Analysis of Brownfields Cleanup Alternatives – Preliminary Evaluation
Front Street Apartments, 37 Front Street, Portland, Maine

Prepared by the Portland Housing Authority (PHA)

I. Introduction & Background

a. Site Location

The site is located at 37 Front Street in Portland, Maine (herein referred to as "the Site").

b. Previous Site Use(s) and any previous cleanup/remediation

Prior to circa 1956, the Site existed as undeveloped land, and consisted of tidal flats of Hansom's Creek and Back Cove before being filled for development. The Site was developed in 1971 for its current use as the Front Street Apartments complex, which is owned and managed by the PHA. The Site is currently improved with 11 buildings, which include ten multi-unit residential buildings and one building used as a community center. Surrounding properties have been utilized for residential purposes dating back to the 1800s.

c. Site Assessment Findings

In support of PHA's proposed redevelopment of the Site, a Phase I Environmental Site Assessment (ESA) was completed in January of 2016. The Phase I ESA did not identify any "Recognized Environmental Conditions" as defined by ASTM International Standard E 1527-13; however, the potential presence of urban fill at the Site was identified as an environmental concern. Based on Site history, it is known that portions of the Site and vicinity were constructed on areas formerly part of Back Cove, and subsequently built up by emplacement of fill materials of unknown origin, including "urban fill" soils. Urban fill soils typically contain deleterious components, including coal, ash, bricks, glass, coal ash, demolition/fire debris, and other soil contaminants which may contain elevated concentrations of petroleum-related compounds, polycyclic aromatic hydrocarbons (PAHs) and/or metals (e.g., arsenic and lead). Additionally, this ESA identified potential non-scope environmental concerns which included the possibility that asbestos-containing building materials (ACM), lead-based paint (LBP), polychlorinated biphenyl (PCB)-containing fluorescent light ballasts, mercury-containing fluorescent light bulbs, and other potential universal wastes existed in the buildings.

A Limited Subsurface Environmental Assessment was conducted in August of 2016 which included the advancement of soil borings and the collection of soil vapor samples to evaluate the potential for vapor intrusion into future Site structures. The assessment identified the presence of multiple layers of fill material onsite including glass, plastic, rubber, coal ash, and demolition debris at depths ranging from approximately 8 to 14 feet below grade. Surficial soils at the Site were found to contain PAH compounds, arsenic, and lead at concentrations which exceed the Maine Department of Environmental Protection (MEDEP) Remedial Action Guidelines (RAGs) for the "Residential" exposure scenario, as well as applicable state-wide

background concentrations. Additionally, subsurface soils contained concentrations of lead and benzene which exceed the MEDEP RAGs for the "Excavation/ Construction Worker" exposure scenario. As such, surficial soils onsite currently pose an exposure risk to Site residents and users; and subsurface soils pose a future exposure risk to excavation/construction workers during redevelopment activities.

Low concentrations of petroleum fractions, volatile organic compounds (VOCs) and chlorofluorocarbons including chloromethane, dichlorofluoromethane, and trichlorofluoromethane were detected in the soil vapor samples collected from the Site. However, the concentrations of these contaminants did not exceed the MEDEP RAG for Residential Indoor Air. Therefore, the petroleum vapors in the soil gas are not expected to represent a vapor intrusion risk to future residential development at the Site.

To address the issues associated with potential hazardous building materials, Ransom completed a limited Hazardous Materials Inventory (HMI) inspection of the Site Buildings. Asbestos-containing materials were identified which included: textured ceiling paint (aka "popcorn" ceiling) on approximately 25% of the total square footage of ceilings within the Site buildings; brown pebble pattern sheet flooring on 100% of all first and second floor areas; cement board paneling in mechanical ducts between the basement and the second floor in each unit; and a small amount of 9-inch vinyl-asbestos tile and associated mastic. No lead-based paint or PCB materials were identified. This survey was limited both in scope, as well as in inspection and sampling techniques, therefore, it does not constitute a fully-compliant pre-demolition survey under MEDEP or U.S. Environmental Protection Agency (EPA) requirements. Prior to initiating demolition activities, each interior area must be inspected for materials not previously encountered, as well as to further quantify and delineate the already-identified ACM. All ACM will require abatement and proper disposal prior to any building demolition or renovations.

d. Project Goal (site reuse plan)

The Site is a planned for residential redevelopment. As part of this redevelopment, the existing Site buildings will be demolished and new buildings, parking area, greenspace and courtyards will be constructed. The property is zoned as an R-5 residential zone, characterized by medium-density residential development (single-family and low-intensity multifamily dwellings on individual lots).

e. Regional and Site Vulnerabilities

According to the US Global Change Research Program (USGCRP), trends for the northeast region of the United States include increased temperatures, increased precipitation with greater variability, increased extreme precipitation events, and rises in sea level.

According to FEMA Flood Zone Map 2300510007C (July 17, 1986), the Site is not located within a 100-year flood zone; however, portions of the Site are located within 650 feet of Back Bay, which is influenced by tide and receives runoff from a large residential neighborhood in the City of Portland. As such, increased precipitation that

may affect flood waters and stormwater runoff, as well as rising sea levels, are applicable to the cleanup of the site.

Based on the nature of the Site and its proposed reuse, changing temperature, changing dates of ground thaw/freezing, changing ecological zone, saltwater intrusion and changing groundwater table are not likely to significantly affect the Site.

II. Applicable Regulations and Cleanup Standards

a. Cleanup Oversight Responsibility

The PHA will hire a qualified environmental professional (QEP) to oversee and document the cleanup in accordance with local, State, and Federal requirements. In addition, all documents prepared for this site will be submitted to the MEDEP Voluntary Response Action Program (VRAP).

b. Cleanup Standards for major contaminants

The Site is proposed for residential redevelopment. As such, the MEDEP RAGs for the "Residential" exposure scenario are applicable to soils within the 0 to 2-foot interval. In addition, potential exposure risks to Site workers during future construction activities and utility work (i.e., subsurface water and sewer lines) exists at the Site; therefore, "Excavation/Construction Worker" scenarios also apply to soils in the subsurface (deeper than 2 feet below grade).

c. Laws & Regulations Applicable to the Cleanup

Laws and regulations that are applicable to this cleanup include the Federal Small Business Liability Relief and Brownfields Revitalization Act, the Federal Davis-Bacon Act, MEDEP environmental laws, and local City by-laws and ordinances. Federal, State, and local laws regarding procurement of contractors to conduct the cleanup will be followed. The PHA will competitively bid and retain a qualified environmental professional, in accordance with the competitive procurement provisions of 40 CFR Part 31.36. In addition, all appropriate permits (e.g., notify before you dig, State notifications/permits) will be obtained prior to the work commencing.

III. Evaluation of Cleanup Alternatives

a. Cleanup Alternatives Considered

To address contamination at the Site, three different alternatives were considered, including:

- Alternative #1: No Action.
- Alternative #2: Abatement of Hazardous Building Materials and Cover Systems. This alternative includes removal and abatement of hazardous building materials prior to building construction; the construction of engineered cover systems across the entire Site to prevent human contact with the impacted surficial soils; and targeted soil excavation in the area of proposed foundation footings and subsurface utilities to abate contaminated subsurface soils and prevent worker exposure to contaminants during

redevelopment. Additional institutional controls will also be implemented to ensure that future construction, remediation, or landscaping at the property would not disturb the engineered cover systems or underlying residual contaminated soil. These would likely include Deed Restrictions, a Soil and Groundwater Management Plan, and a Post-Closure Cover System Maintenance Plan.

- Alternative #3: Abatement of Hazardous Building Materials and Excavation with Offsite Disposal. This alternative includes removal and abatement of hazardous building materials prior to building construction; excavation and off-site disposal of impacted surficial soils across the entire site to a depth of two feet below grade; and backfill of excavation areas with clean fill to proposed redevelopment grades. Additional institutional controls will also be implemented to ensure that future construction, remediation, or landscaping at the property would not disturb subsurface contaminated soils at depths greater than two feet below grade; these would likely include Deed Restrictions and a Soil and Groundwater Management Plan.

b. Cost Estimate of Cleanup Alternatives

To satisfy EPA requirements, the effectiveness, implementability, and cost of each alternative must be considered prior to selecting a recommended cleanup alternative.

<u>Effectiveness – Including Vulnerability/Resiliency Considerations</u>

- Alternative #1: The No Action alternative is not effective in controlling or preventing the exposure of future receptors to hazardous building materials or soil contamination at the Site; nor is it protective of human health and the environment. Additionally, stormwater and precipitation will continue to come into contact with the contamination soil; this creates a risk that a rising groundwater table and stormwater runoff could transport contaminated media to off-site sources, such as Back Bay.
- Alternative #2: Abatement by removal of hazardous building materials is an effective way to prevent future receptors from coming into direct contact with asbestos containing materials and universal waste, and soil cover systems are an effective way to prevent future receptors from coming into direct contact with contaminated surficial soils, if the cap is maintained. However, capping is not an effective way to control exposures for Site excavation workers during future construction activities. To mitigate these risks, a Post-Closure Cover System Maintenance Plan and a Soil Management Plan would also be prepared. Additionally, as part of this alternative, soils located in areas proposed to be excavated for foundation footings, utilities and other sub-surface infrastructure would be removed from Site and properly disposed. By removing soils which may come into contact with future Site excavation workers, the cleanup alternative is more protective of human health. In addition, an institutional control (land use restriction) would need to be recorded on the deed to prevent future excavations beneath the cover system without notification to the MEDEP. The cover systems alternative would include site grading to shed stormwater in an appropriate manner; as such, issues associated with increased rainfall

would not be a problem; however, flood waters and rising sea levels may have the potential to raise groundwater levels, resulting in groundwater coming into contact with contaminated surficial soils. Because public water is provided to the Site and surrounding areas, impacted groundwater is not anticipated to pose a significant risk to future Site residents.

- Alternative #3: Abatement by removal of hazardous building materials is an effective way to prevent future receptors from coming into direct contact with asbestos containing materials and universal waste, and excavation and offsite disposal of contaminated soils is an effective way to eliminate exposure risks at the Site. Because the contamination will be removed, the exposure pathways will no longer exist. This alternative is also the most effective way to prevent precipitation, stormwater runoff, rising groundwater tables, rising sea level, and potential flooding from coming into contact with impacted media, because the contamination sources are being removed from Site.

Implementability

- Alternative #1: No Action is easy to implement since no actions will be conducted.
- Alternative #2: This alternative is relatively easy to implement. The necessary services and materials to complete the remedial tasks are readily available, including the necessary equipment and contractors. However, there are ongoing maintenance and inspection requirements associated with the deed restrictions that protect the cover systems, which may be difficult to maintain in the future. Additionally, the removal of excess soils in the vicinity of subsurface infrastructure and utilities may be more difficult to implement. Soil removal is a standard technique for soil abatement; however, dust suppression, erosion and sedimentation control, excavation safety and monitoring, confirmatory sampling activities to ensure all contaminated soils are removed, and short-term disturbance to the community are anticipated in association with soil removal activities.
- Alternative #3: Abatement by removal of hazardous building materials is relatively easy to implement; however, excavation of contaminated soils is moderately difficult to implement. This alternative is able to be implemented using standard construction techniques; however, monitoring (e.g., dust suppression, erosion and sedimentation control, excavation safety and monitoring) during cleanup activities, confirmatory sampling activities to ensure all contaminated soils are removed, and short-term disturbance to the community (e.g., trucks transporting contaminated sediments and backfill) are anticipated. However, ongoing monitoring and maintenance will not be required following excavation and offsite disposal.

Cost

- There will be no costs under Alternative #1: No Action.
- It is estimated that Alternative #2 will be on the order of $559,000. See Table 1 for an estimate of remedial costs.

- Alternative #3 is estimated to cost roughly $1,228,900. See Table 2 for an estimate of remedial costs.

c. Recommended Cleanup Alternative

The recommended cleanup alternative is Alternative #2: Abatement of Hazardous Building Materials and Cover Systems. This alternative is practical, implementable, and effective in protecting human health and the environment. It is also an effective way to prevent future receptors from coming into direct contact with hazardous building material and contaminated soils onsite.

Alternative #1: No Action cannot be recommended since it does not address site risks; and Alternative #3 is cost prohibitive.

d. Green and Sustainable Remediation Measures for Selected Alternative

To make the selected alternative greener, or more sustainable, several techniques are planned. The most recent Best Management Practices (BMPs) issued under ASTM Standard E-2893: Standard Guide for Greener Cleanups will be used as a reference in this effort. The Town will require the cleanup contractor to follow an idle-reduction policy and use heavy equipment with advanced emissions controls operated on ultra-low sulfur diesel. The excavation work would be conducted during the dry-weather months (summertime) in order to minimize groundwater infiltration into the excavation area, in turn reducing dewatering needs and the amount of dewatering liquids requiring disposal/treatment. The number of mobilizations to the Site would be minimized and erosion control measures would be used to minimize runoff into environmentally sensitive areas. In addition, the Town plans to ask bidding cleanup contractors to propose additional green remediation techniques in their response to the Request for Proposals for the cleanup contract.

Table 1: Summary of Estimated Remediation Costs
Portland Housing Authority, 37 Front Street, Portland, Maine
Alternative #2 - Abatement of Hazardous Building Materials and Cover Systems

	Quantity	Units	Unit Cost	Total
Hazardous Building Materials Abatement				
Eastern Lot	1	LS	$212,100	$212,100
Construction of Cover Systems [1]				
Engineered Cover System - Eastern Lot [2]	10,000	SY	$15	$150,000
Footing & Utility Contaminated Soil Removal	1,000	CY	$100	$100,000
Disposal Waste Characterization Samples [3]	5	Ea	$1,000	$5,000
Erosion and Sedimentation Control	1	LS	$3,000	$3,000
Dust Control / Site H&S	1	LS	$4,000	$4,000
Engineering Design	1	LS	$12,000	$12,000
Construction Oversight and Bidding Phase Services	1	LS	$14,000	$14,000
VRAP Closure Reporting and Documentation [4]	1	LS	$8,000	$8,000
Subtotal				*$508,100*
Contingency 10% [5]				$50,900
TOTAL				**$559,000**

LS = Lump Sum, Gal = Gallon, EA = Each, SY = Square Yard

1 Assumes cover system installation on entirety of Site
2 Cover systems shall be either: 12" gravel over marker layer; or 12" of fill/loam combination over marker layer
3 Assumes 1 waste characterization soil sample per every 250 tons of soil disposed off-site
4 Cost includes VRAP Closure Report, Soil and Groundwater Management Plan, and Declaration of Environmental Covenant.
5 Covers previously unidentified issues that could come up during cleanup activities on Site.

NOTE: These costs do not include eligible programmatic costs which include, but are not limited to: Final Cleanup/ Abatement Plan, Site-Specific Quality Assurance Project Plan, Historic Preservation, and Community Outreach.

Table 2: Summary of Estimated Remediation Costs
Portland Housing Authority, 37 Front Street, Portland, Maine
Alternative #3 - Abatement of Hazardous Building Materials and Excavation with Off-Site Disposal

	Quantity	Units	Unit Cost	Total
Hazardous Building Materials Abatement				
Eastern Lot	1	LS	$212,100	$212,100
Soil Removal and Offsite Disposal				
Excavation, Transportation and Disposal of Soil - Eastern Lot (1)	6800	CY	$100	$680,000
Disposal Waste Characterization Samples (2)	34	Ea	$1,000	$34,000
Clean Backfill	6800	CY	$20	$136,000
Site Restoration, Grading, Seeding	1	LS	$3,000	$3,000
Erosion and Sedimentation Control	1	LS	$4,000	$4,000
Dust Control / Site H&S	1	LS	$4,000	$4,000
Engineering Design	1	LS	$12,000	$12,000
Construction Oversight and Bidding Phase Services	1	LS	$24,000	$24,000
VRAP Closure Reporting and Documentation (3)	1	LS	$8,000	$8,000
Subtotal				$1,117,100
Contingency 10% (4)				$111,800
TOTAL				**$1,228,900**

LS = Lump Sum, Gal = Gallon, Ea = Each, CY = Cubic Yards

1 Assumes surficial soils (0-2 feet bgs) are removed across the entirety of the Site

2 Assumes 1 waste characterization soil sample per every 250 tons of soil disposed off-site

3 Cost includes VRAP Closure Report, Soil and Groundwater Management Plan, and Declaration of Environmental Covenant.

4 Covers previously unidentified issues that could come up during cleanup activities on Site.

NOTE: These costs do not include eligible programmatic costs which include, but are not limited to: Final Cleanup/ Abatement Plan, Site-Specific Quality Assurance Project Plan, Historic Preservation, and Community Outreach.