Analysis of Brownfield Cleanup Alternatives

480 Union Street Project
New Bedford, Ma
USEPA Brownfields Cleanup Grant
Weston & Sampson and Resource Controls
7/3/2014

CITY OF NEW BEDFORD
JONATHAN F. MITCHELL, MAYOR
DEPARTMENT OF ENVIRONMENTAL STEWARDSHIP
133 William Street-Room 304, New Bedford, MA 02740 - Telephone 508-991-6188 - Fax 1-508-961-3045

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1.0 INTRODUCTION AND BACKGROUND

1.1 General

Weston & Sampson and Resource Controls have prepared this Analysis of Brownfields Cleanup Alternatives (ABCA) for 478 – 480 Union Street in New Bedford, Massachusetts, Massachusetts Department of Environmental Protection (DEP) Release Tracking Number (RTN) 4-23596 on behalf of the City of New Bedford. The cleanup of the Site is supported by a Brownfields Cleanup Grant, which is funded by the USEPA. This ABCA has been prepared in accordance with USEPA guidelines and in general accordance with the regulatory requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.0850.

The Site is identified as Map 45, Lot 9, in the City of New Bedford Tax Assessor's database. The Site location is shown on Figure 1 – Locus Map and Figure 2 – Site Plan. RTN 4-23596 is associated with the detection of petroleum related compounds detected above applicable DEP Method 1 S-1 soil standards within soils located in three separate areas at the Site: Area 1 – located on the northwestern portion of the Site in the area of former gasoline USTs; Area 2 - located on the northern portion Site in the area of other former gasoline USTs; and Area 3 - located on the western portion of the Site in the area of former fuel oil USTs. Additionally, lead was identified in fill material soils on the northern portion of the Site above the Method 1 S-1 standard. Groundwater sampling has not detected concentrations above applicable GW-2/3 standards. The goals of the project are to protect current and future human health and the environment, remove a blighted property from New Bedford, create a vibrant living space for local residents, and achieve a Permanent Solution with No Conditions in accordance with Massachusetts MCP. Once the Site has been remediated, the City will market the property for residential redevelopment.

The cleanup will be overseen by a State of Massachusetts Licensed Site Professional (LSP) under the guidelines of the MCP. It is expected that remedial cleanup will be performed as a Release Abatement Measure (RAM) and documented in a RAM Plan. Required regulatory documents prepared for this Site will be submitted to the DEP electronically and tracked under RTN 4-23596.

1.2 Site Location and Description

The approximate geographical coordinates for the Site are as follows:

UTM Coordinates:	338,481 mE
	4,610,806 mN
Latitude/Longitude:	41° 37' 57" N
	70° 56' 21" W

The Site is comprised of an undeveloped, 0.42 acre vacant parcel of land. Asphalt and concrete surfaces remain on the northern portion of the Site. The Site is located in a densely populated, residential and commercial neighborhood of New Bedford, on the south side of Union Street, southeast of the intersection of Union Street and Newton Street. Union Street is located north of the Site, across which are a residence, a church and a commercial building. Residential properties border the Site to the east, south and west, within 500 feet of the Site. A school is located northwest of the Site across Union Street.

1.3 Site History

1.1.1 Operations and Ownership

A limited review of Site ownership and operational history was completed during Phase I and Phase II ESA activities at the Site. The findings of the Site ownership and operational history are summarized below.

Records at the City of New Bedford Assessor's Office indicate the Site is currently owned by the City of New Bedford. The City acquired the property from Martins Family Nominee Trust through tax-title taking in 2009. George and Karen Martin had acquired the property from the Alan Cohen Trust on July 17, 1997. Alan Cohen purchased the property from Colonial Restaurant and Store Equipment Co. on December 11, 1986.

Historical atlas maps indicate that the Site was developed with two residential structures in 1906. A gasoline filling station and automobile service garage existed at the Site between 1915 and the late 1970's. The Site was reportedly utilized by a restaurant supply company in the 1980's and a dance studio in the 1990's.

1.1.2 Oil and Hazardous Materials (OHM) Usage and Storage

The Site is a vacant lot where OHM is not currently used or stored. Historic use of the Site as a gasoline filling station and automotive service garage included the use and storage of OHM. Additional information regarding OHM use and storage history at the Site is limited. Municipal records and historic Sanborn atlas maps indicated that numerous USTs were historically located at the Site. Five gasoline tanks were depicted in a 1924 atlas map on the northern portion of the Site. A 1950 atlas map indicates three additional gasoline tanks were located on the northwestern portion of the Site. Municipal records indicate that two 1,000-gallon #2 fuel oil USTs were removed from the Site in 1984 and 1992 and a 550-gallon waste oil UST was removed from the Site in 1989. Tank installation and/or removal permits also exist for numerous other USTs including one 3,000-gallon gasoline UST and one 2,000-gallon gasoline UST. However, additional UST information including reports detailing the removal of the historic USTs at the Site was not identified. Figure 2 depicts the location of some of the historic on-Site USTs as identified in the historic atlas maps and previous reports for the Site. Based on the subsurface investigation activities conducted to date, there is no evidence of current or historic OHM storage remaining at the Site.

Historic information/mapping did not include information about utilities and/or floor drains at the Site. The former Site building was previously serviced with municipal water and sewer from mains located in Union Street. All utilities were disconnected prior to demolition and removal of the building in early 2011. There are currently no subsurface utilities at the Site.

1.4 Area Receptors

According to the Area Receptors Map (Figure 3) prepared using the MassGIS Environmental Receptors Database, the Site is not located within an Interim Well Protection Area (IWPA), Potentially Productive Aquifer, or within a Current or Potential Drinking Water Source Area. There are no wetlands or water bodies located on the Site. There are no known private or public potable wells within 500 feet of the Site. The Site and surrounding area are serviced with municipal potable water and sewer.

There are no wetlands or water bodies located on the Site. The closest surface water body and associated wetlands to the Site is the Acushnet River which is located approximately 1 mile east of the Site.

1.5 Project Goal / Site Reuse Plan

The project goal is to remediate the Site to allow for the future, unrestricted use of the property. The proposed planned reuse for the Site is residential redevelopment.

1.6 MCP Method 1 Soil and Groundwater Classification

1.1.1 Soil

For the purpose of evaluating the exposure potential to soil, the MCP classifies soil in three distinct categories: S-1, S-2, and S-3. Category S-1 soils are associated with the highest potential for exposure while Category S-3 soils have the lowest potential for exposure. The divisions amongst the soil categories are dependent upon the frequency and intensity of site use by both children and adults, and the accessibility of the site soil. Soil categories were selected pursuant to 310 CMR 40.0933(9).

The Site is currently vacant and located within 500 feet of residential dwellings. The northern and western portions of the Site are paved. The remaining portions of the Site are unpaved. Based on the MCP soil classification guidance, soil located between 0 and 3 feet below grade in unpaved areas are considered "accessible" and soil between 0 and 3 feet below grade in paved areas are considered "potentially accessible". Soil located between 3 and 15 feet below grade is also considered "potentially accessible". Adults may be present at the Site during potential subsurface utility repairs or landscaping, at low frequency and high intensity. Adult and children trespassers are also considered potential receptors at low frequency and low intensity.

Based on the current Site use, the S-2 category is applicable to surficial soil within 0 and 3 feet below grade and category S-3 is applicable to remaining soil at the Site. However, as a conservative measure and to evaluate potential future unrestricted residential use of the Site, the S-1 category, has been selected.

1.1.2 Groundwater

According to the MCP classification requirements at 310 CMR 40.0932, groundwater at the Site is categorized as GW-2 and GW-3. The GW-1 category does not apply because the Site does not lie within a Zone II, Interim Wellhead Protection Area, Potentially Productive Aquifer, or Zone A of a Class A surface water body. Groundwater that is located within 30 feet of occupied buildings and is measured to be less than 15 feet below grade (as applies to the Site) is classified as GW-2. Therefore for future Site use, groundwater contaminant concentrations should be compared to the MCP Method 1 GW-2 Cleanup Standards. Groundwater at all disposal sites shall be considered a potential source of discharge to surface water, and therefore shall be categorized at a minimum as category GW-3. In summary, the applicable groundwater cleanup categories for the Site are GW-2 and GW-3.

1.7 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, the MCP, and City by-laws. Federal, state, and local laws regarding procurement of contractors to conduct the cleanup will be followed. As described, all cleanup will be in accordance with the MCP; 310 CMR 40.0000. All applicable permits and documentation (e.g., Dig Safe, soil transport/disposal manifests, etc.) will be obtained prior to the work commencing, and all work will be conducted in accordance with the conditions for approval.

Contaminated soil and groundwater at the Site is regulated under the MCP. Pursuant to the requirements of the MCP, any site that has contamination in excess of a reportable threshold or has a reportable condition generally must be reported to DEP. The site is then tracked under a RTN. The MCP specifies certain deadlines for assessment and cleanup. Cleanup is achieved once the nature and extent of contamination is known and the contaminants are either removed or the exposure to those contaminants is limited and a condition of no significant risk to human health and the environment can be demonstrated. Site closure under the MCP is documented by a Permanent Solution Statement. In some cases, contamination can be left in place

provided that it is demonstrated that a condition of no significant risk exists under current conditions, and that future site uses are limited with an Activity and Use Limitation (AUL).

The cleanup at the Site will be overseen by a State of Massachusetts Licensed Site Professional (LSP) under the guidelines of the MCP. It is expected that remedial cleanup will be performed as a RAM and documented in a RAM Plan. Required regulatory documents prepared for the Site will be submitted to the DEP electronically and tracked under RTN 4-23596.

2.0 RELEASE HISTORY AND SUMMARY OF RESPONSE ACTIONS

2.1 Release History

An original release of petroleum hydrocarbons to soil and groundwater at the Site was reported to the DEP in 1993 and RTN 4-1265 was assigned to the Site. The release was identified during a previous investigation performed by Harborline Engineering in 1992. Prime Engineering performed additional assessment of the Site in 1997 and submitted a Class B- RAO Statement to the DEP for RTN 4-1265 in support of regulatory closure.

In 2011, Weston & Sampson performed an initial subsurface investigation at the Site on behalf of the City of New Bedford. Petroleum impacted soil was identified in exceedance of DEP RCS- 1 standards in the area of former gasoline and fuel oil USTs. Additionally, a concentration of lead was identified in fill material soil above the RCS-1 standard. The identification of soil impacted above RCS-1 standards represented a 120-day reportable release condition to the DEP. On October 3, 2011, Weston & Sampson reported the release condition to the DEP on behalf of the City of New Bedford. At that time the DEP assigned RTN 4-23596 to the Site. A summary of Site assessment response actions conducted for each RTN is provided below. See Figure 2 for sampling locations.

2.2 Previous Investigations (RTN 4-1265)

A previous subsurface investigation was performed at the Site in 1992 by Harborline Engineering. The investigation included the installation of three monitoring wells (MW-1, MW-2 and MW-3) on the northwestern and northern portion of the Site. Soil samples were not submitted for laboratory analysis. Laboratory analysis of groundwater samples collected from monitoring well MW-1 and MW-3 identified petroleum constituents above DEP reportable concentrations. Haborline determined that results indicated that a release of oil or hazardous material was identified at the Site. The release was subsequently reported to the DEP and RTN 4-1265 was assigned to the Site.

In 1997, Prime Engineering installed two additional soil borings (P-1 and P-2) on the northern portion of the Site. A single composite soil sample was submitted for laboratory analysis from each of the borings. Analysis did not identify concentrations of petroleum hydrocarbons above applicable DEP Method 1 S-1 soil standards. Prime also collected groundwater samples from MW-1, MW-2, and MW-3. Analysis of the groundwater samples did not identify concentrations of petroleum hydrocarbons above applicable DEP Method 1 GW-2 / GW-3 groundwater standards. Prime concluded that a condition of No Significant Risk existed at the Site and submitted a Class B-1 RAO Statement to the DEP for RTN 4-1265 in support of regulatory closure.

Although an RAO had been issued to the DEP in support of regulatory closure, the soil and groundwater sampling performed in support of the 1997 RAO did not include sampling in the areas of many of the historic UST locations at the Site. Weston & Sampson conducted additional assessment in these areas of the Site on behalf of the City of New Bedford as detailed below.

2.3 Weston & Sampson Site Assessment, 2010 - 2013

The following is a summary of the Site assessment performed by Weston & Sampson between 2010 and 2013. A summary of soil and groundwater sampling data collected by Weston & Sampson to date is presented in Appendix A.

2.3.1 Phase I ESA, 2010

In August and September 2010, Weston & Sampson completed a Phase I ESA of the Site. The ESA included an environmental database search, review of local, state, and federal regulatory agency files, and a limited reconnaissance of the Site and vicinity for potential off-Site contamination sources. The Phase I ESA identified recognized environmental conditions (RECs) associated with the potential impacts from historic use as an automobile service garage with multiple USTs and previously identified impacted soil and groundwater at the Site (RTN 4-1265).

2.3.2 Initial Phase II ESA, 2011

Based on the findings of the Phase I ESA, a Phase II ESA was performed at the Site in April and May 2011. The Phase II ESA was performed to assess potential concerns identified in the Phase I and included the following:

- Geophysical survey was performed to locate any historic USTs;
- Excavation of test pits (TP-1 through TP-9) utilizing a track mounted excavator;
- Advancement of soil borings (WS-1 through WS-11) and installation of groundwater monitoring wells (WS-1 through WS-8) utilizing Geprobe drilling techniques;
- PID field screening of soil samples collected from test pits and borings; and,
- Soil and groundwater sampling and analysis.

The investigation did not identify any abandoned USTs at the Site. Analysis of soil samples identified petroleum impacts in excess of applicable RCS-1 standards at the Site. The impacted soils were identified on the northwestern and northern portion of the Site in the area of former gasoline USTs and on the western portion of the Site in the area of former fuel oil USTs. Additionally, a concentration of lead was identified in fill material soils on the northern portion of the Site above the RCS-1 standard. Groundwater impacts were not identified above applicable RCGW-2/GW-3 standards.

The identification of soil impacted above RCS-1 standards represented a 120-day reportable release condition to the DEP. On October 3, 2011, Weston & Sampson reported the release condition to the DEP on behalf of the City of New Bedford. At that time the DEP assigned RTN 4-23596 to the Site.

2.3.3 Additional Phase II ESA, 2012

Weston & Sampson performed additional Phase II ESA activities at the Site in 2012 to further assess the nature and extent of impacted soil and groundwater at the Site. The additional Phase II ESA included:

- Advancement of additional soil borings (WS-12 through WS-33) and the installation of two additional groundwater monitoring wells (WS-12 and WS-23);
- PID field screening of soil samples collected from the borings; and,
- Soil and groundwater sampling and analysis.

Results of the Additional Phase II ESA confirmed that petroleum impacted soil exists above DEP Method 1 S-1 standards between 10 to 19 feet below ground surface (bgs) on the northwestern and northern portion of the Site in two separate areas where gasoline USTs were previously located. Additionally, petroleum

impacted soil exists above Method 1 S-1 standards between 7 and 15 feet bgs on the western portion of the Site in an area where former fuel oil USTs were previously located. Lead was detected in fill material soil on the northern portion of the Site at average concentrations below the Method 1 S-1 standard. Analysis of groundwater samples collected throughout the Site did not identify concentrations of petroleum constituents or lead above applicable GW-2/3 standards.

2.3.4 Additional Phase II ESA, 2013

An additional Phase II ESA was performed at the Site by Weston & Sampson between May and July 2013 to confirm the extent of potential soil excavation and removal in Areas 1, 2, and 3. The assessment included:

- Advancement of soil borings B-1 through B-17 along the perimeter of potential excavation areas and in the center of the potential excavation areas.
- PID field screening of soil samples collected from the borings and analysis of potential in-situ post excavation soil samples; and,
- Performance of two groundwater monitoring events to obtain temporal groundwater data and confirm groundwater flow direction at the Site.

The Additional Phase II ESA was successful in obtaining in-situ post excavation soil samples that will support remedial design and planning as well as risk characterization for the Site. Results of groundwater monitoring events have confirmed that groundwater is not impacted above applicable Method 1 GW-2/3 standards. Results of the groundwater elevation survey have confirmed the general northeastern groundwater flow direction at the Site. A western flow component was identified on the western portion of the Site at Area 3.

3.0 ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

This ABCA meets the performance standards as required by the USEPA. Additionally, this format meets the requirements of the MCP. The evaluation performed considered an initial screening of potential remedial action alternatives and a detailed evaluation of the potentially applicable remedial alternatives identified in the initial screening. The Community Relations Plan (CRP) for the project, required as part of USEPA funding is included in Appendix B of this report.

3.1 Initial Screening of Remedial Technologies

An initial screening of remedial technologies was completed to identify feasible remedial action alternatives, based on the contaminants of concern identified at the Site. Technologies that remove, destroy and/or contain contaminants preventing exposure to achieve a condition of “No Significant Risk” (NSR) under current and future Site uses were evaluated during the initial screening. For the initial screening, Weston & Sampson considered various technical resources and evaluated proven and innovative remedial technologies. As soil is the primary affected media at the Site, this initial screening focused on technologies that address soil impacts. Weston & Sampson evaluated potential technologies based on the following factors: effectiveness with Site contaminants and subsurface conditions; implementability; protection of human health and environment; and cost. Technologies found to be implementable, proven, accepted in the industry, cost effective, and protective of human health, safety, public welfare, and the environment were retained for detailed evaluation. A summary of the results of the initial screening results are presented in Table 1. A description of the technologies considered in the initial screening and an assessment of the effectiveness, implementability and cost for each technology is provided below.

3.1.1 No Action

No Action would leave all impacted soil in place and rely solely on natural attenuation to reduce the concentration of Site contaminants. While this technology is readily implementable and requires no initial capital investment or continued operation and maintenance, this technology is ineffective at allowing for residential use in the near future given the contaminants and subsurface conditions at the Site. The Site is regulated by the MCP and currently MCP response actions are required to achieve regulatory closure as well as a permanent solution. Therefore, No Action was excluded from further evaluation because it fails to support achieving a Permanent Solution for the Site and does not meet the redevelopment goals for the Site.

3.1.2 Access Restriction

Access restrictions use physical controls (e.g., fencing) and signs to prevent Site access to subsurface soils and promote awareness of Site conditions in order to control exposure to contaminants. Access restrictions do not currently exists at this time because contamination above currently applicable S-2 and S-3 standards is limited to potentially inaccessible soils between 3 to 15 feet.

Access restrictions are an effective method for eliminating risk of exposure to site contaminants and subsurface conditions. However, implementing access restrictions for future use of the site would not result in achieving a Permanent Solution. Implementing access restrictions would achieve a temporary solution at the Site and require long-term maintenance of the physical controls to ensure that future exposure to Site contaminants is controlled. These methods do not support the future use of the Site as residential reuse, since it requires keeping potential receptors out of the area where impacted soils have been identified. Access restriction was not retained for detailed evaluation because it fails to support achieving a Permanent Solution for the Site and does not meet the redevelopment goals for the Site.

3.1.3 Soil Excavation & Off-Site Disposal

Soil Excavation and off-site disposal utilizes heavy machinery to excavate contaminated soil, which is loaded on trucks and transported off-site for treatment, recycling or disposal. Excavation and disposal is an effective technology for remediating soils with organic and inorganic contaminants and is particularly effective when contaminated soils are intermixed with historic fill materials and debris. Factors that may limit the effectiveness of this technology include: distance to a disposal facility; depth of excavation required; fugitive emissions during excavation; potential public impacts during excavation (noise, dust, traffic); and management of groundwater during excavation.

Soil excavation and disposal is a readily implementable technology given Site conditions and will successfully reduce concentrations to below Site specific risk based standards. Implementing this technology is moderately difficult at significant depth as it requires engineering and environmental controls (e.g., support of excavation, dust controls, etc.), and because it has short-term impacts on the surrounding community (e.g., increase truck traffic, noise, etc.). The requirements for engineering controls, along with the costs associated with transportation and disposal of contaminated soils, make the initial costs associated with this technology high. However, ongoing monitoring and maintenance will not be required following excavation and off-Site disposal.

Excavation and off-Site disposal was retained for detailed evaluation because this technology is the most effective technology for eliminating risk at the Site, since the bulk of the contamination will be removed and a Permanent Solution under the MCP can be achieved. Furthermore, excavation would expose any unknown sources of contamination, such as remaining USTs, which were not identified during previous subsurface investigations due to method limitations. Excavation can also be readily be implemented.

3.1.4 Soil Vapor Extraction (SVE) / Air Sparging (AS)

Soil vapor extraction (SVE) involves applying a vacuum to the soil to remove volatile and some semi-volatile contaminants in the unsaturated zone. The extracted vapors are collected by an aboveground system where they are treated or destroyed. In addition, the air flow induced through the unsaturated soil by vacuum extraction volatilizes contaminants and stimulates aerobic biodegradation.

Coupling soil vapor extraction with air sparging (AS) results in added contaminant recovery efficiency. AS involves injecting atmospheric air into the saturated zone beneath the contaminated zone to cause volatilization of adsorbed and dissolved phase volatiles and some semi volatile compounds. The vapor laden air is then collected from the vadose zone by an extraction system which transfers the vapors to an aboveground system where they are treated or destroyed. In addition, the air flow induced through the saturated and unsaturated soils stimulates aerobic biodegradation. Factors limiting the applicability and effectiveness of SVE/AS include: soil type, moisture content, organic content, and air permeability; treatment of exhaust air; disposal of spent activated carbon; and geologic conditions. This technology is effective for gasoline and fuel oil UST release sites, and may be successful in reducing concentrations to below standards. However, the remediation of the Site utilizing SVE/AS could take years and may not be very effective due to Site geology and the location of impacted soils beneath the water table.

SVE/AS is also difficult to implement. This alterative requires field pilot studies, remedial design, the installation of numerous well points and the capitalization and installation of equipment for SVE/AS operation. This alternative also requires on-going monitoring and maintenance and close monitoring of field conditions to ensure vapor control and limit migration. Consequently, due to these technical limitations, the cost to implement this technology is high. However, this technology is effective for gasoline and fuel oil UST release sites. Therefore, despite the technical limitations and overall high costs, this method has been retained as a possible remedial alternative.

3.1.5 Stabilization

Stabilization is a treatment technology that involves mixing contaminated soils with a stabilizing agent to physically encapsulate or induce a chemical reaction that will reduce the overall mobility or toxicity of contaminants. Stabilization is typically implemented to address inorganic contaminants. Organic contaminants are generally not immobilized.

Given that Site contaminants include primarily organic contaminants, the effectiveness of this technology with Site conditions is very limited. Overall effectiveness of technology may also be limited because of the large volume soil to be treated and heterogenic subsurface conditions associated with soil intermixed with historic fill, which can limit the mixing of a stabilizing agent and reduce the overall treatment efficiency. Consequently, due to these technical limitations, the cost to implement this technology is high. This technology was not retained for detailed evaluation because of technical limitations due to Site conditions and does not meet the redevelopment goals for the Site.

3.1.6 Soil Capping / Protective Barriers

Installation of caps or protective barriers is a common remedial method that includes constructing a physical barrier to restrict access to contaminated soil and mitigate the potential migration of Site contaminants into groundwater. This physical barrier prevents direct exposure and minimizes infiltration of precipitation through soils with high concentrations of contaminants. Caps can be constructed using a variety of materials, including clean soil, asphalt, concrete, geosynthetic liners or combinations of each.

Soil capping is an effective technology for many contaminants and subsurface conditions at the Site. This technology is also readily implementable and reliable. The costs to implement this technology are moderate and vary depending of the materials used to construct the cap. However, soil capping was not retained for

detailed evaluation because it does not achieve the redevelopment goals for the Site which includes unrestricted residential use.

3.1.7 Institutional Controls

In accordance with the MCP, remediation of disposal sites must consider the current and likely future use(s) of the Site. If a cleanup is based on anything less than "unrestricted use", then the closure must include a deed restriction that specifies the extent of contaminated materials left on-site and identifies the allowable uses of the Site. Under the MCP, these deed restrictions are known as AULs. An AUL can be placed on a site to prohibit certain site activities/uses that would result in exposure to site contaminants if certain protective measures are not taken (e.g. pavement maintenance).

Institutional Controls (i.e. deed restriction) was not retained for the detailed evaluation because although it is effective, readily implementable, and can support other remedial technologies as part of a comprehensive remedial alternative, this remedy does not meet the redevelopment goals for the Site which includes unrestricted residential use.

3.2 Development of Remedial Action Alternatives (RAA)

As indicated above, the initial screening identified the following technologies for further evaluation:

- **RAA-1**: Soil Excavation and Off-Site Disposal; and
- **RAA-2**: Air Sparging (AS) / Soil Vapor Extraction (SVE).

3.3 Description of Remedial Alternatives

3.3.1 RAA-1: Soil Excavation and Off-Site Disposal

RAA-1 consists of:

- Excavating impacted soil to a maximum depth of 13 to 15 feet bgs. Area 1: 6 to 13 feet bgs; Area 2: 10 to 13 feet bgs; and Area 3: 6 to 15 feet bgs.
- Transport of approximately 800 cubic yards (cy) of impacted soil for beneficial re-use as daily cover, intermediate cover, and/or pre-capping contour material at a Massachusetts landfill;
- Dewatering, treatment and discharge of groundwater encountered during excavation activities;
- Visual and perimeter dust monitoring;
- Implementing erosion, sedimentation and/or dust controls during excavation activities;
- Backfilling remedial excavations with Site soils exhibiting total Volatile Organic Compound (TVOC) concentrations less than 20 parts per million by volume (ppmv) and/or clean fill to existing grades; and
- Restoration of the area for redevelopment.

3.3.2 RAA-2: Soil Vapor Extraction (SVE) / Air Sparging (AS)

RAA-2 consists of:

- Field pilot studies;
- Remedial design;
- Installation of numerous well points;
- Capitalization and installation of equipment for AS / SVE operation; and
- On-going monitoring and maintenance.

3.4 Detailed Screening of Remedial Alternatives

A detailed screening of remedial alternatives was conducted using utilizing MCP criteria of effectiveness, reliability, implementability, duration, benefits and cost as indicated below.

3.4.1 Effectiveness

RAA-1 (Soil Excavation and Disposal) is the most effective alternative to achieve a permanent solution at the Site since it includes the removal of impacted soils to Site specific risk based standards to a depth of 13 to 15 feet bgs. RAA-1 is also the most effective alternative for reducing the overall mass of contaminants at the Site. RAA-1 would likely achieve a condition of NSR for unrestricted use at the Site. Furthermore, RAA-1 will include the beneficial re-use of 3-5 excavated materials as daily cover, intermediate cover, and/or pre-capping contour material at a Massachusetts landfill. RAA-2 (SVE/AS) may not be able to achieve Site specific risk based standards for unrestricted residential use, due to the limitations of the technology and Site conditions. In addition, RAA-2 would be more difficult to implement and would require on-going monitoring and maintenance.

3.4.2 Reliability

RAA-1 is considered the most reliable short-term alternative for removing contaminants from the Site since it is a proven, effective and readily implemented technology, which can be executed in a short period of time. In the short-term, control measures such as dewatering and dust control measures will be required; however, these measures can be easily designed and implemented during excavation activities.

RAA-2 could take years to successfully obtain remediation goals and does not provide the degree of certainty of RAA-1 with respect to achieving Site specific risk based standards for unrestricted residential use, largely due to Site geology and the location of impacted soils beneath the water table. Control measures such as treating exhaust air to eliminate possible risk to the public and the environment and regeneration or disposing of spent activated carbon may also be required. Furthermore, RAA-2 also requires close monitoring of field conditions to ensure vapor control and limit migration.

RAA-1 is considered the most reliable because the impacted soil would be removed from the Site. Due to technical limitations, the long-term reliability of RAA-2 is dependent upon the ongoing monitoring and maintenance of the remedial system.

3.4.3 Implementability

Implementing RAA-1 will not be difficult since there are no existing structures, operations and/or utilities at the Site. Engineering controls (sheeting or sloping) would be required to support the excavation and environmental controls (air monitoring and dust controls) would be required to protect and prevent exposures to on-Site construction workers and off-Site receptors during excavation activities. Dewatering and potential treatment of contaminated groundwater may also be required.

Ample area exists at the Site for soil staging, dewatering treatment (if necessary) and contractor equipment. Since excavation volumes are limited, groundwater dewatering could be easily implemented. A permit will be required for discharge of treated groundwater to the municipal sewer system. All materials, services, and equipment are readily available for implementing an excavation program at the Site. Based on the data collected to date, no conditions have been identified that would restrict the disposal of the impacted soil at a Massachusetts landfill. RAA-1 remedial activities would be performed in accordance with a RAM Plan submitted to the DEP. RAA-2 is a technically more complex remedy and would be performed in accordance with a Phase IV Remedial Implementation Plan (RIP) submitted to DEP. This alterative requires field pilot studies, remedial design, the installation of numerous well points and the capitalization and installation of

equipment for AS / SVE operation. This alternative also requires on-going monitoring and maintenance and close monitoring of field conditions to ensure vapor control and limit migration. Furthermore, the materials, services, and equipment are not as readily available for implementing RAA-2 at the Site. Therefore RAA-2 is the most difficult alternative to implement.

3.4.4 Costs

The preliminary costs for implementing each of the RAAs are as follows:

- $238,000 for RAA-1
- $350,000 for RAA-2

Costs associated with the implementation of RAA-1 include: design; permitting: LSP oversight / preparation of regulatory submittals; and contractor costs (soil excavation, dewatering/treatment, transportation/disposal and Site restoration). The cost estimate assumes excavation depths of 6-13 feet in Area 1, 10-13 feet bgs in Area 2 and 6-15 feet bgs in Area 3 to remove approximately 800 cy of soil. The estimate assumes the reuse of approximate 780 cy of soil excavated at the Site for backfill and the import of an additional 800 cy of soil for backfill. The total cost for this alternative is approximately $238,000.

Costs associated with the implementation of RAA-2 include: pilot studies; remedial design; installation of well points and capitalization / installation of equipment, as well as on-going monitoring and maintenance of the remedial system. The capitalization and installation of the equipment, along with the operation and monitoring (O&M) costs of the system alone is approximately $288,400. This cost assumes a three (3) year operation of the SVE/ AS system. The time and associated cost may vary depending on the technical limitations of the system, due to Site geology and location of impacted soils beneath the water table. Total cost for this alternative, including engineering and oversight is approximately $350,000.

3.4.5 Risks

Potential risks from the implementation of RAA-1 include short term risk associated with excavation activities. The risks can be controlled via implementation of engineering and environmental controls. Engineering controls include sheeting or sloping to support the excavation, groundwater dewatering containment and treatment, and environmental controls (air monitoring and erosion, sedimentation and dust controls). RAA-1 would not pose any long term risk as soil excavation and removal would not require any long term monitoring or operation and maintenance. RAA-1 would achieve a Permanent Solution and a condition of NSR to human health safety, public welfare and the environment.

Potential risks associated with RAA-2 are limited to health and safety risk associated with the on-Site work during the installation of the remediation system and long term health and safety risk associated with maintenance and operation of the system. However, these risks would be minimal. RAA-2 would have greater long term risks to potential human health safety, public welfare and the environment as it would take years to achieve a Permanent Solution and a condition of NSR.

Additionally RAA-2 poses more risk of uncertainty with respect to the ability to achieve cleanup goals for the Site due to the technical limitations of the remedial system, with respect to Site geology and location of impacted soils beneath the water table, and the amount of time needed to achieve the cleanup goals. RAA-2 also requires on-going monitoring and maintenance of the remedial system. Conversely, RAA-1 is a proven, effective and readily implemented technology which can be executed in a short period of time.

RAA-1 is more effective for addressing current and future exposure pathways and achieving a condition of NSR for the Site with unrestricted use. RAA-1 eliminates risk by removing the impacted soil from the Site to below Site specific risk based standards for unrestricted use.

3.4.6 Benefits

RAA-1 provides the most benefit because it would remove the impacted material located in the three distinct areas at the Site to risked based standards for unrestricted use. By removing the impacted soil to 13 to 15 feet, RAA-1 does not require long-term monitoring and maintenance or placing an AUL on the Site to mitigate soil exposures. As such, RAA-1 provided for the most productive reuse of the Site.

RAA-2 may not be effective in reducing concentrations to below unrestricted use risk based standards. Unlike RAA-1, there are technical limitations of RAA-2 which may impact the ability and/or the time needed for the system to achieve the cleanup goals, including Site geology and location of impacted soils beneath the water table. As such, RAA-2 may not achieve a Permanent Solution with unrestricted use and may not provide for the most productive reuse of the Site.

RAA-2 will also create a greater impact to the neighboring residents whose properties have been affected by the release, due to the time needed to achieve remedial goals. RAA-2 also requires on-going monitoring and maintenance of the remedial system. Conversely, although RAA-1 is more intrusive, it is a proven, effective and easily implemented technology which can be executed in a relatively short period of time.

RAA-2 is a more sustainable approach, in accordance with USEPA's Clean and Greener Policy guidelines as RAA-1 would require more trucks for excavation and off-site disposal, which increases fuel consumption and emissions, creates a greater impact to the neighborhood as a whole, and has an overall larger environmental footprint than RAA-2. However, the excavated material from RAA-1 will be beneficially re-used as daily cover, intermediate cover, and/or pre-capping contour material at a Massachusetts landfill facility.

RAA-1 is a more effective and timely remedy that completely eliminates the exposure pathways at the Site, and the cost to implement such a remedy is less than the cost of reducing the exposure risks in RAA-2.

3.4.7 Timeline

The approximate timeframe to complete each of the RAAs are:

- 4 to 6 months for RAA-1
- 36 to 48 months for RAA-2

3.5 Justification for the Selected Remedial Action Alternative

The selected remedial action alternative for the Site is RAA-1, soil excavation and off-Site disposal. RAA-1 was selected because it cost-effectively eliminates exposure to Site contaminants, and also reduces the total volume and mass of impacted materials at the Site. Implementing this alternative will support a Permanent Solution and enable the unrestricted reuse and redevelopment of the Site. RAA-1 is a proven, effective and readily implemented technology which can be executed in a short period of time. In addition, beneficial reuse of soil generated during excavation activities will be conducted in accordance with USEPA's Clean and Green Cleanup guidelines, as a sustainable alternative to off-Site disposal at a landfill. A conceptual layout of RAA-1 excavation areas is shown in Figure 2 – Site Plan.

3.6 Feasibility Evaluation

As part of the selection of the comprehensive RAA, Weston & Sampson evaluated the feasibility of achieving a permanent solution and achieving background conditions at the Site. The feasibility was conducted in general accordance with the MCP guidance document entitled Conducting Feasibility Evaluation under the MCP (Policy #WSC-04-160).

3.6.1 Feasibility of Achieving a Permanent Solution

The selected RAA for the Site will result in achieving a Permanent Solution for the Site, by removing contaminated soils in the three, distinct impacted areas to a depth of 13 to 15 feet bgs, thereby achieving a condition of NSR and allowing for the unrestricted reuse of the property.

3.6.2 Feasibility of Achieving a Background

In accordance with the DEP guidance, the feasibility of achieving background considers the technological feasibility and cost-benefit of achieving background. Excavation and off-Site disposal is a proven remedial technology capable of reducing contaminant concentrations at the Site beyond NSR and achieving or approaching background levels.

Remedial activities will be performed to remove petroleum impacted soil to a depth of approximately 13 to 15 feet bgs. Some residual petroleum compounds will remain in Site soil above background concentrations (non-detect), however these soils will be located at depths greater than 13-15 feet bgs.

Pursuant to Section 9.3.2.3 of DEP Policy "Conducting Feasibility Evaluations under the MCP (Policy #WSC-04-160), petroleum compounds are considered degradable and non-persistent. As such, the benefits of additional remedial excavation to remove soil at depths greater than three (3) feet bgs in an attempt to achieve or approach background conditions are considered insufficient to justify the cost of those actions. Therefore, pursuant to Policy #WSC-04-160, it is "categorically infeasible" to achieve or approach background conditions at the Site.

3.7 Projected Schedule for Implementation

In accordance with the MCP requirements for this Site, the project schedule and DEP regulatory submittals are anticipated as follows:

- Remedial design, and prepare RAM Plan to document the remedial approach: Summer 2014;
- Conduct Remediation: Summer; and
- Submit a Permanent Solution Report: Fall 2014.

Based on this project time line, the implementation of remedial activities at the Site are likely to occur in late summer of 2014, when the groundwater table is expected to be at its lowest. The estimated timeframe by which the implementation of the selected remedial action alternative will result in the achievement of No Significant Risk is approximately 9 months from the start of design.

3.8 Green and Sustainable Remediation Considerations

The City of New Bedford shall consider green and sustainable remediation options during the implementation of the selected remedial design. The remedial design shall incorporate when possible green remediation principles into the contracting process, administrative process, general on-site operations, field investigation/remediation activities, per the Green and Sustainable Remediation (GSR) Guidance Document

by EPA Region 1, included as Appendix B. Specifically, the City of New Bedford and its contractors shall consider the following based on the selected remedial design:

- Suggest contractors follow Region 1's Clean and Green Policy for Contaminated Sites
- Suggest contractors consider green remediation best management practices
- Encourage the use of laboratory sub-contractors that are committed to green chemistry for the purpose of reducing the amount and toxicity of chemicals used and required to be disposed of.
- Encourage use of contractors who utilize clean fuel and emission technology to operate heavy equipment onsite, as well as fuel for vehicles to travel to and from the site.
- Encourage sustainable and environmentally responsible practices for all field work, including minimizing waste by reusing and recycling waste, protecting and conserving water, and scheduling activities so as to minimize travel to and from the site.
- Have idle reduction policy for all field equipment
- Maximize efficiency in transport/disposal of soils and backfill, utilizing practices such as backloading.

3.9 Public Involvement

The ABCA for the project will be made available to the public for review and comment for a thirty-day period. The CRP and ABCA will also be presented to local citizens at a public meeting. The CRP is included in Appendix B.

4.0 LIMITATIONS

This ABCA Report was prepared for the use of the City of New Bedford and the USEPA exclusively. The findings provided by Weston & Sampson in this report are based solely on the information reported in this document. Future investigations, and/or information that was not available to Weston & Sampson at the time of the investigation, may result in a modification of the findings stated in this report.
Should additional information become available concerning this Site or neighboring properties, which could directly impact the Site in the future, that information should be made available to Weston & Sampson for review so that, if necessary, conclusions presented in this report may be modified. The conclusions of this report are based on Site conditions observed by Weston & Sampson personnel at the time of the investigation, information provided by the City of New Bedford, and samples collected and analyzed on the dates shown or stated in this report. This report has been prepared in accordance with generally accepted engineering and geological practices. No other warranty, express or implied, is made.

FIGURES

FIGURE 1
NEW BEDFORD, MASSACHUSETTS
478-480 UNION STREET

LOCUS MAP

0 2,000 4,000 Feet

Weston&Sampson

O:\New Bedford\Reports\Union Street Site\Figure 1 - Locus Map.mxd 9/10/2010 12:01:45 PM commonuse

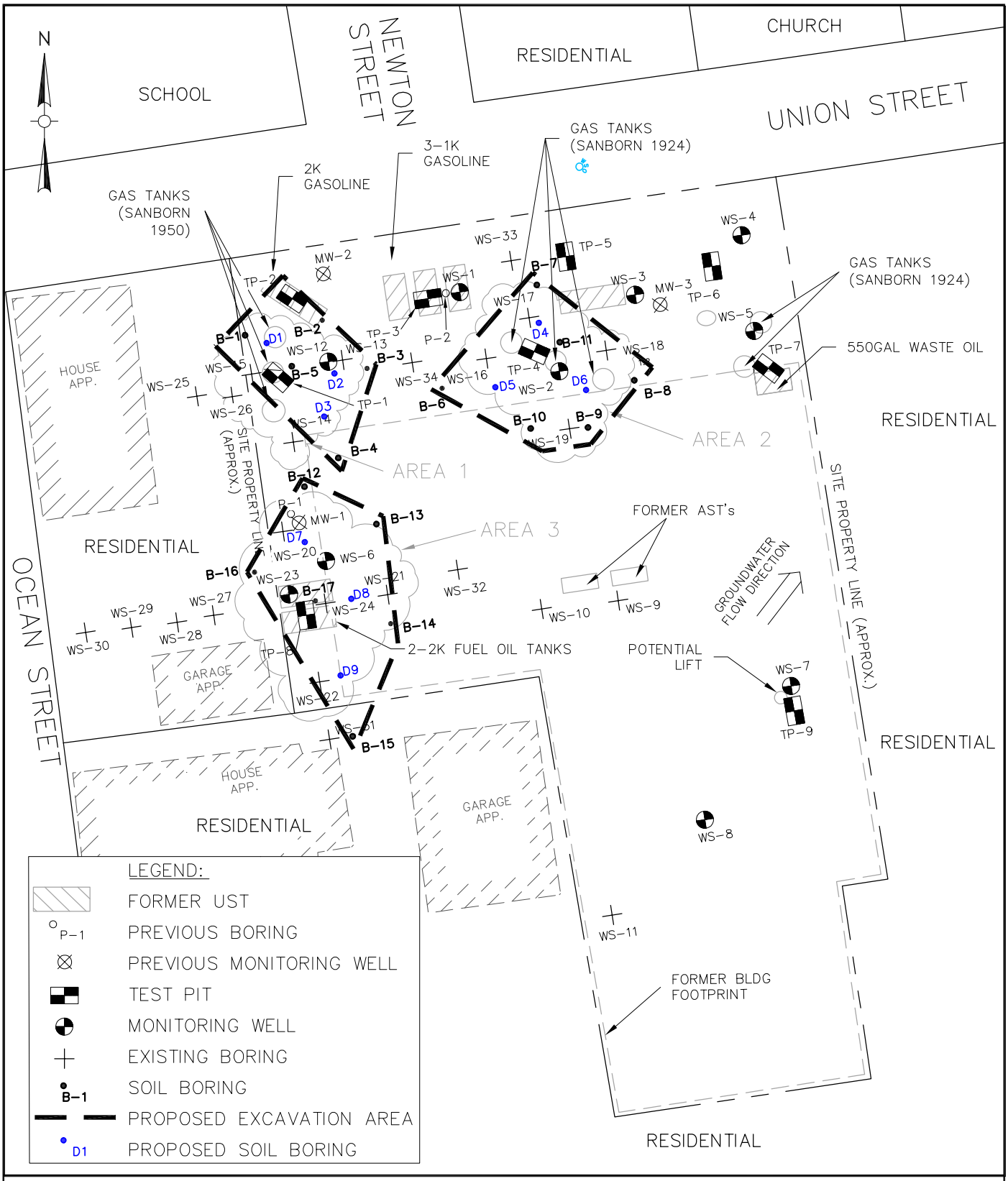

FIGURE 2
478-480 UNION STREET
NEW BEDFORD, MASSACHUSETTS

SITE PLAN

SCALE: 1"=30'

0 30 60

Z:\MA-Foxboro-Projects\SH ESS Projects\New Bedford Brownfields\CADD\Union St\Survey\052611\dwg\UNION Street rev 7-23-13.dwg

O:\New Bedford\Reports\Union Street Site\Figure 4 - Area Receptors Map.mxd 9/10/2010 1:33:34 PM commonuse

N
W E
S

1,000 500 0 1,000 Feet

0.25 0.125 0 0.25 Miles

Data Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Radii shown are approximately 500 feet and 1/2-mile from center of Site.

Legend

- Town Boundaries
- State Boundary
- Ground Water
- Surface Water
- Non-Community
- NHESP Certified Vernal Pools
- Railroads by Ownership
- Pipeline
- Pipeline Arbitrary Extension
- Powerline
- Powerline Arbitrary Extension
- Ski Lift/Tramway
- Substation
- Landing Strip/Airport
- Highway Exit Locations

All Roads

Road Classification

- Limited Access Highway
- Multi-lane Hwy, not limited access
- Other Numbered Highway
- Major Road, Collector
- Minor Road, Arterial
- Sub-basins
- Major Basins
- Solid Waste Facilities
- Protected Open Space
- ACECs
- Zone A
- IWPAs
- DEP Approved Zone IIs
- River, Stream, Shoreline
- Water
- Wetland
- Sole Source Aquifers
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Priority Habitats of Rare Species

Non Potential Drinking Water Source Area

- High Yield
- Medium Yield

Aquifers

- High Yield
- Medium Yield

MA Towns (from Survey Points)

- MA Towns (from Survey Points)

FIGURE 3

Area Receptors Map
478-480 Union Street
New Bedford, MA

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TABLES

Table 1
Initial Screening of Potential Remedial Technologies
478 - 480 Union Street
New Bedford, MA

Remedial Technology	Target Media	Relative Performance Information							Effectiveness	Implementability	Total Cleanup Time	Retained for Detailed Analysis	Comments
		Development Status	Applicability with Site Conditions	Reliability and Maintenance	Availability	Cost	Capital or O&M Intensive	Residuals Generated					
Removal Technologies													
Excavation and Off-Site Disposal	Soil	Full Scale	Good	Good	Good	High	Capital	Dewatered Ground Water	This technology is effective for remediating soil with organic and inorganic contaminants and will successfully reduce concentrations to below unrestricted use direct contact standards. This technology is a proven and most effective technology for eliminating risk at the Site, since contamination will be removed and the exposure pathways will no longer exist.	Readily implemented however can be moderately difficult to implement at greater depths. Requires extensive engineering controls for deep excavation, such as dewatering and support of excavation. This alternative also requires traffic management to minimize impact to the surrounding community associated with off-site transport of contaminated fill materials.	Months	Yes	Technology retained because it will achieve a Permanent Solution for the Site.
Treatment Technologies													
Air Sparging (AS) & Soil Vapor Extraction (SVE)	Soil	Full Scale	Average	Average	Average	High	Captial and O&M	Exhaust air and spent activated carbon	This technology is effective for gasoline and fuel oil UST release sites, and may be successful in reducing concentrations to below unrestricted use direct contact standards. However, the total cleanup time could take years and may not be very effective due to Site geology and the location of impacted soils beneath the water table.	Difficult to implement. This alterative requires field pilot studies, remedial design, the installation of numerous well points and the capitalization and installation of equipment for AS / SVE operation. This alternative also requires on-going monitoring and maintenance and close monitoring of field conditions to ensure vapor control and limit migration.	Years	Yes	Technology retained because may achieve a Permanent Solution for the Site.
In-Situ Stabilization	Soil	Full Scale	Poor	Poor	Average	High	Capital	None	Effective for reducing the mobility or toxicity of metals, but does not reduce or eliminate potential exposure to organic contaminants.	Not implementable. This technology does not meet the remedial objectives and given the quantity of soil and soil conditions, achieving proper mixing of stabilizing agent with conventional equipment may also be difficult.	Months	No	In-situ stabilization may also not be effective for organic compounds such as PAHs or petroleum-related constituents. This technology was not retained for detailed evaluation.
Containment Technologies													
Capping	Soil	Full Scale	Good	Average	Good	Low / Moderate	Capital & O&M	None	Effectively controls direct exposure between impacted fill materials and onsite receptors by creating a physical barrier. Not suitable for redevelopment goals.	Readily implementable. Would require some excavation to accommodate site grading and stormwater control requirements. Also requires post-construction inspection to ensure physical integrity is maintained.	Months	No	Not retained for detailed evaluation because it does not achieve the redevelopment goals of the Site for unrestricted use.
Institutional Controls													
No Action	Soil	Full Scale	Poor	Poor	Good	Low	No	None	Ineffective for site contaminants and subsurface conditions. Not suitable for redevelopment goals.	Readily implementable.	N/A	No	Not retained for detailed evaluation because it does not achieve a Permanent Solutionor or allow for unrestircted reuse of the Site.
Access Restrictions	Soil	Full Scale	Poor	Average	Poor	Low	Capital and O&M	None	Effective for preventing access to areas of the Site where fill has been detected, however not effective for redevelopment goals.	Readily implementable.	Weeks	No	Not retained for detailed evaluation because it does not achieve a Permanent Solutionor or allow for unrestircted reuse of the Site.
Activity and Use Limitations	Soil	Full Scale	Good	Good	Good	Low	O&M	None	Effectively controls exposure pathways; however not effective for redevelopment goals	Readily implementable with the owner's approval.	N/A	No	Not retained for detailed evaluation because it does not achieve the redevelopment goals of the Site for unrestricted use.

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APPENDIX A

Summary of Analytical Results

Table 1a
Weston & Sampson
Summary of Soil Analytical Results
478-480 Union Street
New Bedford, MA

Sample ID	TP-1 (10-12')	TP-2 (6-9')	DUP-1 TP-2 6-9'	TP-3 (9-12')	TP-4 (2-5')	TP-4 (11.5-12.5')	TP-5 (10-13')	TP-6 (7-9')	TP-7 (9-11')	TP-8 (7-9')	TP-9 (9-11')	Method 1 Soil Standards	
Date Sampled	4/14/11	4/14/11	4/14/11	4/14/11	4/14/11	4/14/11	4/14/11	4/15/11	4/15/11	4/15/11	4/15/11	S1/GW2 mg/kg	S1/GW3 mg/kg
Parameters (mg/kg)													
EPH													
C9-C18 Aliphatics	--	--	--	--	--	--	--	--	<34	**1,800**	<32	1,000	1,000
C19-C36 Aliphatics	--	--	--	--	--	--	--	--	<34	**320**	<32	3,000	3,000
C11-C22 Aromatics	--	--	--	--	--	--	--	--	<34	**1,400**	<32	1,000	1,000
PAH's													
Acenapthene	--	--	--	--	<0.55	--	--	--	<0.56	**2.1**	<0.54	1,000	1,000
Acenaphthylene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	600	10
Anthracene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	1,000	1,000
Benzo(a)anthracene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	7	7
Benzo(a)pyrene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	2	2
Benzo(b)fluoranthene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	7	7
Benzo(g,h,i)perylene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	1,000	1,000
Benzo(k)fluoranthene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	70	70
Chrysene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	70	70
Dibenzo(a,h)anthracene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	0.7	0.7
Fluoranthene	--	--	--	--	**0.56**	--	--	--	<0.56	**2.0**	<0.54	1,000	1,000
Fluorene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	1,000	1,000
Indeno(1,2,3-cd) Pyrene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	7	7
2-Methylnaphthalene	--	--	--	--	<0.55	--	--	--	<0.56	**2.2**	<0.54	80	300
Naphthalene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	40	500
Phenanthrene	--	--	--	--	<0.55	--	--	--	<0.56	**2.4**	<0.54	500	500
Pyrene	--	--	--	--	<0.55	--	--	--	<0.56	<0.55	<0.54	1,000	1,000
VPH													
C5-C8 Aliphatics	**45**	**2.6**	**2.4**	**6.2**	**2.8**	**1.7**	<1.0	<1.1	<1.0	**7.4**	<1.2	100	100
C9-C12 Aliphatics	**430**	<1.2	<1.0	**63**	<1.4	**18**	<1.0	<1.1	<1.0	**120**	<1.2	1,000	1,000
C9-C10 Aromatics	**480**	<1.2	<1.0	**53**	<1.4	**16**	<1.0	<1.1	<1.0	**180**	<1.2	100	100
Targeted VOCs													
Benzene	<1.6	**0.14**	**0.13**	<0.22	--	<0.11	<0.10	<0.11	--	<0.29	--	30	30
Toluene	<1.6	**0.39**	**0.38**	<0.22	--	<0.11	<0.10	<0.11	--	<0.29	--	500	500
Ethylbenzene	**10**	<0.12	<0.10	**0.88**	--	**0.23**	<0.10	<0.11	--	**0.74**	--	500	500
Napthalene	<4.0	<0.30	<0.26	<0.55	--	<0.27	<0.26	<0.27	--	**11**	--	40	500
Total Xylenes	**5.8**	**0.59**	**0.55**	**0.27**	--	<0.11	<0.10	<0.11	--	**0.96**	--	300	500
VOCs 8260	--	--	--	--	ND	--	--	--	ND	--	ND	**	**
Trace Metals													
Arsenic	--	<3.5	--	--	<3.5	--	--	--	<3.3	--	<3.3	20	20
Barium	--	**31**	--	--	**120**	--	--	--	**40**	--	**18**	1,000	1,000
Cadmium	--	<0.58	--	--	**0.59**	--	--	--	<0.56	--	<0.55	2	2
Chromium	--	**8.1**	--	--	**12**	--	--	--	**13**	--	**9.6**	30	30
Lead	**10**	**22**	--	<5.3	**370**	<5.3	--	--	<5.6	--	<5.5	300	300
Mercury	--	**0.044**	--	--	<0.34	--	--	--	<0.19	--	<0.018	20	20
PCBs	--	--	--	--	<.093	--			<.088	--	<.082	2	2

Notes:
"--" = Not Analayzed
NS = No Standard
ND= Not Detected. Detection Limit Varies
EPH = Extractable Petroleum Hydrocarbons
PAH = Polycyclic Aromatic Hydrocarbons

VPH = Volatile Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
SVOCs = Semil-Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls

** Standard Varies with Compound
BOLD = Parameter detected above laboratroy detection lim

Exceeds Method 1 Soil Standards S1/GW2 c
Standards obtained from 310 CMR 40.0000, revised June 26, 2009.

Table 1b
Weston & Sampson
Summary of Soil Analytical Results
478-480 Union Street
New Bedford, MA

Sample ID	WS-2 (15-19')	WS-6 (8-10')	WS-8 (9')	WS-9 (6-10')	WS-10 (10-15')	WS-11 (0.5-2')	WS-12 (13.5-15')	WS-12 (13.5-15') DUP-1	WS-13 (13.5-15')	WS-14 (13.5-15')	WS-15 (13.5-15')	WS-16 (0-5')	WS-16 (15-19')	WS-16 (0-5') DUP-2	WS-17 (0-5')	WS-17 (15-19')	WS-18 (0-5')	WS-18 (15-19')	WS-19 (0-5')	WS-19 (15-19')	WS-20 (13-15')	WS-21 (13-15')	WS-22 (13-15')	WS-23 (13-15')	WS-23 (13-15') DUP 3	WS-24 (13-15')	Method 3 UCLs	Method 1 Soil Standards			
Date Sampled	4/21/2011	4/21/2011	4/22/11	4/22/11	4/22/11	4/22/11	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12	5/11/12		S1/GW2	S1/GW3	S3/GW2	S3/GW3
Parameters (mg/kg)																											mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EPH																															
C9-C18 Aliphatics	--	**4,300**	<34	<34	<32	<31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**32,000**	**55,000**	**16,000**	**10,000**	**20,000**	**19,000**	20,000	1,000	1,000	5,000	5,000
C19-C36 Aliphatics	--	**700**	<34	<34	<32	<31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**3,900**	**8,200**	**2,000**	**1,400**	**3,400**	**3,000**	20,000	3,000	3,000	5,000	5,000
C11-C22 Aromatics	--	**3,900**	<34	<34	<32	**33**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11,000**	**14,000**	**4,400**	**4,000**	**11,000**	**8,900**	10,000	1,000	1,000	5,000	5,000
								--						--																	
PAH's								--						--																	
Acenapthene	--	**9.4**	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**27**	**40**	**10**	**8.9**	**22**	**20**	10,000	1,000	1,000	5,000	5,000
Acenapthylene	--	<3.0	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**65**	**110**	**18**	**27**	**59**	**55**	10,000	600	10	600	10
Anthracene	--	<3.0	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**3.3**	**5.5**	**1.9**	**1.5**	**9.4**	**8.4**	10,000	1,000	1,000	5,000	5,000
Benzo(a)anthracene	--	<3.0	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<1.6	<1.3	<1.1	<1.9	<2.4	3,000	7	7	300	300
Benzo(a)pyrene	--	<3.0	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<1.6	<1.3	<1.1	<1.9	<2.4	300	2	2	30	30
Benzo(b)fluoranthene	--	<3.0	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<1.6	<1.3	<1.1	<1.9	<2.4	3,000	7	7	300	300
Benzo(g,h,i)perylene	--	<3.0	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<1.6	<1.3	<1.1	<1.9	<2.4	10,000	1,000	1,000	5,000	5,000
Benzo(k)fluoranthene	--	<3.0	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<1.6	<1.3	<1.1	<1.9	<2.4	10,000	70	70	3,000	3,000
Chrysene	--	<3.0	<0.57	<0.57	<0.53	**0.57**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<1.6	<1.3	<1.1	<1.9	<2.4	10,000	70	70	3,000	3,000
Dibenz(a,h)antracene	--	<3.0	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<1.6	<1.3	<1.1	<1.9	<2.4	300	0.7	0.7	30	30
Fluoranthene	--	<3.0	<0.57	<0.57	<0.53	**0.81**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.9**	**4.1**	<1.3	<1.1	**4.0**	**3.1**	10,000	1,000	1,000	5,000	5,000
Fluorene	--	**8.6**	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**66**	**110**	**25**	**27**	**62**	**58**	10,000	1,000	1,000	5,000	5,000
Indeno(1,2,3-cd)pyrene	--	<3.0	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<1.6	<1.3	<1.1	<1.9	<2.4	3,000	7	7	300	300
2-Methylnaphthalene	--	**69**	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**170**	**470**	**12**	**68**	**150**	**230**	5,000	80	300	80	500
Naphthalene	--	**9.6**	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**47**	**120**	**14**	**21**	**51**	**64**	10,000	40	500	40	3,000
Phenanthrene	--	**10**	<0.57	<0.57	<0.53	<0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**45**	**73**	**23**	**17**	**42**	**40**	10,000	500	500	3,000	3,000
Pyrene	--	<3.0	<0.57	<0.57	<0.53	**0.98**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**3.4**	**5.6**	**1.6**	**2.2**	**7.7**	**7**	10,000	1,000	1,000	5,000	5,000
VPH																															
C5-C8 Aliphatics	**240**	**61**	<1.0	<1.1	<1.3	<1.1	**370**	**480**	**63**	<5	**4,400**	--	**3,000**	--	--	**170**	--	<6.7	--	<5.6	**46**	**100**	**51**	**120**	--	**31**	5,000	100	100	500	500
C9-C12 Aliphatics	**230**	**340**	<1.0	<1.1	**1.6**	<1.1	**360**	**530**	<6.2	**66**	**2,800**	--	**2,000**	--	--	**120**	--	<6.7	--	<5.6	**240**	**820**	**87**	**980**	--	**320**	20,000	1,000	1,000	5,000	5,000
C9-C10 Aromatics	**220**	**510**	<1.0	<1.1	<1.3	<1.1	**220**	**240**	<6.2	**62**	**1,400**	--	**1,100**	--	--	**74**	--	<6.7	--	<5.6	**180**	**590**	**90**	**670**	--	**220**	5,000	100	100	500	500
Targeted VOCs																															
Benzene	**0.54**	<0.66	--	<0.06	--	--	<0.70	<0.34	<0.31	<0.25	<2.6	--	<2.3	--	--	<0.37	--	<0.33	--	<0.28	<0.29	<0.66	<0.34	<0.72	--	<0.25	9,000	30	30	700	900
Ethlybenzene	**9.5**	**3.4**	--	<0.11	--	--	<0.70	<0.34	<0.31	<0.25	<2.6	--	<2.3	--	--	<0.37	--	<0.33	--	<0.28	<0.29	<0.66	<0.34	<0.72	--	<0.25	10,000	500	500	1,000	3,000
Methyl tert-butyl ether	ND	ND	--	ND	--	--	<0.14	<0.07	<0.06	<0.05	<0.52	--	<0.46	--	--	<0.08	--	<0.07	--	<0.06	<0.06	<0.13	<0.07	<0.72	--	<0.25	5,000	100	100	100	500
Naphthalene	<1.3	**32**	--	<0.28	--	--	<0.70	<0.34	<0.31	<0.25	**9.6**	--	<2.3	--	--	<0.37	--	<0.33	--	<0.28	**2.9**	**16**	**0.75**	**23**	--	**6**	10,000	40	500	40	3,000
Toluene	**1.8**	<0.66	--	<0.11	--	--	<0.70	<0.34	<0.31	<0.25	<2.6	--	<2.3	--	--	<0.37	--	<0.33	--	<0.28	<0.29	<0.66	<0.34	<0.72	--	<0.25	10,000	500	500	2,000	3,000
Total Xylenes	**4.1**	**5.4**	--	<0.33	--	--	<1.4	<0.68	<0.62	<0.50	<5.2	--	<4.6	--	--	<0.74	--	<0.66	--	<0.56	<0.58	<1.32	<0.68	<1.4	--	<0.50	10,000	300	500	300	3,000
VOCs 8260B	--	--	ND	--	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**	**	**	**	**
Trace Metals																															
Barium	--	--	**10**	--	**15**	**50**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10,000	1,000	1,000	5,000	5,000
Chromium	--	--	**9.4**	--	**14**	**11**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,000	30	30	200	200
Lead	--	--	--	--	--	--	--	--	--	--	--	**48**	--	**20**	**150**	--	**70**	--	**300**	--	--	--	--	--	--	--	3,000	300	300	300	300
PCBs	--	--	<0.092	--	<0.089	<0.087	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100	2	2	3	3

Notes:
"--" = Not Analyzed
NS = No Standard
ND= Not Detected. Detection Limit Varies
EPH = Extractable Petroleum Hydrocarbons
PAH = Polycyclic Aromatic Hydrocarbons

VPH = Volatile Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
SVOCs = Semil-Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls

** Standard Varies with Compound
BOLD = Parameter detected above laboratroy detection limit

BOLD = Exceeds MCP Soil Standards

Standards obtained from 310 CMR 40.0000, revised June 26, 2009.

Table 1c
Weston & Sampson
Summary of Soil Analytical Results - Adjacent Properties
478 - 480 Union Street
New Bedford, MA

Sample ID	WS-26 (13-15')	WS-30 (13-15')	DUP WS-30 (13-15')	WS-31 (13-15')	Method 1 Soil Standards	
Date Sampled	11/2/2012	11/2/2012	11/2/2012	11/2/2012	S1/GW2 mg/kg	S1/GW3 mg/kg
Parameters (mg/kg)						
EPH						
C9-C18 Aliphatics	--	<23	<12	<12	1,000	1,000
C19-C36 Aliphatics	--	<23	<12	<12	3,000	3,000
C11-C22 Aromatics	--	<23	<12	<12	1,000	1,000
Target PAH's	--	<.023	<0.12	<0.12	***	***
VPH						
C5-C8 Aliphatics	<7.9	<9.1	<8.7	<8.6	100	100
C9-C12 Aliphatics	<7.9	<9.1	<8.7	<8.6	1,000	1,000
C9-C10 Aromatics	<7.9	<9.1	<8.7	<8.6	100	100
Target VOCs	ND	ND	ND	ND	***	***

Notes:
"--" = Not Analyzed
ND= Not Detected. Detection Limit Varies with Compound.
*** = Standard varies with Compound.
Method 1 Standards are from the MCP, 310 CMR 40.0000, revised February 14, 2008.

Table 1d
Weston & Sampson
Summary of Soil Analytical Results
478-480 Union Street
New Bedford, MA

	Area 1									Area 2									Area 3															
Sample ID	**B-1 8-10'**	**B-1 13-15'**	**B-2 8-10'**	**B-2 13-15'**	**B-3 8-10'**	**B-3 13-15'**	**B-4 8-10'**	**B-4 13-15'**	**B-5 13-15'**	**B-6 8-10'**	**B-6 13-15'**	**B-7 8-10'**	**B-7 13-15'**	**B-8 8-10'**	**B-9 8-10'**	**B-10 8-10'**	**B-10 13-15'**	**B-11 13-15'**	**B-12 8-10'**	**B-12 13-15'**	**B-13 8-10'**	**B-13 13-15'**	**B-14 8-10'**	**B-14 13-15'**	**B-15 8-10'**	**B-15 13-15''**	**B-16 8-10'**	**B-16 13-15'**	**B-17 13-15'**	**Dup 1 B-17 13-15'**	**Dup 2 B-6 13-15'**	**Method 3 UCLs**	**Method 1 Soil Standards S1/GW2**	**S1/GW3**	**S3/GW2**	**S3/GW3**
Date Sampled	5/28/13	5/28/13	5/28/13	5/28/13	5/28/13	5/28/13	5/28/13	5/28/13	5/28/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/29/13	5/28/13	5/28/13	5/28/13	5/28/13	5/28/13	5/28/13	5/26/13					
PID - TVOCs (ppmv)	ND	**2,032**	**0.1**	**197**	ND	**120**	ND	**538**	**1,950**	ND	**30**	ND	**1,270**	ND	ND	ND	**592**	**2,175**	ND	**289**	ND	**152**	**50**	**286**	ND	ND	ND	**295**	**277**							
Parameters (mg/kg)																																mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EPH																																				
C9-C18 Aliphatics	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	**2,800**	<11	**1,600**	**8,100**	**9,300**	<10	<12	<10	**12,000**	**11,000**	**10,000**	--	20,000	1,000	1,000	5,000	5,000
C19-C36 Aliphatics	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	**420**	<11	**240**	**1,900**	**1,400**	<10	<12	<10	**1,700**	**1,600**	**1,500**	--	20,000	3,000	3,000	5,000	5,000
C11-C22 Aromatics	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	**780**	<11	**610**	**1,600**	**1,900**	<10	<12	<10	**2,300**	**2,200**	**2,100**	--	10,000	1,000	1,000	5,000	5,000
PAH's																																				
Acenapthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	**1.7**	<0.11	**1.6**	**1.5**	**5.5**	<0.10	<0.12	<0.10	**5.9**	**4.8**	**5.1**	--	10,000	1,000	1,000	5,000	5,000
Acenapthylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	**2.6**	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	10,000	600	10	600	10
Anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	**0.67**	<0.11	**0.52**	**0.41**	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	10,000	1,000	1,000	5,000	5,000
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	<0.11	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	3,000	7	7	300	300
Benzo(a)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	<0.11	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	300	2	2	30	30
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	<0.11	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	3,000	7	7	300	300
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	<0.11	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	10,000	1,000	1,000	5,000	5,000
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	<0.11	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	10,000	70	70	3,000	3,000
Chrysene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	<0.11	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	10,000	70	70	3,000	3,000
Dibenz(a,h)antracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	<0.11	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	300	0.7	0.7	30	30
Fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	**0.25**	<0.11	**0.15**	<0.11	**0.72**	<0.10	<0.12	<0.10	**0.82**	**1.2**	**1.2**	--	10,000	1,000	1,000	5,000	5,000
Fluorene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	**3.4**	<0.11	**3.4**	**1.8**	**19**	<0.10	<0.12	<0.10	**15**	**17**	**20**	--	10,000	1,000	1,000	5,000	5,000
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	<0.11	<0.12	<0.10	<0.12	<0.10	<0.12	<0.12	<0.12	--	3,000	7	7	300	300
2-Methylnaphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	**8.4**	<0.11	**16**	**3.0**	**61**	<0.10	<0.12	<0.10	**45**	**88**	**80**	--	5,000	80	300	80	500
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	**1.7**	<0.11	**4.1**	**0.88**	**12**	<0.10	<0.12	<0.10	**6.8**	**18**	**18**	--	10,000	40	500	40	3,000
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	**2.4**	<0.11	**2.8**	**1.5**	**13**	<0.10	<0.12	<0.10	**11**	**15**	**15**	--	10,000	500	500	3,000	3,000
Pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10	<0.12	<0.11	<0.11	<0.11	**0.15**	<0.10	<0.12	<0.10	<0.12	**0.53**	**0.44**	--	10,000	1,000	1,000	5,000	5,000
VPH																																				
C5-C8 Aliphatics	<7.2	**890**	<7.5	**11**	<9.2	<9.6	<9.4	<99	**390**	<9.6	<9.5	<8.1	**380**	<8.2	<7.9	<8.4	**82**	**670**	<6.3	<95	<9.2	<75	<190	<95	<8.6	<10	<8.1	<100	<190	<190	--	5,000	100	100	500	500
C9-C12 Aliphatics	<7.2	**360**	<7.5	**29**	<9.2	<9.6	<9.4	**130**	**230**	<9.6	<9.5	<8.1	**320**	<8.2	<7.9	<8.4	**190**	**470**	<6.3	**170**	<9.2	**76**	**200**	<95	<8.6	<10	<8.1	**130**	**270**	**270**	--	20,000	1,000	1,000	5,000	5,000
C9-C10 Aromatics	<7.2	**300**	<7.5	**25**	<9.2	<9.6	<9.4	**260**	**450**	<9.6	<9.5	<8.1	**310**	<8.2	<7.9	<8.4	**170**	**330**	<6.3	**300**	<9.2	**160**	**470**	**280**	<8.6	<10	<8.1	**280**	**720**	**820**	--	5,000	100	100	500	500
Targeted VOCs																																				
Benzene	<0.036	<0.84	<0.037	<0.044	<0.046	<0.048	<0.047	<0.049	<0.52	<0.048	<0.048	<0.041	<0.71	<0.041	<0.040	<0.042	<00.37	<0034	<0.031	<0.047	<0.046	<0.038	<0.096	<0.048	<0.043	<0.050	<0.041	<0.052	<0.096	<0.095	--	9,000	30	30	700	900
Ethlybenzene	<0.036	**1.1**	<0.037	**0.12**	<0.046	<0.048	<0.047	**0.54**	**2.3**	<0.048	<0.048	<0.041	**1.4**	<0.041	<0.040	<0.042	**0.48**	**2.1**	<0.031	**0.85**	<0.046	<0.038	<0.096	**0.79**	<00.43	<0.050	<0.041	<0.052	**4.6**	**5.1**	--	10,000	500	500	1,000	3,000
Methyl tert-butyl ether	<0.036	<0.84	<0.037	<0.044	<0.046	<0.048	<0.047	<0.049	<0.52	<0.048	<0.048	<0.041	<0.71	<0.041	<0.040	<0.042	<0.037	<0.034	<0.031	<0.047	<0.046	<0.038	<0.096	<0.048	<0.043	<0.050	<0.041	<0.052	<0.096	<0.095	--	5,000	100	100	100	500
Naphthalene	<0.18	<4.2	<0.19	<0.22	<0.23	<0.24	<0.24	**4.0**	**3.8**	<0.24	<0.24	<0.20	<3.5	<0.21	<0.20	<0.21	<1.8	<1.7	<0.16	**4.0**	<0.23	**3.2**	<4.8	**3.1**	<0.22	<0.25	<0.20	**4.3**	**37**	**45**	--	10,000	40	500	40	3,000
Toluene	<0.036	<0.84	<0.037	<0.044	<0.046	<0.048	<0.047	<0.049	<0.52	<0.048	<0.048	<0.041	<0.71	<0.041	<0.040	<0.042	<0.037	<0.034	<0.031	<0.047	<0.046	<0.038	<0.96	<0.048	<0.043	<0.050	<0.041	<0.052	<0.96	<0.095	--	10,000	500	500	2,000	3,000
Total Xylenes	<0.072	**5.4**	<0.075	**0.51**	<0.092	<0.096	<0.094	<0.99	**7.7**	<0.096	<0.095	<0.081	**5.8**	<0.082	<0.079	<0.084	**1.5**	**6.8**	<0.063	**1.6**	<0.092	**0.72**	<1.9	**0.83**	<0.086	<0.050	<0.081	**1.4**	**14.8**	**16.8**	--	10,000	300	500	300	3,000
VOCs 8260B	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**	**	**	**	**
Trace Metals																																				
Barium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10,000	1,000	1,000	5,000	5,000
Chromium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2,000	30	30	200	200
Lead	**3.7**	**2.9**	**11**	**5.8**	**2.4**	**1.7**	**5.0**	**2.0**	**5.1**	**1.4**	**2.1**	**2.6**	**1.8**	**2.9**	**2.4**	**2.9**	**1.8**	**9.5**	--	--	--	--	--	--	--	--	--	--	--	--	**1.9**	3,000	300	300	300	300
PCBs	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100	2	2	3	3

QA/QC by SD

Notes:
"--" = Not Analyzed
NS = No Standard
ND= Not Detected. Detection Limit Varies
EPH = Extractable Petroleum Hydrocarbons
PAH = Polycyclic Aromatic Hydrocarbons

VPH = Volatile Petroelum Hydrocarbons
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
SVOCs = Semi-Volatile Organic Compounds
BOLD = Parameter detected above laboratory detection limit
BOLD = Exceeds Method 1 Soil Standards

Table 2
Weston & Sampson
Summary of Groundwater Analytical Results
478-480 Union Street
New Bedford, MA

Sample ID	MW-1	WS-1			WS-2			MW-2			WS-3			WS-4			WS-5	WS-6			WS-7	WS-8	WS-12			WS-23			WS-23 DUP-1		Method 1 Groundwater Standards	
Date Sampled	4/29/11	4/29/11	5/22/13	7/18/13	4/29/11	5/21/13	7/18/13	4/29/11	5/21/13	7/18/13	4/28/11	5/21/13	7/18/13	4/28/11	5/21/13	7/18/13	4/28/11	4/29/11	5/22/13	7/18/13	4/28/11	4/28/11	5/25/12	5/22/13	7/18/13	5/25/12	5/22/13	7/19/13	5/23/13	7/19/13		
																															GW-2	GW-3
Parameters (Units)																																
EPH (ug/l)																																
C9-C18 Aliphatics	<100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	**320**	**170**	**210**	<200	<120	--	--	--	**260**	**210**	**390**	**190**	**420**	5,000	50,000
C19-C36 Aliphatics	**130**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	**160**	<100	<100	<200	<120	--	--	--	<100	<100	**250**	<100	**260**	NS	50,000
C11-C22 Aromatics	**190**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<200	**1,100**	**650**	**800**	<200	<120	--	--	--	**730**	**420**	**400**	**550**	**450**	50,000	5,000
PAHs (ug/l)																																
Acenaphthene	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	**3.4**	**9.9**	**7.2**	<0.5	<0.5	--	--	--	**11**	**4.1**	<2.0	4	<2.0	NS	6,000
Acenapthylene	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	**0.8**	<2.0	<2.0	<0.5	<0.5	--	--	--	<2	<2.0	<2.0	<2.0	<2.0	10,000	40
Fluorene	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	**6.4**	**9.4**	**8.9**	<0.5	<0.5	--	--	--	**8.7**	**4.9**	**2.5**	**5.1**	**2.9**	NS	40
2-Methylnaphthalene	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	**160**	**150**	**160**	<0.5	<0.5	--	--	--	**130**	**57**	**20**	**54**	**24**	2,000	20,000
Naphthalene	**1.7**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	**100**	**100**	**99**	<0.5	<0.5	--	--	--	**120**	**62**	**22**	**58**	**23**	1,000	20,000
Phenanthrene	<0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.5	**5.4**	**3.9**	**5**	<0.5	<0.5	--	--	--	**3.7**	<2.0	<2.0	<2.0	<2.0	NS	10,000
VPH (ug/l)																																
C5-C8 Aliphatics	<20	**1,400**	**500**	**610**	**910**	<100	<100	<20	<100	<100	<20	<100	<100	<20	<100	<100	<20	<40	<100	<200	<20	<20	<100	<100	<100	<100	<100	<100	<100	<200	3,000	50,000
C9-C12 Aliphatics	<20	**440**	**110**	**160**	**320**	<100	<100	<20	<100	<100	<20	<100	<100	<20	<100	<100	<20	**510**	**150**	**280**	<20	<20	<100	**110**	<100	**410**	**100**	<100	110	<200	5,000	50,000
C9-C10 Aromatics	<20	**930**	**420**	**370**	**440**	<100	<100	<20	<100	<100	<20	<100	<100	<20	<100	<100	<20	**1,100**	**1,200**	**1,000**	<20	<20	<100	<100	<100	**780**	**550**	**320**	**550**	**360**	7,000	50,000
Targeted VOCs (ug/l)																																
Ethlybenzene	<5.0	**7**	**1.8**	**1.5**	**8**	<5.0	<1.0	<5.0	<1.0	<1.0	<5.0	<1.0	<1.0	<5.0	<5.0	<1.0	--	**27**	**27**	**25**	--	--	<5.0	<1.0	<5.0	**12**	**12**	**5.6**	**10**	**5.8**	20,000	5,000
Naphthalene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--	**210**	**200**	**170**	--	--	<5.0	<5.0	<5.0	**190**	**110**	**48**	**110**	**48**	1,000	20,000
Toluene	<5.0	<5.0	**1.1**	<1.0	<5.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<1.0	<1.0	<5.0	<1.0	<1.0	--	<10	<1.0	<2.0			<5.0	<1.0	<1.0	<5.0	<1.0	<2.0	<1.0	<2.0	50,000	40,000
Xylenes	**5**	<10	<2.0	<2.0	**5**	<2.0	<2.0	<10	<2.0	<2.0	<10	<2.0	<2.0	<10	<5.0	<2.0	--	**46**	**43.8**	**39**	--	--	<10	<2.0	<2.0	**33**	**27.8**	**12.1**	**24.5**	**11**	9,000	5,000
VOCs 8260B (ug/l)																																
Acetone	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	--	--	<10	--	--	--	<10	<10	--	--	--	--	--	--	--	--	50,000	50,000
Benzene	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	--	--	<0.50	--	--	--	<0.50	<0.50	--	--	--	--	--	--	--	--	2,000	10,000
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	--	--	<0.50	--	--	--	<0.50	<0.50	--	--	--	--	--	--	--	--	1,000	20,000
Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50	--	--	<0.50	--	--	--	<0.50	<0.50	--	--	--	--	--	--	--	--	50,000	40,000
PCBs (ug/l)	--	--	--	--	<0.2	--	--	--	--	--	--	--	--	<0.2	--	--	<0.2	--	--	--	<0.2	<0.2	--	--	--	--	--	--	--	--	5	10
Trace Metals (mg/l)																																
Barium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.19**	--	--	--	<0.05	**0.07**	--	--	--	--	--	--	--	--	NS	50
Mercury	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.0002	--	--	--	<0.0002	**0.0002**	--	--	--	--	--	--	--	--	NS	0.02
SVOCs 8270 (ug/l)																																
Benzo(a)anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.025	--	--	--	--	NS	1,000
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.025	--	--	--	--	NS	400
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.025	--	--	--	--	NS	20
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.025	--	--	--	--	NS	100
Chrysene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.025	--	--	--	--	NS	70
Dibenzo(a,h)anthracene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.025	--	--	--	--	NS	40
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.025	--	--	--	--	NS	100

Notes:
Only compounds detected are listed
-- = Not Analyzed
NS = No Standard Established
ug/l = micrograms per liter
mg/l = milligram per liter
EPH = Extractable Petroleum Hydrocarbons

PAH = Polycyclic Aromatic Hydrocarbons
VPH = Volatile Petroelum Hydrocarbons
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
SVOCs = Semi-Volatile Organic Compounds
BOLD = Parameter detected above laboratory detection limit
BOLD Exceeds RCGW-2 or Method 1 GW-2/3
MCP Method 1 Standards are from the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, revised June 26, 2009

APPENDIX B

Green and Sustainable Remediation Guidance Document – EPA Region 1

GREEN AND SUSTAINABLE REMEDIATION (GSR) GUIDANCE DOCUMENT – EPA REGION 1

SUGGESTIONS/IDEAS FOR GREEN REMEDIATION INCORPORATION INTO BROWNFIELDS ASSESSMENTS AND CLEANUPS

(modified from EPA Region 2 "Clean and Green Policy", Att. B: Region 2 "Green Checklist")

Note: Information presented in the following bullets provides a good framework for considering the incorporation of green remediation into a project. However, the information provides suggestions, not requirements. In addition, the information provided does not represent a comprehensive listing of all green remediation options, and not every green remediation measure will be applicable, beneficial, or feasible for a given project. Always remember to take into consideration the specific needs and circumstances of a project when incorporating green remediation.

ADMINISTRATIVE

- **Incorporate green remediation principles into the contracting process, as possible** (http://www.epa.gov/oswer/greencleanups/principles.html)
  - Suggest contractors follow Region 1's Clean and Green Policy for Contaminated Sites (http://www.epa.gov/region1/brownfields/pdfs/CleanGreenPolicy.pdf)
  - Suggest contractors consider green remediation best management practices, as applicable (http://www.clu-in.org/greenremediation/docs/GR_Quick_Ref_FS_Intro.pdf and http://www.clu-in.org/greenremediation/docs/GR_factsheet_topics_update.pdf)
  - Encourage the use of laboratory sub-contractors that are committed to green chemistry (http://www.epa.gov/greenchemistry/). The purpose is to reduce the amount and toxicity of chemicals used and required to be disposed.
  - Encourage use of contractors who utilize clean fuel and emission technologies to operate heavy equipment onsite (http://www.clu-in.org/greenremediation/docs/Clean_FuelEmis_GR_fact_sheet_8-31-10.pdf).

- **Consider future use at the beginning of project to guide the investigation and remedy selection**
  Note: Sampling and remedial action selection should first be based on state and federal requirements for being protective of human health and the environment. Once feasible alternatives that satisfy those requirements are identified, then selection and improved efficiency of those alternatives can be considered.
  - Future use and redevelopment layout may guide the type of sampling and remediation required; ensure that sampling and remedial actions are the most efficient and sustainable methods available
  - Encourage development of renewable energy production facilities on contaminated lands
  - Consider the type and location of contamination on the property to help guide green infrastructure choices if it is a desired or required component of site redevelopment (http://cfpub.epa.gov/npdes/home.cfm?program_id=298)

- **Reporting and Communication**
  - Interim and final documents should 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 ON-SITE OPERATIONS

- **Encourage sustainable practices in trailers/buildings**
  - Utilize existing buildings for field office, if possible/safe
  - Situate trailer to benefit from existing vegetation (e.g., shaded by trees in the summer to reduce cooling costs and out in the open during cooler months to utilize natural solar heat)
  - Utilize "green" trailers if possible

- **Minimize non-renewable energy consumption**
  - Use energy efficient equipment
  - Purchase renewable energy supply through local utility programs
  - Purchase Renewable Energy Credits/Certificates (RECs or Green Tags)
  - Research potential for Green Pricing Programs and Power Purchase agreements
  - Utilize renewable Onsite Generation Systems, e.g., solar photovoltaic (PV), wind turbines, and biomass combustion

- **Use environmentally preferable products**
  For guidance, see the EPA Environmentally Preferable Purchasing (EPP) website (http://www.epa.gov/epp/)
  - Compact Fluorescent Lights (CFL) or LED
  - Environmentally friendly electronics (e.g., ENERGY STAR)
  - Recycled products
  - Avoid use of pesticides where feasible and follow EPA's Integrated Pest Management Practices (http://www.epa.gov/pesticides/factsheets/ipm.htm)
  - Use native plants instead of placing hydroseed for erosion control
  - Use plants instead of rip rap for erosion control, if practical

- **Encourage sustainable and environmentally responsible practices**
  Minimize waste
  - Reuse or recycle waste
  - Protect and conserve water
  - Use alternative fuel vehicles (hybrid-electric, biodiesel, ultra-low sulfur diesel)
  - Carpool
  - Schedule activities efficiently so as to minimize travel to and from the site
  - Consider ecological revitalization needs and potential through remediation (http://www.epa.gov/superfund/accomp/news/ecological_revitalization.htm)

FIELD INVESTIGATIONS/REMEDIATIONS

- **Mobilization**
  - Encourage use of fuel-efficient / alternative fuel vehicles and equipment
  - Minimize mobilizations
  - Use existing roadways where available
  - Provide for erosion and sediment control to minimize runoff into environmentally sensitive areas
  - Avoid environmentally sensitive areas and cutting native trees/vegetation when placing trailers and storage areas, and while building access roads

- Encourage use of diesel engines that meet the most stringent EPA on-road emissions standards available upon time of project's implementation or utilize EPA or CARB verified emission control technology to reduce particulate matter (PM) emissions by a minimum of 85% when technologically feasible on all on-road diesel engines (http://www.clu-in.org/greenremediation/docs/Clean_FuelEmis_GR_fact_sheet_8-31-10.pdf)

- **Demolition of on-site structures**
  - Minimize demolition of structures and buildings, when possible
  - Recycle demolition and construction material where possible
  - Keep the ultimate redevelopment of the site in mind. Enable the reuse of clean demolition and construction materials on site whenever possible.
  - For further guidance: see the EPA Construction and Demolition Waste site (http://www.epa.gov/wastes/nonhaz/industrial/cd/)

- **Field Screening**
  - Use non-invasive technologies, where feasible, for subsurface characterization to minimize wastes (Electrical Resistivity Tomography, Borehole Radar Tomography, Ground Penetrating Radar, Seismic Refraction/Reflection, Electromagnetic Survey).
  - Incorporate systematic planning, dynamic work strategies, and real-time measurements into work plans (TRIAD) to promote efficiency in investigations (http://www.epa.gov/tio/download/misc/triadprimer.pdf)
  - Minimize number of field mobilizations
  - Minimize number of samples sent to laboratories, with state approval, of course
  - Use mobile laboratories

- **Drilling/Excavating**

  Elements of each of the following are discussed at: http://www.clu-in.org/greenremediation/docs/Clean_FuelEmis_GR_fact_sheet_8-31-10.pdf
  - Have idle reduction policy and idle reduction devices installed on machinery
  - Use ultra-low sulfur diesel and/or fuel-grade biodiesel as fuel on machinery
  - Maximize use of machinery equipped with advanced emission controls
  - Encourage use of diesel engines that meet the most stringent EPA on-road emissions standards available upon time of project's implementation or utilize EPA or CARB verified emission control technology to reduce PM emissions by a minimum of 85% when technologically feasible on all on-road diesel engines.
  - Have contractors conduct regular engine maintenance on machinery to improve efficiency

- **Transport and Disposal of Soils and Backfill**
  - Maximize efficiency in transport/disposal of soils and backfill, utilizing practices such as backloading.

APPENDIX C

Community Relations Plan

COMMUNITY RELATIONS PLAN
FOR THE PROPOSED UNION STREET SITE CLEANUP PROJECT
478 – 480 Union Street
New Bedford, MA
US EPA Brownfields Cleanup Grant

OVERVIEW OF COMMUNITY RELATIONS PLAN

Purpose: The purpose of the Community Relations Plan (CRP) is to describe the strategy that the City of New Bedford (the City) will use to address the concerns of residents who may be impacted by the proposed cleanup of 478 – 480 Union Street property (the Site) located in New Bedford, Massachusetts. This CRP outlines how the City will involve the public, particularly potentially affected residents, City officials, nearby business owners, non-profits and local community based organizations in the decision-making process regarding the environmental cleanup at the Site.

Active members of the community are essential resources for the success of the CRP. The City perceives these citizens and organizations as key stakeholders and points of contact and communication within the local New Bedford neighborhood. One measure of success of the environmental cleanup and subsequent redevelopment of the Site will be the involvement of well-informed citizens in each step of the remediation process.

The cleanup of the Site is funded by a Brownfields Cleanup Grant, which was awarded by the United States Environmental Protection Agency (EPA). Once the Site has been remediated, the city proposes redeveloping the Site for residential use.

SPOKESPERSON AND INFORMATION REPOSITORY

Ray Holberger is the spokesperson for this project. He can be contacted at:

City of New Bedford - Office of Environmental Stewardship
New Bedford City Hall
133 Williams Street - Room 304
New Bedford, MA 02740
(508) 979-1529
ray.holberger@newbedford-ma.gov

An Information Repository that contains reports for environmental activities that have been conducted and will be conducted on this site through this work is located at the Lawler Library, 745 Rockdale Avenue, New Bedford, Massachusetts 02740. To conduct a review of the Information Repository, the Lawler Library should be contacted at 508-991-6216 to make an appointment during normal business hours: Mondays and Fridays - 10:00am to 6:00pm; Tuesday and Thursday - 12:00pm to 8:00pm; and Saturdays - 9:00am to 5:00pm (closed Wednesdays, Sundays and Holidays).

SITE DESCRIPTION AND HISTORY

Site Location

The Site is comprised of an undeveloped, 0.42 acre vacant parcel of land. The Site is identified as Map 45, Lot 9, in the City of New Bedford Tax Assessor's database. Asphalt and concrete surfaces remain on the northern portion of the Site. Topography of the Site is generally flat. The elevation of the Site is approximately 50-52 feet above mean sea level.

The Site is located on the south side of Union Street, southeast of the intersection of Union Street and Newton Street. The Site is located in a residential and commercial area. Union Street is located north of the Site, across which are a residence, a church and a commercial building. Residential properties border the Site to the east, south and west. A school is located northwest of the Site across Union Street.

Site History

Operations and Ownership

A limited Site ownership and operational history was completed during Phase I and Phase II Environmental Site Assessment (ESA) activities at the Site on behalf of the City of New Bedford. Weston & Sampson conducted a review of information on file at the City of New Bedford municipal offices, as well as a review of historical U.S. Geological Survey (USGS) maps and aerial photography available through the Massachusetts Office of Geographic and Information (MassGIS) and Environmental Data Resources (EDR). The findings of the Site ownership and operational history are summarized below.

Historical atlas maps indicate that the Site was developed with two residential structures in 1906. A gasoline filling station and automobile service garage existed at the Site between 1915 and the late 1970's. The garage building occupied the majority of the area of the Site. The Site was reportedly utilized by a restaurant supply company in the 1980's and a dance studio in the 1990's. The Site is currently owned by the City of New Bedford, which acquired the property through tax-title taking in 2009.

Oil and Hazardous Materials (OHM) Usage and Storage

The Site is a vacant lot where OHM is not currently used or stored. Historic use of the Site as a gasoline filling station and automotive service garage included the use and storage of OHM. Additional information regarding OHM use and storage history at the Site is limited. Municipal records and historic Sanborn atlas maps indicated that numerous underground storage tanks (USTs) were historically located at the Site. Five gasoline tanks were depicted in a 1924 atlas map on the northern portion of the Site. A 1950 atlas map indicates three additional gasoline tanks were located on the northwestern portion of the Site. Municipal records indicate that two 1,000-gallon #2 fuel oil USTs were removed from the Site in 1984 and 1992 and a 550-gallon waste oil UST was removed from the Site in 1989. Tank installation and/or removal permits also exist for numerous other USTs including one 3,000-gallon gasoline UST and one 2,000-gallon gasoline UST. However, additional UST information including reports detailing the removal of the historic USTs at the Site was not identified. Figure 2 depicts the location of some of the historic on-Site USTs as identified in the historic atlas maps and previous reports for the Site. No other current or historic OHM storage has been identified at the Site.

Historic information/mapping did not include information about utilities and/or floor drains at the Site. The former Site building was previously serviced with municipal water and sewer from mains located in Union Street. All utilities were disconnected prior to demolition and removal of the building. There are currently no subsurface utilities at the Site.

Site Investigations

An investigation performed at the Site in 1992 by Harborline Engineering identified petroleum impacted soil and groundwater above applicable Massachusetts Department of Environmental Protection (DEP) release notification criteria. The release was subsequently reported to the DEP and RTN 4-1265 was assigned to the Site. Although a Class B-1 Response Action Outcome (RAO) regulatory closure report was submitted to the DEP in 1997 from Prime Engineering, Inc. for the identified impacts associated with RTN 4-1265, soil and groundwater sampling performed in support of regulatory closure did not include sampling in the area of many of the historic UST locations.

In July 2010, the City hired Weston & Sampson Engineers to conduct an ASTM Phase I Environmental Site Assessment (ESA) for the Site. The assessment was performed in August and September 2010. The Phase I ESA identified Recognized Environmental Concerns (RECs) for the Site including potential impacts from historic use as an automobile service garage with multiple USTs and previously identified impacted soil and groundwater at the Site. In the spring of 2011, Weston & Sampson performed an initial Phase II ESA to evaluate the RECs and to assess the extent of contamination remaining at the Site. Results of a geophysical and test pit investigation did not identify any abandoned USTs. The Phase II ESA did, however, identify petroleum impacted soil in exceedance of applicable DEP reportable concentration (RC) S-1 standards. The impacted soils were identified on the northwestern and northern portion of the Site in the area of former gasoline USTs and on the western portion of the Site in the area of former fuel oil USTs. Additionally, a concentration of lead was identified in fill material soils on the northern portion of the Site above the RCS-1 standard.

The release was reported to the DEP in October 2011 and RTN 4-23596 was assigned to the Site. An Additional Phase II ESA was performed in 2012 and 2013 to further assess the nature and extent of impacted soil and groundwater. Results of the assessment confirmed that petroleum impacted soils remain at the Site above DEP Method 1 S-1 standards. However, analysis of groundwater samples collected throughout the Site did not identify concentrations above applicable GW-2/3 standards. Additional details regarding the historical site investigations and/or remedial activities are documented in reports on file with DEP. No other releases at the Site have been reported to the DEP for regulatory tracking purposes.

Nature of Threat to Public Health and Environment

The primary contaminants of concerns at the Site include petroleum related compounds detected above applicable DEP Method 1 S-1 standards within soils located in three separate areas at the Site: Area 1 located on the northwestern portion of the Site in the area of former gasoline USTs; Area 2 located on the northern portion Site in the area of other former gasoline USTs; and Area 3 located on the western portion of the Site in the area of former fuel oil USTs. Additionally, lead was identified in fill material soils on the northern portion of the Site above Method 1 S-1 standard. No groundwater concentrations of hazardous materials have been detected above applicable GW-2/3 standards.

Based on the data collected, soils at the Site may pose a risk with respect to future, unrestricted use if cleanup does not occur; therefore, remediation at the Site is required. The current proposed remediation plan is to excavate and remove impacted soils to a depth of 13 to 15 feet below ground surface (bgs). The excavated soils would be disposed of off-site at a licensed, Massachusetts landfill. The Site would be closed out through contaminated soil removal. The findings of supplemental Phase II ESA conducted between May and July 2013, indicate that

following the proposed remediation, a condition of No Significant Risk (NSR) would exist and the Site can be closed out under the Massachusetts Contingency Plan (MCP). To address short term risks during cleanup and construction activities, the contractor would implement engineering controls such as dust controls and air monitoring, control of storm water runoff and the dewatering and treatment of groundwater, if necessary. Brownfields Cleanup Grant funds would be used to reduce threats to human health and the environment by facilitating the removal and offsite disposal of impacted soils.

COMMUNITY BACKGROUND

Community Profile

The Site is located in a densely populated residential/commercial area of New Bedford. The Site is bounded to the North by Union Street, beyond which are residential and commercial properties. Residential properties abut the Site to the east, south and west. New Bedford is defined as an "Economically Distressed Area" (EDA) and remains a historically diverse city with a disproportionately high "environmental justice population." Roughly one half of the population is Portuguese or of Portuguese descent. According to the 2010 Census and the American Community Survey (ACS) conducted by the US Census Bureau from 2008-2012, the population of New Bedford is 95,072. The nonwhite percentage of the population is 23%; including 16.7% Hispanic or Latino origin and 6.4% African American. Furthermore, according to the 2012 US Census ACS, the median houshold income of $36,789 in New Bedford is 55% of the Massachusetts average of $66,658, and 69%of the national average of $53,046. Over 37% of the population of the City has income below the poverty level, compared to 11.4% for the Commonwealth of Massachusetts as a whole. The City of New Bedford is saddled with chronically high unemployment rates, low educational attainment, and a relatively unskilled labor force. According to the 2012 US Census Bureau ACS, New Bedford's unemployment rate was 11.0 %, higher than both the Massachusetts average of 8.1% and the national average of 10.1%. The high school dropout rate for the New Bedford School Department was 20.8% in 2010/2011 school year, more than twice the state average of 8.2% (Massachusetts Department of Education). Only 8% of the city's 18-and-older population holds at least a bachelor's degree. This figure trails far behind 22% figure for the Commonwealth of Massachusetts and 18% nationally.

The City of New Bedford's industrial history has left a legacy of environmental contamination that impedes its economic development. Brownfields sites range in size and complexity. A majority of sites are concentrated in the City's urban core, which accounts for nearly half of the land area in the City and is home to more than half of its population.

Chronology of Community Involvement

The Site was identified for investigation by the City in 2010 through a Brownfields Assessment Grant provided by the EPA to evaluate selected properties in the New Bedford region. The project and future site work is funded through a Brownfields Cleanup Grant, which is also funded by the EPA.

Most recently, the City hosted a public meeting at the Main Branch of the New Bedford Public Library, located at 613 Pleasant Street in New Bedford, Massachusetts on November 14, 2011. The meeting was to present the EPA Cleanup Grant application and Analysis of Brownfields Cleanup Alternatives (ABCA) for the cleanup of the Site, and to solicit input from the public, prior to submittal of the draft applications. The public meeting and availability of the draft ABCA for

review were advertised in the New Bedford Standard Times and on the City's website. Key Community Concerns

The following general comments from the community were received at the meeting: 1) The proposal should include information about how the City plans to create employment opportunities for local residents, local qualified contractors or trainees of the City's Brownfields Job Training Grant program; and 2) Some of the proposed other resources for leveraging funding may not be applicable for residential development. The City should explore other opportunities for funding, including Mass Housing. In addition, the City of New Bedford received one formal comment from the public, stating that the City should look into the New Jersey Institute of Technology's Brownfields technical assistance program available to communities.
The community will continue to receive information about the Site, including notification of public meetings and community updates regarding the status of the remediation and redevelopment project, on the internet at:

http://www.newbedford-ma.gov/Environmental/brownfields/478_480_Union_St.html.

The City will also continue to seek public input on concerns specific to the site throughout the cleanup process. The City will hold a public meeting to educate and update the community regarding remediation and proposed redevelopment activities.

CONTINUED COMMUNITY INVOLVEMENT

The ABCA for the project will be made available to the public for review and comment for a thirty-day period. The CRP and ABCA will also be presented to local citizens at a public meeting. The following provides an estimated schedule for the project.

Task	Estimated Start Date	Estimated Completion Date
Publish Public Notice in *The New Bedford Standard Times and SouthCoastToday.com* (which will announce public meeting, timing of public comment period and availability of information repository)	Spring 2014	Spring 2014
30-day Public Comment Period for Draft ABCA	Spring 2014	Spring 2014
Public Meeting to Discuss ABCA	Spring 2014	Spring 2014
End of Public Comment Period	Spring 2014	Spring 2014
Response to comments Received	Spring/Summer 2014	Spring/Summer 2014
Finalization of ABCA	Summer 2014	Summer 2014
Implementation of Remedial Alternative	Summer/Early Fall 2014	Summer/Early Fall 2014