

1.0 ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

1.1 Introduction/Background: Site Location and Purpose of Analysis of Brownfields Cleanup Alternatives

The subject property is an approximately 2.40-acre property developed with a vacant former ice making facility, refrigerated building, and office building and is located at 1 & 11 Union Street in the City of Brewer, Maine. See Figure 1 for a Site Location Map. Information obtained from the City of Brewer Assessor's Department indicated that the tax assessment parcel numbers for the subject property are Tax Map 29 Lots 124 and 126. See Figure 2 for site features.

Beacon Environmental Consultants, LLC (Beacon) is providing this Analysis of Brownfields Cleanup Alternatives (ABCA) to the Maine Department of Environmental Protection (MEDEP) to evaluate cleanup alternatives associated with redevelopment of the Site. This ABCA includes an *Introduction & Background* (Section 1), a discussion of *Applicable Regulations and Cleanup Standards* (Section 2), and an *Evaluation of Cleanup Alternatives* (Section 3).

1.2 Site Current and Past Uses

The Subject Property consists of approximately 2.40 acres and was initially a portion of the Smith Planing Mill and the S.H. Barber Shipyard in the late 1800s. Getchell Brothers Ice acquired the property in the 1940s and constructed the first ice house. Currently, the property is developed with several buildings of wood or concrete construction, and have the following interior square footage:

- Ice Plant Building - Located on the northern portion of the property, this is an approximately 13,027 square foot wooden and metal framed building formerly used to manufacture ice for sale. A 120 square foot loading platform is located on the southern side of the building. The majority of the building is one level with some small structures built onto the top and sides of the original structure.
- Office Building - Located in the center of the property, this structure was originally constructed in the 1950s and it is approximately 2,610 square feet in size with a 25 square foot wooden porch on the northern side of the building. The second floor of the building is used as offices for Getchell Brothers. The basement level has one office, a conference room, bathroom, and the utility room which includes the natural gas boiler and storage of records. The tax card indicated that this structure was built in 1888 but Sanborn maps indicate that it was built between 1950 and 1955.
- Refrigeration Building - Located on the Southern portion of the property, this structure was originally constructed in 1982 and is an approximately 2,554 square foot refrigerated building which was used for storage of ice cream and novelty frozen items. An approximately 961 square foot metal garage is connected to the northern portion of the building and used for storage of equipment and materials. This garage also includes an office area on a mezzanine level.
- Former Pumphouse - Located on the northeastern corner of the property this is a small wooden shed which at one time was used to pump water from the river to the Ice Plant Building. The roof has collapsed on the back side of this structure making it inaccessible.

Significant renovation occurred in the 1950s and 1980s when additions were constructed on the Ice Plant Building. In the summer of 2018, a garage structure attached to refrigeration building was demolished.

Currently, the property is unoccupied with Getchell Brothers Ice using the former factory building for storage of equipment.

The ground surface at the site slopes slightly to the west. Groundcover consists primarily of the buildings, paved surfaces, and vegetated areas along the northeastern boundary.

Based on information reviewed during the historical record review, through the Penobscot County Registry of Deeds and available file Site Assessments (as discussed below), historical Site ownership and operator information is provided in the table below.

Previous Owner and/or Operator Information

Owner/Occupant	Years
Getchell Brothers, Inc.	1945-Present
Penobscot Lumber	1910-1945
Smith Planing Mill	1880s-1910s

1. This prior ownership information was ascertained from limited research at Penobscot County's Registry of deeds.

1.3 Previous Site Assessments Findings

UST Site Assessment, prepared by Millett Associates, August 1994

One 4,000-gallon diesel UST was removed from the property by Lynch Construction in July 1994. A sample of the soil around the fill pipe had a photoionization detector (PID) reading of 104 parts per million (ppm). All other samples collected were 0.0 ppm around the UST. The tank was removed from the ground and observed to be in good condition. No remedial work was anticipated to be needed.

Phase I ESA, prepared by Beacon, January 10, 2019

Beacon Environmental Consultants, LLC performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 of the property located at 1 and 11 Union Street, Brewer, Maine 04412.

This assessment revealed the following RECs in connection with the property:

- Floor drains connected to the Penobscot River;
- A hole in the floor of the freezer reconditioning room opens to the ground below and paint waste was observed in this area.

This assessment revealed the following HRECs in connection with the property:

- One 2,000-gallon gasoline UST, one 1,000-gallon heating oil UST, one 500-gallon heating oil UST, and one 275-gallon heating oil UST were removed from the property in 1989;
- One 4,000-gallon diesel UST was removed from the property in 1994.

This assessment did not reveal CRECs in connection with the property.

This assessment revealed the following environmental conditions in connection with the property:

- Asbestos-containing materials (ACM), Lead-Based Paint (LBP), and/or Polychlorinated Biphenyls (PCBs) may be present within building components.

Beacon recommended:

- A Hazardous Building Materials Inventory (HBMI) be completed;
- Hazardous substances and petroleum products should be removed and properly disposed of at an appropriate disposal facility; and
- A Phase II ESA should be completed to determine if impacts to soil, groundwater, or soil gas are present on the Site.

Phase II ESA, prepared by Beacon, December 9, 2019

Following a review of the Phase I ESA, Beacon developed a Site-Specific Quality Assurance Project Plan (SSQAPP) in May 2019 to support the Phase II ESA. Between May 9 and May 16, 2019, Beacon performed the following work as part of the Phase II ESA for the Site:

- Advanced twelve (12) soil borings utilizing a Geoprobe track-mounted rig and collected (8) subsurface soil samples and one duplicate sample and four (4) surface soil sample for laboratory analysis;
- Collected two (2) surficial soil samples with a hand probe for laboratory analysis;
- Installed 1” monitoring wells at five (5) locations and collected five groundwater samples and one duplicate for laboratory analysis;
- Installed three subslab soil vapor locations and three soil vapor sample locations and collected six total soil gas samples for laboratory analysis;
- Completed an inventory of universal waste;
- Subcontracted with Atlantic Environmental Contractors, Inc. (Atlantic) for an asbestos and lead-based paint inspection of the property.

Soil and groundwater collected from Site investigations were submitted to Alpha Analytical Laboratory (Alpha) in Westboro, Massachusetts for laboratory analysis. Soil vapor collected from Site investigations were submitted to Alpha of Mansfield, Massachusetts for laboratory analysis.

Laboratory analysis of surficial soil samples from SS-03, B-06 (and its duplicate B-13) and B-12 had concentrations of lead above the MEDEP Remedial Action Guidelines (RAGs) for Residential Scenarios. B-06 (and its duplicate B-13) also had concentrations of benzo(a)pyrene above the MEDEP RAGs for Residential Scenarios.

Laboratory analysis of subsurface soil samples from boring B-09 were elevated above the MEDEP RAGs for Residential Scenarios for lead. Laboratory analysis of subsurface soil samples from boring B-04 were elevated above the MEDEP RAGs for Residential Scenarios for benzo(a)pyrene.

Laboratory analysis of groundwater samples collected from three on-site monitoring wells MW-02, MW-06 (and its duplicate MW-13), and MW-09 reported concentrations of lead above the MEDEP RAGs for Residential Scenarios, samples collected from MW-09 also had concentrations of benzo(a)pyrene above the MEDEP Residential RAGs.

Laboratory analysis of soil vapor samples and subslab soil vapor samples were below the MEDEP RAG attenuation factor guidance for Residential and Commercial Scenarios.

Impacts were documented to be above MEDEP Residential RAGs in surficial and subsurface soil and above MEDEP Residential RAGs for groundwater. ACM, LBP and Universal Waste were identified within on-site buildings.

Beacon recommended:

- Soils on the property should be characterized and managed appropriately prior to off-site disposal based on elevated concentrations of contaminants of concern. If the soil is to be managed on-site a cover system may be required to prevent contact threat;
- If the buildings are demolished, the floor drains should be evaluated by an environmental professional;
- An Analysis of Brownfields Cleanup Alternatives (ABCA) should be completed for the property;
- A Declaration of Environmental Covenant (DEC) should be completed to include prohibition of usage of on-site drinking water without MEDEP approval; and
- Prior to demolition or renovation of on-site buildings, ACM, LBP, and Universal Waste should be managed appropriately.

Phase I ESA, prepared by Beacon, January 4, 2024

Beacon performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E1527-21 of the vacant commercial property located at 1 & 11 Union Street in the City of Brewer, Penobscot County, Maine.

This assessment revealed the following RECs in connection with the property:

- Floor drains connected to the Penobscot River;
- Impacts were documented to be above MEDEP Residential RAGs in surficial and subsurface soil and above MEDEP Residential RAGs for groundwater.

This assessment revealed the following HRECs in connection with the property:

- One 2,000-gallon gasoline UST, one 1,000-gallon heating oil UST, one 500-gallon heating oil UST, and one 275-gallon heating oil UST were removed from the property in 1989;
- One 4,000-gallon diesel UST was removed from the property in 1994.

This assessment did not reveal CRECs in connection with the property.

This assessment revealed the following environmental conditions in connection with the property:

- Asbestos-containing materials (ACM) and Lead-Based Paint (LBP) are present within building components.

Beacon recommended:

- If the buildings are demolished, the floor drains should be evaluated by an environmental professional;
- An Environmental Media Management Plan (EMMP) should be completed for the property;
- A Declaration of Environmental Covenant (DEC) should be completed to include prohibition of usage of on-site drinking water without MEDEP approval; and
- Prior to demolition or renovation of on-site buildings, ACM, LBP, and Universal Waste should be managed appropriately.

1.4 Redevelopment Project Goals

The current redevelopment plans may include mixed usage of the property with commercial and potential residential occupancy.

The project cleanup goals are to remove the hazardous building materials and to remove accessibility to impacted soils above the regulatory guidelines.

2.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

2.1 Cleanup Oversight and Responsibility

The cleanup will be overseen by an environmental consultant/environmental professional who will coordinate with the MEDEP and follow applicable guidelines and regulations of the MEDEP and the USEPA. The documents prepared in support of the cleanup will be submitted to both MEDEP and USEPA for review and comment as applicable.

2.2 Cleanup Standards for Major Contaminants

Major contaminants identified are below. Applicable Cleanup Standards follow.

Hazardous Building Materials/Universal Waste – Asbestos, lead-based paint, and universal waste were identified within the site buildings on the property.

Surficial Soils - Surficial soil samples from locations on the northern and western portions of the property were elevated above the MEDEP Residential User RAGs for lead and polyaromatic hydrocarbons.

Subsurface Soils – Subsurface soil samples from the northern portion of the property were elevated above the MEDEP Residential User RAGs for lead and polyaromatic hydrocarbons.

Groundwater – Groundwater samples were elevated above the MEDEP Residential RAGs for lead and polyaromatic hydrocarbons.

Cleanup Objectives - The objective of the remediation at the Site is to remove an environmental and public safety hazard, achieve No Further Action Assurance Letter from MEDEP, and achieve Site closure by elimination or management of environmental conditions that pose a risk to human health and/or the environment. In order to achieve this objective, the following cleanup goals and/or regulatory standards and/or guidelines are applicable:

- Universal, Solid, and Other Regulated Wastes
 - USDOT 49 CFR 100-199 - Transportation of Hazardous Materials
 - MEDEP Chapter 400 – Solid Waste Management
 - MEDEP Chapters 850 - 857 - Maine Hazardous Waste Management Regulations

2.3 Laws and Regulations Applicable to the Cleanup

Applicable laws and regulations associated with this cleanup will include the following:

- Brownfields Revitalization Act
- Federal Davis-Bacon Act
- MEDEP state environmental laws and regulations, and
- City By-Laws, as applicable.

Other laws and regulations that may be applicable are cited above. In addition, federal, state, and local laws which identify procurement of cleanup contractors to conduct and oversee cleanup will be followed during the remediation and cleanup. All applicable permits to conduct the work and hazardous waste manifests for off-site disposal of the contaminated materials will be obtained.

3.0 ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

Each remedial alternative was evaluated with respect to the comparative evaluation criteria including: effectiveness, reliability, implementability, preliminary cost, and the impact of potential climate changes to the remedy based on selection.

The preliminary cost estimates presented (including preliminary engineering, bidding, remediation, contingency, etc.) are approximate estimates prepared solely for the relative comparison of the identified alternatives. As such, these cost data are not to be used as design-level estimates.

3.1 Areas of Concern (AOCs)

Two areas of concern have been identified on the property:

1. Surficial and surface soils on the western and northeastern portions of the property.
2. Hazardous Building materials.

Additionally, one site-wide concern has been identified on the property:

1. Groundwater on the property.

3.2 Evaluation of Remedial Alternatives

A description of each alternate and the results of the comparative analysis are presented in the following subsections.

3.3 Identification of Remedial Alternatives

Potential alternatives were evaluated for addressing the environmental conditions that could pose a risk to human health and/or the environment at the Site. A limited number of practicable remedial alternatives that could be implemented at the Site based on available Site data were developed. The “No Action” alternative was included as part of the evaluation to establish a basis for conducting remedial actions at the Site and as required in the Cleanup Grant application.

The remedial alternatives identified for consideration under this alternatives analysis include:

1. No Action Alternative;
2. ACM and Universal Waste Removal, and Off-Site Soil Disposal
3. ACM and Universal Waste Removal, and On-Site Soil Management under a Cover System

A description of each alternative and the results of the comparative analysis are presented in the following subsections.

Alternative #1: No Action

This alternative involves no additional response actions at the Site. Under this alternative, the Site is not redeveloped. The No Action alternative would not prevent exposure of Site contaminants to humans and the environment. Therefore, the No Further Action alternative will not meet the remedial action objectives and cleanup goals and will not be evaluated further with respect to the comparative evaluation criteria.

The costs for Remedial Alternative #1 are estimated to be **\$0.00**.

Alternative #2 – ACM, Hazardous Waste, and Universal Waste Removal, Soil Removal and Off-Site Disposal

This alternative involves removal of the asbestos and universal waste from the on-site structures and completes the excavation and removal of impacted soils in preparation of new construction. As the plans for the ultimate reuse of the project have not been fully completed; the volume of soil is not completely known; therefore, it is based on an estimate of approximately 1,000 cubic yards of soil (two feet thick from the area that is currently paved) and replace it with clean material. The alternative will utilize standard construction techniques to excavate soils and load them into dump trailers for off-site disposal at a licensed disposal facility. Disposal characterization would need to be completed to gain acceptance for disposal. The alternative would include proper management of wastes for off-site disposal, as applicable. The estimated cost ranges for implementing Remedial Alternative #2 are presented below.

ACM Abatement	\$20,000 to \$30,000
Universal/Hazardous Waste Removal	\$15,000 to \$20,000
Soil Characterization	\$5,000 to \$10,000
Soil Excavation of 1,000 cubic yards	\$15,000 to \$25,000
Disposal of Soil at a Licensed Landfill	\$160,000 to \$180,000
1,000 cubic yards of Clean Soil and Placement	\$20,000 to \$30,000
Confirmation Analytical	\$12,000 to \$15,000
Site Oversight/Engineering/Closure	\$10,000 to \$20,000

The range of costs for Remedial Alternative #2 is estimated to be between **\$257,000.00 and \$330,000.00**.

Alternative #3 – ACM, Hazardous Waste, and Universal Waste Removal, Soil Removal and Installation of a Marker Layer and Cover System

This alternative is different from Alternative #2 in that instead of the off-site disposal of the impacted soils, instead it would be excavated for on-site disposal on a portion of the undevelopable area of the property with a marker layer and cover system of eighteen (18) inches of clean soil and hydroseed would be placed over these soils. This alternative would be effective at reducing risk at the Site; however, may limit future use of a portion of the property. The estimated cost ranges for implementing Remedial Alternative #3 are presented below.

ACM Abatement	\$20,000 to \$30,000
Universal Waste Removal	\$15,000 to \$20,000
Soil Excavation of 1,000 cubic yards	\$15,000 to \$25,000
On-site Placement of Soil	\$40,000 to \$60,000
Marker Layer	\$1,000 to \$3,000
400 cubic yards of Clean Soil and Placement	\$15,000 to \$20,000
Hydroseed	\$2,000 to \$5,000
Confirmation Analytical	\$12,000 to \$15,000
Site Oversight/Engineering/Closure	\$5,000 to \$10,000

The range of costs for Remedial Alternative #3 is estimated to be between **\$125,000.00 and \$188,000.00**.

*Note - If the property is restricted to commercial use, the marker layer would not be required and the cost would be reduced by approximately \$1,000 to \$3,000.00.

3.4 Comparison to Evaluation Criteria – Sitewide Soils

This Section presents a relative comparison of the selected remedial alternatives (Alternatives #2 and #3). Alternative #1 is not carried through for review based on the fact that this alternative does not meet the remedial objectives.

Effectiveness: Remedial Alternative #2 would be effective at achieving Site closure. Alternative #3 would have continuing obligations in the form of annual site inspections of the cover system to verify that it does not have erosion issues.

Reliability: Remedial Alternative #2 is more reliable in preventing exposure to future users of the Site because the buildings and soils will be completely removed from the property. Alternative #3 is a simple approach involving the removal and covering the soils on the property.

Difficulty of Implementation: Remedial Alternative #3 would be moderately more difficult to implement as impacted soils would be present on the property during the excavation phase and would need to be kept secure. The cover system created on the property would require an annual inspection. Remedial Alternative #2 would be relatively easy to implement as it includes the removal of all impacted soils from the property and disposal at a licensed disposal facility.

Cost-Benefit: Due to the significant removal and off-disposal, as well as more vehicle emissions, versus removing a smaller amount of soil and creating a cover system over the soils on-site, Remedial Alternative #2 is most likely to be the highest cost.

3.5 Selection of Remedial Alternative

The No Action Alternative (Remedial Alternative #1) was included in this analysis for comparative purposes only and is not a feasible alternative because it does not meet the remedial action objectives.

Remedial Alternatives #2 and #3 were evaluated to address cleanup of impacts within the surficial soils. Alternative #2 provides the most effective method of providing site closure and Alternative #3 would limit redevelopment on the subject property; however, it would meet the current reuse plan for the City. Therefore, Alternative #2 is chosen as the preferred remedial alternative.

3.6 Costs for Selected Alternatives

In addition to the selected alternatives, MEDEP will require that the property comply with the Voluntary Response Action Program (VRAP) so that work performed on the property to remediate the impacts is documented and a Commissioner’s Certificate of Completion (COC) can be issued to the property owner at the completion of the site work. Additionally, new construction on the property would be required to comply with the current Environmental Media Management Plan (EMMP) developed by Beacon in April 2024.

Total costs associated with the selected alternatives are tabulated below:

Selected Alternative	Cost Range
Alternative #2 – ACM, Hazardous Waste, and Universal Waste Removal, Soil Removal and Off-Site Disposal	\$257,000.00 to \$330,000.00
Total	\$257,000 to \$330,000

3.7 Green and Sustainable Remediation and Climate Change

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 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
- Use of local contractors to limit vehicle emissions
- Reuse or recycle waste
- 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
- Maximize use of machinery equipped with advanced emission controls

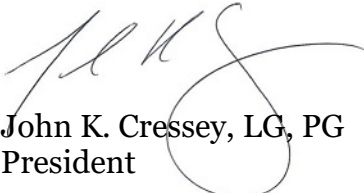
Climate Change Conditions

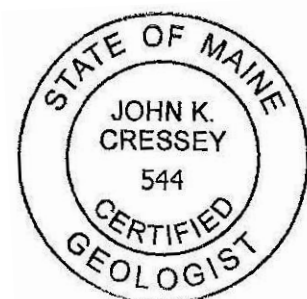
In evaluating climate change conditions, the proposed cleanup activities were evaluated with regard to proximity to a coastline, flood plain, in an area with a potential increase of drought, and impact of increased frequency and intensity of storms. The Site is located along the Penobscot River. The Site topographic elevation is approximately 18 feet above mean sea level, and local topography slopes westerly towards the Penobscot River. The remedial activities proposed for the Site include the removal of surficial soils (0-3' BGS) and therefore flooding or other climate-related activities may be a concern for the Site and is another factor in the decision to remove the soil instead of developing a cover system.

Please feel free to contact me with any questions.

Sincerely,

BEACON ENVIRONMENTAL CONSULTANTS, LLC


John K. Cressey, LG, PG
President



BEACON ENVIRONMENTAL CONSULTANTS, LLC