Waste Management Division
PO Box 95, 29 Hazen Drive
Concord, NH 03302

Type of Submittal (Check One-Most Applicable)

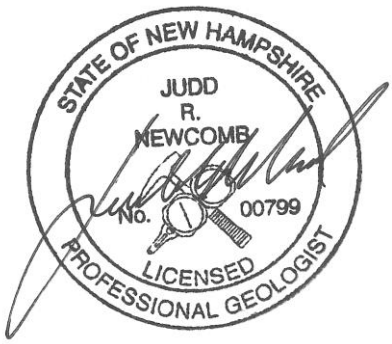
☐ Work Scope ☐ Reimbursement Request	☐ Remedial Action • Remedial Action Plan • Bid Plans and Specifications • Remedial Action Implementation Report ☐ Treatment System and POE O&M ☐ Activity and Use Restriction
☐ UST Facility Report ☐ AST Facility Report	
☐ Emergency/Initial Response Action ☐ Groundwater Quality Assessment	☐ Temporary Surface Water Discharge Permit
☐ Initial Site Characterization ☐ Site Investigation • Site Investigation Report • Supplemental Site Investigation Report • GMZ Delineation • Source Area Investigation • Data Submittal • Annual Summary Report ☒ Unsolicited Brownfields Submittal ☐ Closure Documentation	☐ Groundwater Management Permit • Permit Application • Renewal Application • Deed Recordation Documentation • Abutter Notification Documentation • Release of Recordation ☐ Data Submittal ☐ Annual Summary Report

ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES/ REMEDIAL ACTION PLAN

Ernie's Auto Sales Property
180 East Main Street
Tilton, New Hampshire
NHDES # 199311019

Prepared For:
THE TOWN OF TILTON, NEW HAMPSHIRE
257 Main Street
Tilton, NH 03276
Phone: (603) 286-4521 ex. 101
Contact: Joyce Fulweiler, Town Administrator
townadmin@tiltonnh.org

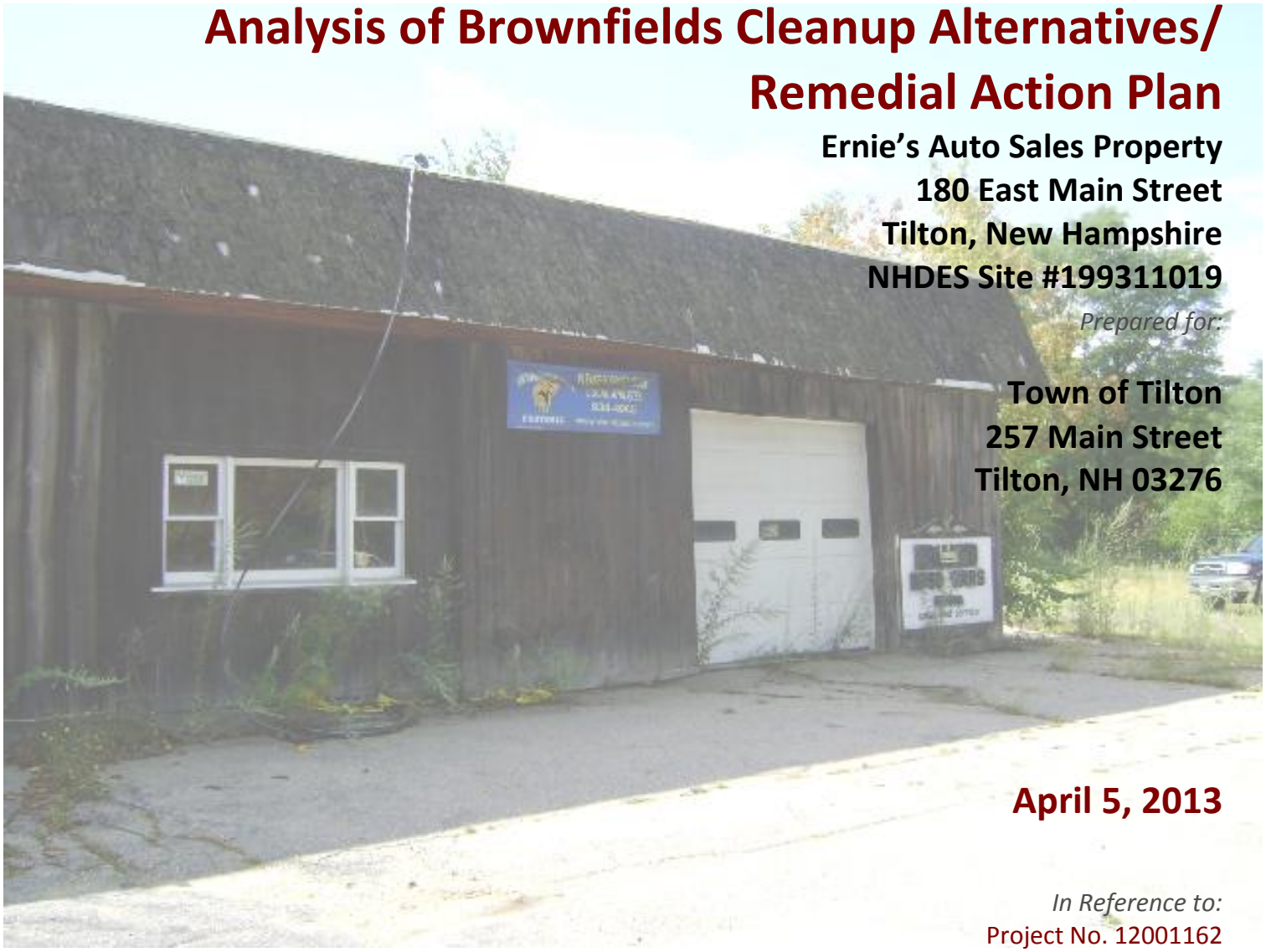
Prepared By:
CREDERE ASSOCIATES, LLC
776 Main Street
Westbrook, Maine 04092
Phone: (207) 828-1272 ext. 16
Contact: Judd R. Newcomb, CG, PG



June 3, 2013

Recommended Risk Category (check one)

☐ 1. Immediate Human Health Risk (Impacted water supply well, etc.)	☐ 4. Surface Water Impact	☒ 7. Alternate Water Available/Low Level Groundwater Contamination (<1,000 X AGQS)
☐ 2. Potential Human Health Risk (Water supply well within 1,000' or Site within SWPA)	☐ 5. No Alternate Water Available/No Existing Wells in Area	☐ 8. No AGQS Violation/No Source Remaining
☐ 3. Free Product or Source Hazard	☐ 6. Alternate Water Available/High Level Groundwater Contamination (>1,000 X AGQS)	☐ Closure Recommended



Analysis of Brownfields Cleanup Alternatives/ Remedial Action Plan

Ernie's Auto Sales Property
180 East Main Street
Tilton, New Hampshire
NHDES Site #199311019

Prepared for:

Town of Tilton
257 Main Street
Tilton, NH 03276

April 5, 2013

In Reference to:
Project No. 12001162

Submitted by:
Credere Associates, LLC
776 Main Street
Westbrook, ME 04092

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1. INTRODUCTION

Credere Associates, LLC (Credere) has prepared this Analysis of Brownfields Cleanup Alternatives (ABCA) for the former Ernie's Auto Sales property (the Site) located at 180 East Main Street in Tilton, New Hampshire. This work is being funded by a United States Environmental Protection Agency (EPA) Brownfield Cleanup Grant #96162501 that the Town of Tilton, New Hampshire received. The following ABCA was prepared to detail the selection of the most appropriate remedial alternatives for addressing the known environmental contaminants at the Site. A work plan for the selected remedial alternative is also included in this document.

1.1 PURPOSE AND SCOPE

The purpose of this report is to evaluate Brownfields cleanup alternatives to mitigate identified environmental conditions at the Site. Based on the information and results from previous investigations completed by Credere, environmental conditions that require mitigation include the following:

- Concentrations of polycyclic aromatic hydrocarbons (PAHs), lead and arsenic are present in subsurface soil adjacent to the west side of the garage building (i.e. at soil boring/monitoring well SB-5/MW-5) exceeding applicable New Hampshire Department of Environmental Services (NHDES) Soil Remediation Standards (SRS).
- Concentrations of PAHs are also present in surficial soil at multiple locations across the Site exceeding applicable NHDES SRS. The presence of these contaminants in surficial soil are attributed to the presence of asphalt, coal, and ash materials that were identified in the collected samples and are considered "background" as defined by New Hampshire Code of Administrative Rule Env-Or 602.03. While these PAHs are not regulated by the NHDES, they pose potential health risk and are to be addressed as part of this ABCA.
- Concentrations of arsenic in groundwater are present beneath a portion of the Site exceeding its NHDES Ambient Groundwater Quality Standard (AGQS).
- The removal of two abandoned hydraulic lift cylinders that were discovered during the recent demolition of the Site buildings.

Remedial alternatives based on feasibility, effectiveness, cost, and the potential for the redevelopment of the Site have been considered. Key consideration was given to the following items in the development of these remedial alternatives:

- Geologic and hydrogeologic conditions including depth to bedrock, soil types and permeabilities, nature of contaminants, and depth to groundwater.
- Potential exposure to construction workers during remediation and to park users from contamination remaining after the remedial action.

- Potential onsite and off-site environmental receptors, including possible environmental receptors such as the Winnipesaukee River.
- Planned future reuse of the Site.

With these criteria in mind, the overall objectives of this report include the following:

- Evaluating the remedial alternatives against the evaluation criteria presented below;
- Selecting the remedial alternative that best meets the objectives and considerations of the project; and
- Presenting a general work plan for implementing the selected remedial alternative.

The Comparison of Alternatives section (**Section 8.0**) discusses the criteria used for comparing each of the alternatives. Each alternative was evaluated based on the following:

- Effectiveness and Reliability;
- Feasibility and Ease of Implementation;
- Risk Reduction and Associated Benefits;
- Cost Effectiveness; and
- Estimated Time to Reach No Further Action.

2. BACKGROUND INFORMATION

The Site is composed of one 0.8-acre parcel of land located at 180 East Main Street in Tilton, New Hampshire, which is situated adjacent to the Winnipesaukee River. The Site is currently owned by the Town of Tilton. Although exact dates were not determined, the Site was formerly operated as a gas station from approximately 1939 until the 1970s. An automobile body shop, used automobile repair shop, automobile salvage yard, used automotive sales, and a U-Haul truck rental business have also reportedly occupied the Site.

All Site buildings were demolished in January and February 2013. The remaining features on the Site include a mixture of asphalt-paved and gravel parking areas, and lawn and vegetated areas located along the eastern and southern property lines.

According to NHDES records, four (4) underground storage tanks (USTs) were removed from the Site in 1993 and approximately 30 yards of contaminated soil was removed from the tank graves. These USTs are discussed in more detail in the following section.

The Site is referenced by the Town of Tilton Tax Assessor's office as Map U-04, Lot 71. **Figure 1** locates the site on the Northfield, New Hampshire quadrangle prepared by the United States Geological Survey (USGS). A detailed Site plan is presented as **Figure 2**.

2.1 SURROUNDING LAND USE

The Site is located in a mixed use area of Tilton. Adjoining properties include the following:

North: The Site is bordered to the north by the intersection of East Main Street and Copeland Road (up-gradient). Beyond East Main Street to the east of Copeland Road is the Tilton police station. To the west of Copeland Road is an undeveloped wooded lot.

East: The Site is bordered to the east by a residence (upgradient to cross-gradient).

South: The Site is bordered to the south by the Winnipesaukee River (downgradient).

West: The Site is bordered to the west by a vacant gravel lot (cross-gradient).

2.2 FUTURE SITE USE

The Town of Tilton, in association with the Winnipesaukee River Trails Association, intends to develop the Site into a park and trailhead for the riverfront trail system.

3. SUMMARY OF PREVIOUS INVESTIGATIONS

The following section summarizes the pertinent findings of previous investigations conducted for the Site or for the properties located in the vicinity of the Site.

Phase I Environmental Site Assessment, Credere, November 2, 2010

A Phase I ESA was completed by Credere for the Ernie's Auto Sales property in November 2010. The Phase I ESA was completed in accordance with ASTM Standard Practice E 1527-05. Based on the information obtained as a part of the Phase I ESA, the following recognized environmental conditions (RECs) were identified at the Site:

- REC-1 – The former use of the Site as a gas station between 1939 and the 1970s, past distribution, and past and present bulk storage of petroleum products (including a 275-gallon aboveground storage tank (AST) and a 55-gallon drum) may have resulted in releases of petroleum which may have impacted the environmental conditions of the Site.
- REC-2 – A release of petroleum was discovered on September 16, 1993, during the closure of two (2) 3,000-gallon and one (1) 4,000-gallon gasoline USTs and one (1) 2,000-gallon waste oil UST. Though this release is considered by the NHDES to be closed, the release represented a REC as impacted soil and/or groundwater may remain at the Site.
- REC-3 – The former use of the Site as an auto repair facility between the approximate dates of 1939 and 1978 represented a REC because hazardous materials and petroleum products were likely stored, used, and may have been disposed of on the Site and may have impacted the environmental conditions of the Site.
- REC-4 – The floor drain observed within the garage bay with an unknown discharge point represented a REC because the drain is a potential conduit to the environment whereby releases of petroleum products and hazardous substances from former activities may have impacted the environmental conditions at the Site.
- REC-5 – A suspected dump and fill area was observed along the southern portion of the Site including items such as, but not limited to, urban fill, automobile parts, and utility pole sections. Petroleum products and/or hazardous substances associated with these materials may have been released and impacted the environmental conditions at the Site.
- REC-6 – Stressed vegetation was observed below a pole mounted electrical transformer located along the northern Site boundary. This condition represented a REC because it could be indicative of a release of petroleum-based and/or polychlorinated biphenyl (PCB)-containing dielectric fluid that may have impacted the environmental conditions of the Site.

Additionally, Credere identified three (3) *de minimis* environmental conditions (DMEC) at the Site.

- DMEC-1 – Oil staining observed on the floor of the cottage represented a DMEC because it is evidence of a release; however, a pathway to the environment was not likely.
- DMEC-2 – Multiple small volume containers (less than 50-gallons each) of oil, gasoline, and automotive lubricants and cleaning materials represented a DMEC because of the poor conditions in which they were stored; however, a pathway to the environment was not likely.
- DMEC-3 – Multiple stains observed on the gravel parking lot represented a DMEC because they are evidence of small petroleum releases which may have impacted surficial soil at the Site. However, based on observed conditions, it was not likely that these small spills have significantly impacted environmental media at the Site.

The following four (4) ASTM Non-Scope considerations (NCs) were also noted during the Phase I ESA:

- NC-1 – Based on the age of the Site buildings, potential asbestos-containing materials (ACMs) may be present on the interior and exterior of the buildings.
- NC-2 – Based on the age of the Site buildings, lead-based paint may be present on the interior and exterior of the buildings.
- NC-3 – Based on the age of the Site buildings, PCB-containing bulk products may be present on the interior and exterior of the buildings.
- NC-4 – Based on the condition of the Site buildings and the collapsed roof of the garage, mold is likely present in the buildings.

Phase II Environmental Site Assessment, Credere, June 2, 2011

A Phase II ESA was completed by Credere for the Ernie's Auto Sales property in June 2011. The Phase II ESA was completed in accordance with ASTM Standard Practice E 1903-97 (reapproved 2002). The Phase II ESA work included performing a ground penetrating radar (GPR) survey to locate potential subsurface structures; conducting lead-based paint and asbestos surveys of the two Site buildings; and collecting surficial soil, subsurface soil, and groundwater samples. The following represents the conclusions and recommendations from this report.

- REC-1, which was associated with the former use of the Site as a gas station, past distribution, and past and present bulk storage of petroleum products, has been dismissed because no direct evidence of a release of petroleum in the distribution area or from the past and present bulk storage containers was observed based on the collected laboratory analytical data. [Note: arsenic was quantified in groundwater and may have been mobilized by reducing conditions created by the former presence of a plume of petroleum contaminants in groundwater or may be a background condition.]

- REC-2, which was associated with the documented historical release from the gasoline and waste oil USTs, was dismissed because no evidence of soil or groundwater contamination was observed in the laboratory analytical data for the samples collected in the vicinity of the USTs.
- REC-3, which was associated with the former use of the Site as an auto repair facility, could not be confirmed or dismissed from the data collected because it was not clear if metals detected at levels that exceeded both NHDES SRS and AGQS are related to prior activities at the Site or are conversely associated with an area wide background condition. The identified metals impacted soils and groundwater still represent a potential health risk that require proper management.
- REC-4, which was associated with the floor drain observed in the garage, has been dismissed because results of the GPR survey indicated that the floor drain was connected to the municipal sewer system; therefore, a pathway to the subsurface environment is unlikely.
- REC-5, which was associated with the suspected dump and fill area observed along the southern portion of the Site, has been dismissed. A faint anomaly observed during the GPR survey was determined to be the result of a cluster of asphalt which was confirmed through the hand excavation of a test pit. No evidence of contamination was observed in laboratory analytical data for subsurface soil samples collected from the suspected dump and fill areas.
- REC-6, which was associated with the stressed vegetation below the pole mounted electrical transformer, has been dismissed because no PCBs were detected in surficial soil sample SS-6, which was collected below the transformer.
- NC-1, which was associated with potential presence of ACMs, has been confirmed because ACMs were identified in both Site buildings.
- NC-2, which was associated with the potential presence of lead-based paint in the Site buildings, has been confirmed because lead-based paint was identified on surfaces in both buildings.
- NC-3, which was associated with PCB-containing bulk products within the Site buildings, has been confirmed because PCBs were identified in bulk products within both buildings. Concentrations of PCBs identified in paint in both buildings (samples BM-2 and BM-4) exceeded 1 part per million (ppm), but were below 50 ppm. Based on observed conditions, these materials have been characterized as excluded PCB products. Though these materials are not regulated for disposal, if removed from use, these products must be disposed at a facility authorized to accept PCB-containing materials at the at-found concentrations. All other bulk products analyzed had total PCB concentrations of less than 1 ppm; therefore, they are unregulated.
- NC-4, which was associated with the possible presence of mold in the Site buildings, was not addressed because it was likely that the buildings will be demolished.
- The presence of PAHs noted in surficial and subsurface soils were attributed to the presence of asphalt, coal, and ash materials that were identified in these samples. As a result, these PAHs meet the NHDES definition of "background" as defined by Env-Or 602.03. It was Credere's interpretation that PAHs identified onsite are not subject to the NHDES SRS [per Env-Or

606.19(f)], but similar to the metals identified in soil, they still represent a health risk which should be appropriately managed.

Based on these conclusions, Credere recommended that the following tasks should be completed for the Site:

- Credere recommended that PAH-contaminated soil should be managed under a soil management plan during any future redevelopment of the Site. The management plan should be designed to eliminate human contact with these soils.
- Credere recommended that additional subsurface soil sampling in the vicinity of soil boring SB-5 should be conducted to determine the vertical and horizontal extent of the arsenic and lead that exceeded the NHDES SRS because the soil represented a potential health risk. In addition, Credere recommended that soil should be managed in accordance with a soil management plan during any future redevelopment of the Site.
- Credere recommended that additional groundwater sampling and analysis should be completed to monitor the presence of arsenic in groundwater at the Site, because the arsenic in groundwater represented a potential risk, which may require mitigation during future redevelopment of the Site.
- Credere recommended that, if the Site buildings were to be renovated or demolished:
- Removal of all identified ACM should be conducted by a licensed asbestos abatement professional in accordance with all applicable state and federal regulations.
- Removal activities and disposal of all identified lead-based paint should be conducted in accordance with the applicable state and federal regulations.
- Removal of identified excluded PCB products should be conducted by qualified personnel and the selected disposal facility should be licensed to accept these materials in accordance with applicable state regulations.
- A mold survey should be conducted to identify the presence of hazardous molds within the buildings. Conversely, if the buildings are to be razed, Credere recommended that demolition activities should be conducted in such a manner as to protect human health from potential mold hazards.

Supplemental Phase II Environmental Site Assessment, Credere, October 2011

This supplemental work was performed to delineate the extent of the previously identified arsenic and lead concentrations and to perform a second round of groundwater sampling to verify the presence of dissolved arsenic concentrations in groundwater. A summary of Credere's conclusions in relation to the work completed as part of this Supplemental Phase II ESA are presented below:

- The extent of lead and arsenic contamination exceeding the SRS is limited to the approximate area around previously drilled boring SB-5 that is depicted on **Figure 2**. Given the previous

depth of contamination noted, the extent of contaminated soil requiring remediation was estimated at approximately 50± cubic yards (225 square feet of soil to a depth of at least approximately 6 feet). However, X-ray fluorescence (XRF) field screening results indicated that some additional arsenic exceeding SRS may be present in the vicinity of soil borings SB-12 and SB-14, but this was not confirmed with laboratory samples. Based on these results, there is the potential for arsenic contaminated soil to exist deeper and extend beyond the limits depicted on **Figure 2**.

- Based on the data collected, Credere determined that it was inconclusive whether the detected arsenic in groundwater was the result of a release of hazardous substances related to Site activities, the result of changes in the geochemistry of groundwater related to past releases of petroleum, or was related to a background condition. Credere indicated that the presence of arsenic in groundwater represented a potential health risk to future Site workers and users that should be properly managed in the future.

Based on observations and results of the initial and Supplemental Phase II ESAs conducted at the Site, Credere made the following recommendations regarding the documented soil and groundwater conditions:

- A remedial action plan should be developed to address the proper management of lead and arsenic-impacted soil identified in soil boring SB-5, because the presence of this subsurface contamination represents a risk to future Site workers and users. In addition, the remedial action plan should also address the field screened arsenic in SB-12 and SB-14.
- Biannual groundwater sampling should also be conducted to monitor the detected arsenic concentrations in groundwater.
- It was recommended that the "background" PAHs identified at the Site soil should be managed under a soil management plan during any future redevelopment of the Site. The management plan should be devised to eliminate human contact with these soils.

Please note that Credere has not included our recommendations regarding the building or building materials because it was razed as a part of previous remediation work conducted under this grant in January and February 2013. It should also be noted that following building demolition in February 2013, two (2) hydraulic lift cylinders were discovered to have been abandoned beneath the Site buildings. These lift cylinders are likely to contain hydraulic oil and require excavation and proper disposal.

4. CONCEPTUAL SITE MODEL

The previous Phase II and Supplemental Phase II ESAs were designed to provide an understanding of environmental conditions and to further assess the RECs previously identified at the Site. The following section is a description of the Conceptual Site Model (CSM), which incorporates information from the Phase II Investigations and contains the following components:

- Physical Setting;
- Contaminants of Concern;
- Exposure Pathways;
- Potential Receptors; and
- Remaining data gaps, if any.

4.1 PHYSICAL SETTING

Topography and drainage

Based upon a review of the 1987 Northfield, NH 7.5 minute Quadrangle, the Site is between 440 and 460 feet above mean sea level (MSL). Topography at the Site generally slopes in two directions. The north side of the Site slopes gently to the northwest, while the south side tends to slope radially to the south and west. Stormwater on the north side of the Site likely follows surficial topography resulting in a northwesterly flow which terminates at a catch basin located in the northwestern corner of the Site. This catch basin reportedly discharges via a culvert into a drainage ditch. The ultimate outfall of this drainage ditch is the Winnipesaukee River. Stormwater on the south side of the Site generally follows the topography radially to the south and west and flows directly into the Winnipesaukee River.

Regional topography within a 0.5-mile radius of the Site consists of rolling hills sloping towards the Winnipesaukee River ranging from 400 to 600 feet above MSL.

Surficial Geology

According to the *Geohydrology and Groundwater Quality Data of Stratified-Drift Aquifers in the Winnipesaukee River Basin, Central New Hampshire*, United States Geological Survey (USGS), Water-Resources Investigations Report 94-4150, by Joseph D. Ayotte (1997), the surficial geology at the Site consists of glacial till over bedrock.

Surficial materials observed at the Site during Phase II ESA activities revealed predominantly loose to dense sand with some gravel at depth, which is consistent with stratified drift aquifers and glacial till.

Bedrock Geology

According to the *Generalized Bedrock Geologic Map of New Hampshire* compiled by the USGS, the Site is underlain primarily by metamorphic rocks of the Silurian age, consisting of aluminous schist, quartzite, calc-silicate granofels, and bimodal metavolcanic rocks. According to the USGS, the average depth to bedrock is 35-feet bgs, but can be up to 200-feet below ground surface (bgs) in localized areas. No bedrock was encountered during soil boring and test pit activities during Credere's previous Phase II ESA at the Site, which had maximum depths of approximately 14 feet bgs.

Groundwater Characteristics

According to the *Geohydrology and Groundwater Quality Data of Stratified-Drift Aquifers in the Winnipesaukee River Basin, Central New Hampshire*, USGS, Water-Resources Investigations Report 94-4150, by Joseph D. Ayotte (1997), the Site is located over the Gardners Grove aquifer (a portion of the Tri-Town Aquifer), which is classified as a major aquifer by the USGS and a groundwater protection district by the New Hampshire Department of Environmental Services (NHDES). Drilled wells within the vicinity of the Site encountered groundwater at depths ranging from 8-feet to 20-feet bgs.

Groundwater in overburden materials at the Site was observed at depths ranging from 7.52 to 10.65 feet bgs during the July 26, 2011, sampling event. Based on groundwater elevations observed during the Phase II and Supplemental Phase II ESAs, groundwater at the Site generally flows to the southwest at a gradient of approximately 3%. It should be noted that local groundwater flow may be highly varied due to precipitation events, stormwater runoff, infiltration/recharge, the presence of subsurface structures and utilities, and varying subsurface hydrogeologic conditions.

4.2 CONTAMINANTS OF CONCERN

The contaminants of concern discussed in this CSM are those compounds that were detected above applicable state and/or federal standards and guidelines, or those which pose a potential risk to human health or the environment.

- Arsenic and lead previously detected in subsurface soil from soil boring SB-5 at a depth of 4 to 6 feet bgs are COCs for the Site. Based on concentrations of these COCs, which exceed their applicable NHDES SRS, compared to the lower concentrations in surrounding soil borings SB-8 through SB-11, which do not exceed the applicable NHDES SRS, it appears that the metals detected in SB-5 are the result of Site activities and are not representative of background conditions. Based on XRF field screening results from soil borings SB-12 and SB-14, there is the potential that additional arsenic and/or lead contaminated soil may be present in this area of the Site that would require excavation.
- Arsenic detected at concentrations exceeding the applicable NHDES AGQS in groundwater samples collected from multiple monitoring wells on the Site (MW-2, MW-3, and MW-5) is a COC for the Site. It is Credere's opinion that the detected arsenic appears to have been

mobilized by changes in groundwater chemistry associated with historical petroleum releases to the subsurface at the Site or may be the result of a background condition.

- Multiple PAH compounds including benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and indeno(1,2.3-cd)pyrene previously detected in surficial soils across the Site and in subsurface soils at a depth of 4 to 6 feet bgs in boring SB-5 are COCs for the Site. Additionally, the laboratory PQL for dibenzo(a,h)anthracene was higher than the SRS in subsurface soil sample SB-5(4-6); therefore, this analyte is also conservatively considered to be a COC. The presence of PAHs in surficial soil has been attributed to a background condition, but PAHs are carried through this CSM because they represent a health risk.
- Due to the identification of two (2) abandoned hydraulic lifts beneath the demolished Site building, hydraulic oil is also a COC for subsurface soil at the Site.

4.3 DEFINITIONS OF EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS

To aid in a thorough understanding of the environmental concerns present at the Site, a graphical presentation of the identified COCs and potential migration pathways to receptors is included as **Figure 3**. Exposure Pathways and Potential Receptors depicted on the CSM figure are defined below.

Exposure pathways describe how a human or environmental receptor comes into contact with contaminants that may be present at the Site. Exposure pathways presented in the CSM include the following:

- Inhalation: This pathway is primarily associated with groundwater contamination within 30 feet of an occupied structure when groundwater elevation is less than 15 feet below surface grade, or when depth to groundwater is unknown. This pathway is applicable when receptors may inhale impacted media in the form of vapor.
- Dermal Absorption: Exposure via dermal absorption occurs when receptors are exposed to chemical concentrations present in soil, groundwater, or surface water through direct contact with the skin.
- Active Ingestion: The active ingestion pathway represents exposure which may occur through the active ingestion of contaminant concentrations via a drinking water supply well or through agricultural products.
- Incidental Uptake This pathway is applicable when receptors may incidentally ingest or inhale impacted media in the form of dust or airborne particulates.

Potential Receptors are categorized by duration of exposure and intensity of use at the Site. The receptor categories described in the CSM include the following:

- Resident: The residential receptor is defined by high durational exposure and high intensity usage which may occur through gardening, digging, and recreational sports. This group includes the occupants of a residential property or a residential neighborhood.
- Commercial: Commercial receptors are those which are present at the Site for long durations but with low intensity exposure such as indoor office workers.
- Site Worker: Site workers are present at the Site for short durations though intensity of use is high, such as during non-routine activities including construction or utility work. Examples include outdoor commercial workers and construction workers.
- Visitor: Visitors are characterized by low duration, i.e. less than two hours per day, and low intensity usage such as that which would occur during activities such as walking, shopping, and bird watching.
- Terrestrial and Aquatic Biota: These receptors include flora and fauna which may be exposed to contaminants in their respective land-based or aquatic environments.

4.4 CONCEPTUAL SITE MODEL SUMMARY

Based on cumulative investigation results for the Site, primary impacted media include surficial soil (PAHs only), subsurface soil (PAHs, lead, and arsenic), and groundwater (arsenic only) due to releases associated with previous Site usage and/or background conditions.

PAHs in surficial soils have the potential to migrate through aeolian dispersion and impact both on-site and off-site residential, commercial, site worker, and visitor, terrestrial biota, and aquatic biota receptors via incidental uptake and dermal absorption. Lead, arsenic, and PAHs, and potential hydraulic oil in subsurface soils have the potential to impact the site worker receptor group during proposed Site redevelopment via incidental uptake and dermal absorption. Terrestrial and aquatic biota also have the potential to be exposed through active ingestion of surficial soil and/or surface water if impacted.

Arsenic in groundwater has the potential to impact Site workers via incidental uptake and dermal absorption during Site redevelopment. The direct active ingestion pathway is not considered open for Site workers because the Site groundwater is not used for drinking purposes.

5. ESTIMATE OF IMPACTED MEDIA AND CLEANUP GOALS

To determine the most appropriate cleanup method for the Site, the volume of impacted media must first be determined and then, the cleanup goals for the Site must be analyzed considering the future reuse of the Site.

5.1 ESTIMATE OF CONTAMINANT-IMPACTED MEDIA

Based on the results of the previous environmental investigations, the estimated volumes of contaminated media include the following:

- Approximately 50 cubic yards of surficial and subsurface soil containing concentrations of PAHs, arsenic, and lead exceeding applicable NHDES SRS are located at Site, based on an approximate area of 225 square feet around boring location SB-5 and an approximate depth of contamination of 6 feet. It should be noted that XRF field screening indicated the presence of arsenic exceeding NHDES SRS in soil borings CA-SB-12 and CA-SB-14 suggesting that the limits of the contaminated soil may extend beyond the approximate limits shown on **Figure 2**. In addition, the contaminated soil may extend deeper than 6 feet at SB-5.
- Arsenic contaminated groundwater present beneath the Site in the area of monitoring wells MW-2, MW-3, and MW-5.
- Approximately 2,580 cubic yards of surficial soil containing background concentrations of PAHs. This estimate is based on an approximate area of the Site of 34,850 square feet and a depth of contamination of 2 feet.

5.2 CLEANUP GOALS

To determine necessary remedial actions at the Site, the sampling results were compared to applicable state and federal standards/guidelines and/or background concentrations. These standards and/or guidelines and associated impacted media are described below.

Soil

Soil containing concentrations of PAHs, arsenic, and/or lead at concentrations exceeding the applicable NHDES SRS, which are detailed in NHDES Env-Or 600 Contaminated Site Management, will require remediation to mitigate further mobilization of arsenic into groundwater and prevent site worker and visitor exposure to these contaminants.

Groundwater

Following soil remediation, groundwater containing arsenic at concentrations currently exceeding the applicable NHDES AGQS detailed in NHDES Env-Or 600 Contaminated Site Management will require monitoring until concentrations are below the AGQS.

6. PRESUMPTIVE REMEDIAL MEASURES

The following presumptive remedial measures are offered:

6.1 MONITORING OF ARSENIC IN GROUNDWATER

Arsenic contaminated groundwater was identified at the Site in monitoring wells MW-2, MW-3, and MW-5. The arsenic appears to have been mobilized from the native mineralogy. Documented petroleum in soil at the Site, and likely past petroleum releases to groundwater, which have already attenuated, have left behind reducing (i.e. low dissolved oxygen and negative oxygen-reduction potential) conditions in groundwater, and have created an environment where mobilization of arsenic occurs readily. Therefore, the source of arsenic in groundwater at the Site is likely historical releases of petroleum at the Site. As the petroleum releases continue to attenuate over time, the concentration of dissolved oxygen in groundwater should increase. The rate of this dissolved oxygen rebound should be accelerated now that the Site buildings have been demolished due to an increased rate of groundwater recharge from infiltration of precipitation in the former building areas. Over time, this increase in dissolved oxygen should result in a transition from a reducing to oxidizing environment, which should significantly limit the ability of arsenic to mobilize and lower the observed concentration in groundwater.

Based on our understanding of the arsenic in groundwater at the Site and our knowledge of groundwater treatment technologies available for arsenic, it is our opinion the only appropriate, reliable, and cost effective solution for remediation is to establish a long term sampling program to monitor arsenic until concentrations drop below AGQS. As such, the implementation of a long-term arsenic groundwater monitoring program at the Site is considered a presumptive remedial measure.

6.2 REMOVAL OF THE HYDRAULIC LIFT CYLINDERS

Two (2) hydraulic lift cylinders were discovered following the demolition of the Site buildings in February 2013. These cylinders likely contain hydraulic oil and require excavation and proper disposal to prevent this oil from releasing to the environment. Because these cylinders cannot be left in place and are easily accessible, the excavation of the cylinders is considered a presumptive remedy.

6.3 PRESUMPTIVE REMEDY COSTS

Costs presented below account for three (3) rounds of groundwater sampling at the Site (MW-2, MW-3, and MW-5) for arsenic analysis and for the excavation and disposal of the identified hydraulic lifts. It should also be noted that soil remediation activities at the Site may damage or destroy existing Site monitoring wells; therefore, it is assumed that additional costs will be incurred to replace the groundwater monitoring well network following soil remediation.

Monitoring Well Replacement (3 wells)	$5,000
Annual Sampling for Arsenic (3 rounds)	$6,000
Hydraulic Lift Removal	$3,000
Total	**$14,000**

The costs presented in this section have been included with each alternative discussed in **Section 8**.

7. EVALUATION OF REMEDIAL ALTERNATIVES

Based on the potential remaining exposure pathways previously discussed, the remedial actions selected for the Site should accomplish the following objectives:

1. Minimize the potential for dermal absorption and incidental uptake of arsenic, lead, and PAH contaminated soil, and,
2. Reduce/eliminate the potential migration pathway to groundwater.

Multiple remedial alternatives are available to address the identified contaminated surficial and subsurface soil. However, based on past experience at sites with similar contaminants and conditions, Credere has pre-screened general advantages and disadvantages of various treatment options and have selected three remedial alternatives for further evaluation and comparison.

1. No Action
2. Soil Removal With Covering
3. Removal of All Impacted Soil

These remedial alternatives were evaluated for implementation at the Site and are further discussed in the following sections.

7.1 SOIL CONTAMINATION

Approximately 50 cubic yards of surficial and subsurface soil containing concentrations of PAHs, arsenic, and lead exceeding applicable NHDES SRS will require remediation, based on an approximate area of 225 square feet around boring location SB-5 and a depth of contamination of at least 6 feet. However, based on XRF field screening results from soil borings SB-12 and SB-14, there is the potential that additional arsenic and/or lead contaminated soil may be present in this area of the Site that would require excavation based on initial field screening and confirmatory laboratory sample results. In addition, approximately 2,580 cubic yards of surficial soil containing concentrations of PAHs exceeding applicable NHDES SRS will require remediation and/or property management, based on an approximate area of the Site of 34,850 square feet and a depth of contamination of at least 2 feet. In order to address the soil contamination at the Site, the following three remedial alternatives will be evaluated.

<u>"No Action" Alternative</u>

A "No Action" alternative signifies that no soil treatment, removal, or remediation would be implemented at the Site. However, the "No Action" alternative does not include a means for mitigating or eliminating potential exposure to contaminated soil. Therefore, the potential for human exposure through dermal absorption and incidental uptake of dust continues to exist for future construction workers or park users. This alternative is presented and discussed through the

subsequent portions of this report as a baseline comparison, and represents the existing conditions at the Site.

Source Removal with Covering Alternative

This alternative would involve the excavation, removal, and disposal of the arsenic, lead, and PAH contaminated subsurface soil in the area of SB-5 to a depth of at least6 feet. Samples of the removed materials would need to be collected and analyzed according to Resource Conservation and Recovery Act (RCRA) requirements and the acceptance criteria for the selected disposal facility. Following removal, confirmatory samples would be collected from the excavation limits and submitted for laboratory analysis to ensure that the cleanup goals are met. Removed soil would be replaced with clean compacted fill to meet future Site development grading specifications.

The PAH contaminated surficial soil would then be covered in-situ in a manner consisting of the following key elements:

a) Temporarily re-routing stormwater drainage during implementation;
b) Excavation and grading of soil to required subgrade based on final Site designs;
c) Placing a permeable geotextile fabric marker layer on top of the excavated areas and existing surface soil to demarcate the contaminated soil being left in place;
d) Construction of an appropriate soil cover system consisting of a minimum of 6 inches of compacted clean fill or loam, or at least 3 inches of fill or gravel sub-base followed by at least 3 inches of asphalt pavement or 4 inches of concrete;
e) Resetting of stormwater conveyance system (if necessary); and,
f) Long-term maintenance and monitoring of the cover system.

Contaminated soil that is required to be excavated to achieve final grades for Site redevelopment may be relocated to areas that require fill onsite. As the entire Site is planned to be covered, the relocation of this material will not affect Site cleanup. If it is not possible to relocate this material on-site, it will be transported to an appropriate receiving facility following property characterization and facility acceptance.

A typical detail for a clean fill, asphalt, or concrete cover system to be placed over the identified contaminated soil is presented on **Figure 4**.

Removal of All Impacted Soil Alternative

The full soil removal alternative would involve the excavation and removal of all arsenic, lead, and PAH contaminated surficial and subsurface soil at the Site. Characterization samples would need to be collected and analyzed according to RCRA requirements and the acceptance criteria for the selected disposal facility. Following removal, confirmatory samples would be collected from the

excavation limits and submitted for laboratory analysis to ensure that the cleanup goals were met and human and environmental risk is adequately managed. Removed soil would be replaced with clean compacted fill based on the required grades for planned future Site development.

8. COMPARISON OF ALTERNATIVES

As discussed in the previous section, three remedial alternatives were evaluated for remediation and/or management of surficial soil contamination and subsurface soil contamination, at the Site. These remedial alternatives have been evaluated and compared to one another using the five criteria listed below:

1. Effectiveness and Reliability
2. Feasibility and Ease of Implementation
3. Risk Reduction & Associated Benefits
4. Cost Effectiveness
5. Estimated Time to Reach "No Further Action"

A brief summary of these five criteria and a discussion as to how they pertain to the available selected remedial alternatives is presented below. A comparison of remedial alternatives with respect to the above-listed criteria for each selected alternative is presented in **Table 1**.

8.1 DESCRIPTION OF EVALUATION CRITERIA

Effectiveness and Reliability

This criterion addresses the ability of the alternative to meet the cleanup standards and the long-term reliability of the alternative.

Feasibility and Ease of Implementation

This criterion analyzes technical feasibility and the availability of services and materials. Availability of services and materials evaluates the need for off-site treatment, storage, or disposal services and the availability of such services. Necessary equipment, specialists, and additional resources are also evaluated.

Risk Reduction and Associated Benefits

This criterion is categorized as a threshold criterion. Alternatives must pass this criterion to be considered for implementation as the recommended alternative. It addresses whether or not a remedy provides adequate protection and describes how the risks posed by the site are eliminated, reduced, or controlled. Protection of human health is assessed by evaluating how risk from each exposure route is eliminated, reduced, or controlled through specific alternatives.

Cost Effectiveness

Cost information presented for the alternatives evaluates the estimated capital, operational and maintenance costs of each alternative. Capital costs include direct capital costs such as materials and

equipment and indirect capital costs such as engineering, contingencies, licenses, and permits. Costs are presented as a balancing criterion such that if a number of remedial alternatives are comparable for the previously discussed criteria, cost may be used as a distinguishing factor in the selection of remedial action. Estimated costs were developed based on prior project and contractor experience, and current estimates received from contractors. Remediation is scheduled to take place in 2013, and as such, costs presented are in year 2013 dollars.

Estimated Time to Reach "No Further Action"

This criterion is defined as the time it will take to achieve "No Further Action" in accordance with state guidelines. New Hampshire Code of Administrative Rules Chapter Env-Or 609.02 states that no additional investigation, remedial measures, or groundwater monitoring will be required and a certificate of "No Further Action" will be issued if all the following criteria have been met:

- All human health hazards associated with direct exposure to contaminants through dermal contact, ingestions, and inhalation have been eliminated;
- All necessary activity and use restrictions have been implemented;
- All sources of groundwater contamination have been eliminated;
- All on-site and off-site dissolved contamination levels meet groundwater quality criteria as specified in Env-Or 603.01;
- All recorded release of recordation notices are on file with the department as required by Env-Or 607.09;
- All penalty(ies) or fine(s) issued under RSA 146-A, RSA 146-C, RSA-147-A, and RSA 485-C have been paid;
- All invoices associated with the NHDES's recoverable cost pursuant to RSA 146-A, RSA 146-C, RSA-147-A, and RSA 485-C have been paid; and
- All fees and costs due under RSA 147-F have been paid.

Because soil remediation at the Site is not a requirement of the NHDES, the time to reach "No Further Action" at the Site will be determined based on the presumptive remedy that includes groundwater monitoring. Therefore, since three rounds of groundwater sampling (i.e. spaced 6 months apart) are planned and it is anticipated that concentrations of arsenic in groundwater will steadily decrease to below NHDES AGQS following remediation activities at the Site, once all financial liabilities have been settled with the NHDES, the time to reach "No Further Action" at the Site is estimated to be 18 months.

8.2 SOIL CONTAMINATION

"No Action" Alternative

The "No Action" alternative involves no soil remediation, removal, or capping, and would not protect future Site construction workers or park users. As such, the "No Action" response is not wholly protective of human health and the environment. Additionally, without action, the toxicity, mobility, and volume of contaminants will not be reduced. Therefore, this alternative is ineffective as a permanent remedial solution. As a result, this alternative will not be further considered as a remedial alternative for the Site.

Source Removal with Covering Alternative

Effectiveness and Reliability

Once the lead and arsenic contaminated subsurface soil is removed, the threat of exposure to these contaminants will be eliminated. In addition, placing a cover system over the PAH contaminated surficial soil will effectively manage the direct contact and incidental uptake exposure pathways associated with these contaminants. These methods have been proven to be reliable in conjunction with long-term maintenance and proper soil management practices.

Feasibility and Ease of Implementation

This alternative would utilize standard construction techniques for the both the off-site disposal of contaminated soil, and the on-site covering of remaining contaminated soil. Therefore, this alternative is technically practical at the Site. Covering contaminated soil is an accepted form of exposure risk reduction and has been proven to be both effective and easily implementable.

Risk Reduction and Associated Benefits

This alternative focuses on mitigating exposure to contaminated soil via dermal absorption and incidental uptake of dust. In addition, covering the PAH contaminated surficial soil with clean soil, concrete, or asphalt, will reduce the exposure risk for Site occupants. A Soil Management Plan will be developed for the management and disposal of soil from the Site in the future to ensure that this risk reduction method remains effective. Covering of remaining contaminated soil is being done voluntarily to manage the risk of background contaminants but is not specifically a requirement of NHDES.

This alternative does not eliminate the risk for contaminated soil left in-place to adversely impact area groundwater. However, PAHs have a low mobility/leaching potential and groundwater has not been adversely impacted by these contaminants.

Recognizing that contaminated soil will remain in place, this alternative only partially fulfills the overall protection of human health and the environment. However, as long as the cover system is properly maintained it would effectively eliminate the dermal absorption and incidental uptake of dust pathways, and adequately reduce the risk of potential future groundwater degradation. The

implementation of a Soil Management Plan will also help ensure the long-term reduction of risk at the Site.

Cost Effectiveness

The estimated costs presented below include the tasks necessary to excavate contaminated soil located in the area of SB-5 and install a cover system over remaining contaminated soil at the Site. Based on the analytical results from the Phase II Investigations, approximately 50 cubic yards (approximately 75 tons) of soil will require excavation and offsite disposal, and an area of 34,850 square feet (0.80 acre) will require the installation of a cover system. Based on prior project experience and contractor budget estimates, the approximate costs to complete this remedial alternative are estimated as follows:

Remedial Planning/Engineering	$25,000
Contractor Mobilization	$2,000
Hydraulic Lift Removal	$3,000
Excavation and Disposal of Contaminated Soil	$26,000
Cover System Installation	$66,000
Site Restoration	$15,000
Cleanup Oversight	$10,000
Cleanup Reporting	$3,300
Soil Management Plan	$2,000
Monitoring Well Replacement	$5,000
Groundwater Monitoring (3 rounds)	$6,000
Total	**$163,300**

Estimated Time to Reach "No Further Action"

The time to reach "No Further Action" at the Site will be driven by the long term monitoring of groundwater for arsenic. Based on the planned three rounds of groundwater sampling (i.e. spaced 6 months apart), it is anticipated that "No Further Action" can be achieved within 18 months of cleanup activities.

Removal of All Impacted Soil Alternative

Effectiveness and Reliability

Once all contaminated soil is removed from the Site, the remedial action objectives have been attained and this alternative would be effective. Removing all contaminated soil from the Site would be a reliable remedial method and would immediately eliminate the direct contact and incidental uptake exposure pathways.

Feasibility and Ease of Implementation

This alternative would utilize standard construction techniques for the excavation and off-site disposal of contaminated soil, and therefore, is technically practical at the Site. Soil removal is an accepted form of exposure risk reduction and has been proven to be both effective and implementable. However, removing large quantities of soil can be cumbersome, increases the need for fill materials, does not support sustainability goals, and can increase project duration and cost.

Risk Reduction and Associated Benefits

This alternative focuses on eliminating exposure to contaminated soil via dermal absorption and incidental uptake of dust by removing all contaminated soil from the Site. Once all contaminated soil is removed, there would be no exposure risks at the Site and long term management plans or institutional controls would not be required.

Cost Effectiveness

The estimated costs presented below include the tasks necessary to fully excavate all contaminated soil on the Site for offsite disposal. Based on the analytical results from the Phase II Investigations, an area of at least 225 square feet of soil will required excavation to a minimum of 6 feet bgs (at least 50 cubic yards or approximately 75 tons), and an area of approximately 34,850 square feet will require excavation to at least 2 feet bgs (2,580 cubic yards or approximately 3,870 tons). Following excavation, significant confirmatory soil sampling would be required across the Site and additional excavation may be necessary. Based on prior project experience and contractor budget estimates, the approximate costs to complete this remedial alternative are estimated as follows:

Remedial Planning/Engineering	$25,000
Contractor Mobilization	$2,000
Hydraulic Lift Removal	$3,000
Excavation and Disposal of Contaminated Soil	$285,000
Backfilling/	$100,000
Oversight/Confirmatory Sampling	$20,000
Site Restoration	$15,000
Cleanup Reporting	$3,300
Monitoring Well Replacement	$5,000
Groundwater Monitoring (3 rounds)	$6,000
Total	**$464,300**

Estimated Time to Reach "No Further Action"

The time to reach "No Further Action" at the Site will be driven by the long term monitoring of groundwater for arsenic. Based on the planned three rounds of groundwater sampling (i.e. spaced 6 months apart), it is anticipated that "No Further Action" can be achieved within 18 months of cleanup activities.

8.3 JUSTIFICATION FOR THE SELECTED REMEDIAL ALTERNATIVE

Each of the alternatives and the comparison criteria are summarized in **Table 1**. Based on the evaluation of the remedial alternatives presented above, the recommended alternative is the source removal with covering alternative. This alternative meets each of the comparison criteria evaluated in this report, and is the best alternative considering the comparison of costs versus benefit for the Site, and meets sustainability goals of the Town of Tilton for the project.

9. PROPOSED REMEDIAL ACTION WORK PLAN

As indicated above, source removal with covering of remaining contaminated soil is the selected alternative to address known conditions at the Site. Credere will coordinate and direct the performance of the selected remedial activities. This section describes Site preparation, source removal, soil covering procedures, and Site closure and reporting activities that will be completed as part of the Site remediation. A Health and Safety Plan for completion of these activities will be prepared prior to start of remediation.

9.1 SOURCE REMOVAL WITH COVERING ALTERNATIVE PROCEDURES

Site Preparation

A limited amount of Site work will be necessary to prepare the area for the soil removal and covering. Site preparation work will include the following:

- Pre-marking the Site for DigSafe;
- Removal of large pieces of debris from the work areas, including trees and brush as necessary;
- Regrading as necessary to prevent runoff from entering the adjacent Winnipesaukee River;
- Setting up erosion and sedimentation controls such as silt fence and hay bales; and,
- Setting up barriers to prevent public access to the Site;

Source Area Removal

Following Site preparation, contaminated soil in the area of SB-5 will be excavated for off-site disposal. Soil will be excavated using the following methods:

- Demarcating the excavation area;
- Establishing a stockpile and/or live loading area for contaminated soil using the appropriate measures to prevent the spread of contaminated soil (e.g. poly sheeting);
- Ensuring dust control measures (e.g. a pressurized water tank to allow for the spraying/wetting of soil) are available at the Site;
- The excavation of contaminated soil in the vicinity of SB-5 as depicted on **Figure 2**, to a depth of at least 6 feet bgs and real-time field screening of the soil excavation margins with an XRF for arsenic and lead;
- Once clean margins are reached, initial excavation confirmatory soil sampling will be conducted with 24-hour laboratory turnaround;
- Following receipt of the laboratory analytical results, the contractor will either be directed to backfill the excavation or to remove additional soil. This process may be repeated until laboratory results indicate that clean excavation margins have been reached.

- Backfilling of the excavation with an approved material in accordance with the project specifications.

Following completion of excavation and backfilling activities, groundwater monitoring will be necessary to determine the effectiveness of source area removal on improving groundwater conditions at the Site.

Cover System Installation

A typical covering detail for clean fill/soil, asphalt, and concrete to be placed over the identified contaminated soil is presented on **Figure 4**. The following covering procedures will be implemented during the remedial action:

- A permeable geotextile fabric or other appropriate marker layer (e.g. snow fence) will be placed directly over the contaminated soil to indicate the distinction between the cover system and the underlying contaminated soil.
- A minimum of 6 inches of clean fill, loam, or gravel (per project specifications) shall be placed as covering materials over contaminated soil. Alternatively, a minimum of 3 inches of clean compacted fill will be placed over the marker layer in areas proposed for future asphalt pavement or concrete surfaces. Additional gravel sub-base materials may be necessary beyond the minimum covering requirements discussed herein to maintain the structural integrity of any road, road shoulders, or other structures associated with the proposed future redevelopment plans.
- Each covered area will be graded so that the stormwater runoff is directed to an appropriate area.
- Seed or landscape the non-paved covered areas to prevent erosion prior to any road construction and final Site work.

9.2 SOIL MANAGEMENT PLAN

A Soil Management Plan will be developed to ensure the physical integrity and effectiveness of the cover system and to minimize future exposure to remaining onsite contaminants. If a disturbance of the cover system or soil is necessary due to future redevelopment of the Site, or for other reasons such as future utility work, the NHDES will be notified and the contaminated soil will be properly managed and disposed in accordance with applicable regulatory guidelines. A monitoring program will be established to evaluate the physical integrity and effectiveness of the cover system.

9.3 STATE AND FEDERAL PERMITS REQUIRED

A NHDES Groundwater Management Permit (GMP) may be necessary for the long term monitoring of the arsenic in groundwater. Other than the GMP, no permits are anticipated as a part of this remediation project. Any necessary permitting will be obtained by others, if necessary, as part of redevelopment.

9.4 REMEDIAL ACTION IMPLEMENTATION REPORTING AND NO FURTHER ACTION

After the PAH, arsenic, and lead impacted soils have been removed and/or covered, the Site will be regraded consistent with final drainage and Site design. All miscellaneous surficial solid waste on the Site, including, but not limited to scrap metal, asphalt, and refuse will be removed from the Site for proper disposal. Any materials used during Site preparation, remedial activities, and construction will also be removed from the Site and waste materials will be properly disposed of.

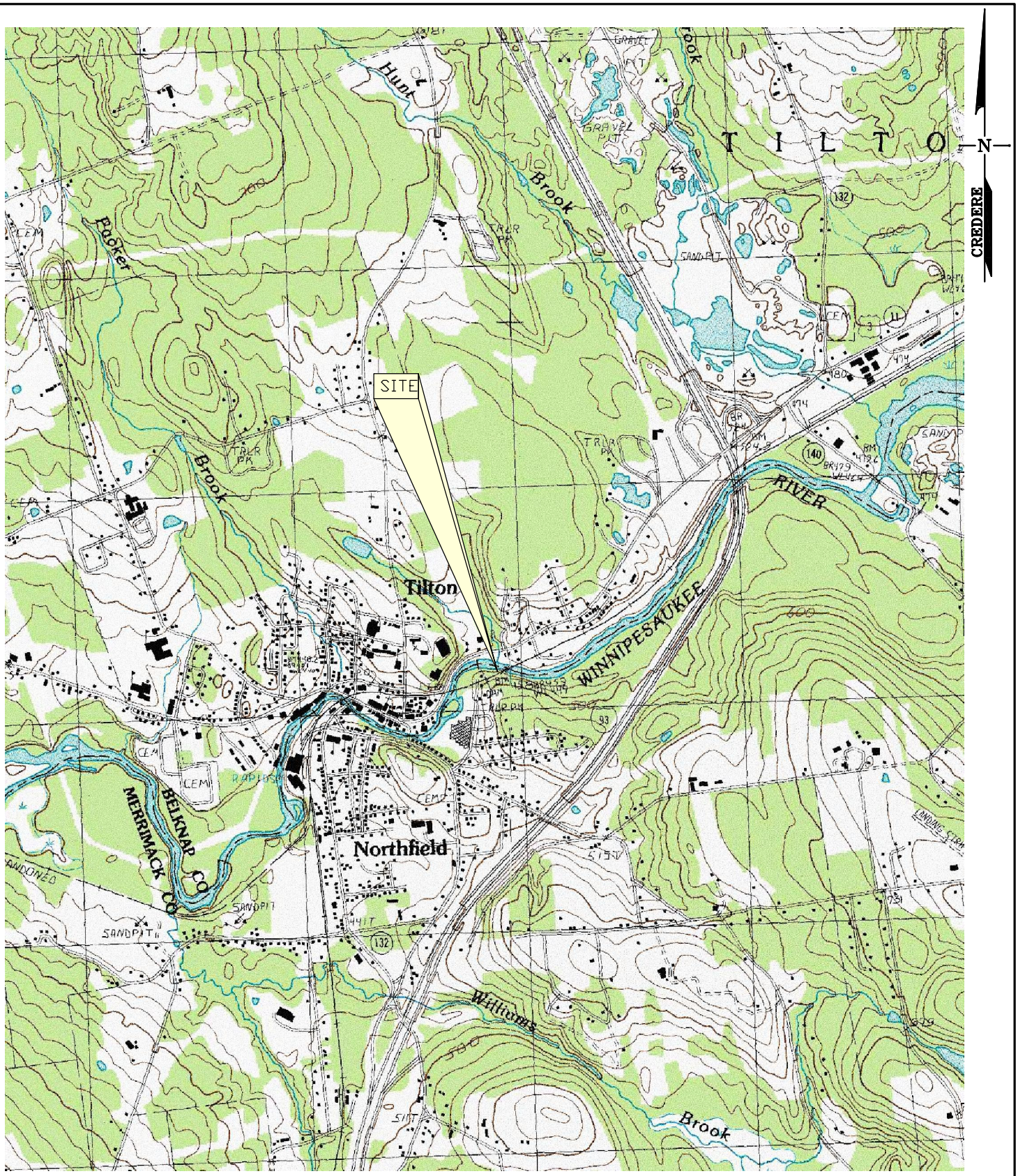
Following soil removal and covering, a Remedial Action Implementation Report (RAIR) will be prepared for the soil remediation activities performed at the Site and submitted to NHDES within 90 days. Groundwater will require additional monitoring for arsenic in monitoring wells MW-2, MW-3, and MW-5 at approximate 6-month intervals (following remediation in October 2013, and May 2014, etc.). Periodic Status Reports will be prepared and submitted to the NHDES following each groundwater sampling event in accordance with Env-Or 606.18 (a–b). If groundwater conditions improve and arsenic remains below the NHDES AGQS for two consecutive sampling events, then the final Periodic Status Report will be prepared that requests the NHDES issue a certificate of "No Further Action."

10. CONCLUSIONS

Credere developed this ABCA for the former Ernie's Auto Sales property located at 180 East Main Street in Tilton, New Hampshire. The purpose of this study is to evaluate potential remedial action alternatives to mitigate identified environmental conditions at the Site. Based on the findings of this study, a summary of our conclusions and recommendations are presented below:

1. Groundwater monitoring of arsenic in groundwater will be employed as a presumptive remedial measure because it is the only effective and reliable approach for this contaminant.
2. The hydraulic lift cylinders identified at the Site will be removed as a presumptive remedial measure to prevent the release of hydraulic oil to the environment and necessary for the redevelopment to occur.
3. Remedial actions are necessary to address PAH, arsenic, and lead impacted surficial and/or subsurface soil and groundwater at the Site. The most appropriate remedial alternative to address the exposure risks to these contaminants is a combination of source removal and covering, which will mitigate the exposure risks for direct contact or incidental uptake of contaminated soil and is expected to reduce arsenic concentrations in groundwater through the removal of arsenic contaminated soil. Future risk posed by remaining contaminated soil at the Site following the completion of the above-described remedies will be managed through of a Soil Management Plan.

FIGURES



USGS 7.5 MINUTE NORTHFIELD, NH QUADRANGLE (1987)

DRAWN BY: WTE	DATE: 2/8/2013
CHECKED BY: RSV/JRN	PROJECT: 12001162

FIGURE 1 - SITE LOCATION PLAN

CREDERE ASSOCIATES, LLC
776 MAIN STREET
WESTBROOK, MAINE 04092
TEL: 207.828.1272
FAX: 207.887.1051
WWW.CREDERELLC.COM

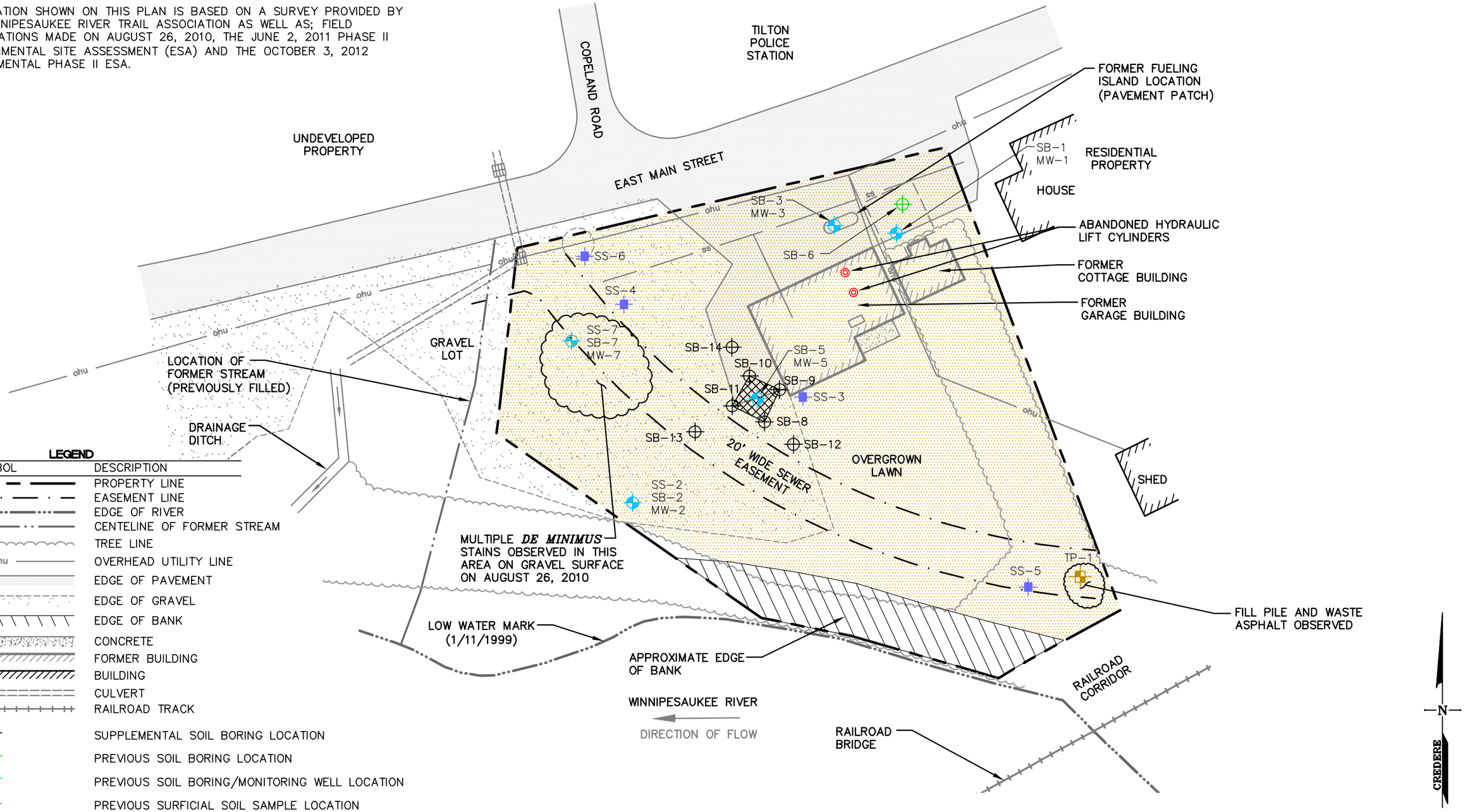
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET
TILTON, NH
NHDES# 199311019

GRAPHIC SCALE
2,000 0 1,000 2,000
1 inch = 2,000ft.

SITE

J:\CREDERE\12001162\SSQAPP-SOIL WORK\Proposed Sampling Plan 2-8-2013.dwg plot date: 2/8/2013 8:54 AM

NOTES:
1. INFORMATION SHOWN ON THIS PLAN IS BASED ON A SURVEY PROVIDED BY THE WINNIPESAUKEE RIVER TRAIL ASSOCIATION AS WELL AS; FIELD OBSERVATIONS MADE ON AUGUST 26, 2010, THE JUNE 2, 2011 PHASE II ENVIRONMENTAL SITE ASSESSMENT (ESA) AND THE OCTOBER 3, 2012 SUPPLEMENTAL PHASE II ESA.



LEGEND

SYMBOL	DESCRIPTION
	PROPERTY LINE
	EASEMENT LINE
	EDGE OF RIVER
	CENTELINE OF FORMER STREAM
	TREE LINE
ohu	OVERHEAD UTILITY LINE
	EDGE OF PAVEMENT
	EDGE OF GRAVEL
	EDGE OF BANK
	CONCRETE
	FORMER BUILDING
	BUILDING
	CULVERT
	RAILROAD TRACK
	SUPPLEMENTAL SOIL BORING LOCATION
	PREVIOUS SOIL BORING LOCATION
	PREVIOUS SOIL BORING/MONITORING WELL LOCATION
	PREVIOUS SURFICIAL SOIL SAMPLE LOCATION
	PREVIOUS TEST PIT LOCATION
	HYDRAULIC LIFT CYLINDER
	ESTIMATED APPROXIMATE EXTENT OF LEAD AND ARSENIC CONTAMINATED SOIL (225 FT² AND 6'± DEPTH)
	EXTENT OF SOIL COVERING SYSTEM

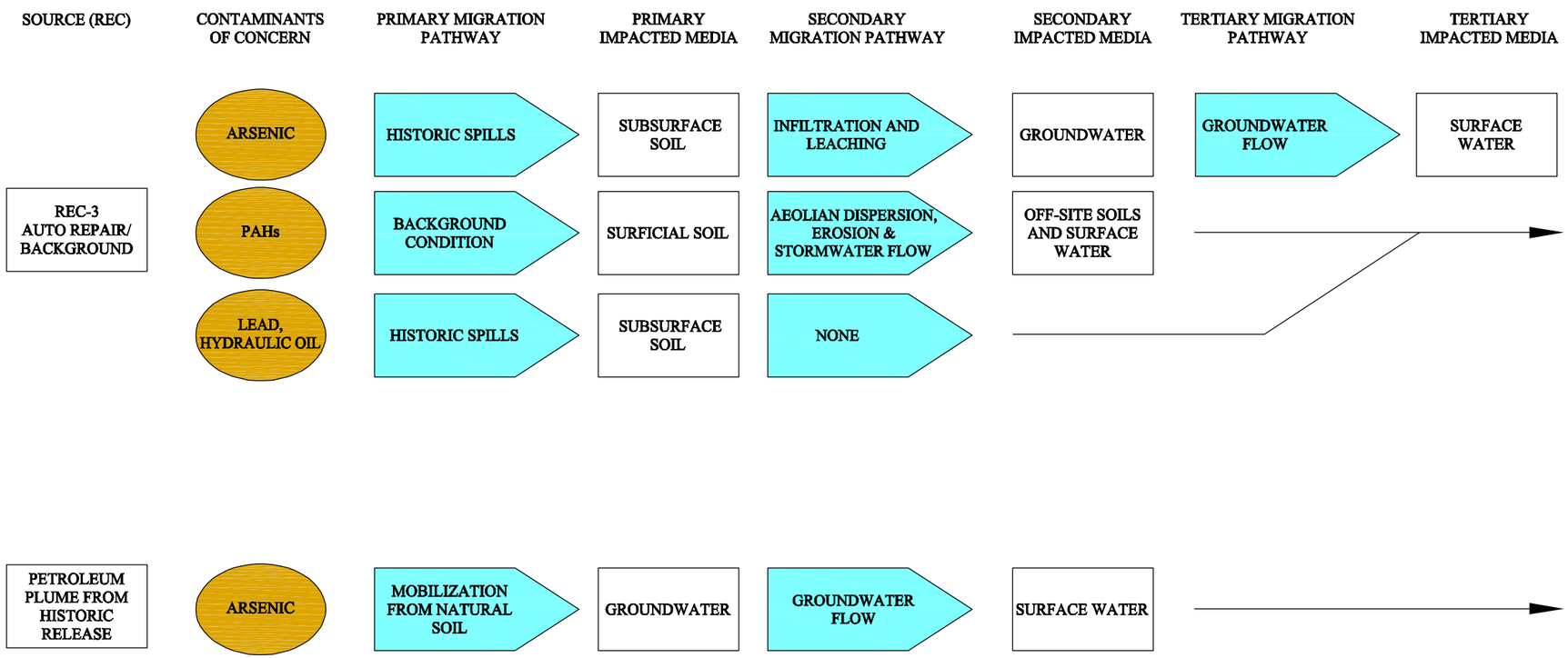
DRAWN BY: WTE	DATE: 2/19/13
CHECKED BY: RSV/JSS	PROJECT: 12001162

CREDERE ASSOCIATES, LLC
776 MAIN STREET
WESTBROOK, MAINE 04092
TEL: 207.828.1272
FAX: 207.887.1051
WWW.CREDERELLC.COM

FIGURE 2
DETAILED SITE PLAN

ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET
TILTON, NH
NHDES #199311019

GRAPHIC SCALE
40 0 20 40
1 inch = 40 ft.



POTENTIAL EXPOSURE PATHWAYS

	RESIDENTIAL	COMMERCIAL	SITE WORKER	VISITOR	TERRESTRIAL BIOTA	AQUATIC BIOTA
INHALATION						
DERMAL ABSORPTION	X	X	X	X	X	X
ACTIVE INGESTION					X	X
INCIDENTAL UPTAKE	X	X	X	X	X	X

POTENTIAL EXPOSURE PATHWAYS

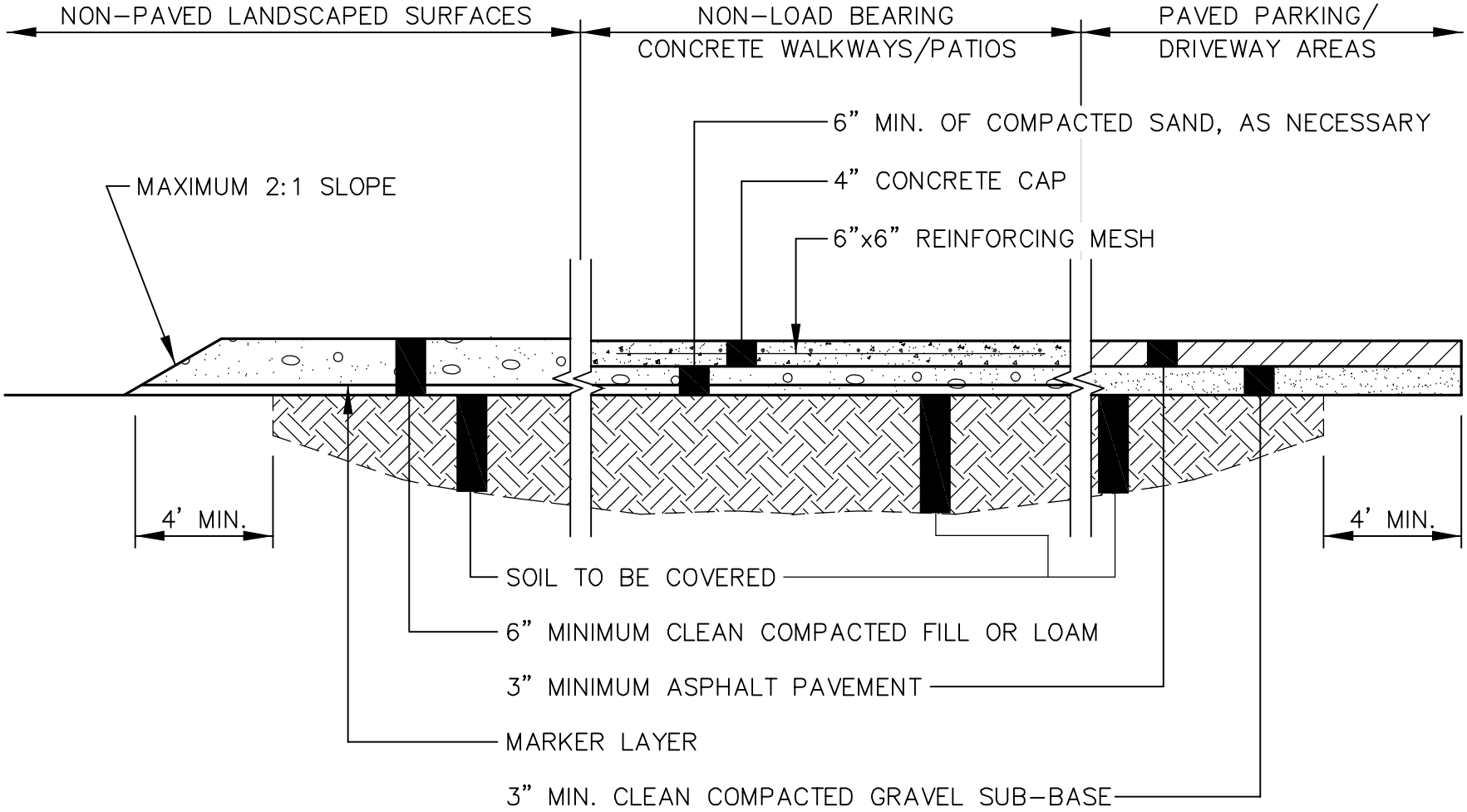
	RESIDENTIAL	COMMERCIAL	SITE WORKER	VISITOR	TERRESTRIAL BIOTA	AQUATIC BIOTA
INHALATION						
DERMAL ABSORPTION			X			X
ACTIVE INGESTION						X
INCIDENTAL UPTAKE						X

DRAWN BY: WTE	DATE: 2/20/13
CHECKED BY: RSV/JSS	PROJECT: 12001162

Credere Associates, LLC
776 Main Street
Westbrook, Maine 04092
Tel. (207) 828-1272
Fax (207) 887-1051
www.crederellc.com

FIGURE 3
UPDATED CONCEPTUAL SITE MODEL

ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET
TILTON, NH
NHDES #199311019



NOTE

THE QUANTITIES IDENTIFIED ARE MINIMUM REQUIREMENTS FOR COVERING OF THE IDENTIFIED CONTAMINATED SOILS. ADDITIONAL SUB-BASE MATERIALS MAY BE REQUIRED IN AREAS PROPOSED FOR ASPHALT PAVING AND/OR CONCRETE SIDEWALKS/PATIOS, AS NECESSARY, TO MAINTAIN STRUCTURAL INTEGRITY OF THESE MATERIALS.

DRAWN BY: WTE | DATE: 2/15/2013
CHECKED BY: JRN | PROJECT: 12001162

CREDERE ASSOCIATES, LLC
776 MAIN STREET
WESTBROOK, MAINE 04092
TEL: 207.828.1272
FAX: 207.887.1051
WWW.CREDERELLC.COM

SOIL COVERING SCHEMATIC

ERNIE'S AUTO SALES
180 EAST MAIN STREET
TILTON, NEW HAMPSHIRE
NHDES# 199311019

SKETCH NO: FIGURE 4

SCALE: N.T.S.

J:\CREDERE\12001162\ABCA-RAP FIGURES\Cover Schematic.dwg plot date: 3/6/2013 2:06 PM

TABLES

Table 1
Former Ernie's Auto Sales
180 East Main Street
Tilton, New Hampshire

Summary of Remedial Alternatives for Contaminated Soil

Remedial Alternative	1) No Action	2) Source Removal with Covering	3) Removal of All Impacted Soil
Effectiveness & Reliability	• Not Effective or Reliable.	• Soil excavation and covering has been proven effective and reliable. • Maintenance of cover system over time is required.	• Soil removal/excavation is an accepted form of remediation and has been proven highly effective and reliable.
Feasibility & Ease of Implementation	• Not feasible but easily implementable.	• Cover system installation utilizes standard construction techniques and is, therefore, technically feasible for the Site and is easily implementable.	• Removal utilizes standard excavation and construction techniques for removal of the contaminated soil and, therefore, is technically feasible for the Site and easily implementable.
Risk Reduction and Associated Benefits	• No reduction in risks. • Risks to human health by direct contact, incidental uptake, and ingestion will remain. • No reduction in toxicity, mobility, or volume of the contaminated media.	• Risks to human health by direct contact, and incidental uptake are reduced by removing and/or covering contaminated soil. • The implementation of a Soil Management Plan will ensure that onsite covered soils are not disturbed inappropriately. If the material must be disturbed during future construction, it will be properly managed and disposed. This will limit potential exposure to impacted media onsite. • Covering will reduce the risk of human contact with contaminated soil; however, institutional controls do not to reduce the toxicity or volume of contamination onsite.	• Risks to human health by direct contact, and incidental uptake of contaminated soil are eliminated by removing these materials from site. • Risk to the environment is eliminated by removal of the contaminated soil. • The volume of contaminated soil on the Site is eliminated; therefore the toxicity and mobility of the contaminants is reduced.
Cost Effectiveness	• No Cost	• $163,300 to excavate 50 cubic yards of contaminated soil and install a cover system of 34,850 square feet of contaminated soil.	• $464,300 to excavate all contaminated soil on the Site for offsite disposal.
Estimated Time to Reach "No Further Action"	• NFA will not be achieved.	• NFA will be achieved as soon as the excavated soil is disposed of off-site, the cover system is installed, and arsenic in groundwater is below NHDES AGQS (18 months).	• NFA will be achieved as soon as the excavated soil is disposed of off-site and arsenic in groundwater is below NHDES AGQS (18 months).
Comments	• This alternative does not remove the recognized environmental conditions and contamination stigma from the Site, therefore, hindering redevelopment.	• This is an appropriate remedial alternative because it meets the goals and objectives of the cleanup project.	• Removing large quantities of soil can be cumbersome, increases the need for fill materials, can increase project duration and cost, and does not meet sustainability goals.

APPENDIX A

PHASE II INVESTIGATION SAMPLE SUMMARY TABLES

TABLE 1
ERNIES AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE

SUMMARY OF EXPLORATION LOCATIONS AND SAMPLING METHODS

Location Name	Sample Depth (feet)	Media Sampled	Type of Exploration	Sampling Method
TP-1	0-2	Subsurface Soil	Test Pit Composite	Pre-cleaned Trowel
SS-2	0-2	Surficial Soil	Surficial Soil Sample	Pre-cleaned Split-Spoon
SS-3	0-2	Surficial Soil	Surficial Soil Sample	Pre-cleaned Trowel
SS-4	0-2	Surficial Soil	Surficial Soil Sample	Pre-cleaned Trowel
SS-5	0-2	Surficial Soil	Surficial Soil Sample	Pre-cleaned Trowel
SS-6	0-2	Surficial Soil	Surficial Soil Sample	Pre-cleaned Trowel
SS-7	0-2	Surficial Soil	Surficial Soil Sample	Pre-cleaned Split-Spoon
SB-1	9-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-2	8-9.5	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-3	10-12	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-5 (4-6)	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-5 (8-10)	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-6	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-7	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
MW-1	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-2	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-3	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-5	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-7	NA	Groundwater	Monitoring Well	Low-flow Sampling

TABLE 2
ERNIES AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE

SUMMARY OF PHOTO IONIZATION DEVICE FIELD SCREENING RESULTS

Location	Sample Depth (feet bgs)	Sample Date	PID Results (ppmv)	Evidence of Petroleum Impact or Petroleum Saturated Soils
Test Pit Sample				
TP-1	0-2*	12/2/2010	1.6	No Evidence Observed
Surficial Soil Samples				
SS-1	0-2*	12/2/2010	1.4	No Evidence Observed
SS-2	0-2*	12/6/2010	2.7	No Evidence Observed
SS-3	0-2*	12/2/2010	1.7	No Evidence Observed
SS-4	0-2*	12/2/2010	1.6	No Evidence Observed
SS-5	0-2*	12/2/2010	2.6	No Evidence Observed
SS-6	0-2*	12/2/2010	1.6	No Evidence Observed
SS-7	0-2*	12/6/2010	2.2	No Evidence Observed
Subsurface Soil Samples				
SB-1	0-2	12/6/2010	ND	No Evidence Observed
	2-4		ND	No Evidence Observed
	4-6		1.7	No Evidence Observed
	6-7		ND	No Evidence Observed
	7-8		ND	No Evidence Observed
	8-9		14.7	Petroleum Odor
	9-10*		325.0	Petroleum Odor
	10-12		40.2	Petroleum Odor
	12-14		6.7	No Evidence Observed
SB-2	0-2	12/6/2010	2.7	No Evidence Observed
	2-4		2.7	No Evidence Observed
	4-6		2.9	No Evidence Observed
	6-8		3.0	No Evidence Observed
	8-9.5*		2.5	No Evidence Observed
	9.5-10		2.3	No Evidence Observed
	10-12		ND	No Evidence Observed
SB-3	0-2	12/6/2010	6.6	No Evidence Observed
	2-4		2.7	No Evidence Observed
	4-6		2.5	No Evidence Observed
	6-8		1.6	No Evidence Observed
	8-9		13.2	Petroleum Odor
	10-12*		79.8	Petroleum Odor
SB-5	0-2	12/6/2010	2.3	No Evidence Observed
	2-4		2.3	No Evidence Observed
	4-6*		4.1	No Evidence Observed
	6-8		2.5	No Evidence Observed
	8-10*		8.2	Petroleum Odor
	10-12		3.2	Petroleum Odor
	12-14		2.7	No Evidence Observed
SB-6	0-2	12/6/2010	ND	No Evidence Observed
	2-4		ND	No Evidence Observed
	4-6		ND	No Evidence Observed
	6-8*		ND	No Evidence Observed
	8-10		2.5	No Evidence Observed
	10-12		1.9	No Evidence Observed
	12-14		ND	No Evidence Observed
SB-7	0-2	12/6/2010	2.2	No Evidence Observed
	2-4		2.5	No Evidence Observed
	4-6		2.3	No Evidence Observed
	6-8		5.3	No Evidence Observed
	8-10*		200.3	Petroleum Odor
	10-12		5.4	No Evidence Observed

Notes:
Samples were field screened using a Thermo OVM 580B PID; the PID was calibrated using 100 ppm isobutylene and a response factor of 1.0.
ND - VOCs not detected with PID
ppmv - parts per million by volume
bgs - below ground surface

TABLE 3
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE

SUMMARY OF X-RAY FLUORESCENT FIELD SCREENING RESULTS FOR RCRA 8 METALS

Location	Sample Depth (feet bgs)	Sample Date	NHDES Soil Remediation Standard and Metal Concentration (mg/kg)							
			Cr	As	Se	Ag	Cd	Ba	Hg	Pb
			130	11	180	89	33	1,000	6	400
Test Pit Sample										
TP-1	2	12/2/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	71
Surficial Soil Samples										
SS-1	0-2	12/2/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	56
SS-2	0-2	12/6/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	41
SS-3	0-2	12/2/2010	131	<LOD	<LOD	<LOD	<LOD	370	<LOD	111
SS-4	0-2	12/2/2010	<LOD	17	<LOD	<LOD	<LOD	<LOD	<LOD	108
SS-5	0-2	12/2/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	54
SS-6	0-2	12/2/2010	<LOD	<LOD	6	<LOD	<LOD	<LOD	<LOD	60
SS-7	0-2	12/6/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	13	70
Subsurface Soil Samples										
SB-1	0-2	12/6/2010	115	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	63
	2-4		<LOD	14	<LOD	<LOD	<LOD	<LOD	<LOD	44
	4-6		<LOD	12	<LOD	<LOD	<LOD	<LOD	<LOD	36
	6-7		<LOD	9	3	<LOD	<LOD	<LOD	<LOD	33
	7-8		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	14
	8-9		<LOD	<LOD	<LOD	<LOD	<LOD	428	<LOD	21
	9-10		<LOD	16	<LOD	<LOD	<LOD	<LOD	<LOD	17
	10-12		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
	12-14		<LOD	44	<LOD	<LOD	<LOD	<LOD	<LOD	27
SB-2	0-2	12/6/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	41
	2-4		<LOD	13	<LOD	<LOD	<LOD	<LOD	<LOD	39
	4-6		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	49
	6-8		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	40
	8-9.5		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	18
	9.5-10		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	76
	10-12		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	28
SB-3	0-2	12/6/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	42
	2-4		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	33
	4-6		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	24
	6-8		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	18
	8-10		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	22
	10-12		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	28
SB-5	0-2	12/6/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	40
	2-4		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	246
	4-6		<LOD	110	<LOD	<LOD	<LOD	<LOD	47	5873
	6-8		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	106
	8-10		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	44
	10-12		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	25
	12-14		<LOD	8	<LOD	<LOD	<LOD	<LOD	<LOD	11
SB-6	0-2	12/6/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	38
	2-4		<LOD	<LOD	<LOD	<LOD	<LOD	368	<LOD	65
	4-6		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	44
	6-8		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	38
	8-10		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	24
	10-12		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	16
	12-14		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	18
SB-7	0-2	12/6/2010	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	13	70
	2-4		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	61
	4-6		<LOD	<LOD	<LOD	<LOD	<LOD	478	<LOD	145
	6-8		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	10	32
	8-10		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	38
	10-12		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	29

<LOD - Concentration less than instrument level of detection

Exceeds NHDES Soil Remediation Standards

bgs - below ground surface

TABLE 4
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE

SUMMARY OF ANALYTICAL RESULTS FOR SOIL SAMPLES

Parameter	Regulatory Standard	Subsurface Soil Sample Location, Date, and Depth (feet)														
	Soil Remediation[2] (mg/kg)	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	TP-1	DUP-SS	SB-1	SB-2	SB-3	SB-5(4-6)	SB-5(8-10)	SB-6	SB-7
		12/6/2010	12/2/2010	12/2/2010	12/2/2010	12/2/2010	12/6/2010	12/2/2010	12/2/2010	12/6/2010	12/6/2010	12/6/2010	12/6/2010	12/6/2010	12/6/2010	12/6/2010
		0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-0.5'	9-10'	8-9.5'	10-12'	4-6'	8-10'	6-8'	8-10'
Volatile Organic Compounds (mg/kg) EPA Method 8260B[1]																
Chloroform	NE	**0.1**	ND<0.1	ND<0.1	--	--	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	--	ND<0.1	ND<0.1	ND<0.1
n-propylbenzene	85	ND<0.1	ND<0.1	ND<0.1	--	--	ND<0.1	ND<0.1	ND<0.1	**0.2**	ND<0.1	ND<0.1	--	ND<0.1	ND<0.1	**0.4**
1,3,5-trimethylbenzene	6	ND<0.1	ND<0.1	ND<0.1	--	--	ND<0.1	ND<0.1	ND<0.1	**0.2**	ND<0.1	ND<0.1	--	ND<0.1	ND<0.1	ND<0.1
1,2,4-trimethylbenzene	130	ND<0.1	ND<0.1	ND<0.1	--	--	ND<0.1	ND<0.1	ND<0.1	**0.8**	ND<0.1	ND<0.1	--	ND<0.1	ND<0.1	**0.2**
Sec-butylbenzene	130	ND<0.1	ND<0.1	ND<0.1	--	--	ND<0.1	ND<0.1	ND<0.1	**0.3**	ND<0.1	ND<0.1	--	ND<0.1	ND<0.1	**0.7**
4-isopropyltoluene	3,400	ND<0.1	ND<0.1	ND<0.1	--	--	ND<0.1	ND<0.1	ND<0.1	**0.2**	ND<0.1	ND<0.1	--	ND<0.1	ND<0.1	**0.2**
Naphthalene	5	ND<0.1	ND<0.1	ND<0.1	--	--	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	--	**4.0**	ND<0.1	ND<0.1
Total Petroleum Hydrocarbons (mg/kg) EPA Method 8100M																
TPH	10,000	**730**	ND<210	ND<220	ND<230	--	ND<210	--	ND<220	ND<220	ND<240	ND<220	--	**6,200**	ND<220	ND<270
Metals EPA Method 6010C																
Arsenic	11	**6.8**	--	**8.7**	**6.2**	--	**7.8**	**6.7**	**8.8**	**11**	**3.1**	**10**	**14**	--	--	**7.4**
Barium	1,000	**43**	--	**61**	**43**	--	**49**	**48**	**69**	**36**	**36**	**63**	**310**	--	--	**43**
Cadmium	33	ND<0.2	--	ND<0.2	ND<0.2	--	ND<0.2	ND<0.2	ND<0.2	ND<0.2	**0.3**	ND<0.2	**0.8**	--	--	**0.3**
Chromium	130*	**13**	--	**21**	**12**	--	**16**	**12**	**20**	**15**	**54**	**21**	**23**	--	--	**42**
Lead	400	**30**	--	**59**	**44**	--	**53**	**48**	**58**	**8.2**	**30**	**11**	**750**	--	**14**	**44**
Mercury	6	**0.07**	--	**0.11**	ND<0.07	--	**0.14 M**	ND<0.07	**0.13**	ND<0.07	**0.17**	ND<0.07	**0.26**	--	--	ND<0.08
Selenium	180	ND<3	--	ND<3	ND<3	--	ND<3	ND<3	ND<3	ND<3	ND<3	ND<2	ND<3	--	--	ND<3
Silver	89	ND<0.4	--	ND<0.4	ND<0.4	--	ND<0.4	ND<0.4	ND<0.4	ND<0.4	**0.6**	ND<0.3	ND<0.4	--	--	ND<0.5
Copper	NE	--	--	--	**18**	--	--	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (mg/kg) EPA Method 8270D[1]																
Acenaphthylene	490	**0.7**	--	**1.2**	**0.71**	--	**0.7**	**0.6**	**0.7**	ND<0.5	ND<0.6	ND<0.5	ND<2.9	--	--	ND<0.7
Phenanthrene	960	**2.6**	--	**2.2**	**2.8**	--	**2.7**	**1.9**	**1.4**	ND<0.5	**0.7**	ND<0.5	ND<2.9	--	--	**1.0**
Anthracene	1,000	**0.7**	--	ND<0.5	**1.3**	--	**0.7**	**0.7**	ND<0.6	ND<0.5	ND<0.6	ND<0.5	ND<2.9	--	--	ND<0.7
Fluoranthene	960	**5.6**	--	**4.6**	**12**	--	**4.1**	**7.0**	**2.7**	ND<0.5	**1.1**	ND<0.5	ND<2.9	--	--	**1.5**
Pyrene	720	**5.9**	--	**5.3**	**9.8**	--	**4.0**	**6.5**	**3.1**	ND<0.5	**1.3**	ND<0.5	ND<2.9	--	--	**1.8**
Benzo[a]anthracene	1	**2.9**	--	**2.8**	**3.5**	--	**1.8**	**4.2**	**1.5**	ND<0.5	ND<0.6	ND<0.5	**0.6**	--	--	**0.7**
Chrysene	120	**2.9**	--	**3.6**	**6.3**	--	**2.3**	**4.0**	**2.1**	ND<0.5	**0.7**	ND<0.5	ND<2.9	--	--	**1.0**
Benzo[b]fluoranthene	1	**2.8**	--	**2.1**	**3.3**	--	**1.2**	**3.1**	**1.1**	ND<0.5	ND<0.6	ND<0.5	**1.2**	--	--	ND<0.7
Benzo[k]fluoranthene	12	**2.3**	--	**2.6**	**3.3**	--	**1.7**	**2.5**	**1.4**	ND<0.5	ND<0.6	ND<0.5	ND<2.9	--	--	ND<0.7
Benzo[a]pyrene	0.7	**2.5**	--	**2.6**	**2.4**	--	**1.5**	**3.4**	**1.4**	ND<0.5	ND<0.6	ND<0.5	**1.1**	--	--	ND<0.7
Indeno(1,2,3-cd)pyrene	1	**0.6**	--	**1.4**	**1.3**	--	**0.6**	**1.9**	**0.8**	ND<0.5	ND<0.6	ND<0.5	ND<0.6	--	--	ND<0.7
Dibenzo(a,h)anthracene	0.7	ND<0.5	--	**0.6**	**0.68**	--	ND<0.5	**0.6**	ND<0.6	ND<0.5	ND<0.6	ND<0.5	ND<2.6	--	--	ND<0.7
Benzo(g,h,i)perylene	960	**0.6**	--	**1.6**	**1.4**	--	**0.6**	**2.2**	**1.0**	ND<0.5	ND<0.6	ND<0.5	**0.7**	--	--	ND<0.7
Polychlorinated Biphenyls (mg/kg) EPA Method 8082[1]																
PCB-1260	1	ND<0.2	--	ND<0.2	--	ND<0.2	ND<0.2	--	ND<0.2	ND<0.2	**0.6**	**0.2**	ND<0.2	--	--	**0.3**

NOTES:
[1] Only analytes identified above detection limit are summarized .
[2] New Hampshire Soil Remediation Standards from the Risk Characterization Management Policy Env-Or 606.19, Soil Remediation Criteria.
* = The regulatory threshold for chromium VI was used because it is the most stringent standard for chromium.
M = Matrix spike recovery was outside the control limits of 75% - 125%. Matrix interference suspected.
NE = No regulatory guideline established
ND<0.1 = Not detected above quantitation limit (i.e. 0.2 mg/kg)
-- = Intentionally not sampled
Bold Exceeds laboratory quantitation limit
Laboratory quantitation limit exceeds regulatory standard
Exceeds NH DES Soil Remediation Standards.

TABLE 5
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE

SUMMARY OF GROUNDWATER MONITORING WELL GAUGING AND GROUNDWATER ELEVATIONS

MONITORING WELL ID	WELL LOCATION	WELL DEPTH (ft bgs)	(1) WELL ELEVATION (ft)	GROUND ELEVATION AT WELL (ft)	(2) DEPTH TO GROUNDWATER (ft)	(3) CALCULATED GROUNDWATER ELEVATION (ft)	LNAPL THICKNESS (ft)
Overburden Monitoring Wells							
MW-1	In area of former waste oil UST	13.47	463.34	463.86	7.19	456.15	None Observed
MW-2	In suspected dump and fill area on south side of subject property	13.50	461.97	462.29	8.75	453.22	None Observed
MW-3	In area of former fueling island	13.50	462.96	463.43	6.88	456.08	None Observed
MW-5	Downgradient of garage building	13.48	461.94	462.29	6.55	455.39	None Observed
MW-7	In suspected dump and fill area on west side of subject property	13.40	460.83	461.30	6.06	454.77	None Observed

Notes:
(1) The highest point on the top of PVC casing was surveyed
(2) Groundwater levels gauged to top of PVC riser using an electronic water level meter.
(3) Groundwater Elevation = Ground Elevation at Well - (Ground Elevation at Well - Well Elevation) - Depth to Groundwater
Measured groundwater elevations shown on this table are different from bottom of soil boring exploration shown on soil boring logs.
LNAPL = Light non-aqueous phase liquid.

TABLE 6
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES

Parameter	Regulatory Standard	Sample Location and Date						
	NH AGQS[2] (µg/L)	MW-1	MW-2	MW-3	MW-5	MW-7	DUP-MW	TRIP BLANK
		12/8/2010	12/8/2010	12/8/2010	12/8/2010	12/8/2010	12/8/2010	12/8/2010
[1]Volatile Organic Compounds (ug/L) EPA Method 8260B								
Xylene (m&p)	10,000	ND<2	ND < 2	ND<2	ND < 2	ND < 2	**2**	ND<2
Isopropylbenzene	800	ND<2	ND < 2	**3**	ND < 2	ND < 2	ND<2	ND<2
n-propylbenzene	260	**4**	ND < 2	**12**	ND < 2	ND < 2	**3**	ND<2
1,3,5-trimethylbenzene	330	**4**	ND < 2	ND < 2	ND < 2	ND < 2	**4**	ND<2
1,2,4-trimethylbenzene	330	**14**	ND < 2	**22**	ND < 2	ND < 2	**14**	ND<2
Sec-butylbenzene	260	**2**	ND < 2	**3**	ND < 2	ND < 2	**2**	ND<2
Metals EPA Method 6010C (ug/L)								
Arsenic	10	ND<8	**18**	--	**19**	ND<8	ND<8	--
Barium	2,000	ND<50	**140**	--	**60**	**170**	ND<50	--
Cadmium	5	ND<4	ND<4	--	ND<4	ND<4	ND<4	--
Chromium	100	ND<50	ND<50	--	ND<50	ND<50	ND<50	--
Lead	15	ND<8	ND<8	ND<8	ND<8	ND<8	ND<8	--
Mercury	2	ND<0.2	ND<0.2	--	ND<0.2	ND<0.2	ND<0.2	--
Selenium	50	ND < 50	ND<50	--	ND<50	ND<50	ND<50	--
Silver	100	ND < 7	ND<7	--	ND < 7	ND<7	ND<7	--
[1]Polycyclic Aromatic Hydrocarbons (ug/L) EPA Method 8270D								
Naphthalene	20	ND < 0.5	**1.1**	--	ND < 0.5	ND<0.5	ND < 0.5	--

NOTES:

[1] Only analytes above detection level are summarized.

[2] New Hampshire Code of Administrative Rules Ambient Groundwater Quality Standards (AGQS), effective July 23, 2008.

NE = No regulatory guideline established.

ND<0.2 = Not detected above quantitation limit (i.e. 0.2 ug/L).

NS = Not Sampled.

Bold Exceeds laboratory quantitation limit.

Exceeds NHDES Ambient Groundwater Quality Standards.

TABLE 7
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE

SUMMARY OF ANALYTICAL RESULTS FOR POTENTIAL PCB-CONTAINING BULK PRODUCT SAMPLES

Parameter	Regulatory Standard	Building Materials Sample Identification Number, Date, and Description			
	PCB Bulk Product Waste[2] (mg/kg)	BM-1	BM-2	BM-3	BM-4
		12/8/2010	12/8/2010	12/8/2010	12/8/2010
		Cottage Exterior White Paint	Garage Interior Pink Paint	Cottage Mastic Under Linoleum Tiles On Wall	Cottage Blue Paint On Rear Door
[1]Polychlorinated Biphenyls (mg/kg) EPA Method 8082					
Aroclor 1016	-	ND<0.2	**2.2**	ND<0.1	ND <0.2
Aroclor 1254	-	**0.5**	ND <0.2	**0.5**	**2.5**
Aroclor 1260	-	ND<0.2	ND <0.2	ND<0.1	**2.4**
TOTAL PCBs	**50**	**0.5**	**2.2**	**0.5**	**4.9**

NOTES:

[1] Only those PCB aroclors identified above detection limit are summarized .

[2] 40 CFR 761.3

PCB = Polychlorinated biphenyl

ND<0.1 = Not detected above quantitation limit (i.e. 0.1 mg/kg)

Bold = Exceeds laboratory quantitation limit

Exceeds Federal Regulatory Standard

TABLE 8
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE

SUMMARY OF DUPLICATE SAMPLE ANALYSES

Parameter	NHDES Threshold [1]	Quantitation Limit (mg/kg) or (ug/L)	5x Quantitation Limit	Sample [2]	Duplicate	Relative Percent Difference
VOCs						
DUP-SS; duplicate of SS-4 0-2'						
All parameters non-detect.						
DUP-MW; duplicate of MW-1						
1,2,4-trimethylbenzene	330	2	10	14	14	0.0%
All other parameters non-detect or below 5X quantitation limit						
TPH						
DUP-SS; duplicate of SS-4 0-2'						
All parameters non-detect.						
DUP-MW; duplicate of MW-1						
Not analyzed for TPH						
Metals						
DUP-SS; duplicate of SS-4 0-2'						
Arsenic	11	0.5	2.5	8.7	8.8	1.1%
Barium	1,000	3.0	15.0	61	69	12.3%
Chromium	130	3.0	15.0	21	20	4.9%
Lead	400	0.5	2.5	59	58	1.7%
All other parameters non-detect or below 5X quantitation limit						
DUP-MW; duplicate of MW-1						
All parameters non-detect.						
PAHs						
DUP-SS; duplicate of SS-4 0-2'						
Fluoranthene	960	0.5	2.5	4.6	2.7	52.1%
Pyrene	720	0.5	2.5	5.3	3.1	52.4%
All other parameters non-detect or below 5X quantitation limit						
DUP-MW; duplicate of MW-1						
All parameters non-detect.						
PCBs						
DUP-SS; duplicate of SS-4 0-2'						
All parameters non-detect.						
DUP-MW; duplicate of MW-1						
Not analyzed for PCBs						

NOTES:

[1] New Hampshire Soil Remediation Standards Env-Or 606.19 or Env-Or 603.3 Ambient Groundwater Quality Standards.

[2] Only analytes above detection level and five times the quantitation limit are summarized herein.

NA - Not applicable

NC - RPD Not calculated due to results being below five times the PQL

NE - Not established

ND - All analyte concentrations were below the analytical method practical quantitation limit

Exceeds Relative Percent Difference quality control limit of 35% for samples as specified in the Generic QAPP

TABLE 9
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE

LEAD-BASED PAINT SURVEY RESULTS

Reading No.	XRF Meter Mode	Pass Fail Standard	Lead Concentration (mg/cm^2)	+/-	Building	Interior or Exterior	Building Side	Component	Color
1	Standardization	PASS							
2	Lead Paint Inspection	Negative	0.07	0.06	garage	exterior	side a	door	white
3	Lead Paint Inspection	Positive	1.6	0.2	garage	exterior	side a	door	white
4	Lead Paint Inspection	Positive	1.07	0.07	garage	exterior	side a	door	white
5	Lead Paint Inspection	Negative	0	0	garage	exterior	side a	window sill	white
6	Lead Paint Inspection	Negative	0	0	garage	exterior	side a	window frame	white
7	Lead Paint Inspection	Negative	0	0	garage	exterior	side a	window frame	white
8	Lead Paint Inspection	Negative	0.07	0.04	garage	exterior	side a	sign	--
9	Lead Paint Inspection	Negative	0.02	0.02	garage	exterior	side a	sign	--
10	Lead Paint Inspection	Negative	0	0	garage	exterior	side a	window frame	white
11	Lead Paint Inspection	Negative	0	0	garage	exterior	side a	window frame	white
12	Lead Paint Inspection	Negative	0.01	0.02	garage	exterior	side b	window frame	white
13	Lead Paint Inspection	Negative	0	0	garage	exterior	side d	rear door	white
14	Lead Paint Inspection	Negative	0.67	0.07	cottage	exterior	side a	siding center	white
15	Lead Paint Inspection	Positive	1.29	0.15	cottage	exterior	side a	siding right	white
16	Lead Paint Inspection	Positive	1.96	0.22	cottage	exterior	side a	siding right	white
17	Lead Paint Inspection	Negative	0.72	0.07	cottage	exterior	side a	trim right	blue
18	Lead Paint Inspection	Negative	0.05	0.02	cottage	exterior	side a	trim right	blue
19	Lead Paint Inspection	Negative	0	0	cottage	exterior	side a	trim center	blue
20	Lead Paint Inspection	Positive	3.29	0.51	cottage	exterior	side a	trim left	blue
21	Lead Paint Inspection	Positive	2.55	0.21	cottage	exterior	side a	trim left	blue
22	Lead Paint Inspection	Positive	1.59	0.23	cottage	exterior	side a	white siding	white
23	Lead Paint Inspection	Negative	0.68	0.13	cottage	exterior	side d	siding	white
24	Lead Paint Inspection	Positive	1.27	0.14	cottage	exterior	side d	siding	white
25	Standardization	PASS							
26	Lead Paint Inspection	Positive	1.02	0.09	cottage	exterior	side d	trim	blue
27	Lead Paint Inspection	Positive	2.17	0.29	cottage	exterior	side c	siding	white
28	Lead Paint Inspection	Negative	0.11	0.05	cottage	exterior	side c	trim	blue
29	Lead Paint Inspection	Negative	0.22	0.06	cottage	exterior	side b	siding	white
30	Lead Paint Inspection	Negative	0.81	0.07	cottage	exterior	side b	siding	white
31	Lead Paint Inspection	Negative	0.55	0.08	cottage	exterior	side b	siding	white
32	Lead Paint Inspection	Positive	2.27	0.3	cottage	exterior	side b	siding	white
33	Lead Paint Inspection	Negative	0.02	0.02	cottage	interior	--	trim	pale
34	Lead Paint Inspection	Negative	0.01	0	cottage	interior	--	trim	pale
35	Lead Paint Inspection	Negative	0.02	0.02	cottage	interior	--	trim and door	black
36	Lead Paint Inspection	Negative	0.02	0.02	cottage	interior	--	trim and door	black
37	Lead Paint Inspection	Negative	0.83	0.08	cottage	interior	--	trim and door	black
38	Lead Paint Inspection	Positive	1.5	0.24	cottage	interior	--	trim and door	black
39	Lead Paint Inspection	Negative	0.79	0.1	cottage	interior	--	trim and door	black
40	Lead Paint Inspection	Negative	0	0	cottage	interior	--	wall	pale
41	Lead Paint Inspection	Negative	0.01	0.02	cottage	interior	--	wall	pale
42	Lead Paint Inspection	Negative	0	0	cottage	interior	--	wall	pale
43	Lead Paint Inspection	Negative	0.01	0.01	cottage	interior	--	wall	pale
44	Lead Paint Inspection	Negative	0	0	cottage	interior	--	wall	white
45	Lead Paint Inspection	Negative	0	0	cottage	interior	--	wall	white
46	Lead Paint Inspection	Negative	0.01	0.01	cottage	interior	--	wall	white
47	Lead Paint Inspection	Positive	1	0.21	garage	exterior	--	old siding	white
48	Standardization	PASS					--		
49	Lead Paint Inspection	Negative	0.02	0.02	garage	exterior	--	old siding	blue
50	Lead Paint Inspection	Positive	1	0.03	garage	exterior	--	old siding	blue
51	Lead Paint Inspection	Negative	0	0	garage	interior	--	wall	white
52	Lead Paint Inspection	Negative	0	0	garage	interior	--	wall	white
53	Lead Paint Inspection	Negative	0.18	0.13	garage	interior	--	front door	--
54	Lead Paint Inspection	Positive	1.4	0.18	garage	interior	--	front door	--
55	Lead Paint Inspection	Negative	0	0	garage	interior	--	wall	pink
56	Lead Paint Inspection	Negative	0	0	garage	interior	--	wall	pink
57	Lead Paint Inspection	Negative	0	0	garage	interior	--	wall	pink
58	Lead Paint Inspection	Positive	1.73	0.25	garage	interior	--	garage wall	black
59	Lead Paint Inspection	Negative	0	0	garage	interior	--	garage wall	p-board
60	Lead Paint Inspection	Negative	0	0	garage	interior	--	garage wall	wood
61	Lead Paint Inspection	Negative	0.01	0	garage	interior	--	garage wall	wood
62	Lead Paint Inspection	Negative	0	0	garage	interior	--	garage wall	p-board
63	Lead Paint Inspection	Positive	3.15	0.41	garage	interior	--	garage wall	black
64	Lead Paint Inspection	Positive	3.6	0.7	garage	interior	side a	garage door	--
65	Lead Paint Inspection	Negative	0.1	0.1	garage	interior	side a	garage wall	white

NOTES:
XRF = X-Ray fluorescense
+/- = Probable variation
-- = Side not identified because surface is easily identifiable within building
Positive = Lead concentration > 1.0 mg/cm^2

APPENDIX B

SUPPLEMENTAL PHASE II INVESTIGATION SAMPLE SUMMARY TABLES

TABLE 1
ERNIES AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE
NHDES #199311019

SUMMARY OF EXPLORATION LOCATIONS AND SAMPLING METHODS

Location Name	Sample Depth (feet)	Media Sampled	Type of Exploration	Sampling Method
SB-8	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-9	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-10	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-11	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	5-7	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	7-9	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	9-11	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-12	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-13	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-14	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
MW-1	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-2	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-3	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-5	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-7	Could Not Be Located			

Notes:
Monitoring well MW-7 could not be located during the July 26, 2011 groundwater sampling activities.

TABLE 2
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE
NHDES #199311019

SUMMARY OF X-RAY FLUORESCENT FIELD SCREENING RESULTS FOR ARSENIC AND LEAD

Location	Sample Depth (feet bgs)	Sample Date	NHDES Soil Remediation Standard Metal Concentration (mg/kg)	
			As	Pb
			11	400
Subsurface Soil Samples				
SB-8	0-2*	7/26/2011	<LOD	**57**
	2-4		<LOD	**228**
	4-6*		<LOD	**44**
	6-8		<LOD	**59**
	8-10*		<LOD	**29**
SB-9	0-2*	7/26/2011	<LOD	**211**
	2-4		<LOD	**25**
	5-7*		<LOD	**51**
	7-9		<LOD	**51**
	9-11*		<LOD	**17**
SB-10	0-2*	7/26/2011	<LOD	**72**
	2-4		<LOD	**81**
	4-6*		<LOD	**50**
	6-8		<LOD	**240**
	8-10*		<LOD	**20**
SB-11	0-2*	7/26/2011	<LOD	**67**
	2-4		<LOD	**69**
	4-6*		<LOD	**63**
	6-8		<LOD	**44**
	8-10*		<LOD	**17**
SB-12	0-2	7/26/2011	**10**	**44**
	2-4		**15**	**83**
	4-6		**12**	**96**
	6-8		<LOD	**16**
	8-10		<LOD	**64**
SB-13	0-2	7/26/2011	<LOD	**45**
	2-4		<LOD	**77**
	4-6		<LOD	**38**
	6-8		<LOD	**68**
	8-10		<LOD	**17**
SB-14	0-2	7/26/2011	**11**	**88**
	2-4		<LOD	**39**
	4-6		<LOD	**108**
	6-8		<LOD	**74**
	8-10		<LOD	**20**

<LOD - Concentration less than instrument level of detection

Exceeds NHDES Soil Remediation Standards

* = Sample submitted to laboratory for analysis

bgs - below ground surface

TABLE 3
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE
NHDES #199311019

SUMMARY OF LABORATORY ANALYTICAL RESULTS FOR SOIL SAMPLES

Parameter	Regulatory Standard	Soil Sample Location, Date, and Depth (feet)												
	Soil Remediation[2] (mg/kg)	SB-5(4-6)	SB-8(0-2)	SB-8(4-6)	SB-8(8-10)	SB-9(0-2)	SB-9(5-7)	SB-9(9-11)	SB-10(0-2)	SB-10(4-6)	SB-10(8-10)	SB-11(0-2)	SB-11(4-6)	SB-11(8-10)
		12/6/2010	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011
		4-6'	0-2'	4-6'	8-10'	0-2'	5-7'	9-11'	0-2'	4-6'	8-10'	0-2'	4-6'	8-10'
Metals EPA Method 6010C														
Arsenic	11	**14**	**8.2**	**8.1**	**3.6**	**7.1**	**7.1**	**2.4**	**6.4**	**6.1**	**7.9**	**9.3**	**6.2**	**3.9**
Lead	400	**750**	**43**	**48**	**7.9**	**30**	**130**	**25**	**140**	**87**	**19**	**45**	**63**	**9.1**

NOTES:
Bold Exceeds laboratory quantitation limit
Sampled during initial Phase II activities
Exceeds NH DES Soil Remediation Standards.

TABLE 4
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE
NHDES #199311019

SUMMARY OF GROUNDWATER MONITORING WELL GAUGING AND GROUNDWATER ELEVATIONS

MONITORING WELL ID	WELL LOCATION	WELL DEPTH (ft bgs)	(1) WELL ELEVATION (ft)	GROUND ELEVATION AT WELL (ft)	(2) DEPTH TO GROUNDWATER (ft)	(3) CALCULATED GROUNDWATER ELEVATION (ft)	LNAPL THICKNESS (ft)
Overburden Monitoring Wells							
MW-1	In area of former waste oil UST	13.2	463.34	463.86	7.90	455.44	None Observed
MW-2	In suspected dump and fill area on south side of subject property	13.40	461.97	462.29	10.65	451.32	None Observed
MW-3	In area of former fueling island	13.20	462.96	463.43	7.52	455.44	None Observed
MW-5	Downgradient of garage building	13.25	461.94	462.29	7.54	454.40	None Observed
MW-7	In suspected dump and fill area on west side of subject property	Not Found					

Notes:
(1) The highest point on the top of PVC casing was surveyed
(2) Groundwater levels gauged to top of PVC riser using an electronic water level meter.
(3) Groundwater Elevation = Well Elevation - Depth to Groundwater
LNAPL = Light non-aqueous phase liquid.

TABLE 5
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE
NHDES #199311019

SUMMARY OF LABORATORY ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES

Monitoring Well Location	Sampling Date	Metals
		Dissolved Arsenic
AGQS (µg/L)		10
MW-1	12/8/2010	ND<8
	7/26/2011	ND<8
MW-2	12/8/2010	**18**
	7/26/2011	**29**
MW-3	12/8/2010	NS
	7/26/2011	**15**
MW-5	12/8/2010	**19**
	7/26/2011	**15**
MW-7	12/8/2010	ND<8
	7/26/2011	NS

NOTES:
ND <8 = Not detected above quantitation limit (i.e. 8 µg/l)
NS - Not sampled
Bold Exceeds laboratory quantitation limit
Exceeds NHDES Ambient Groundwater Quality Standards (AGQS).

TABLE 6
ERNIE'S AUTO SALES PROPERTY
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE
NHDES #199311019

SUMMARY OF DUPLICATE SAMPLE ANALYSES

Parameter	NHDES Threshold [1]	Quantitation Limit (mg/kg) or (ug/L)	5x Quantitation Limit	Sample	Duplicate	Relative Percent Difference
Metals						
DUP-SB-1; duplicate of SB-11(8-10)						
Arsenic	11	0.8	4.0	3.9	5.3	30.4%
Lead	400	0.8	4.0	9.1	7.4	20.6%
DUP-MW; duplicate of MW-5						
Dissolved Arsenic	10	8	40.0	15	16	6.5%

NOTES:
[1] New Hampshire Soil Remediation Standards Env-Or 606.19 or Env-Or 603.3 Ambient Groundwater Quality Standards.
Exceeds Relative Percent Difference quality control limit of 35% for samples as specified in the Generic QAPP