to implement the remedy and reach an endpoint of “no further action.”

Remedial consideration was given to the following goals:

- Eliminate or reduce potential/current exposure to receptors, to the extent possible;
- Eliminate or reduce the risk of exposure to potential future Site users, Site workers, and trespassers to the contamination identified based on the proposed future reuse of the Site; and
- Eliminate or reduce potential environmental impacts to off-site receptors, including environmental receptors.

The remedial alternatives of the Site will be evaluated separately for the buildings, each of these impacted media having three alternatives considered. The remedial alternatives evaluated in this ABCA for each media include:

Building Alternatives:

- Alternative 1: No Action.
- Alternative 2: Abate the building of asbestos containing materials (ACMs) and other hazardous building materials first, then demolish the buildings at a later date.
- Alternative 3: Abate the building of ACMs and other hazardous building materials and demolish the buildings at the same time.

Sections 4.0 and 5.0 provide a detailed discussion of the evaluation criteria and evaluation of the proposed remedial alternatives for each impacted media, respectively.

2.0 Environmental Site Conditions

2.1 Previous Environmental Investigations

McPhail Associates, LLC – Phase I Environmental Site Assessment Report, Leefort Terrace, Salem, Massachusetts – November 9, 2020

McPhail conducted a Phase I ESA of the Site in November 2020 for the Leefort Terrace parcels (41-0249-0 and 41-0242-0) and five City of Salem owned parcels to the west of the Site (41-0243-01, 41-244-0, 41-0245-0, 41-0235-0, and 41-0236-0). Based on the findings of McPhail Phase I ESA report dated November 9, 2020, two recognized environmental conditions (RECs) and one historic recognized environmental condition (HREC) were identified related to the five City of Salem owned parcels which are no longer included as part of the redevelopment plans.

McPhail Associates, LLC – Phase II Site Assessment – Leefort Terrace, Salem, Massachusetts – March 17, 2022

In December 2021, McPhail conducted a limited Phase II Site Assessment including the completion of 9 soil borings along the western property boundary of the SHA property and the City of Salem vacant lots. Four samples along the western boundary were analyzed for total metals, polychlorinated biphenyls (PCBs), and extractable petroleum hydrocarbons (EPH) with target PAHs.

Benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene were detected in soil boring B-108 above MassDEP RCS-1 reporting standards. These detections were consistent with MassDEP Background Levels for soil containing coal ash or wood ash and evidence of coal ash or wood ash was observed within fill material in the boring. Total lead was also detected in soil boring B-108 above MassDEP RCS-1 reporting standards at a concentration of 722 mg/kg. The total lead concentration was also consistent with the MassDEP Background Levels for soil containing coal ash or wood ash.

McPhail concluded that upon review of available documentation and soil analytical results, the release related to RTN 3-20276 at the City of Salem parcels to the west is not considered to have impacted the subsurface conditions at the SHA property.

Boston Environmental Corporation/TRC Environmental Corporation – Preliminary Asbestos and Regulated Building Materials Survey – February 2021

In February 2021, Boston Environmental Corporation (BEC) performed an inspection for hazardous building materials for the eight existing on-Site buildings in. The purpose of this assessment was to evaluate the presence of asbestos-containing materials (ACM), lead-containing paint (LCP), PCBs, and other hazardous or regulated materials throughout the buildings that will require remediation and/or disposal prior to the planned demolition and Site redevelopment activities. Due to the residential buildings being occupied, BEC was granted access to the interior of nine out of fifty residential apartments as well as the building boiler/utility rooms and the community/office building.

BEC collected 327 bulk samples of building materials suspected to contain asbestos of which 298 were analyzed, and laboratory analyses determined that thirty-one samples contained greater

than 1 percent asbestos. BEC collected seven samples of paint chips for laboratory analysis of LCP. LCP is present at the Site at variable concentrations. Seven bulk samples of window and door caulking were collected for laboratory analysis for PCBs. The samples collected for PCB analysis were all non-detect for PCBs.

The BEC report concluded that asbestos materials had been identified at the Site and must be removed and properly disposed of by a licensed asbestos abatement contractor prior to and/or during the planned building demolition. Also, LCP was identified throughout the Site buildings, BEC recommended that demolition work be conducted in accordance with the OSHA "Lead in Construction" standard and that TCLP testing for lead be conducted prior to material disposal. BEC recommended that a comprehensive supplemental asbestos and regulated building materials survey be conducted once the residential units are vacated so that there would be unrestricted access for a comprehensive pre-demolition investigation.

2.2 Regulatory Compliance History

The Site has no MassDEP regulatory compliance history.

2.3 Potential Threats to the Public Health and Environment

The Preliminary Asbestos and Regulated Material Survey conducted by BEC in 2021 indicated the presence of friable and non-friable ACMs and LCP within the eight Site buildings. Building demolition would disturb ACM, LCP, and other hazardous building materials at the Site. Disturbance of ACM would result in asbestos being made airborne which would result in an increased potential for human exposure via inhalation to construction workers and nearby public. Environmental response activities including the proper abatement and disposal practices of asbestos and other regulated hazardous materials are required prior to and/or during any building demolition and/or renovation activity that will disturb these materials at the Site.

3.0 Evaluation of Remediation Alternatives

3.1 Remedial Action Objective and Cleanup Goals

The objective of remediation at the Site is to abate the identified hazardous building materials followed by demolition of the existing residential complex in preparation for the redevelopment of Leefort Terrace with a single new 3- and 4-story building containing 124 units of 100% affordable housing with 1-, 2-, and 3- bedroom apartments.

The remediation of ACMs and other hazardous building materials is necessary prior to and/or during the demolition of existing Site buildings. The existing buildings are within a coastal floodplain and are at significant risk of impacts of sea level rise and storm-related flooding. The demolition and redevelopment of the Site allows for a climate resilient structure to be built, as well as increases the number of affordable housing units in the area. In order to ensure climate resilience, residences will be elevated with the majority of parking areas in the basement beneath the structure.

3.1.1 Applicable Regulations and Cleanup Standards

BC Leefort Terrance LLC and SHA will undertake responsibility to remediate ACMs, LCP, and other regulated hazardous materials at the Site prior to demolition following applicable federal, state, and local regulation. Applicable regulations and cleanup standards include the following:

- National Emissions Standards for Hazardous Air Pollutants (NESHAP) 40 Code of Federal Regulations (CFR) 61;
- EPA Asbestos Hazard Emergency Response Act (AHERA) 40 CFR 763;
- Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1101;
- OSHA 29 CFR 1926.26 Safety and Health Regulations for Construction, Occupational Health and Environmental Controls, Lead;
- Massachusetts Department of Labor Standards 453 Code of Massachusetts Regulations (CMR) 6.00; and
- MassDEP 310 CMR 7.15.

3.2 Identification of Remedial Alternatives

Several potential alternatives were evaluated for addressing the ACMs, LCP, and other hazardous building materials at the Site. From that evaluation, TRC identified a limited number of practicable remedial alternatives that could be implemented at the Site based on available Site data and TRC experience. The “No Further Action” alternative was also included as part of the evaluation to establish a basis for conducting remedial actions at the Site. The remedial alternatives identified for consideration under this alternatives analysis include:

1. No Further Action;
2. Abate the buildings of ACMs and other hazardous building materials first, then demolish the buildings at a later date; and

3. Abate the buildings of ACMs and other hazardous building materials and demolish the buildings at the same time.

3.3 Evaluation and Comparison of Remedial Alternatives

Each remedial alternative identified above was first evaluated to determine whether it could facilitate the demolition of the existing site buildings and redevelopment of the Site. Those alternatives that were deemed capable of allowing for redevelopment were further evaluated using the comparative evaluation criteria including: effectiveness, short- and long-term reliability, difficulty of implementation, cost, resiliency to climate change, potential risks, and timeliness. The cost estimates presented in this document are preliminary estimates, based on an estimated Site Work Cost Table provided by Callahan Construction and the Preliminary Hazardous Building Survey report provided by Boston Environmental Corporation that were prepared solely as preliminary cost estimated in support of the proposed site redevelopment and are used herein for the relative comparison of the identified alternatives and should not be used as final design-level estimates. A table comparing the estimated costs and schedules for each selected alternative is provided as Table 1. A comparison of the benefits of the proposed remedial alternatives is provided as Table 2. A description of each alternative and the results of the comparative analysis are presented in the following subsections.

Remedial Alternative #1: No Further Action

A “No Further Action” alternative indicates that no remedial activities will be conducted at the Site. The “No Further Action” alternative does not include activities to mitigate, eliminate or reduce exposure to contaminated material: therefore, the potential for human exposure through direct contact, ingestion, and inhalation has not been controlled and continues to exist for potential future Site visitors, Site workers (construction/utility), and or trespassers.

The “No Further Action” alternative does not involve any remedial activities; therefore, the “No Further Action” response is not protective of human health and the environment and does not meet the threshold criteria as previously discussed. However, this alternative has been included to demonstrate a comparison between the alternatives. Also “No Further Action” does not meet the remedial action objectives and cleanup goals as the buildings are planned to be demolished and the Site redeveloped. Therefore, Alternative #1 will not be evaluated further with respect to the comparative evaluation criteria.

Remedial Alternative #2 – Abate the buildings of ACM and other hazardous building materials first, then demolish the buildings at a later date

This alternative involves abatement of ACM and other hazardous building materials in order to reduce exposure risks for future demolition and redevelopment. An environmental contractor licensed in Massachusetts for asbestos and hazardous building material removal would be hired to perform the work and would remove the identified ACMs and other hazardous building materials in compliance with federal, state, and local regulations.

Under this alternative, a separate contractor would later mobilize to the Site after abatement and perform the building demolition and site redevelopment. The ACM and other hazardous building material waste would be taken off-Site and properly disposed of according to federal, state, and

local regulation prior to building demolition work. This alternative adds about 5 weeks to the schedule.

Remedial Alternative #3 – Abate the buildings of ACMs and other hazardous building materials and demolish the buildings at the same time

This alternative would be similar to Remedial Alternative #2. ACMs and other hazardous building materials would be abated and removed from the Site following applicable federal, state, and local regulations in order to reduce the risk of exposure for future site uses.

Under this alternative, however, the abatement and demolition activities would occur concurrently with anticipated work efficiencies achieved by using less contractors, equipment, and mobilizations to complete the proposed work.

3.3.1 Effectiveness, Feasibility, and Cost of Alternatives

The effectiveness, feasibility, and cost of each alternative were considered prior to selecting a recommended cleanup alternative, in accordance with the U.S. Environmental Protection Agency (EPA) requirements.

3.3.2 Effectiveness

- Building Alternative 1 (No Action): This alternative is not effective in controlling or preventing the exposure of receptors to contamination at the Site, or in the elimination of a potential continuing contaminant source at the Site. This alternative does not provide a reduction in risk.
- Building Alternative 2 (Abate, then demolish later): This alternative which includes abatement of hazardous building materials is an effective alternative for eliminating the direct contact exposure pathway. The alternative will be effective at removing the source of contamination and minimizing potential exposure while protecting the nearby environmental receptors.
- Building Alternative 3 (Abate and demolish concurrently): This alternative which includes abatement of hazardous building materials is an effective alternative for eliminating the direct contact exposure pathway. The alternative will be effective at removing the source of contamination and minimizing potential exposure while protecting the nearby environmental receptors.

3.3.3 Feasibility and Ease of Implementation

- Building Alternative 1 (No Action): Easy to implement as no remedial actions will be conducted at the Site.
- Building Alternative 2 (Abate, then demolish later): This remedial alternative would utilize readily available standard construction techniques for hazardous material abatement and renovation. This alternative is technically practical and easily implementable at the Site.

- Building Alternative 3 (Abate and demolish concurrently): This remedial alternative would utilize readily available standard construction techniques for hazardous material abatement and renovation. This alternative is technically practical and easily implementable at the Site.

3.3.4 Cost Effectiveness

- Building Alternative 1 (No Action): No cost as no remedial activities will be implemented.
- Building Alternative 2 (Abate, then demolish later): Cost of Alternative 2 is estimated to be approximately \$ 1,028,556. Assumptions for preliminary costing purposes include:
 - Abatement of interior ACM and Hazardous Building Materials (HBMs)
 - Abatement of exterior ACM and HBMs including chimney caulking and window caulking
 - Consultant and oversight costs
 - Temporary structures and closure measures, and later removal and stabilization
 - Building Demolition
 - Mobilization x 2
 - Project design, bidding, and procurement time and cost related to the separate abatement and demolition projects
 - Potential for additional waste disposal and transportation cost
 - Adds approximately 5 weeks to the schedule
 - Costs do not include contingency
- Building Alternative 3 (Abate and demolish concurrently): Cost of Alternative 3 is estimated to be approximately \$780,668. Assumptions for preliminary costing purposes include:
 - Abatement of interior ACM and HBMs
 - Abatement of exterior ACM and HBMs including chimney caulking and window caulking
 - Consultant and oversight costs
 - Building Demolition
 - Mobilization
 - Costs do not include contingency

3.3.5 Resiliency to Climate Change

- Building Alternative 1 (No Action): This alternative impedes plans to redevelop the Site, subsequently prohibiting efforts to save and rebuild the Site in a way that is resilient to the changing climate. In the case of flooding related to climate change impacting the Site buildings, ACM abatement may be necessary in the recovery effort regardless. This alternative is not effective in controlling or preventing the exposure of receptors to

contamination at the Site, or in the elimination of a potential continuing contaminant source at the Site. This alternative does not provide a reduction in risk.

- Building Alternative 2 (Abate, then demolish later): This alternative, which includes abatement of hazardous building materials and demolition, supports and facilitates plans to redevelop the Site, effectively rebuilding a structure that is resilient to the changing climate.
- Building Alternative 3 (Abate and demolish concurrently): This alternative which includes abatement of hazardous building materials and demolition, supports and facilitates plans to redevelop the Site, effectively rebuilding a structure that is resilient to the changing climate.

See Table 1 for a cost summary and schedule comparison of the proposed remedial alternatives.

3.3.6 Overall Comparison to Comparative Evaluation Criteria

This section presents a relative comparison of the selected building remedial alternatives. See Table 2 for the remedial alternatives evaluation matrix.

Effectiveness – Building Alternative #3 is the most effective means to mitigate potential issues with the structure as it reduces project schedule, eliminates the need for temporary covers, and only requires one contractor mobilization. Building Alternative #2 requires additional schedule and two separate contractor mobilizations but can be nearly equally effective. Building Alternative #1 is considered the least effective as exposure is not mitigated.

Reliability – Building Alternatives #2 and #3 are more reliable than Building Alternative #1 in preventing exposure to future users of the Site because the HBMs are removed. Building Alternative #1 is not reliable as no remedial action implemented. Building Alternative #2 is less reliable than Building Alternative #3, as leaving the structure exposed to the elements for any amount of time introduces potential for impacts from storms, etc. Therefore, Building Alternative #3 is the most reliable of these alternatives.

Difficulty of Implementation – There is no difficulty associated with Building Alternative #1, as no actions are taken. There is more difficulty associated with Building Alternative #2 than Building Alternative #3, as additional measures are required to cover the building envelope between the time when abatement occurs and the time when demolition occurs and multiple contractor mobilizations would be required. Building Alternative #3 is relatively easy to implement as demolition occurs concurrently, or immediately following abatement.

Cost-Benefit – The cost to implement Building Alternative #3 is less than Building Alternative #2. There is no cost associated with Building Alternative #1 as no remedial activities would occur.

Potential Risks – The potential short-term and long-term risks associated with each alternative are considered low to moderate with the exception of Building Alternative #1, which is a No Action Alternative, and therefore no remedial activities are conducted. Potential short-term risks associated with Building Alternative #2 include risk of compromising the building envelope from weather or other factors while waiting for the building demolition to be completed after abatement.

Timeliness – The following estimated time frames are associated with implementation of each alternative:

- Building Alternative #1: No associated timeframe.
- Building Alternative #2: The associated timeline is longer as abatement and demolition would occur as separate project phases.
- Building Alternative #3: The associated timeline is shorter than Building Alternative #2 as the abatement and demolition would occur concurrently with one contractor mobilization.

Based on the above, Building Alternative #1 is the timeliest of the alternatives. However, the additional time required for Building Alternatives #2 and #3 are associated with greater protection of future Site use and protection of Site construction workers.

Resiliency to Climate Change – Building Alternatives #2 and #3 both support and facilitate plans to redevelop the Site, building a new residential structure that is resilient to the changing climate and escalating flooding. Building Alternative #1 prohibits redevelopment of the Site, leaving it vulnerable and at-risk to the changing climate.

Conclusion – Building Alternative #3 is the best selection as it is the most effective and reliable alternative while also the least difficult to implement and having the least potential risks, compared to Building Alternative #2. Building Alternative #1 is not recommended because it does not address the risks posed by the HBMs.

Green and Sustainable Remediation – The following measures will be implemented where applicable, beneficial, or feasible to improve the overall sustainability of the proposed remedial alternative as recommended by the U.S. EPA Region 1 Green and Sustainable Remediation Guidance.

Administrative

- Green remediation principles will be incorporated into the contracting process, as possible.
- Interim and final documents will be submitted in digital rather than hardcopy format, unless otherwise requested by EPA or required by law, in an effort to save paper. This is especially applicable to voluminous data reports.
- Optimize the use of electronic and centralized communication and outreach to the local community.

General Site Operations

- Use energy efficient equipment
- Reuse or recycle waste in the visual and access control berms
- Protect and conserve water
- Use alternative fuel vehicles (hybrid-electric, biodiesel, ultra-low sulfur diesel)
- Carpool for Site visits and project meetings and/or use public transportation

- Schedule activities efficiently so as to minimize travel to and from the Site

Remediation Operations

- Encourage use of fuel-efficient / alternative fuel vehicles and equipment
- Minimize mobilizations
- Provide for erosion control to minimize runoff into environmentally sensitive areas
- Encourage use of diesel engines that meet the most stringent EPA on-road emissions standards available upon time of project's implementation
- Have idle reduction policy and idle reduction devices installed on machinery
- Use ultra-low sulfur diesel and/or fuel-grade biodiesel as fuel on machinery
- Maximize use of machinery equipped with advanced emission controls
- Maximize efficiency in transport/disposal of soils and backfill, utilizing practices such as backloading.

3.4 Recommended Cleanup Alternative

Remedial Alternative #3 is the recommended cleanup alternative for the abatement and demolition of the Site structures. It is considered to be the most practical alternative to mitigate the risk posed by the contamination considering the proposed Site redevelopment scenario, reliability, effectiveness, ease of implementation, and cost.

Remedial Alternative #1 is not recommended because it does not allow for the abatement and demolition of the Site buildings.

Remedial Alternative #2 is not recommended because it would take more time to complete and require separate contractor mobilizations in between abatement and demolition.

4.0 DOCUMENTATION AND REPORTING

Hazardous materials abatement and building demolition activities will be performed in accordance with a set of technical specifications to be developed. Following abatement and building demolition activities, hazardous material abatement closure reports will be provided to SHA and BC Leefort Terrace LLC.

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5.0 LIMITATIONS

TRC's study was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area, and TRC observed that degree of care and skill generally exercised by other consultants under similar circumstances and conditions. TRC's findings and conclusions must be considered not as scientific certainties, but rather as our professional opinion concerning the significance of the limited data gathered during the course of the study. No other warranty, express or implied is made. Specifically, TRC does not and cannot represent that the subject property contains no hazardous material, oil, or other latent condition beyond that observed by TRC during its study. Additionally, TRC makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a MEDEP audit.

The observations described in this report were made under the conditions stated therein. The conclusions presented in the report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by Client. The work described in this report was carried out in accordance with the Terms and Conditions referenced in our contract with the Client.

In preparing this report, TRC has relied on certain information obtained from previous reports, and on information contained in the files of state and/or local agencies available to TRC at the time of the study. Although there may have been some degree of overlap in the information provided by these various sources, TRC did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

No specific attempt was made to check on the compliance of present or past owners or operators of the Site with federal, state, or local laws and regulations, environmental or otherwise. The conclusions and recommendations contained in this report are based in part upon the data obtained from a limited number of soil samples and groundwater samples obtained from widely spread subsurface explorations. The nature and extent of variations between these explorations may not become evident until further exploration. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

TRC has relied upon the quantitative laboratory analyses data provided by various laboratories and has not conducted an independent evaluation of the reliability of these data.

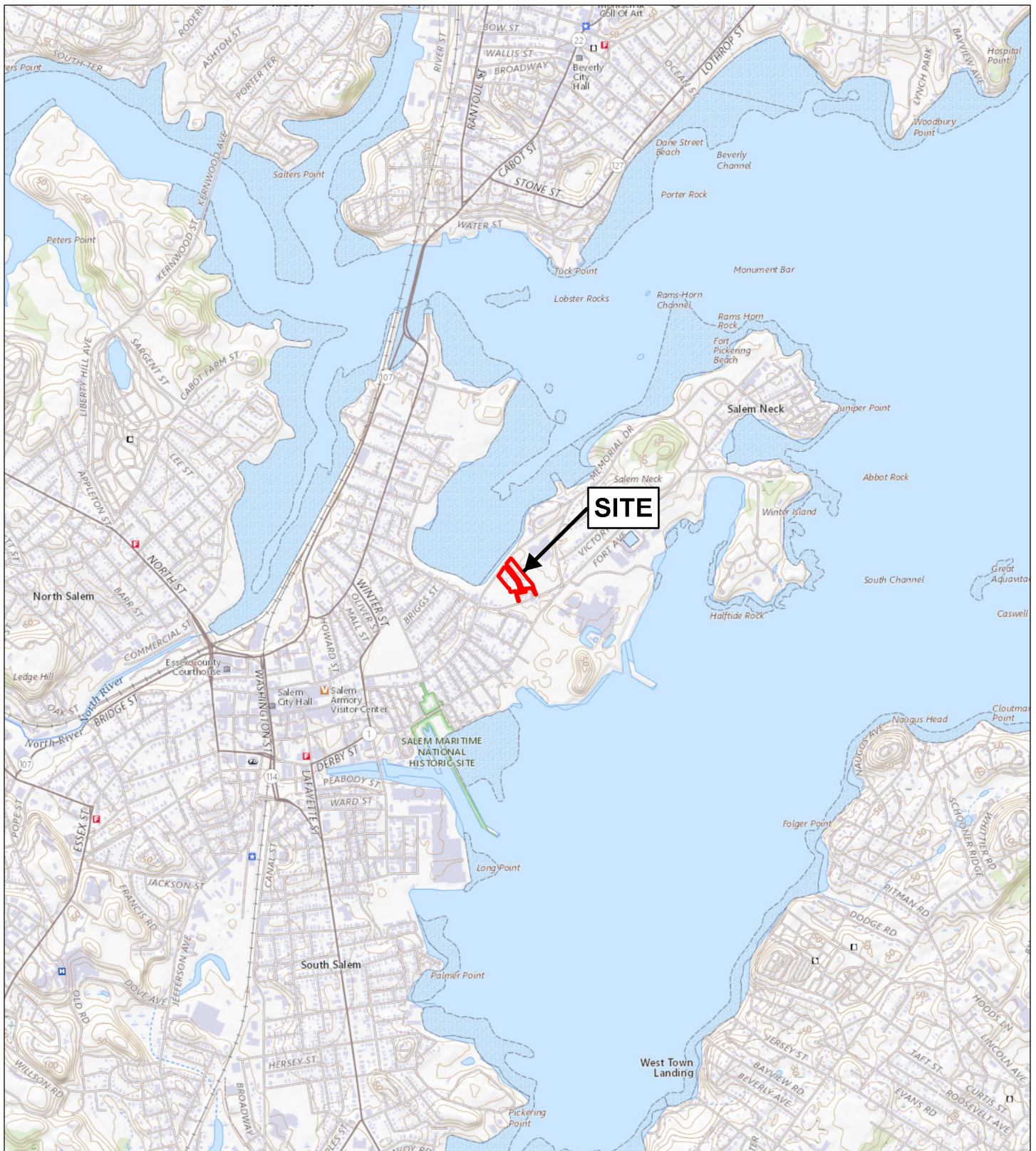
The conclusions and recommendations contained in this report are based in part upon various types of chemical data and are contingent upon their validity. These data have been reviewed and interpretations made in the report. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their migration pathways may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, these data should be reviewed by TRC and the conclusions and recommendations presented herein modified accordingly.

Historic chemical analyses have been performed for specific parameters as described in the text. However, it should be noted that additional chemical constituents not searched for during the

referenced studies might be present at the subject property. Nothing herein limits, changes or modifies TRC's contract with the client.

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FIGURES



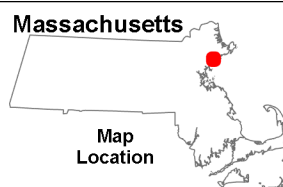
 Approximate Site Location



0 2,000
Feet



Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854
978-970-5600



**SITE LOCATION MAP
LEEFORT TERRACE
1 AND 2 LEEFORT TERRACE
SALEM, MASSACHUSETTS**

FIGURE 1

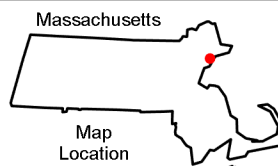
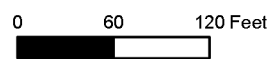
AUGUST, 2023

Base Map: USGS/The National Map



 Approximate Site Location

 Adjacent Parcels



Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854
978-970-5600

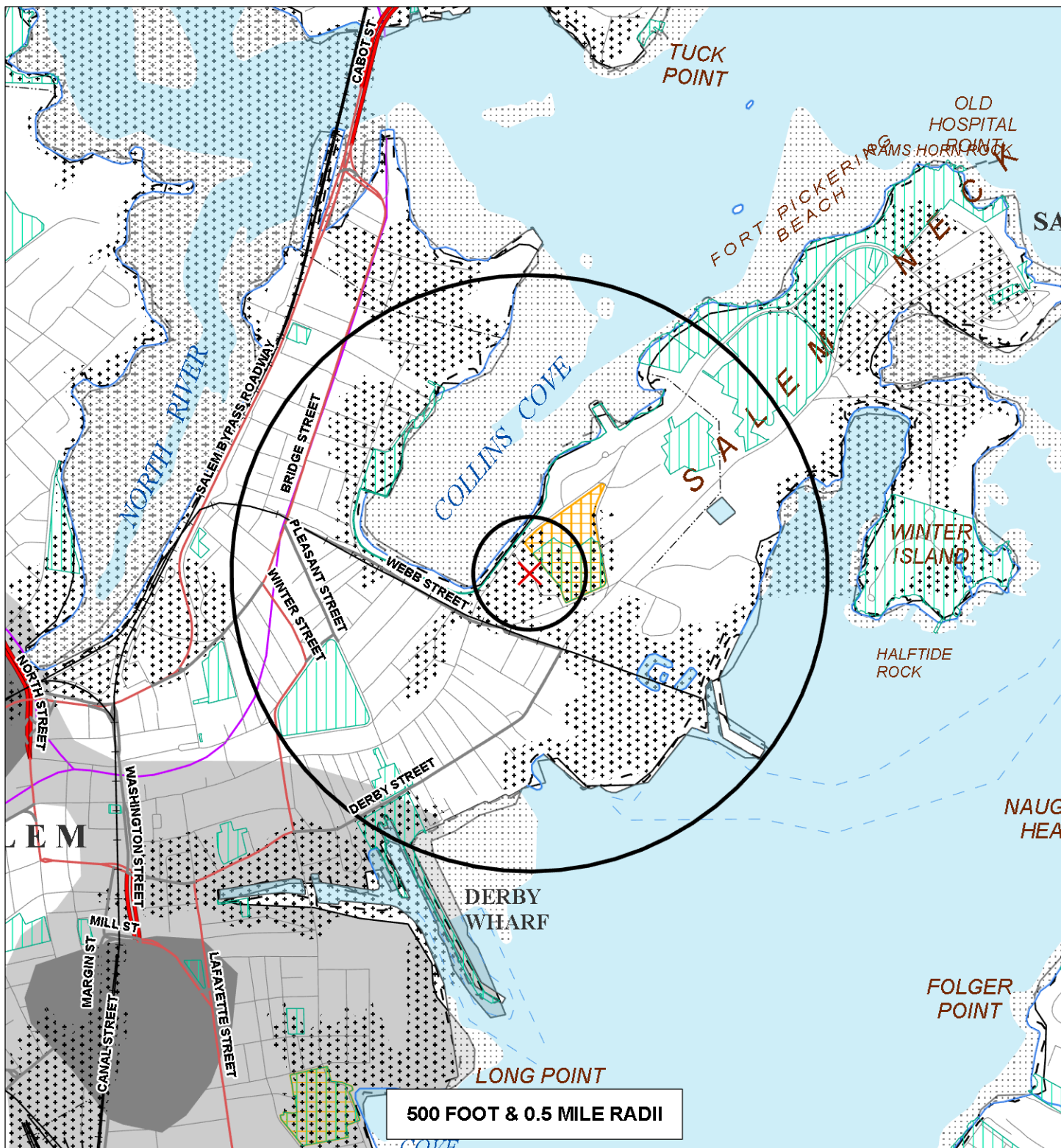
**SITE LAYOUT MAP
LEEFORT TERRACE
1 AND 2 LEEFORT TERRACE
SALEM, MASSACHUSETTS**

FIGURE 2

AUGUST, 2023

Base Map: Esri and its contributors

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Roads: Limited Access, Multi-Lane, Major/Minor, Track, Trail
 Railroad, Pipeline, Powerline
 Major Basin, Sub Basin, Perennial Stream, Intermittent Stream,
 Shoreline, Man made Shore, Dam, Aqueduct
 Wetland, Salt Wetland, Submerged Wetland, Open Water, Reservoir, Tidal Flat/Shoal
 Potentially Productive Aquifers: Medium, High Yield
 Non-Potential Drinking Water Source Area: Medium, High Yield
 EPA Sole Source Aquifer, FEMA 100 Yr. Floodplain, DEP Solid Waste Facility
 Approved Zone II, IWPA, Surface Water Supply Zone A
 Protected Open Space, ACEC
 Priority Habitat, Certified Vernal Pool
 Boundaries: County and Town
 Public Water Supplies: Ground, Surface, Non-Community (NTNC, TNC)



Wannalancit Mills
 650 Suffolk Street
 Lowell, MA 01854
 978-970-5600

FIGURE 3

MASSDEP PRIORITY RESOURCE MAP
 LEEFORT TERRACE
 1 AND 2 LEEFORT TERRACE
 SALEM, MA



0 1,250
 Feet

AUG
 2023

TABLES

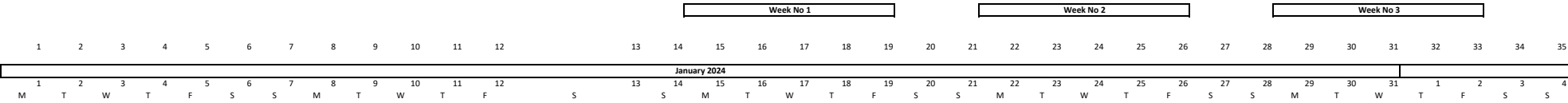
DRAFT

Table 1
Cost Summary of the Proposed Remedial Alternatives
Leefort Terrace
1 2 Lee Fort Terrace, Salem, Massachusetts

Abatement Costs:	Alternate No. 1:	Alternate No. 2:	Notes	Alternate No. 3:
Abatement Labor:		\$421,560		\$421,560
Materials/Equipment:		\$70,260		\$70,260
Disposal:		\$249,814		\$249,814
Fee's, Permits, Mobilization, Misc.:		\$39,034		\$39,034
			<i>General Condition Valuation:</i>	
			<i>1 Month of General Conditios =\$198,310</i>	
Additional General Condition Time:		\$247,888	<i>1.25 (5 weeks) x\$198,310=\$247,888</i>	\$0
Additional Demo Down Time:		\$0	<i>Adds 5 weeks to overall schedule</i>	\$0
Total:		\$1,028,556		\$780,668

Best Economical
and Efficient Plan

Notes:
 1 Base Year 2023
 2 Costs do not include taxes or contractor markups
 3 Costs based on Callahan/Boston Environmental/WaypointKLA estimates



1

2

3

4

5

6

7

Building No. 1 / 7 Day Abatement

1

2

3

4

5

6

7

Building No. 2 / 7 Day Abatement

Alternative 2:

Complete the entire Project Wide Abatement Scope of Work, and then begin the Building Demolition

Adds 4.5 Weeks to the Schedule

1

2

3

4

5

6

7

Building No. 1 / 7 Day Abatement

1

2

3

4

5

6

7

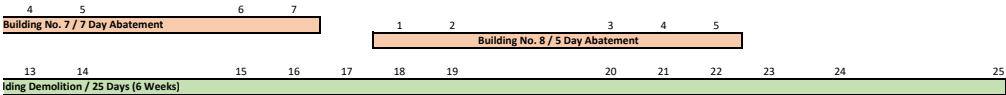
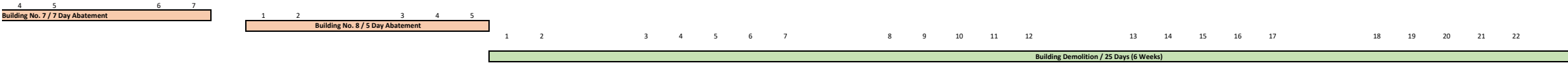
Building No. 2 / 7 Day Abatement

Alternative 3:

Begin the Demolition work half way through the Abatement work, saves 4.5 weeks, and eliminates any Demo Down Time

No Demo Down Time
Reduces Construction Schedule

			Week No 10							Week No 11							Week No 12							Week No 13							Week No 14							Week No 15													
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125							
											April 2024																																								
21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4							
T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S							



Week No 16

126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152
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May 2024

5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F

23 24 25

Table 2
Remedial Alternative Evaluation Matrix
Leefort Terrace
1 and 2 Leefort Terrace
Salem Massachusetts

Comparative Evaluation Criteria*:			Comparative Effectiveness	Comparative Reliability	Comparative Difficulty of Implementation	Comparative Cost	Comparative Implementation Risks	Comparative Resiliency to Climate Change	Comparative Benefits	Comparative Timeliness	Notes
Remedial Action Alternative	#1	No Further Action	Low	Low	Low	Low	High	Low	Low	Short	The No Further Action alternative will not allow for redevelopment of the site.
	#2	Site Building Abatement and Demolition Occurring in Separate Phases	High	High	High	High	Moderate	High	High	Short	
	#3	Site Building Abatement and Demolition Occurring in Single Phase	High	High	Moderate	Moderate	Moderate	High	High	Short	

* Effectiveness - the ability of the remedy to treat, destroy, detoxify, reuse, or recycle contaminants at the Site.
Reliability - the degree of certainty that the remedy will be successful over the short- and long-term timeframes.
Difficulty of Implementation - comparative difficulty in terms of technical complexity, integration with facility operations, monitoring requirements, and material and labor availability.
Relative Costs - Costs in terms of remedy design and implementation.
Implementation Risks - comparative risks posed by the Site to workers, the community, and the environment during and after remedy implementation.
Resiliency to Climate Change - the ability of the remedy to address observed and forecasted climate change conditions for the area of the proejct and associated site specific risk factors.
Benefits - the comparative benefits of the alternative including the provision for productive Site reuse, restoration of natural resources, and other non-pecuniary benefits.
Timeliness - the relative time for the alternative to eliminate uncontrolled hazardous material.