

**ANALYSIS OF BROWNFIELDS CLEANUP
ALTERNATIVES REQUIREMENT REPORT AND
RELEASE ABATEMENT MEASURE PLAN
PUBLIC COMMENT DRAFT**

**Former Reliable Truss Site
Soil Excavation and Removal
246 River Road
New Bedford, Massachusetts
Release Tracking Number 4-17604**

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1.0 INTRODUCTION

TRC Environmental Corporation (TRC) prepared this Analysis of Brownfields Cleanup Alternatives (ABCA) and Release Abatement Measure (RAM) Plan for the property located at 246 River Road in New Bedford, Massachusetts (the “Site”) to fulfill the requirements of a United States Environmental Protection Agency (EPA) Brownfields cleanup grant awarded to the City of New Bedford (the “City”). The RAM Plan portion of this document is intended to fulfill the requirements of 310 Code of Massachusetts Regulations (CMR) 40.0444, as set forth in the Massachusetts Contingency Plan (MCP). The proposed work will be completed under TRC’s Quality Assurance Project Plan (QAPP) Addendum E2, dated July 29, 2009.

1.1 Purpose

TRC was retained by the City to prepare an ABCA and a RAM Plan as a combined document to provide the framework for outlining and achieving the cleanup goals for the Former Reliable Truss Site. The purpose of the ABCA is to document Site conditions and evaluate practicable remedial alternatives having the potential to limit exposures of Site contaminants to current and future users. The most feasible remedial alternative was chosen based on this evaluation. The RAM Plan outlines the remedial action sequence, and provides the regulatory vehicle under which Site cleanup can occur.

This document meets the requirements for an Alternatives Analysis under the EPA Brownfields Cleanup Grant Program in accordance with the *Brownfields Cleanup Grants - Major Tasks* checklist for EPA Region 1 dated January 9, 2006.

1.2 Scope of Work

This document presents an evaluation of potential remedial alternatives to address lead-impacted soil at the Site. As set forth in the *Brownfields Cleanup Grants - Major Tasks* checklist, a remedial alternatives analysis for an ABCA Report includes:

- Information pertaining to the Site background and the potential threats the Site may pose to public health and/or the environment;
- Documentation that the situation at the Site meets the need for an environmental response action;
- Identification of the objectives of the environmental response action, including an analysis of potential cleanup alternatives, enforcement activities, and projected costs; and
- Identification of the most feasible remedial action, with an explanation of the rationale for its selection.

Following submission, this ABCA Report will be on file for 30 days to allow for public review and comment. After consideration of any input received during the public comment period, the selected cleanup alternative will be implemented in accordance with the RAM Plan as detailed in Section 4.0.

2.0 BACKGROUND

2.1 Site Description

The Site is currently owned by the City and consists of an approximate 2.9-acre irregularly-shaped lot located at 246 River Road in New Bedford, Massachusetts. The Universal Transverse Mercator (UTM) coordinates for the Site are N4503309 and E337987, and are located within a portion of the New Bedford Harbor Superfund Site. The Site is bounded by the Acushnet River to the east and north, River Road and residential housing to the west, and an undeveloped section of Truro Street (also owned by the City) to the south. A Site Location Map is provided as Figure 1.

Review of a United States Geological Survey (USGS) Topographic Quadrangle New Bedford North, Massachusetts (dated 1979) indicates that the Site is located approximately five feet above mean sea level. The topography of the Site is generally level with River Road with low relief. The exception is a steep, east-sloping embankment and concrete wall, which extends approximately 110 linear feet along the northern boundary of the Site adjacent to the Acushnet River. The Site abuts approximately 900 linear feet of Acushnet River shoreline.

The Site was developed as a commercial property in 1924, and has a history as a lumber yard and manufacturing center for wooden cabinets and wooden trusses. The most prominent commercial enterprise to occupy the Site was the former Reliable Truss Company. The structures associated with the former Reliable Truss Company were demolished by 2001. The Site is currently vacant, but the rubble remains of a building footprint exist on the north of the property. An approximate six-foot high perimeter fence has been installed along the west and south of the Site, which restricts access to passers-by. The remainder of the parcel is unpaved, and covered with dense, early-successional vegetation. A layer of fill material overlies the native geology across the entire property. A detailed history was provided in a Phase I Environmental Site Assessment (ESA) report (Ambient, 2001), and updated in a Phase II Comprehensive Site Assessment (CSA) report (Atlantic, 2002).

Underground concrete storm water drains exist at the north and south ends of the Site, extending easterly from River Road and discharging through outfalls to the Acushnet River. Two storm drain catch basins had been located on the west side of the former Site building, and reportedly discharged through outfalls to the Acushnet River. These catch basins have not been observed at the Site since the Site building demolition.

The Disposal Site is defined as the area in which uncontrolled lead contamination has come to be located in soil due to past releases. This area was determined based on an evaluation of areas of fill as determined by boring logs and geophysical survey, the horizontal extent of soil contamination greater than background and MCP Method 1 soil cleanup standards, and the areas of EPA soil and sediment cleanup in the Acushnet River abutting the Site. Currently, the extent of soil contamination, and therefore the Disposal Site boundary, extends beyond the southern property line of 246 River Road, and onto two parcels located to the south. Both of these parcels are also owned by the City. The full extent of soil contamination to the south is partially defined based on current data. Figure 2 depicts current conditions at the Site.

2.2 Petroleum and Hazardous Substance Storage History

According to the Phase I ESA report, two 275-gallon aboveground storage tanks (ASTs) were located adjacent to the former on-site building. One AST was used to store kerosene, and the other was used to store diesel fuel. The Phase I ESA reported no visual evidence of leaks or spills at either AST location (Ambient, 2001). Both ASTs were removed from the Site by October 2001.

Several five-gallon or smaller containers of oil and other fluids (resins, solvents, lubricants, and unknown liquids) were observed in the former Site building and sheds. Minor oil stains were observed beneath the spout of an oil drum on the concrete floor of the former Site building. In addition, one dry transformer was identified inside the wall of the former Site building. However, no evidence of leaks or spills was observed near the transformer (Ambient, 2001).

Suspected asbestos-containing materials (ACM) were observed in two locations in the former Site building. Friable white insulating material covering a boiler was observed in a utility room, and a protective panel located in front of the aforementioned transformer was constructed of cement like gray material (Ambient, 2001). However, all oil and hazardous materials containers, including ACM, had been removed from the Site by October 2001 prior to demolition (Atlantic, 2002).

2.3 Potential Receptors

Human Receptors

The Site is currently vacant with no on-site workers or residents. The western and southern boundaries of the Site are protected by an approximate six-foot high chain link fence. However, it is possible for trespassers to access the Site from the Acushnet River or by circumventing the fence. Surrounding properties include the Acushnet River to the north and east, an undeveloped parcel on the south side of Truro Street, and residential properties to the west across River Road. The City anticipates future redevelopment of the Site as a public park with a walking trail.

According to Massachusetts Geographic Information System (MassGIS) Demographic data viewer for Census 2000, the estimated total population within ½ mile of the Site is approximately 6,000. Review of the USGS Topographic Quadrangle New Bedford North, MA dated 1979, and MassGIS Assessor's 2007 Parcel data viewer, indicates there are no schools or other institutions within 500 feet of the Site.

The Site is not located within an EPA Sole Source Aquifer or Massachusetts Department of Environmental Protection (MassDEP) approved Zone II, Interim Wellhead Protection Area (IWPA), or Surface Water Supply Zone A. No Public Water Supplies exist within ½ mile of the Site. However, medium and high yield aquifers are present within 500 feet of the Site, and the Site is located within both high and medium yield Non-Potential Drinking Water Source Areas. A MassDEP Site Scoring Map is provided as Figure 3.

Environmental Receptors

As shown in Figure 3, the Site is considered Protected Open Space. The eastern boundary of the Site is bordered by the Acushnet River, which represents fish habitat, and a wetland area exits at the southeastern corner of the Site. The eastern portion of the Site is also located within a Federal Emergency Management Agency (FEMA) 100-Year Floodplain. However, no Rare Wildlife, Certified Vernal Pools, or Areas of Critical Environmental Concern are located on the Site.

2.4 Summary of Site Assessment Activities

2.4.1 USEPA Polychlorinated Biphenyl Investigation and Cleanup

Eastern areas of the Site located within 50 feet of the mean high water level of the Acushnet River are considered to be within the New Bedford Harbor Superfund Site (Site Number MAD980731335) under the Comprehensive Environmental Response and Liability Act (CERCLA) or “Superfund.” The Former Reliable Truss Site lies within two sections of the Acushnet River located north of Wood Street in New Bedford, Massachusetts identified as Compliance Demonstration Areas (CDAs) 2 and 6. These areas are shown on Figure 2.

In May 2001, sampling was performed by the EPA in floodplain areas of the Acushnet River to identify and assess the extent of polychlorinated biphenyl (PCB) contamination. Sixty-seven soil and sediment samples were collected from 22 locations at the Site. Total PCB concentrations in soil at the Site ranged from 0.014 to 0.85 milligrams per kilogram (mg/kg), which are less than the EPA Maximum Contaminant Level established in the New Bedford Harbor Superfund Site Record of Decision. These soil PCB concentrations are also less than the current MCP Method 1 S-1/GW-2 and S-1/GW-3 soil cleanup standard of 2 mg/kg. Detected concentrations of PCBs in 9 sediment samples collected from 22 locations near the high water line of the Acushnet River ranged from 5.5 to 680 mg/kg, which are above the standards set by both EPA and MassDEP.

EPA conducted remedial actions at areas of the Site included within CDAs 2 and 6 between 2002 and 2003. The remedial actions consisted of excavation and dredging of soils and sediments, and replacing those areas with clean backfill. The average PCB concentrations in 48 post-excavation samples collected from CDA 2 prior to the placement of clean backfill was 4.4 mg/kg. The average post excavation PCB concentration in 61 post excavation samples from CDA 6 was 7.0 mg/kg (Tetra Tech, 2004).

2.4.2 Former Reliable Truss Site Investigations

In addition to the EPA investigation and cleanup, the following historical investigations/assessments have been conducted at the Site:

- Phase I Environmental Site Investigation by Ambient Engineering, Inc. in 2001 (Ambient, 2001);

- Phase II Comprehensive Site Assessment by Atlantic Environmental Technologies, Inc. in September 2002 (Atlantic, 2002);
- Interim Phase II Comprehensive Site Assessment by TRC in June 2007 (TRC, 2007); and
- Additional investigation activities pursuant to the June 2007 Interim Phase II Comprehensive Site Assessment by TRC in September 2008 (TRC, 2008).

Tabulated summaries of analytical data from all sampling events are available in the following tables: Table 1 – Summary of Analytical Results for Soil Samples, Table 2 – Summary of Analytical Results for Groundwater Samples, Table 3 – Summary of Analytical Results for Sediment Samples, and Table 4 – Summary of Analytical Results for Surface Water Samples. Analytical laboratory reports were included in previous submissions to MassDEP.

Based on the results of the Phase II soil and groundwater testing conducted by Atlantic Environmental Technologies, Inc. in 2002 at the Site, it was concluded that there were three distinct areas of elevated lead concentrations in soil. These areas are shown on Figure 2 as Area 1, Area 2, and Area 3.

In April 2006, TRC conducted additional testing at the Former Reliable Truss Site to better refine the extent of lead-impacted soil in each of these three areas, and to investigate the presence of polycyclic aromatic hydrocarbons (PAHs). PAHs had been detected in at least one soil sample from the Site at concentrations above applicable MCP Reportable Concentrations (RCs) during previous Site investigations. Additionally, site soils were tested for PCBs to confirm the findings of the EPA investigations and remedial actions relative to the Site.

The scope of work, as described in TRC's February 2006 Quality Assurance Project Plan (QAPP) submitted to the EPA, included completion of a ground-penetrating radar (GPR) survey and the installation of 11 soil borings, two of which were completed as groundwater monitoring wells.

The results of TRC's April 2006 investigation confirmed the presence of lead and PAH-impacted soil in the fill material within the three areas of concern identified above. PCBs were not identified above applicable RCs. Additional findings from TRC's April 2006 investigation are noted below:

- Lead was identified above the applicable RC of 300 mg/kg just outside of Area 3 in the fill material at locations TRC-9, 10, and 11 from the 0-3 ft below ground surface (bgs) sample interval. The original Area 3 boundary was subsequently modified to encompass these locations.
- Cadmium and zinc were identified above the applicable RCs within Area 3 in the fill material from location TRC-8 in the 0-3 ft bgs sample interval.
- Lead and benzo(a)pyrene (a PAH constituent), were identified above the applicable RCs just outside of Area 2 in the fill material at location TRC-6 from the 3-6.5 ft bgs and 5.5-6.5 ft bgs sample intervals, respectively.

- Chromium and nickel were identified above the applicable RCs in Area 2 from the native material at location TRC-4 from the 10-12 ft bgs sample interval.

In January 2007, the seven monitoring wells installed by Atlantic in 2002 could not be located and/or were severely damaged, and necessitated the installation of additional monitoring wells. Four monitoring wells were installed by TRC in January 2007, in addition to the two discussed above, to further assess the groundwater quality across the Site. Groundwater samples were collected from the newly-installed wells in order to assess potential impacts to Site groundwater that may have resulted from contaminated fill materials, past site uses, and potential encroachment from the adjacent superfund site. Results from this round of sampling supported previous data relating to the extent of lead contamination in all areas on Site, by indicating that lead contamination appears to be confined to the soil matrix, specifically the layer of fill material. Based on groundwater gauging data collected by TRC in February 2007, groundwater flow direction is inferred to the north/northeast across the Site. However, groundwater elevations and flow direction at the Site are likely to vary daily because of influence from tidal fluctuations up to five feet in the adjacent Acushnet River.

TRC submitted an Interim Phase II CSA to MassDEP for the Site on June 19, 2007 (TRC, 2007). The conclusions presented in TRC's Phase II CSA indicated that a more focused delineation of lead in surface soils was warranted south of the Site's southern property boundary. Sediment and surface water sampling in the adjacent portion of the Acushnet River and associated wetland was also warranted to further assess the extent of lead contamination.

On September 2, 2008, TRC conducted the sampling activities that were recommended in the June 2007 Interim Phase II CSA. The investigations were conducted under QAPP Addendum E, and consisted of seven sediment samples, four surface water samples, and nineteen soil samples. Results of these investigations are discussed below.

Soil

Lead was detected at a depth of 0-3 feet in soil boring TRC-12 at a concentration of 960 mg/kg, which is above the MCP Method 1 S-1/GW-2 and S-1/GW-3 soil cleanup standard. Based on data recovered from other borings in the immediate vicinity of TRC-12, this location is believed to be an isolated area of elevated lead concentrations. The delineation of the extent of contamination in this area is shown on Figure 2.

Soil samples collected in the southern portion of the Site exhibited lead concentrations below the MCP Method 1 S-1/GW-2 and S-1/GW-3 cleanup standard of 300 mg/kg with the exception of a soil sample collected from boring TRC-16 where lead was detected at 1,100 mg/kg.

Sediment/Surface Water

Lead was detected at concentrations in excess of MassDEP soil standards in sediment samples SED-4 and SED-5, and mercury was detected in excess of the applicable standards in sample SED-4 as well as the upstream sample SED-2. Mercury was identified in upstream

sample SED-2. Because of this, further sediment sampling for mercury analysis is not necessary as mercury in sediment may be attributable to background/local conditions.

Site investigation and assessment is ongoing. Additional sediment samples are warranted to further delineate the extent of lead identified in SED-4 and SED-5. Further delineation of lead in soil is warranted to the south of boring TRC-16. Also, further sampling is necessary at several locations across the Site to support an evaluation of the human health risk and hazard associated with current and future Site use.

On July 29, 2009, TRC submitted a QAPP Addendum E2 to EPA for review and approval for the additional proposed soil and sediment sampling activities. TRC proposed an additional nine soil borings (TRC-22 through TRC-30) to refine the extent of lead contamination south of boring location TRC-16. Up to two samples will be collected from each boring and analyzed for lead. TRC also proposed up to 16 soil borings (TRC-31 through TRC-46) across the Site to support a risk characterization. One 0-3 foot sample will be collected from each boring location and analyzed for lead. In addition to the soil samples, TRC also proposes to collect up to four sediment samples (SED-8 through SED-11) to further delineate the extent of lead contamination in sediment in the vicinity of previous sampling location SED-4 and SED-5. Proposed sampling locations are depicted in Figure 4.

2.5 Conceptual Site Model

Historically, the Former Reliable Truss Site has been involved with storing lumber and the manufacture of wooden cabinets and trusses since approximately 1924. Although the buildings have been demolished, fill material deposited on site still contains elevated levels of contaminants, primarily lead.

The layer of fill material ranges from approximately one foot thick at the southern portion of the Site, to up to seven feet at the northeastern and northwestern corners of the Site. Fill consists of a heterogeneous mixture of sand, silt, gravel, brick, coal, and coal ash, and overlies typical native alluvial deposits consisting of fine to coarse sand, gravel, and cobbles. Concentrations of lead in soil/fill range up to 29,000 mg/kg. Four areas of elevated lead (>300 mg/kg) concentrations in surface soil have been delineated at the Site, in addition to four areas that exhibit concentrations in excess of the upper concentration limit (UCL) for lead (3,000 mg/kg).

Groundwater depths at the Site recorded on February 6, 2007 ranged from 3.59 to 6.48 feet below ground surface (bgs), as indicated in Table 5. The groundwater table beneath the Site is generally within the layer of fill material, and slopes northeast toward the Acushnet River. However, groundwater elevations and flow direction at the Site are likely to vary daily because of influence from tidal fluctuations previously noted. The lack of elevated dissolved lead concentrations in any of the groundwater samples collected at the Site suggests that lead contamination is part of the soil/fill matrix, although some lead may adhere to suspended particles within unfiltered groundwater.

Adjacent to the Site, sediments within the Acushnet River exhibit concentrations of lead above Method 1 S-1/GW-2 and S-1/GW-3 soil cleanup standards, despite remedial dredging performed

by the EPA to remove PCBs between 2002 and 2003. However, for reasons that are likely similar to those discussed for groundwater, surface water samples collected in the adjacent Acushnet River did not exhibit elevated lead concentrations.

The chain link fence borders the Site to the west and south, but does not currently prevent access to the Site by trespassers who may enter the Site from the north, or from the Acushnet River. Delineation of the soils to the south of the Site suggests that lead contamination extends beyond the area that is encompassed by the fence.

2.6 Need for Environmental Response Actions

Based on analytical information summarized within the Conceptual Site Model, and with consideration paid to both current and proposed future uses of the Site, elevated concentrations of lead within the accessible soil and sediment at the Site indicate a need for further environmental response actions. The objective of any proposed environmental response actions will be to remediate soils and sediment to achieve a condition of No Significant Risk for human and environmental receptors.

The anticipated remedial scenario at this Site will likely include the excavation and removal of fill material containing elevated concentrations of lead in specific areas at the Site. Additional environmental monitoring may be required under this remedial scenario to demonstrate remedial excavation activities were successful.

3.0 ALTERNATIVES ANALYSIS

3.1 Remedial Action Objectives and Cleanup Goals

The objective of remedial action at the Site is to facilitate MCP Site closure by demonstrating that a condition of No Significant Risk to human health and the environment has been achieved. To establish a condition of No Significant Risk, site cleanup must result in a condition that prevents/controls exposure to lead-contaminated soil by construction and utility workers, as well as current trespassers and future recreational users assuming future use of the Site as a park.

3.2 Initial Screening of Remedial Action Technologies

TRC conducted an initial screening of several potential alternatives for addressing the lead-impacted soil. This initial screening was completed in accordance with 310 CMR 40.0856, and aimed to identify alternatives that are reasonably likely to be feasible at the Site. A remedial action alternative is reasonably likely to be feasible if:

- a) The technologies to be employed by the alternative are reasonably likely to achieve a Permanent or Temporary Solution; and,
- b) Individuals with the expertise needed to effectively implement available solutions would be available, regardless of arrangements for securing their services.

EPA has developed a compendium of remediation technologies at both screening levels and in-depth technology reviews. TRC utilized this information located on the internet at EPA's technology innovation program website clu-in (www.clu-in.org), and TRC's experience at similar sites to complete this evaluation.

If a technology was potentially applicable to the remedial objective, it was included in the screening process. The screening process was two-fold. First, technologies were summarized and assessed based on contaminants present. Second, evaluations relative to the following criteria were considered: ability to implement the remedy at this Site, potential for success at meeting the remedial objectives, relative costs, potential risks, and reliability. From that point, technologies were eliminated or considered potentially applicable.

Technologies that were deemed potentially applicable during the initial screening process are as follows:

1. Institutional Controls
2. Reclamation/Recovery
3. Removal (Excavation and Off-site Reuse, Recycling or Disposal)
4. Solidification/Stabilization
5. Containment

A discussion of each of the alternatives is presented in the subsections below.

Alternative #1 - Institutional Controls

Institutional controls establish restrictions on the use of a site that would otherwise result in exposure to the contaminants of concern. Use restrictions can be in the form of legal uses and controls (such as a deed restriction) and physical barriers such as fences. This would require the filing of a deed restriction in the form of an Activity and Use Limitation (AUL), as outlined in 310 CMR 40.1070 of the MCP.

Institutional controls such as fencing are not considered appropriate as a sole remedy for current and existing site uses and have been eliminated.

The use of this alternative would not be retained alone because it does not fully address exposure to contaminated soils at the Site, and does not lessen the toxicity, mobility, or volume of wastes. However, an AUL may be used in conjunction with other alternatives to achieve a condition of No Significant Risk of harm to human health and the environment.

Soil contamination at depths greater than three feet is considered *potentially accessible*, consistent with 310 CMR 40.0933(4)(c)(2). Institutional controls are commonly used to maintain a condition of No Significant Risk at sites and are appropriate, where necessary, to control risks and hazards associated with potentially accessible soils. Therefore, institutional controls have been retained for consideration in the development of remedial alternatives for this Site.

Alternative #2 - Reclamation/Recovery

Reclamation and recovery is a process of soil washing that scrubs soil to remove and separate the portion of the soil that is most polluted. Contaminants tend to sorb to certain soils such as fine-grained silt and clay. Silt and clay in turn stick to larger-grained sand and gravel. Soil washing is a process to separate the silt and clay from the larger-grained clean soils. This results in less soil volume requiring disposal.

Before using soil washing, soil is excavated from the impacted area and the material is sifted to remove large objects such as rocks and debris. The soil is then placed into a scrubbing unit with wash water and detergent. The process discharges wash water that must be treated, contaminated soil that must undergo additional treatment or landfilling, and clean soil.

Soil washing is usually completed at the site, and incorporates air pollution controls to manage dust and other potential air pollution problems. Waste water generated must be treated prior to discharge.

An alternative soil washing method involves using a solvent-based solution to extract bound contaminants. This technology has proven successful with PCBs, but is not designed to treat PAHs or metals, including lead.

Commercialization of these processes is not yet extensive. The presence of a complex mixture of contaminants such as metals, non-volatile organics, and PAHs in a heterogeneous matrix makes it difficult to formulate single washing solutions. Solvents that remain in the soil matrix must be heat treated prior to re-use of the soil. The used solvent wash must be managed and/or treated for disposal.

Considering the complexity of the heterogeneous soil matrix containing lead, other compounds, and remaining wastes requiring further treatment or disposal, this option has been eliminated.

Alternative #3 - Removal – Excavation and Off-site Reuse, Recycling, and/or Disposal

Excavation of contaminated soil can be utilized to remove risk-causing contaminants from a site and lessen the volume of wastes.

Typically, heavy equipment is used for removal, including backhoes, excavators, bulldozers, loaders, vacuum extractors, compactors, and dump trucks.

This alternative typically targets small volumes rather than large volumes, where feasible, due to the increased costs associated with excavation, transportation, and disposal fees. In addition, due to the current and future uses of this Site, complete site restoration would be necessary, thereby increasing costs.

Potential issues include the interference with underground utilities. Structural supports may be required, or certain locations may need to be avoided.

Removal and off-site re-use, recycling, and/or disposal are common methods of site remediation. Given the proven performance of excavation as a site remedy at similar sites, this technology has been retained for further evaluation.

Alternative #4 – Solidification / Stabilization

Solidification/stabilization is a type of cleanup method that treats impacted soil by binding of contaminants to the soil particles. This method usually does not destroy the contaminant. Solidification results in a matrix that is similar to a solid block. Stabilization refers to a change in the contaminants so they become less harmful or less mobile.

Stabilizing and solidifying contaminants is a proven technology used to prevent exposure by physically binding or chemically changing the contaminant of concern. Soil recycling, re-use, and/or disposal options are sometimes enhanced by stabilizing the material.

In general, the soil is mixed with binding agents and water to convert contaminants to a less soluble, mobile, or toxic form. Soils can be excavated and treated at the surface, or injection systems can be used to treat the soil in place, without excavation. Treatment technologies used to treat excavated soil (ex-situ) have the advantage over in-place treatment technologies (in-situ) for the following reasons:

- Ex-situ treatments are not limited by heterogeneities associated with soil and fill in the subsurface.
- The resultant soil-crete can be re-used on or off-site at to-be-determined locations;
- In-situ volume increases and solidified material may not be compatible with current and future uses at the Site; and,
- Ex-situ processes typically provide a higher degree of reliability of mass removal and easily measurable performance criteria.

As a result, in-situ solidification/stabilization treatment has been eliminated as a remedial option.

Although ex-situ solidification/stabilization requires reuse or disposal that may result in additional long term maintenance and capping if re-used on-site, it has been retained as a potentially applicable option for pre-treatment prior to off-site disposal or recycling.

Alternative #5 - Containment

Containment, also referred to as capping, is a remedial technology that involves placing a cover over contaminated material. Excavating soil can be difficult based on site conditions, and expensive when the lateral extent of contaminated soil is large. Capping provides an effective and proven alternative of containment. Containment measures are designed to isolate contaminants to prevent direct contact, erosion, and depending on the contaminants, leaching.

Capping options range from simple, single-layer vegetative soil to multilayer synthetics and may include physical barriers that include clay and soil, asphalt, and concrete. For this Site, it has been determined that lead contamination in the soil matrix is not leaching to groundwater or surface water. The main purpose of containment at this Site would be to eliminate direct contact with the contaminated soil. As a result, single layer capping techniques will be considered.

Clay and soil capping involves placing compacted clay covered with vegetative soil over the area of direct exposure to surficial contamination. Plant cover aids in erosion control and takes up water, preventing saturation in the underlying layer. For this Site, a clay base is likely a drainage issue due to the flat topography. In addition, MassDEP typically requires a minimum of three feet of cover between at-risk contaminated soils and receptors where unconsolidated material is present or utilized. The addition of three feet of cover material would be problematic given the current and future uses of the Site. As a result, any alternative which includes capping must result in the maintenance of current ground surface grades and elevations.

Single layer bituminous asphalt and concrete capping directly on top of the contaminated soils is a proven and cost-effective technology. The contaminants are isolated, preventing direct contact and erosion of the impacted soils. The cap material needs ongoing monitoring and maintenance, but can easily be combined with other remedial measures. As a result, this alternative has been retained.

It should be noted that due to the discontinuous spatial coverage of the areas requiring remediation, and asphalt cap at this Site would be relatively extensive. The asphalt cap would

also represent construction of an impervious area within the buffer zone of the Acushnet River, as well as within portions of the flood storage areas associated with the Acushnet River. These issues would require special permitting and/or mitigation, which may be impracticable.

3.2.1 Comparison to Comparative Evaluation Criteria

This Section presents a relative comparison of the four selected remedial alternatives to the comparative evaluation criteria contained in 310 CMR 40.0858 of the MCP. Remedial alternative #2, reclamation/recovery, has been eliminated. For the purposes of this discussion, it is assumed that Remedial Alternative # 4 (solidification/ stabilization) has been retained only as a pre-treatment option for excavated soils. Its application will not be considered as a sole remedial option. Solidification/stabilization may be coupled with Remedial Alternative # 3 (removal) to increase the options for off-site disposal. In addition, Remedial Alternative #1 (institutional controls) would only be implemented in conjunction with another remedial option, as they do not fully address the contamination at the Site.

Effectiveness – Considering the remaining remedies, Remedial Alternative #3 (removal) will be more effective in reducing risks and achieving a Permanent Solution under the MCP per 310 CMR 40.1000. Containment alternatives do not reuse, recycle, destroy, detoxify, or treat lead contaminated soil at the Site, nor do they reduce levels to those that approach background conditions.

Reliability – Remedial Alternative #3 will be most reliable in preventing exposure to receptors because the contaminated soil is completely removed. Because of the relatively simple nature of design and construction, there is very low potential for failure associated with this alternative. Remedial Alternative #5, containment, does not provide the same level of certainty due to the fact that all contaminated soils will remain on site, and continued monitoring and maintenance will be necessary to ensure the integrity of the containment barrier.

Difficulty of Implementation – Removal via excavation and off-site disposal of lead-impacted soil would be approximately equal in the ease of implementation when compared to containment.

Cost-Benefit – Based on TRC experience at similar sites, Remedial Alternative #5 would be less expensive than Remedial Alternative #3, due to the relatively simple nature of the concept. However, the benefit is reduced as an extensive asphalt containment cap is inconsistent with the proposed future use (a waterfront park with walking trails).

Potential Risks – The potential short-term and long-term risks associated with each alternative are considered low to moderate. Potential short-term risks associated with soil excavation/disposal include possible accidental spills of contaminated soil during soil transport, which could result in short-term exposure to the contaminated soil by surrounding human populations. However, any accidental spill of contaminated soil would be immediately cleaned-up so the duration of any potential human exposure to the contaminated soil would be extremely short-term. Short-term exposure to contaminated soil would also be expected during cap construction activities under Remedial Alternative #5.

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

- Remedial Alternative #3: Soil Excavation and Off-Site Reuse, Recycling and/or Disposal – 1 month
- Remedial Alternative #5: Containment – 1 month

However, Remedial Alternative #5 would require ongoing monitoring and maintenance for the foreseeable future. Based on the above, Remedial Alternative #5 is considered the timelier of the two alternatives.

3.3 Selection of Remedial Alternative

Remedial Alternatives #3 and #5 were evaluated to address the lead-impacted soil at the Site. Both alternatives are comparatively equal in consideration of the following criteria: difficulty to implement and potential risks. However, Remedial Alternative #3 is more effective, reliable, and timelier than Remedial Alternative #5. In addition, the less expensive cost of implementing Remedial Alternative #5 does not result in a benefit to future use, considering the proposed development scenario for the Site. Therefore, Remedial Alternative #3 (Removal – Excavation and Off-site Reuse, Recycling and/or Disposal) is chosen as the preferred remedial alternative. Remedial Alternatives #1 and #4 will likely be used in conjunction with Remedial Alternative #3 to facilitate achievement of the remedial action objectives.

4.0 RELEASE ABATEMENT MEASURE PLAN (310 CMR 40.0444)

This RAM Plan outlines the implementation of the selected remedial alternative, as discussed in Section 3.3. This RAM Plan is organized according to the minimum information needs set forth under 310 CMR 40.0444(1)(a) through (i) of the MCP.

(a) Person Assuming Responsibility for Conducting the Release Abatement Measure

The party undertaking this RAM is:

The City of New Bedford, Massachusetts
133 William Street
New Bedford, MA 02740
Contact: Mr. Scott Alfonse
(508) 979-1487

Relationship to Site: Owner/Operator

(b) Description of Release, Including Site Conditions and Surrounding Receptors

Historically, the Former Reliable Truss Site has been involved with storing lumber and the manufacture of wooden cabinets and trusses since approximately 1924. Although the buildings have been demolished and the Site is currently vacant, fill material deposited across the Site still contains elevated levels of contaminants, primarily lead.

A complete description of the Site, release, and surrounding receptors is provided in Section 2.

(c) Release Abatement Measure Objectives

As stated in Section 3.1, the objective of remediation action at the Site is to achieve MCP Site closure by demonstrating that a condition of No Significant Risk to human health and the environment has been achieved. Site cleanup must result in a condition that prevents exposure to lead-contaminated soil by current and future users of the Site. Remedial Alternative #3 (removal – excavation and off-site reuse, recycling and/or disposal) will be implemented as the primary strategy to address elevated lead concentrations within the soil at the Site. Excavation will aim to achieve final lead Exposure Point Concentrations (EPCs) of less than 300 mg/kg within the upper three feet of soil. Remedial Alternative #4 will be used, if necessary, to treat waste soils that exhibit amplified lead concentrations which would otherwise prevent disposal in a regulated facility. Remedial Alternative #1 will be implemented as an AUL to restrict current and future site uses to those activities that do not present significant risk to the user. RAM activities are detailed in Figure 5.

Removal of Former Building Footprint

Prior to excavation and off-site disposal, removal of the approximate four-inch thick concrete building slab must be performed. A jackhammer, excavator, or other means, may be used to

break the concrete slab into manageable pieces. Concrete pieces will be separated from any are soils that are dislodged during removal of the slab, and stored on site in separate roll-off containers. An estimated volume of up to approximately 265 cubic yards of concrete pieces will be removed and sent to an off-site disposal facility.

Fence Post Removal

Because soils requiring excavation extend beyond the chain link fence located at the south of the Site, this fence and the associated fence posts must be removed prior to excavation. Concrete anchors will be separated from any soils that are dislodged during fence post removal, and stored on site in separate roll-off containers.

Soil Excavation

Soil excavation will target areas at the Site exhibiting EPCs greater than 300 mg/kg of lead, as shown in Figure 5. These areas may be subject to further refinement based on the proposed risk characterization sampling. Excavation will be conducted using conventional excavation equipment such as an excavator or backhoe. Excavation shoring is not anticipated, because the depth of the excavation will be limited to three feet below grade. TRC personnel will be present during excavation activities to oversee the excavation, stockpiling, and off-Site transport of soil. Environmental monitoring will be conducted by TRC in accordance with Section (e) of this RAM Plan. During excavation, soils will be visually examined and screened to segregate highly contaminated soils from less contaminated or uncontaminated soils. Soils will be segregated and stockpiled separately from one another in order to maximize off-Site soil disposal options. It is anticipated that up to 5,000 cubic yards will be excavated and stored at the Site, although this preliminary estimate may be refined based on the results of the proposed risk characterization. Soils that are temporarily stored on site will be managed in accordance with Section (d) of this RAM Plan. The final management of the excavated soil will be determined following disposal characterization analysis.

Groundwater Management

Because the proposed excavation activities are expected to terminate at a depth of three feet below grade, and historic groundwater elevations at the Site have been greater than three feet below grade, excavation dewatering is not anticipated.

Erosion Control

Erosion and sedimentation are not expected to be a concern given the level topography of the Site. As a precaution, haybales will be downgradient of soil stockpiles, and stockpiles will be covered with polyethylene sheeting as described in Section (d) of this RAM Plan. Hay bales will also be placed around catch basins, and a layer of geotextile fabric will be placed directly over catch basins. Since the anticipated footprint of disturbance at the Site is less than one acre, a Storm Water Pollution Prevention Plan is not required.

Post-Excavation Confirmation Sampling

TRC may collect up to forty (40) confirmatory post-excavation soil samples from the side walls and floors of the excavation areas. The samples will be analyzed for lead with an accelerated turnaround time of 24 to 48 hours. Excavation may continue if post-excavation samples indicate that further removal of soil is necessary to achieve remedial goals. Construction fencing will be placed around the excavation areas to restrict access to the area, pending receipt of the confirmatory sample results and placement of backfill in the open excavation.

Backfill

Once the objectives of the RAM removal activities have been achieved, the excavation will be backfilled flush to grade with a mix of clean, imported backfill and native soil. Imported backfill will be tested at least once from each source to confirm that it is not contaminated with oil or hazardous materials. Backfill will be brought up to an elevation consistent with pre-excavation conditions.

Although it is not anticipated, if it is necessary to backfill at or below the water table, gravel and pea stone (free of sand and silt) will be used. A geotextile fabric will be installed above the gravel prior to backfilling the imported sand and native soil mix to keep the fine grained materials from settling into the gravel layer. Depending on the finalized redevelopment plans for the Site, vegetative cover may be selected to replant and stabilize the backfilled areas.

Institutional Controls

In order for a condition of No Significant Risk to be achieved in a feasible manner, and AUL restriction may be placed on the Site. The AUL would prevent the unauthorized use of, and control access to, areas with contaminated soil that could potentially pose a risk to future receptors.

Health and Safety

TRC has prepared a Health and Safety Plan addressing remedial response actions at the Site. The plan will be on site during all field work with the exception of Site visits and utility clearance mark outs.

(d) Remediation Waste Statement

This section describes procedures for the on-site management and off-site disposal of remediation waste generated during this RAM. Remediation waste management will be conducted in accordance with the applicable sections of the MCP, MassDEP *Interim Remediation Waste Management Policy for Petroleum Contaminated Soils*, WSC-94-400, MassDEP Policy COMM#97-001 *Reuse and Disposal of Contaminated Soils and Sediments at Massachusetts Landfills*, 310 CMR 30.00, and 310 CMR 40.0030.

The soil excavated from the areas containing elevated lead at the Site as described in Section (c) of this RAM Plan will be temporarily stored on site (underlain and covered by polyethylene sheeting), and then transported off-site for disposal. Preliminary estimates indicate the total volume of excavated soil to be transported as part of this RAM is up to approximately 5,000 cubic yards.

On-Site Soil Management

Disposal characterization analysis will be conducted in order to evaluate management options for the excavated contaminated soil. Pending analysis, excavated soils will be stored on 6-mil polyethylene sheeting or in lined roll-off containers at the Site, and then covered with 6-mil polyethylene sheeting to form a continuous waterproof barrier over the excavated soil. Soil migration via stormwater runoff will be prevented.

Disposal characterization analysis will consist of supplementing existing Site data as necessary by sampling the excavated soils for one or more of the following analytical parameters, as required by the receiving facility:

- Volatile Organic Compounds via EPA Method 8260B
- Semivolatile Organic Compounds via EPA Method 8270C
- Petroleum Hydrocarbons via EPA Method 8015B
- Polychlorinated Biphenyls via EPA Method 8082
- RCRA-8 Metals (via EPA Methods 6010B/7471A)
- Flashpoint (Ignitability – EPA Method 1010)
- Reactivity (Sulfide and Cyanide – 40 CFR 261.23)
- Corrosivity via EPA Method 9045C
- Toxicity Characteristic Leaching Procedure (TCLP) Analyses as necessary

If the result of TCLP analysis is above 5 mg/L of lead (as leachate), the waste soils may be treated via Remedial Alternative #4 (solidification/stabilization) using a phosphorous oxide treatment compound, or similar, that will reduce the potential for lead to leach, as determined by TCLP testing. Following treatment, the soil will be retested for TCLP analysis.

If the result of TCLP analysis is below 5 mg/L of lead (as leachate), then the soil can be managed as Remediation Waste. The results of these analyses will help determine whether the soil will be treated for disposal as a Remediation Waste or whether the material will be disposed of as a characteristic hazardous waste.

During any soil movement that may be required to treat the soil, TRC will monitor dust generation consistent with the procedures described in Section (e) of this RAM.

Off-Site Reuse, Recycling and/or Disposal

The soils temporarily stored on site will be transported from temporary storage once they can be characterized as appropriate for off-site disposal at a suitable facility, or after solidification/

stabilization treatment. Several suitable off-site facilities are being considered, but the final facility location has not been determined.

Transportation of all materials from the site will be performed using a MassDEP Bill of Lading (BOL) or Hazardous Waste Manifest, as appropriate, and will be performed within 90 days (for hazardous waste) or 120 days (for treated remediation waste) of excavation in accordance with 310 CMR 40.0030 of the MCP.

The transport of contaminated materials from the site to the disposal facility will be in accordance with all United States Department of Transportation (DOT), EPA, and MassDEP regulations, as appropriate. The hauler(s) will be licensed in all states affected by the transport of Site soil.

(e) Environmental Monitoring

TRC personnel will be present during the excavation and off-site transport for storage of lead-contaminated soil and to conduct environmental monitoring as described herein.

Air Monitoring

On-site air monitoring will be conducted to evaluate working conditions, in order to minimize exposures to workers and nearby residents.

Real-Time Dust Monitoring

During RAM-related contaminated soil excavation and management activities, TRC will conduct real-time field screening of dust levels using direct reading instruments that are designed to monitor air quality on a real-time basis at locations upwind and downwind of excavation and soil moving activities. Background samples will be collected for at least 15 minutes at each location prior to the start of site activities. The dust monitoring units will be TSI Dustrak™ units with size-selective inlet for particles of 10 micrometers in diameter or less (PM₁₀), or similar. This instrumentation has an accuracy of 0.001 mg/m³. The dust monitoring instruments will be zeroed before use and at the end of the day, and placed in weatherproof cases with an omnidirectional probe to minimize wind interference. Data will be logged at 60-second intervals and monitored periodically by field personnel during RAM-related excavation activities. Data will be downloaded daily.

If sustained ambient dust levels exceed the EPA National Ambient Air Quality Standard (NAAQS) of 150 µg/m³ at downwind sampling locations (a sustained reading would consist of a reading lasting 15 minutes or longer), TRC will implement corrective actions as described below.

VOC Air Monitoring

Based on previously existing site data, significant VOC emissions are not expected during construction, but field monitoring of the breathing zone for VOCs using a photo-ionization detector (PID) will be conducted within the work area as a precaution.

Action Levels

Instrument readings from the breathing zone and from the downwind monitoring locations will be used to help evaluate the need for instituting additional safety measures or upgrading personal protective equipment (PPE) levels. If nuisance and/or dust conditions are found to exist, corrective actions will be implemented, which may include one or more of the following actions:

- Temporarily discontinuing or slowing work;
- Implementing dust suppression (i.e., wetting soils); and
- Covering soil stockpiles.

The Action Level for airborne dust is based on the EPA 24 hour NAAQS for PM₁₀ particulate of 150 ug/m³.

The same action levels will be employed, as necessary, for potential future soil management/loading activities.

(f) Federal, State, and Local Permits

Federal Permits

No Federal permit requirements are anticipated. If the total footprint of disturbance to the Site during RAM-related activities is greater than one acre, a Construction General Permit and Storm Water Pollution Prevention Plan will be required by the EPA.

State Permits

There are no known State permit requirements.

Local Permits

An Order of Conditions for work within areas covered under the jurisdiction of the Massachusetts Wetlands Protection Act (M.G.L. Ch.131 §40) will be issued by the New Bedford Conservation Commission.

(g) LSP Opinion

The objective of this RAM is to provide the regulatory framework for the City of New Bedford to successfully eliminate lead-contaminated soil exposure to human and environmental receptors, and to achieve site closure under the MCP. This RAM Plan was developed in accordance with 310 CMR 40.0444 as set forth in the MCP.

**David M. Sullivan, LSP, CHMM
TRC Environmental Corporation
Licensed Site Professional No. 1488**

Date

Stamp

5.0 FEASIBILITY OF ACHIEVING BACKGROUND

The MCP requires that at Sites where cleanup up to level of No Significant Risk has been performed, an evaluation of the feasibility to achieve or approach background conditions be performed. Results of this evaluation indicated that cleanup to background was technically feasible, but would require the excavation of soils across the entire Site (approximately 169,000 square feet), up to 7 feet deep in some areas. Cleanup to background would allow unrestricted use of the Site without an AUL, however, the incremental benefit gained by achieving background was not justified by the substantially higher cost.

By removing the areas of soil specified in this RAM Plan (approximately 36,050 square feet to a depth of three feet), the remedial alternative selected for this Site will likely result in reduction of lead concentrations to levels below S-1/GW-2 and S-1/GW-3 standards in the top three feet, to the extent practicable. Exposure to the remaining risk soils will be reduced by the incorporation of an AUL. It is assumed that this conclusion will be supported by TRC's upcoming risk characterization of the Site.

The remedial approach identified herein represents the most appropriate and cost effective alternative, based on TRC's analysis. The scope of work outlined in this RAM Plan is intended to facilitate the filing of a Class A RAO for the Site within the budgetary restrictions of the Brownfields cleanup grant awarded to the City of New Bedford.

6.0 CERTIFICATION OF FINANCIAL RESOURCES

In accordance with 310 CMR 40.0442(5) of the MCP, the City of New Bedford attests to the availability of sufficient financial resources for the transportation and recycling or disposal of excess and unsuitable soils above 1,500 cubic yards.

7.0 PUBLIC INVOLVEMENT

In accordance with 310 CMR 40.0863 and 310 CMR 40.1400 thru 310 CMR 40.1406, the Mayor and the Board of Health for the City of New Bedford have been notified in writing of the availability of this report. The notifications were complete concurrent with the submittal of this report. Copies of the letters are provided in Appendix A.

Consistent with the requirements of the EPA Brownfields cleanup grant, TRC will post this ABCA/RAM Plan in the Site information repository for public review and comment for 30 days prior to commencing Site activities. During the 30-day public comment period, TRC will conduct a public meeting to present an informative overview of the proposed cleanup plans, and to elicit any comments.

8.0 REFERENCES

Ambient, 2001. *Phase I Environmental Site Investigation, Reliable Truss Company Property*, Ambient Engineering, Inc., February 2001.

Atlantic, 2002. *Phase II Comprehensive Site Assessment, River's End Park*, Atlantic Environmental Technologies, Inc., September 25, 2002.

Tetra Tech, 2004. *Cleanup Zones and Residual PCB Levels Remaining after Cleanup North of Wood Street (plan)* Tetra Tech FW, Inc., April 9, 2004

TRC, 2007. *Interim Phase II Comprehensive Site Assessment, 246 River Road Site*. TRC Environmental Corporation, June 2007.

TRC, 2008. *Additional investigation activities pursuant to the June 2007 Interim Phase II Comprehensive Site Assessment, 246 River Road Site*. TRC Environmental Corporation

TABLES

FIGURES

APPENDIX A

PUBLIC NOTIFICATION LETTERS