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DRAFT Analysis of Brownfields Cleanup Alternatives and Remedial Action Plan

Prime Tanning Facility
Lots 130 and 133
35 and 34 Sullivan Street, Berwick, Maine

Prepared for and funded by:
Town of Berwick
11 Sullivan Street, Berwick, Maine
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1. INTRODUCTION

Credere Associates, LLC (Credere) was retained by the Town of Berwick, Maine, (Berwick) to prepare this Analysis of Brownfields Cleanup Alternatives and Remedial Action Plan (ABCA/RAP) for the Prime Tanning Facility Lots 130 and 133 located at 35 and 34 Sullivan Street, respectively, in Berwick, Maine (Site). Berwick is using United States (U.S.) Environmental Protection Agency (EPA) Brownfield Cleanup Grants (BF-00A00197 and BF-00A00445) to conduct cleanup activities. This ABCA/RAP is being prepared to facilitate redevelopment plans for the Site.

1.1 PURPOSE AND SCOPE

The purpose of this report is to evaluate appropriate cleanup alternatives to mitigate environmental conditions at the Site identified through previous environmental investigations. The previous environmental investigations are described in detail in **Section 2**. Consistent with the findings of these investigations, environmental conditions to be addressed at the Site include the following:

- Surficial soil across the Site containing concentrations of polycyclic aromatic hydrocarbons (PAHs) and metals exceeding applicable residential, park user and/or commercial Maine Department of Environmental Protection (DEP) Remedial Action Guidelines for Sites Contaminated with Hazardous Substances (RAGs)
- Subsurface soils at the Site potentially containing concentrations of volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), PAHs, Resource Conservation and Recovery Act (RCRA) 8 metals exceeding applicable residential, park user and/or commercial Maine DEP RAGs
- Subsurface soils beneath the Site building potentially containing concentrations of VOCs, exceeding applicable Maine DEP RAGs
- Brook sediment at the Site potentially containing VOCs, SVOCs, RCRA 8 metals, extractable petroleum hydrocarbon (EPH) target compounds, volatile petroleum hydrocarbon (VPH) target compounds exceeding applicable residential, park user, and/or commercial Maine DEP RAGs
- Hazardous building materials (HBM) potentially present within/on existing the Lot 130 Site building

1.2 SITE DESCRIPTION

The Site is comprised of two parcels (Lots 130 and 133), totaling 3.48 acres. The main former Prime Tanning Facility and vacant Prime Tanning Lot 95 adjoin the Site to the south. The Site is located within a mixed residential and commercial area of Berwick.

Lot 130 is 0.68 acres with one Site building (referred to as the Blue Sort Building) totaling 14,341 square feet. The Blue Sort Building is currently used as storage space and heated using fuel oil-fired air handlers. Water service is provided publicly by the Berwick Water Department and

wastewater services are provided to the Blue Sort Building by the Berwick Sewer Commission. Electrical service is provided by Central Maine Power.

Lot 133 is 2.8 acres and is developed as a parking lot. The parking lot occupies the southern portion of Lot 133 and was formerly used for Prime Tanning employee parking. The remainder of the Site is comprised of dense vegetation. There are no water/sewer connections serving this lot, but a temporary electric service drop is evident along the western property boundary (along Sullivan Street).

1.3 SITE HISTORY

The Town of Berwick acquired the Site in 2014, along with the other Prime Tanning Facility parcels in a public-private partnership with the Funds of Jupiter (FOJ; Prime Tanning primary mortgage holder). The Prime Tanning facility has a long history of industrial use including as a tannery dating back to the late 1800's. This history has been documented in numerous other environmental reports. However, excerpts of the history as they relate to the two Site parcels are provided below:

Lot 130

Manufacturing operations began on Lot 130 as early as 1887 and included shoe manufacturing, planing mill operations, and building materials and lumber supplier until at least 1965. The former buildings on this parcel were removed and the Blue Sort Building was constructed sometime before 1974, presumably at the same time or shortly after Prime Tanning acquired the property. The Blue Sort Building was used for storage related to the main Prime Tanning Facility. The building also housed hide shaving operations until the Prime Tanning facility closed in 2008. Since that time the building has only been intermittently used for the storage of lawn care equipment.

Lot 133

Lot 133 previously contained residential buildings and stables beginning by at least 1887 until circa 1965. By 1974 the lot was owned and operated by Prime Tanning and was principally used as an employee parking lot. The parking lot was paved in 1989 and remains in deteriorated condition to present day. A garage/shed structure was reportedly located in the northwestern portion lot circa 1979 until approximately 2004. Records also indicate that from at least 1981 to 1984, an office building was also located on the Site and used by Prime Tanning.

1.4 PROPOSED REUSE

The current redevelopment plans for the Site involve the redevelopment of Lot 130 into residential condominiums and the redevelopment of Lot 133 into a mix of market rate and workforce apartments.

2. SUMMARY OF PREVIOUS INVESTIGATIONS

The following are summaries of prior environmental reports completed for the Site. Some investigations were completed for the Site as well as the adjoining Prime Tanning parcels to the south and southeast. Only information pertaining to the Site is summarized below.

Phase I Environmental Site Assessment (ESA), ENSR Corp. (ENSR), October 2007

ENSR prepared a Phase I ESA for the Site and adjoining Prime Tanning Facility parcels on behalf of Meriturn Partners. The following recognized environmental conditions (RECs) as they relate to the current Site parcels were identified. Other RECs identified that do not related to the current Site parcels are not summarized below:

- Former tannery operations that likely included the use and disposal of oils, solvents, chromium solutions, and wastewater; as well as the potential burial of waste hide (leather) scraps.
- Historical industrial use of the Blue Sort Building that included processing of hides

Secondary Sourced Hazardous Waste Documents and RCRA Closure, 2008-2010

The following summary of older pertinent environmental information regarding the Site was summarized from Ransom's June 14, 2010, ESA for the Site and adjoining Prime Tanning Facility parcels:

On September 10, 2008, Prime Tanning notified Maine DEP of their intention to close out their Large-Quantity Generator status in conjunction with closure of the Berwick, Maine, facility. The facility formerly generated D001 ignitable wastes derived from mineral spirits and D007 chromium wastes. The letter documented 33 spills of hazardous and non-hazardous materials to the Site between 1983 and 2008, and the locations of hazardous waste storage and accumulation areas. Most of these documented releases occurred to other portions of the facility.

Tewhey Associates prepared a Hazardous Waste Closure Plan that outlined steps for closure of the Berwick facility in November 2008 in accordance with Maine DEP Chapter 851, Section 11. Per the plan, Maine DEP Remedial Action Guidelines for Sites Contaminated with Hazardous Substances (RAGs) were to be used as cleanup goals during Site closure certification. Remedial actions included cleaning the internal floor trench system, assessment and remediation of the hazardous waste storage and satellite accumulation areas, testing and remediation of the dye/dry weigh up rooms, shutdown and remediation of the wastewater treatment plant (located off-Site), locating and properly disposing of leather residue, completing an inventory, proper documentation, and shipment of remaining chemicals and chemical waste, and conducting a historical assessment and interviews.

Maine DEP provided conditional approval of the plan on November 20, 2008, but highlighted the need to remove all leather waste from the Site. To address DEP's condition, subsequent plan addendums indicated, per interviews, waste material was not intentionally disposed on-Site but

were temporarily stored south of Wilson Street with a gravel fill cover (Addendum No. 1); and test pitting was proposed for additional investigation (Addendum No. 2).

Tewhey Associates prepared a Test Pit Program letter report dated February 16, 2009. Six test pits were excavated along the eastern edge of Lot 133, no leather hides, ash, or debris material was observed within these test pits. Hides were discovered north of the main facility during other test pitting work.

The RCRA Closure Certification was submitted to Maine DEP in May 2009. The report documented chemicals formerly used at the Site, disposal of universal/hazardous wastes, remediation and cleaning of the floor drain system, cleaning the treatment plant pipelines, emptying aboveground storage tanks (ASTs), disposal of leather scraps (from the main facility), and consolidating machinery and unused chemicals to the Prime Tanning's Hartland, Maine, facility. As of June 2010, Maine DEP indicated closure activities met closure requirements.

Phase I ESA, Ransom, June 14, 2010

Ransom prepared a Phase I ESA for Southern Maine Regional Planning Commission (SMRPC) on behalf of Prime Tanning Company, Inc. The following RECs as they relate to the current Site parcels were identified. Other RECs identified that do not related to the current Site parcels are not summarized below:

- Historical generation, storage, and releases of hazardous materials at the Site that may have impacted soil, soil vapor, and/or groundwater
- Documented buried leather debris (hides) identified on the Site and the unknown construction history of the Site buildings indicate hides, leather scraps, construction/demolition debris, or other solid waste may have been buried at the Site
- Use, storage and potential releases of oil and/or hazardous materials associated with historical occupation by a shoe factory and lumber company
- Unknowns associated with the former garage in the northwest portion of the Site
- Historical uses of adjacent and upgradient properties including industrial uses may have impacted environmental conditions at the Site
- Potential release to soil and groundwater as evidence by oil and chemical staining throughout the tannery facility

Additionally, the following non-scope items were identified in the Phase I ESA:

- Suspect asbestos containing building materials (ACM), polychlorinated biphenyl (PCB)-containing building materials, and lead-based paint (LBP) observed in/on the Site buildings

PCB Caulk Screen, Summit Environmental Consultants, Inc. (Summit), August 26, 2010

Summit collected ten samples of caulking associated with exterior wall and window systems and submitted them for PCB analysis. As no figure was included in this report, it is unclear which suspect PCB-containing materials were sampled from the Blue Sort Building. No PCBs were

detected above the laboratory reporting limits in the ten caulking samples; however, it is unclear if all suspect materials were sampled.

Asbestos Identification Survey, Summit, September 1, 2010

Summit collected samples of suspect ACM from the Blue Sort Building and buildings located on the adjoining main Prime Tanning Facility parcel. Three samples of suspect ACM were collected of spray on wall and ceiling insulation from the Blue Sort Building. Laboratory results indicated this material did not contain asbestos.

Phase II ESA, St. Germain-Collins (SGC), October 15, 2010

Based on previous Phase I ESA findings and conclusions, SGC identified six Areas of Concern (AOC) for the Site, as follows:

- AOC 1 – Tannery South (off-Site, on the main Prime Tanning Facility parcel)
- AOC 2 – Tannery Central (off-Site, on the main Prime Tanning Facility parcel)
- AOC 3 – Tannery North (off-Site, on the main Prime Tanning Facility parcel)
- AOC 4 – Lot 133
- AOC 5 – Lot 95 (off-Site former residential lot)
- AOC 6 – Lot 130

Contaminants of concern for the investigation were petroleum hydrocarbons, solvents, metals, PAHs, and PCBs. SGC collected soil vapor, soil, and ground water samples for analysis. Conclusions regarding the current Site parcels are summarized below. Additional conclusions relating to the adjoining Prime Tanning Facility parcels are not summarized:

- Soil across the Site was identified to contain only wood and metal debris.
- PAHs were detected in AOCs 1, 3, 4, and 6; however, results were considered representative of the urban environment.
- Lead results exceeded the residential and commercial RAGs in AOCs 1, 3, and 4.
- Due to Site limitations, soil and groundwater was not assessed in areas beneath the Site buildings.

Maine DEP Voluntary Response Action Program (VRAP) No-Action Assurance Letter (NAAL), December 3, 2010

Maine DEP issued a NAAL on December 3, 2010, under their VRAP. This letter releases the VRAP applicants and future owner from certain environmental liabilities under the following conditions:

- Preparation of a Soil Management Plan (SMP) for Maine DEP approval prior to Site excavation or foundation removal in AOCs 1, 2, 3, or 6 (AOC locations are provided in the 2010 Phase II ESA report).

- Notification of Maine DEP prior to Site excavation or foundation removal on AOCs 1, 2, 3, or 6, and oversight of such work by a qualified environmental professional. If contaminated soil is identified, the Maine DEP must be notified and additional soil characterization and/or remedial actions may be required.
- If contaminated soil is to be left in place and not covered with a new foundation, a cover system consisting of a cover/marker layer and at least 12 inches of clean fill, or a Maine DEP-approved impervious layer, must be installed.
- If a new building is constructed, a vapor management system to prevent the potential migration of petroleum and VOC vapors into the structure must be developed and stamped by a Maine Professional Engineer, and approved by the Maine DEP.
- If existing buildings are to remain in place, indoor air quality sampling must be conducted and results must comply with current appropriate regulatory guidelines/standards for the proposed reuse of the building. If indoor air samples do not meet these guidelines, a remedial plan must be submitted to the Maine DEP for review and approval.
- If building demolition/renovation activities are to be conducted on-Site, potentially hazardous building construction materials (e.g., asbestos) must be handled and disposed of appropriately.
- Additional investigation is required to determine if tetrachloroethylene (PCE) vapors are migrating off-Site. If the Site is being considered for residential use, additional investigation and remediation may be required.
- Groundwater extraction shall be prohibited without the written permission of the Maine DEP. It is understood that public water will be supplied to the property if future redevelopment requires potable water.
- Upon completion of the redevelopment and any associated remediation, a Declaration of Environmental Covenants (DEC) consistent with the final Certificate of Completion or No Further Action letter, that is acceptable to the Maine DEP, must be prepared and recorded at the York County Registry of Deeds.

Phase I ESA and Phase I ESA Update, SGC, May 25, 2012, and August 9, 2013, respectively

SGC completed a Phase I ESA on May 25, 2012 on behalf of Verrill Dana. The report was updated after a period of 180 days on August 9, 2013. The following RECs as they relate to the current Site parcels were identified. Other RECs identified that do not related to the current Site parcels are not summarized below:

- The long history of the Site as a tannery, involving the storage, use, and possible release of petroleum products and hazardous substances
- The detection of soil, groundwater, and soil vapor contamination on the Site

ABCA/RAP, Credere, December 6, 2016

Credere completed an ABCA/RAP for off-Site Lots 1, 2, 3, and 7 of Lot 146, and Lot 133, dated December 6, 2016. The ABCA/RAP was completed to determine the appropriate remedial alternative to be implemented on those parcels. The following presumptive remedies were included for Lots, 1, 2, 3, 7, and 133:

- Remediation of out-of-service universal or other regulated waste materials in the Site buildings

The following remedial alternative was selected for Lots 1, 2, 3, 7, and 133:

- Partial Building Removal, VOC Source Removal or Mitigation, Surface Soil Covering, Vapor Intrusion Mitigation, Abatement and Proper Disposal of Hazardous Building Materials, and Institutional Controls

Although this ABCA/RAP included Lot 133, which is part of the current Site boundary, no remedial activities were conducted on that lot. This ABCA/RAP is intended to supersede the previous ABCA/RAP because a new remedial concept has been developed in concert with Lot 130.

3. CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) was developed using the findings of the previous investigations and will be updated in as new data becomes available. This CSM includes a description of the physical setting of the Site, Contaminants of Potential Concern (COPCs), nature and extent of contamination, exposure pathways, and potential human and environmental receptors.

3.1 SITE DESCRIPTION

A detailed Site description consisting of Site use, Site location as depicted on **Figure 1**, and Site utilities is included in **Section 1.2**.

3.2 SITE HISTORY

A description of Site history as it relates to current environmental conditions at the Site is included in **Section 1.3**.

3.3 PHYSICAL SETTING

Topography

Based on Credere's Site observations and the United States Geological Survey (USGS) Topographic Map of the Somersworth Quadrangle, Maine, Site topography of Lot 133 is sloped to the east towards an unnamed brook that runs adjacent to the eastern lot boundary. The topography of Lot 130 is flat with a slight topographic gradient to the east and south. An excerpt from available USGS maps that cover the Site is included as **Figure 1**.

Geological Characteristics

Surficial Geology

According to the Maine Geological Survey (MGS) Surficial Geology map of the Somersworth Quadrangle, Maine, the Site is mapped as glacial till consisting of silt, clay, sand, and gravel of variable composition. Soil borings from previous investigations indicate that surficial geology is layered silty sand, clay and some sand deposits. Artificial fill including leather scraps, metal, glass, and rubble have been identified in some areas of the Site and adjoining main Prime Tanning Facility parcel.

Bedrock Geology

According to the MGS Bedrock Geology map of the Somersworth Quadrangle, Maine, bedrock beneath the Site consists of Silurian feldspathic quartz-biotite granofels, calc-silicate granofels and subordinate quartz-biotite schist of the Berwick Formation. During previous investigations at the Site and adjoining main Prime Tanning Facility parcel, refusal indicating possible bedrock was encountered between 4 and 20 feet below ground surface (bgs).

Hydrology

The Site is located within the surficial drainage basin of the Salmon Falls River, located approximately 200 feet south and west of the Site. The Salmon Falls River flows to the south southeast and discharges to Piscataqua River and then to the Atlantic Ocean, approximately 20 miles from the Site. Precipitation that falls on the Site either infiltrates into Site soil, drains via sheet flow or enters the storm drain system and discharges to the Salmon Falls River. Some ponded water is evident on Lot 130 due to a clogged loading ramp storm water drain.

Previous work at the Site identified depths to groundwater across the Site ranging between approximately 0.5 and 6 feet bgs. Prior environmental investigations have identified groundwater to flow generally south towards the Salmon Falls River. According to the Maine DEP Significant Sand and Gravel Aquifers Map reviewed during this Phase I ESA, no high yielding aquifers are present beneath the Site.

Changing Climate Concerns

Based on the National Oceanic and Atmospheric Administration (NOAA) interactive map of Sea Level Rise and Coastal Flooding Impacts (https://coast.noaa.gov/digitalcoast/tools/slr), sea level rise of up to 6 feet and associated increased coastal flooding is not expected to impact the Site.

The Site is located within 250-feet of the Salmon Falls River. According to FEMA Flood Zone Map 23031C0538G, the Site is not located within a flood zone. Increased frequency of weather events may impact exterior portions of the Site and may result in localized flooding and increased erosion of improperly stabilized surface soil.

Based on the nature of the proposed reuse of the Site and location of the Site outside of a flood zone, changing temperature, wildfires, changing dates of ground thaw/freezing, changing ecological zone, and saltwater intrusion table are not likely to affect the Site.

3.4 SOURCE AREAS & CURRENT COPCS

Source Areas

The following source areas have been identified for the Site based on the prior environmental investigations at the Site and adjoining main Prime Tanning Facility parcel:

- Long history of use of the Site and adjacent main Prime Tanning facility as a tannery, and associated coal/oil emissions
- Long history of Blue Sort Building usage for tanning related operations including: hide shaving, storage, and warehouse space associated with Prime Tanning
- Hazardous Site building components within/on the Blue Sort Building

COPCs

Based on the identified source areas and previous environmental investigations, the following are COPCs for the Site:

- PAHs and lead impacted surficial soil from historical tanning operations and coal/oil emissions
- VOCs, semi volatile organic compounds (SVOCs), PAHs, RCRA 8 metals impacted subsurface soil from historical tanning operations
- VOCs impacted subsurface soil under the Blue Sort Building
- VOCs, SVOCs, RCRA 8 metals, EPH target compounds, VPH target compounds in uncharacterized brook sediment
- Asbestos, lead, and PCBs in the Blue Sort Building
- Mercury and PCBs in certain universal wastes in the Blue Sort Building
- Hexavalent chromium in groundwater from buried leather hides

3.5 NATURE AND EXTENT OF CONTAMINATION

The inferred extent of COPCs based on currently available data is as follows:

PAHs and Lead (associated with historical use of the Site for tannery operations)

PAHs were detected in surficial soil in four soil borings (SB-112, SB-119, SB-120, and SB-101B) across the Site and one test pit location (TP-113) on Lot 133 in exceedance of one or more exposure criteria of the Maine DEP RAGs. Lead was detected in exceedance of Maine DEP RAGs in three test pit locations at Lot 133 (TP-111, TP-114, and TP-122). PAHs and lead are likely attributed to the historical use of the Site for industrial and specifically tannery operations. PAHs and lead are considered COPCs for all surficial Site soil due their presence throughout the adjoining main Prime Tanning Facility parcels.

Based on the characteristic low solubility of PAHs, they are not expected to be found in groundwater. In addition, groundwater analytical results from two prior monitoring wells installed on Lot 133 no lead was quantified above laboratory reporting limits. As such, these contaminants are not inferred to be present in Site groundwater.

VOCs, SVOCs, RCRA 8 Metals (associated with subsurface soil)

VOCs, SVOCs, and metals are associated with buried hides and other solid wastes including wood chips, urban fill, ash/coal ash, railroad ties, and leather tannery scraps observed in subsurface soils at the adjoining main Prime Tanning Facility parcel. The eastern portion of Lot 133 was investigated with a test pit program to confirm or dismiss the presence of hides, but the remainder of the Site, including the Blue Sort Building property, were not assessed. Therefore, there is the potential for buried hides and other solids wastes to be present in other areas of the Site.

VOCs (associated with uncharacterized areas under Blue Sort Building)

VOCs were identified in soil vapor on the adjoining main Prime Tanning Facility parcel in all sub-slab soil gas sample locations during the 2010 Phase II ESA. Soil vapor at the Blue Sort Building has not yet been characterized to date. Because VOCs in soil vapor at the Blue Sort Building

remains a data gap, these contaminants are considered COPCs for the Site. The VOC source is presumed to be contained to soil based on the lack of VOC contamination observed in groundwater.

VOCs, SVOCs, RCRA 8 Metals, EPH target compounds, VPH target compounds (associated with uncharacterized sediment along the northeast Site boundary)

An unnamed brook runs along the eastern Site boundary of Lot 133 toward the main Prime Tanning Facility parcel and eventually discharges to the Salmon Falls River. The brook sediment has not been characterized to understand if past operations have impacted it. Characterization is needed to evaluate background conditions in the brook prior to beginning the remedial design. Potential COPCs include: VOCs, SVOCs, RCRA 8 metals, EPH target compounds, and VPH.

Because the potential contamination associated with the uncharacterized sediment along the northeast Site boundary is not confirmed, the remedial alternatives presented in this ABCA/RAP will not address sediment.

Asbestos, Lead, and PCBs (associated with building materials)

Only the spray-on wall and ceiling insulation were previously sampled as a part of a limited survey. Suspect materials are likely present in/on the building. PCB sampling was also previously conducted for the Prime Tanning Facility buildings, and it is unclear which, if any, of the samples were collected from the Blue Sort Building. Therefore, PCB-containing building materials within/on the Site building remains a data gap. In addition, a lead inspection for lead in paint was not previously been completed for the Blue Sort Building, and therefore remains a data gap. In addition, more characterization of building materials needs to be completed for asbestos and PCBs because prior surveys were not comprehensive ensure to rely on this information for building disposal. As such, asbestos, lead, and PCBs remain COPCs for the Blue Sort Building and are believed to be contained to within/on the Site building.

Universal wastes (associated with the Site building)

Universal wastes in the form of possible PCB ballasts, fluorescent lighting, exit signs, fire extinguishers, maintenance materials (e.g., paints, cleaners, adhesives, etc.), and mercury-containing thermostats are potentially present throughout the Blue Sort Building. An inventory of these materials has not been performed to date.

3.6 EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS

Exposure pathways describe how a human or environmental receptor comes into contact with contaminants that may be present at the Site. Potential migration pathways through groundwater, surface water, air, soils, sediments, and biota were considered for each COPC and each source. A migration pathway is considered an exposure pathway if there is a mechanism of contaminant release from primary or secondary sources, a transport medium, and a point of potential contact with receptors. Both current and potential future releases and migration pathways to receptors are considered. Exposure pathways presented in the CSM include the following:

Inhalation:	This pathway is primarily associated with vapor-forming soil or groundwater contamination beneath or near an occupied structure or preferential pathway to an occupied structure. This pathway is applicable when receptors may inhale impacted media in the form of contaminated vapor. This pathway is also applicable when contaminated soil and/or groundwater are exposed via an excavation.
Dermal Absorption:	Exposure via dermal absorption occurs when receptors are exposed to chemical concentrations present in soil, groundwater, surface water, or hazardous building materials 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, through agricultural products, or through direct consumption of soil (e.g., typically by children or construction workers employing poor hygiene).
Incidental Uptake:	This pathway is applicable when receptors may incidentally inhale or ingest impacted media in the form of contaminated dust, soil, chips, or airborne asbestos fibers.

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, or a daycare.
Commercial Workers:	Commercial receptors are those that are present at the Site for long durations but with low intensity exposure such as indoor office workers.
Excavation or Construction Worker:	Excavation or construction 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 utility and construction contractors and landscapers.
Recreational or Park User:	Park users 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. For this project, this receptor class would apply to visitors to the Site and patrons of the restaurants, hotel, or other future commercial businesses at the Site.

3.7 CONCEPTUAL SITE MODEL SUMMARY

COPCs at the Site include: PAHs and lead in surficial soil across the entire Site; VOCs, SVOCs, and RCRA 8 metals in subsurface soil associated with potential presence of buried leather hides and solid waste; and asbestos, lead, and PCBs associated with hazardous building materials

within/on the Blue Sort Building. Potential VOCs beneath the Blue Sort Building and potentially in the sediment along the unnamed brook (VOCs, SVOCs, RCRA 8 metals, and EPH and VPH target compounds) require additional characterization to understand if they are present. As these contaminants have not been confirmed, sediment remedial actions are not included in this ABCA/RAP.

Based on the planned redevelopment of the Site as residential, receptors at the Site include construction workers during redevelopment, children and their parents (i.e., park users and residents), and commercial works of any office/retail space.

Exposure pathways for all receptors to COPCs include inhalation due to the possible presence of a VOC source area beneath the Blue Sort Building within proximity of the planned residential building and construction workers within excavations; dermal absorption through direct contact with contaminated soil; active ingestion by construction workers employing poor hygiene or children; and incidental uptake of impacted soil in the form of dust lead and PCB-containing dust, or airborne asbestos fibers.

4. CLEANUP GOALS AND APPLICABLE GUIDELINES

The goal relative to the identified COPCs is to eliminate or manage the risks to human health and the environment through proper management, mitigation, and/or disposal of identified COPCs. To achieve this objective, the following cleanup goals or guidelines will be applicable to the cleanup:

Soil and Groundwater

Lot 130

The remediation goal for the impacted soil on Lot 130 and potential impacted soil beneath the Blue Sort Building is to eliminate exposure to excavation/construction workers during the redevelopment and future residents and passive users after redevelopment. Remediation will be considered complete when no soil contamination remains on Lot 130 above Maine DEP RAGs resident use scenario for soil to facilitate the reuse of the Site for residential use without any significant environmental constraints. Exposure to groundwater is limited once construction is complete by prohibiting groundwater extraction. It is understood public water will be supplied to the property for future redevelopment. For soil that will not be reused on-Site, soil will be sampled for disposal characteristics and compared to each facility's published acceptance criteria including the RCRA 20 times rule for metals. If results exceed the 20 times rule, Toxicity Characteristic Leaching Procedure (TCLP) analysis will be run and results will be compared to the limits per EPA Method 1311 and US EPA D Codes for characteristically hazardous wastes.

Lot 133

The remediation goal for the impacted soil on Lot 133 is also to eliminate exposure to excavation/construction workers during the redevelopment and future residents and passive users after redevelopment. Remediation will be considered complete when all identified soil contamination is either located beneath the proposed engineered barrier systems or disposed off-Site. Similar to Lot 130, if soil cannot be reused on-Site, that will be sampled for disposal characteristics.

Sub-Slab Vapor

Any sub-slab air sample analytical results will be compared to the February 5, 2016 Maine DEP Remedial Action Guidelines (RAGs) Table 2 (modified by the attenuation factor in EPA Vapor Intrusion Guidance Table 6.1) as outlined in the Maine DEP Supplemental Guidance for Vapor Intrusion of Chlorinated Solvents and other Persistent Chemicals.

Sediment

Any sediment sample characterization results will be compared to the National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs) for Inorganics in Sediment. Based on Site conditions, results will be compared to the threshold effects level (TEL) criteria.

Asbestos-Containing Materials

Construction work involving exposure or potential exposure to any concentration of asbestos is regulated by OSHA 29 CFR 1910. The cleanup goal for ACM is removal of any ACM to be impacted by demolition to eliminate the potential for exposure to excavation/construction workers during work. Proper removal of ACM to be impacted by demolition activities in accordance with Maine DEP Chapter 425 – Asbestos Management Regulations (Chapter 425) is crucial to achieving this goal. Asbestos removal, handling, and oversight will be conducted by appropriately trained and certified personnel. Project monitoring and confirmatory air sampling will be conducted by a third-party Maine DEP certified asbestos air monitor.

Lead Paint and PCB-Containing Building Materials

Where lead paint and PCB-containing building materials have been identified, building materials waste generated under the selected alternative that cannot be reused onsite would be considered special waste and will be disposed offsite at an appropriately licensed landfill or recycling facility. Offsite disposal will be done in accordance with Maine DEP Chapter 400 – Solid Waste Management.

If materials with PCB concentrations are identified that would be characterized as PCB Bulk Product Waste according to 40 CFR 761, then these materials would need to be removed and disposed in accordance with 40 CFR 761.

Universal and Other Regulated Hazardous Waste

Materials that would be characterized as universal, hazardous, or other regulated waste materials, including fluorescent light bulbs and ballasts, thermostats, fire extinguishers, exit signs, containers of waste, storage tanks, and out-of-service boilers, if present, will be removed from service during the proposed redevelopment activities. As such, the goal of the remediation is to properly manage and dispose of universal, hazardous, or otherwise regulated waste materials in such a way as to prevent a release. Universal or other regulated waste will be identified and managed in accordance with Maine Hazardous Waste Management Regulations – Chapters 850 through 857, 49 CFR 100-199 – Transportation of Hazardous Materials, and 40 CFR 256 – Guidelines for Development and Implementation of State Solid Waste Management Plans.

5. PRESUMPTIVE REMEDIAL MEASURES

The goal relative to the identified COPCs is to eliminate or manage the risks to human health and the environment through proper management, mitigation, and/or disposal of identified COPCs. To achieve this objective, the following presumptive remedial measures will be applicable to the cleanup:

Asbestos Abatement

Redevelopment of the Site will include demolition of the Blue Sort Building. As required by Maine DEP Chapter 425, any identified asbestos is required to be properly abated prior to removal. Therefore, abatement of asbestos is considered a presumptive remedy. No ACM has been identified on the Site building; however, a more comprehensive hazardous Building Materials Survey (HBMS) will be conducted prior to demolition activities to identify any ACM within/on the Site building that is required to be abated. Abatement will be completed in accordance with applicable State and Federal regulations by appropriately licensed contractors.

The anticipated presumptive cost for asbestos removal is estimated at $15,000 including oversight and air clearance sampling.

Universal and Other Regulated Hazardous Waste Removal and Disposal

Remediation of out-of-service universal and other regulated hazardous waste material in the Site building is considered a presumptive remedial measure as these items are considered no-longer suitable for use and removing these items from the Site building for proper disposal is the only alternative that will allow the successful redevelopment of the Site as planned.

The anticipated presumptive cost for universal and other waste removal is estimated at $2,000.
Removal and proper disposal of the Blue Sort Building and its foundations area considered a presumptive remedy because it is required to facilitate the characterization and potential remediation of soil source areas located beneath the building foundation. As part of the demolition, building materials that contain lead or concentrations of PCBs above 1 milligrams per kilogram (mg/kg) will require proper disposal at an appropriately licensed landfill. No lead or PCB-containing building materials have been identified on the Site building. A HBMS will be conducted prior to building removal to identify any lead and PCB-containing building materials within/on the Site building. Disposal of these materials is considered a presumptive remedy to permit redevelopment at the Site.

The anticipated presumptive cost for removal of PCB contaminated building materials is estimated at $5,000 including oversight and air clearance sampling.
The following total presumptive cost will be carried through the subsequent alternative analysis.

Total Presumptive Cost: $22,000

6. DESCRIPTION OF REMEDIAL ALTERNATIVES

The remedial actions selected for the Site will minimize the potential for human exposure and/or mitigate the identified COPCs at the Site. Multiple remedial alternatives are available to address these identified COPCs at the Site. However, based on past experience at sites with similar contaminants and conditions, alternatives were pre-screened for general advantages and disadvantages and the following three (3) remedial alternatives were selected for further evaluation and comparison:

- Alternative #1 – No Action
- Alternative #2 – Consolidation of Contaminated Soils, Reuse of Contaminated Soil Under an Engineered Barrier System, and Implementation of Institutional Controls
- Alternative #3 – Complete Removal and Disposal of Contaminated Soils and Implementation of Institutional Controls

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

Alternative #1 - No Action Alternative

A "No Action" alternative signifies that no remediation activities would be implemented at the Site. The "No Action" alternative does not include a means for mitigating or eliminating potential exposure to impacted soil, soil vapor, or groundwater both during and following redevelopment. Therefore, the potential for human exposure continues to exist for future patrons, residents, excavation/construction workers, and commercial workers. This alternative is presented and discussed throughout the subsequent portion of this report as a baseline for comparison.

Alternative #2 – Consolidation of Contaminated Soils, Reuse of Contaminated Soil Under an Engineered Barrier System, and Implementation of Institutional Controls

Under this alternative, surficial contaminated soil on Lot 130 and any subsurface contaminated soil beneath and surrounding the Lot 130 building will be removed and consolidated onto Lot 133. This soil will be further consolidated with contaminated soil from the periphery of Lot 133 and placed under an engineered barrier system that will be constructed. This engineered barrier systems will be finished as an asphalt parking lot designed to service the future residential buildings on this lot and Lot 130. A second engineered barrier system area will be constructed and reserved from Lot 133 foundation excavation, utility excavations or from other Prime lots. Please note that any buried hides will be properly disposed off-site due to the potential to leach hexavalent chromium to groundwater and impact the nearby Salmon Falls River.

To accomplish this, additional characterization is necessary to pinpoint areas of soil contamination in unassessed areas of the Site and to make sure that any material placed under the barrier systems is not hazardous waste and/or leather hides. This would include remedial assessment and identification of VOC source areas (saturated petroleum soil or VOC sources) beneath the current Site building, and additional characterization and delineation of Site soil to ensure remaining soil

meet the applicable RAGs and any other Maine DEP requirements (i.e., no contaminants are present >10,000 milligrams per kilogram). Soil that cannot be placed under the engineered barrier systems will require off-Site disposal.

The consolidated contaminated soil that can be reused on-Site would be covered with an engineered barrier system. The engineered barrier systems would include the following designs:

- Installation of asphalt or concrete parking areas, sidewalks, foundations, patios, etc. with appropriate top course and sub-base materials
- Two feet of clean fill materials without a marker layer or one foot of clean fill materials over a marker layer in landscaped areas (lawn areas, planting beds, paver-stone patios)

Institutional controls will also be implemented at the Site through a DEC consistent with the Maine "UECA", 38 M.R.S.A. § 3001 et seq. Filing of the DEC with the Site deed will minimize potential exposure to remaining contaminants through restrictions on soil excavation and groundwater extraction and ensure the maintenance of the engineered barrier systems. These controls will ensure the longevity of the alternative through maintenance and monitoring, and ensure future owners, users, or utility workers do not disturb contaminants remaining at the Site; or if disturbance is necessary, that the Maine DEP will be notified and contaminants will be properly managed under the direction of an Environmental Professional in accordance with the applicable regulatory guidelines.

Following the completion of redevelopment activities, potential risk posed by concentrations of hazardous substances that may remain at the Site will be managed though the preparation and use of an Environmental Media Management Plan (EMMP). The EMMP will govern future activities with regards to soil and groundwater and describe the inspection and maintenance requirements for institutional controls located at the Site.

Alternative #3 – Complete Removal and Disposal of Contaminated Soils and Implementation of Institutional Controls

Under this alternative, all contaminated soil located on the Site would be completely removed and disposed off-Site using standard techniques to meet applicable Maine DEP RAGs. This would involve additional characterization of Site soil to ensure remaining soil meet the applicable RAGs. Please note that any encountered buried hides will also be properly disposed off-site due to the potential to leach hexavalent chromium to groundwater and impact the nearby Salmon Falls River.

In addition to the soil removal, institutional controls would be implemented at the Site through a DEC consisted with the Maine "UECA", 38 M.R.S.A. § 3001 et seq. The DEC will include a provision not to withdraw groundwater without written consent from Maine DEP. As such, filing of the DEC with the Site deed will minimize potential exposure to residual groundwater contamination.

7. COMPARISON OF ALTERNATIVES

The comparison and evaluation of the remedial alternatives has been conducted using the five criteria listed below:

1. Risk reduction and effectiveness
2. Feasibility and ease of implementation
3. Cost effectiveness
4. Green remediation potential
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 remedial alternatives is presented below.

7.1 DESCRIPTION OF EVALUATION CRITERIA

Risk Reduction and Effectiveness

Since the primary objective of any remedial action is to reduce or eliminate exposure of humans and the environment to COPCs, risk reduction and effectiveness is considered the primary 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 each specific alternative. This criterion also addresses the ability of the alternative to achieve the cleanup goal and applicable guidelines. This criterion also evaluates the long term reliability of the alternative with respect to upkeep and the resilience of the alternative with respect to reasonably foreseeable changing climate conditions.

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.

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. 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 the 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 2018-2019, and as such, costs presented are in year 2018 dollars.

Green Remediation Potential

This criterion evaluates the extent of green remediation techniques that can be employed as part of the project and their associated benefits relative to other alternatives. This criterion will be evaluated based on its consistency with EPA's *Principle for Greener Cleanup* policy.

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 Maine 38 M.R.S.A. 343-E, as well as to meet the requirements of the Maine DEP VRAP and receive a Certificate of Completion (CoC) from VRAP. Please note this criterion does not take into account redevelopment and other time for non-environmental tasks; however, certain alternatives better prepare the Site for redevelopment, and this will be considered as part of this criteria.

7.2 EVALUATION OF ALTERNATIVES

Alternative #1 – No Action Alternative

The "No Action" alternative involves no remediation of contaminated soil or abatement of hazardous building materials and would not include a means for mitigating or eliminating potential exposure to contaminants both during and following redevelopment. Therefore, the potential for human exposure continues to exist for future residents, excavation/construction workers, patrons, and commercial workers. 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 and does not pass the Risk Reduction threshold criteria. As a result, this alternative cannot be considered as a final alternative for the Site and will not be considered or discussed further.

Alternative #2 – Consolidation of Contaminated Soils, Reuse of Contaminated Soil Under an Engineered Barrier System, and Implementation of Institutional Controls

Risk Reduction and Effectiveness

Once the all accessible contaminated soil is consolidated onto Lot 133 and covered with an engineered barrier, any remaining soil that does not meet requirements for on-Site reuse is disposed off-Site, and institutional controls and EMMP have been developed for the Site; the remedial action objective will have been attained and all risks will have been effectively reduced. This approach has been proven to be effective and reliable means of remediating exposure risk as long the engineered barrier systems area properly maintained. The mobility and extent of contaminants will be reduced but not eliminated. This alternative is effective for the Site because the risk of exposure by potential receptors is significantly reduced.

Because the Site is not located within a FEMA flood zone, it is unlikely erosion will occur at the Site due to flooding and a changing climate. Additionally, any damage to the engineered barrier systems can be promptly repaired according to the EMMP. Therefore, the engineered barrier

systems will be continually effective in a changing climate despite the need for potential minor cover system repair (demonstrated long term reliability and resiliency).

This alternative reduces risk and institutional controls make this alternative continually effective since the engineered barrier system is considered continually effective in a changing climate.

Feasibility and Ease of Implementation

This remedial alternative utilizes standard excavation and construction techniques for excavation, soil consolidation and removal, installation of the engineered barrier system, and long-term management and institutional controls. This alternative can be implemented in conjunction with redevelopment, which creates efficiencies and greater feasibility. **Therefore, this alternative is more feasible and easily implementable than Alternative #3.**

Cost Effectiveness

Based on prior project and contractor experience and current estimates received from contractors, the estimated cost of this alternative is broken down below:

Consulting and Engineering – Both Lots[1]	$75,000
Environmental Cleanup Oversight - Both Lots[2]	$35,000
Presumptive Remedies – Only Lot 130 (See Section 5)	$22,000
Building Removal/Reuse – Lot 130[3]	$35,000
Slab Removal – Lot 130[3]	$30,000
Test Pits – Both Lots	$15,000
Site Work & Soil Relocation - Lot 130[3,6]	$15,000
Site Work & Cover System Grading – Lot 133[3]	$45,000
Disposal of Hides (Both Lots)[4]	$10,000
Clean Fill for Lot 130[3,5]	$25,000
Final Grading, Shimming, & Asphalt Paving for Lot 133[3,7]	$92,000
Confirmatory Sampling	$6,000
Completion Reporting & EMP/Deed Restriction	$20,000
10% Contingency	$42,500
Total	**$467,500**

[1]Assumes actual costs for ABCA, SSQAPP, Haz. Building Survey, Design Plans, and Bid Docs
[2]Based on a full-time cleanup oversight with for 4 weeks including project management
[3]Based on engineering estimate and supported by contractor budgets
[4]Assumes 100 tons of hide removal at $100/ton (Special Waste Disposal)
[5]Assumes 1000 tons at $25/ton delivered
[6]Assumes that no cover system is necessary for Lot 130
[7]Includes subgrade materials

Green Remediation Potential

This alternative stipulates onsite reuse of soil and limited offsite disposal of soil resulting in limited fuel consumption and greenhouse gas emissions, and limited volumes of soil to be disposed in a landfill; therefore, these quantities will be significantly less than Alternative #3. Soil requiring offsite disposal can also alternatively be recycled at more local aggregate recycling facilities in

lieu of landfill disposal. Backfill materials require trucking to the Site but can be sourced locally to reduce shipping distances.

Local contractors with green businesses practices (i.e., biofuel converted utility trucks, renewable/sustainable heating and electricity at their office/yard, etc.) can be given preference during the bidding process. To the extent feasible, the most local disposal facilities can be selected to limit the emissions from trucking wastes to offsite disposal locations. **Therefore, green remediation practices can be implemented with this alternative, and this alternative has greater potential for green remediation practices than Alternative #3.**

Estimated Time to Reach "No Further Action"

Immediately following final inspection of the engineered barrier systems, receipt of any soil disposal receipts, and implementation of the institutional controls, the Site would meet the requirements for "No Further Action" and could attain a Certificate of Completion from the Maine DEP VRAP. This can be accomplished within 6 months to 1 year. This alternative can be implemented in conjunction with redevelopment and allows development to be implemented and completed sooner.

Using this alternative, "No Further Action" could be attained in as little as 6 months from commencement of cleanup activities implementation and leaves the Site in a position for redevelopment with a finished asphalt parking lot.

Alternative #3 – Complete Removal and Disposal of Contaminated Soils and Implementation of Institutional Controls

Risk Reduction and Effectiveness

Once the identified contaminated soil is removed from the Site, confirmatory sample results are verified, and institutional controls have been implemented for the Site, the remedial action objective with respect to soil will have been attained and determination of success is easy to demonstrate. Complete removal of contaminated soil has been proven as an effective means of eliminating exposure risk.

With no remaining impacted soil, erosion and impacts from a changing climate (strong storms, flooding, etc.) would not impede the effectiveness of this Alternative (demonstrated long term reliability and resiliency).

This alternative reduces risk and institutional controls make this alternative continually effective since contamination removal is permanently effective in a changing climate.

Feasibility and Ease of Implementation

This remedial alternative for soil utilizes standard excavation and construction techniques for removal of impacted accessible soil and replacement with clean fill. Since all soil contamination is to be removed, no continued management or restrictions are necessary relative to the soil. The complete extent of soil contamination is presumed to be Site-wide based on limited previous

environmental investigations for the Site and long history of use at the Site and surrounding area for the Prime Tanning Facility. Complete removal of contaminated soil may be difficult and unknowns may be encountered at deeper interval where tannery waste (i.e., leather scraps and hides) may be encountered. However, this alternative for soil is feasible. This remedial alternative also utilizes standard techniques for institutional controls. **Therefore, this alternative is feasible but not as easily implementable as Alternative #2.**

Cost Effectiveness

Based on prior project and contractor experience and current estimates received from contractors, the estimated cost of this alternative is broken down below:

Consulting and Engineering – Both Lots[1]	$75,000
Environmental Cleanup Oversight - Both Lots[2]	$52,000
Presumptive Remedies – Only Lot 130 (See Section 5)	$22,000
Building Removal/Reuse & Slab Removal – Lot 130[3]	$65,000
Test Pitting – Both Lots	$15,000
Excavation, Soil Removal, and Disposal of Contaminated Soil – 1,000 Tons from Lot 130[3,4]	$205,000
Excavation, Soil Removal, and Disposal of Contaminated Soil – 3,000 Tons from Lot 133[3,5]	$621,000
Backfill & Site Grading - Lot 130[3,6]	$40,000
Backfill & Site Grading - Lot 133[3,6]	$105,000
Disposal of Hides (Both Lots)[7]	$10,000
Confirmatory Sampling	$12,000
Completion Reporting & EMP/Deed Restriction	$20,000
10% Contingency	$124,200
Total	**$1,366,200**

[1]Assumes actual costs for ABCA, SSQAPP, Haz. Building Survey, Design Plans, and Bid Docs
[2]Based on a full-time cleanup oversight with for 6 weeks including project management
[3]Based on engineering estimate and supported by contractor budgets
[4]Assumes 1,000 tons removed from Lot 130 and 3,000 tons removed from Lot 133. Disposal costs are assumed of $200/ton with a daily rate of $3000/day for 1 week at Lot 130 and 3 weeks at Lot 133.

Green Remediation Potential

This alternative requires a significant amount of off-Site disposal of contaminated soil resulting in greater fuel consumption and greenhouse gas emissions during transport, and greater volumes of material to be disposed in a landfill compared to Alternative #2. Soil requiring off-Site disposal can also alternatively be recycled at local aggregate recycling facilities in lieu of landfill disposal. It is possible to reduce the transportation impacts by using local contractors, local disposal facilities, and a local source of clean fill. Additionally, subcontractors with green business practices (i.e., biofuel converted utility trucks, renewable/sustainable heating and electricity at their office/yard, etc.) can be given precedence in the bidding process. **Therefore, this alternative has lower potential for green remediation practices than Alternative #2.**

Estimated Time to Reach "No Further Action"

Immediately following receipt of disposal certificate and implementation of the Institutional Controls, the Site would meet the requirements for "No Further Action" and could attain a CoC from the Maine DEP VRAP. This alternative must occur well in advance of construction due to the time required to excavate and transport existing soil and replace with new fill; then allow for needed settlement of the newly placed soil prior to construction.

Using this alternative, "No Further Action" could be attained within four months of implementation but cannot be as readily implemented during redevelopment as Alternative #2.

7.3 JUSTIFICATION FOR THE SELECTED REMEDIAL ALTERNATIVE

The following table summarizes the comparison criteria and alternatives using a relative rank score. The top ranking score is based on the total number of alternatives presented as part of this ABCA (i.e., 3 alternatives), representing the best option for that comparison criteria:

Alternative	Reduced Risk & Effectiveness	Feasibility & Ease	Cost	Green Remediation Potential	Time	Total Score (max score 15)
#1 No Action	0	-	-	-	-	0
#2 Consolidation and Engineered Barrier	2	3	3	3	3	14
#3 Complete Removal and Disposal	3	2	2	2	2	11

0 – indicates threshold criteria not met and alternative is not evaluated, would otherwise represent scores of 1

Based on the evaluation of the remedial alternatives presented above, the recommended alternative is:

- **Alternative #2 – Consolidation of Contaminated Soils, Reuse of Contaminated Soil Under an Engineered Barrier System, and Implementation of Institutional Controls**

This alternative was selected because it is effective at reducing the risk of exposure and remains effective in a changing climate assuming proper maintenance in accordance with an EMMP; is feasible and easy to implement; has greater green remediation potential than Alternative #3; can be completed at a lower cost than Alternative #3; and can be implemented in a similar time frame while better positioning the Site for redevelopment.

8. PROPOSED REMEDIAL ACTION WORK PLAN

This section describes activities that will be completed as part of the Site remediation. A Health and Safety Plan for cleanup activities will be prepared prior to the start of remediation activities. In addition, Credere will present the proposed remediation activities for review and approval by the Maine DEP VRAP prior to initiating this project.

Soil and Groundwater Management Plan

In order to meet the regulatory requirement inherent in the handling of contaminated soil and the possible generation of special waste; to properly manage risk posed by the soil/fill that will be encountered during redevelopment; and to manage the risk posed by potential contaminated groundwater and soil vapor at the Site, a Soil and Groundwater Management Plan (SGMP) was developed for use at the Site, and will include the following:

- A description of soil conditions and associated regulatory applicability
- A listing of proper health and safety work practices and protective equipment for use during Site work activities
- A description of on-Site soil management procedures including soil handling, stockpiling, and dust control for use during Site work activities
- A description of the on-Site soil reuse procedures including the engineered barrier system
- A summary of the methods to be used for the proper transport and disposal of excess soil that may be generated during redevelopment
- A description of groundwater management procedures including generally dewatering of excavations and groundwater collection/treatment/disposal at an off-Site treatment facility

A copy of this SGMP is included as **Appendix A**.

Additional Soil Characterization

Prior to the removal of the Site building, Credere will implement screening of sub-slab soil gas beneath the Site building to identify potential source areas of the chlorinated solvent contamination on the Site. After the removal of the Site building, Credere will conduct test pitting in areas of concern identified during soil gas screening and visual and olfactory observations. Credere will focus on locating source areas of VOC contamination or petroleum, and evaluating fill materials (hides, ash, etc.) at the Site.

Credere will also conduct additional surface soil sampling on Lot 130 and Lot 133 to identified the soils not beneath the Site building that need to be consolidated onto Lot 133. Test pits will also be advanced on Lot 133 to identify any subsurface contamination that would be consolidated under the engineered barrier system. The sediment along the unnamed brook running through Lot 133 will also be analyzed before and after remedial activities to ensure the brook sediment has not been negatively impacted by the redevelopment.

Surface soil intended to be consolidated under the engineered barrier system will be analyzed for PAHs and lead, while subsurface soil will be analyzed for VOCs, SVOCs, EPH, VPH, and RCRA 8 metals. Detections of any contaminant above 10,000 ppm will require that soil to be disposed offsite as hazardous waste. Soil to be disposed offsite will be analyzed for VOCs, SVOCs, RCRA 8 metals, total petroleum hydrocarbons (TPH), PCBs, herbicides, pesticides, flashpoint/ignitability, pH, sulfide and cyanide reactivity, TCLP, and asbestos.

Limited Soil Removal

Any soils identified during the remediation and Site redevelopment that are contaminated with VOCs and may be acting as source areas for potential soil vapor contamination at the Site will be removed and properly disposed off-Site. Additionally, any free product petroleum or petroleum saturated soil will be removed and properly disposed off-Site. During redevelopment of the Site, any residual soil or fill waste that is disturbed as part of Site activities and cannot be consolidated onto Lot 133 will be removed and properly disposed off-Site as special waste.

Building Removal and Disposal of Lead and PCB-Containing Demolition Materials

To characterize and remediate contaminated soil or fill materials beneath the Site building, the Site building and foundations will be removed. Prior to the building removal, building materials with lead or PCBs prior to building removal, and building material waste will be properly removed, handled, transported, and disposed in accordance with Maine DEP Hazardous Waste Management Rules (Chapters 850 through 857).

Asbestos Abatement

Prior to the building removal, an Asbestos Abatement Contractor licensed by Maine DEP will remove and dispose of identified ACM pursuant to Maine DEP Chapter 425. Following the completion of asbestos abatement activities and once waste disposal and successful clearance results are obtained, all documentation will be submitted to the Maine DEP.

Universal/Hazardous Waste Removal and Disposal

Prior to the building removal, identified universal, hazardous, or other regulated wastes in the Site building will be removed and properly disposed by qualified personnel in accordance with the Maine DEP Hazardous Waste Management Rules (Chapters 850 through 857).

Engineered Barrier

In order to manage risk posed contaminated surficial and subsurface soil on the Site, the following engineered barrier system is proposed:

- All identified contaminated soil will be removed from Lot 130 and the periphery of Lot 133 to be reused under the engineered barrier system that is proposed as a parking lot. This will be done in concert with the SGMP, with input from the developer civil engineer and based on the supplemental characterization results. Any excess soil that cannot be used as sub-base/fill material under the engineered barrier system due to the presence of specific

concentrations of contaminants, the presence of any hazardous waste characteristics, or due to grades constraints will be disposed off-Site in accordance with the SGMP.

- A marker layer consisting of a permeable geotextile fabric or similar material will be placed directly over the contaminated soil in the secondary cover system area to indicate the distinction between the clean cover and the underlying contaminated soil.
- A minimum of 12 inches of clean fill will be placed over the marker layer as cover material over contaminated soil in the secondary cover system area. The secondary cover system area will be seeded or mulched to prevent erosion of the clean cover.
- As an alternative to the marker layer, 2 feet of clean fill with no marker layer can be placed above the contaminated soil.
- The proposed asphalt parking lot will be installed directly over the impacted soil and the hardscape will serve as the cover.
- Each covered area will be graded so that the stormwater runoff is directed to an appropriate area.
- Additional sub-base materials may be necessary beyond the minimum cover requirements discussed herein to maintain the structural integrity of the proposed Site features.

Institutional Controls

Following the completion of redevelopment activities, potential risk posed by concentrations of hazardous substances that may remain in soil, groundwater, or soil vapor at the Site will be managed in accordance with an Environmental Management Plan (EMP). The owner will also prepare and record a Declaration of Environmental Covenant (DEC) consistent with the VRAP NAAL and the Maine UECA, 38 M.R.S.A. § 3001 et seq.

State and Federal Permits Required

Proper notification of asbestos projects to the Maine DEP will be required. Local building and planning approvals will also be required. No other permits are anticipated to be required as a part of this remediation.

Remedial Action Reporting

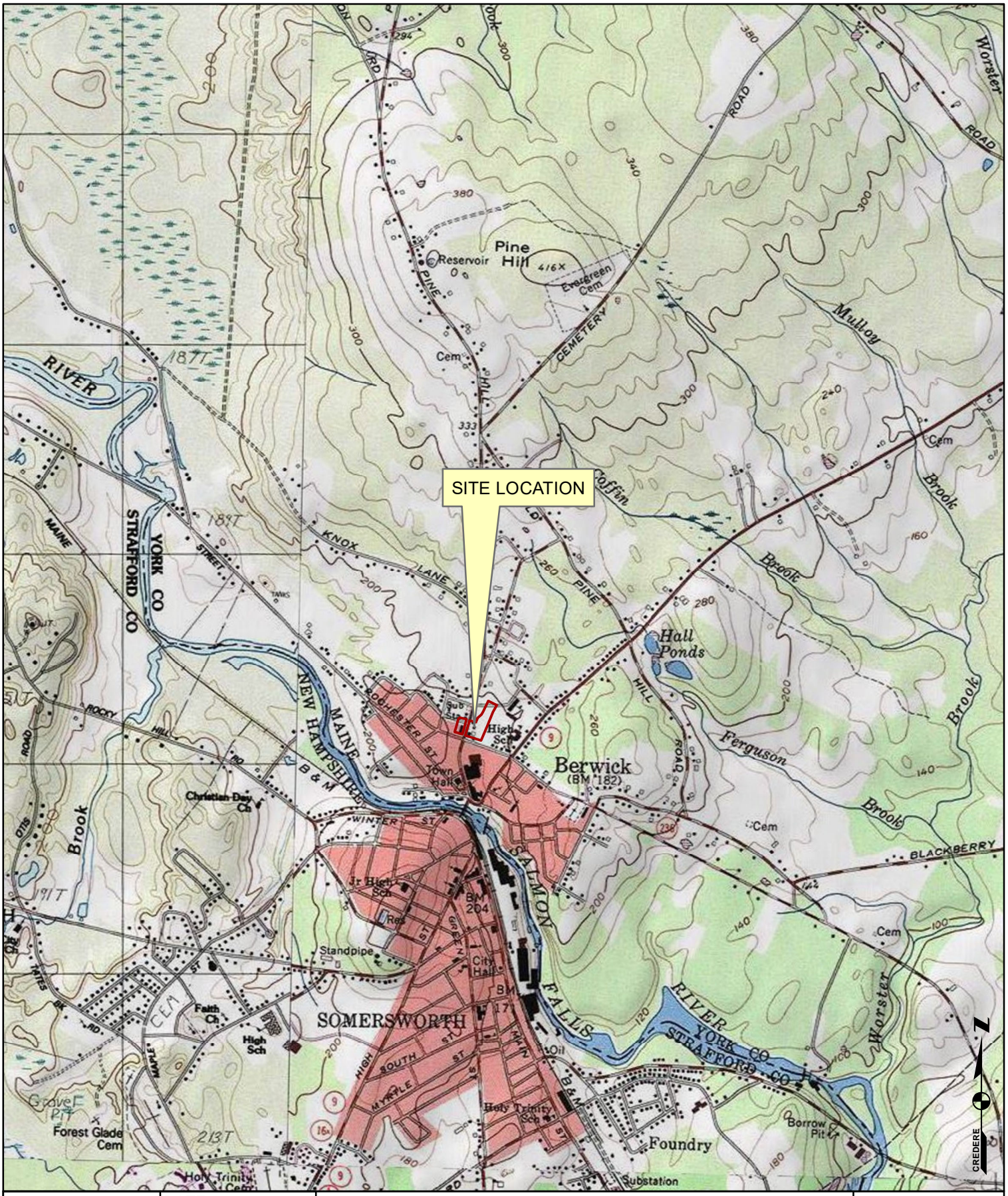
Once cleanup activities are completed, Credere will prepare and submit a Remedial Action Completion Report to the Maine DEP summarizing the field activities conducted as part of the remediation effort including all applicable post-cleanup verification sampling results and disposal documentation. Figures depicting the location of soil removal and engineered barrier system will be included in the report.

9. SUMMARY

Credere was retained by the Town of Berwick, Maine to prepare this ABCA/RAP for the Prime Tanning Facility Lots 130 and 133 located at 35 and 34 Sullivan Street in the Town of Berwick, Maine. The purpose of this study was to evaluate potential remedial action alternatives to mitigate identified environmental conditions at the Site. Based on the findings of this study, a summary of the ABCA process is presented below:

1. Remedial action is necessary to address contaminated soil across the Site and potential contaminated soil vapor on the Site; and hazardous building materials. In consideration of the CSM, applicable regulatory guidelines, and the nature of the specific contaminants detected, Credere evaluated three alternatives to identify the most appropriate cleanup. The three evaluated remedial alternatives were compared for risk reduction and effectiveness, feasibility and ease of implementation, cost effectiveness, green remediation potential, and estimated time to reach "No Further Action".
2. Based on the evaluation of the remedial alternatives presented herein, the recommended alternative for cleanup of the Site is Alternative #2 – Consolidation of Contaminated Soils, Reuse of Contaminated Soil under an Engineered Barrier Systems, and Institutional Controls.
3. This alternative was selected because it is effective at reducing the risk of exposure and remains effective in a changing climate assuming proper maintenance in accordance with the Remedial Action Plan and SGMP; is feasible and easy to implement; has greater green remediation potential than Alternative #3; can be completed at a lower cost than Alternative #3; and can be implemented in a shorter time frame while better positioning the Site for redevelopment.
4. An updated Soil and Groundwater Management Plan (SGMP) that summarizes the execution of the remedial activities is included in this document as **Appendix A**.
5. Long-term risk posed by environmental conditions remaining at the Site following the completion of the above-described remedies will be managed through the filing of a DEC and long-term implementation of an EMMP.

FIGURES



DRAWN BY: **SAF**	DATE: **6/1/2018**
CHECKED BY: **RSV**	PROJECT:**18001444**

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776 MAIN STREET
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FIGURE 1
SITE LOCATION PLAN

PRIME TANNING LOTS 130 AND 133
35 AND 34 SULLIVAN STREET
BERWICK, MAINE

1,000 0 2,000 Feet
1 INCH = 2,000 FEET

Topographic Map Data Copyright© 2013 National Geographic Society, i-cubed

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FIGURE 2
DETAILED SITE PLAN

PRIME TANNING LOTS 130 AND 133
35 AND 34 SULLIVAN STREET
BERWICK, MAINE

- 2010 ASBESTOS SAMPLE LOCATION
- 2010 TEST PIT
- 2010 SOIL BORING/GW MONITORING WELL
- 2010 SOIL BORING
- 2010 SURFACE SOIL SAMPLE
- 2009 TEST PIT
- APPROXIMATE PATH OF UNNAMED BROOK
- SITE ACCESS POINT
- DELINEATED WETLAND AREA
- SITE BOUNDARY
- SITE BUILDING FOOTPRINT
- EXISTING ASPHALT PARKING LOT
- PARCEL BOUNDARY

NOTES:
EXISTING CONDITIONS AND FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE AND ARE BASED ON INFORMATION OBTAINED FROM THE TOWN OF BERWICK ONLINE GIS DATA, PREVIOUS ENVIRONMENTAL REPORTS, MAINE GIS PARCEL LAYER, AND 2012 ORTHO PHOTOS.

Ortho Image

Document Path: T:\Data\ME\Town\Berwick\18001444 - Prime Tanning Lots 130 and 133\Figure 2.mxd

APPENDIX A

Soil and Groundwater Management Plan

CREDERE ASSOCIATES, LLC
776 Main Street
Westbrook, Maine 04092
Phone: 207-828-1272
Fax: 207-887-1051

August 10, 2018

Mr. Stephen Eldridge, MPA
Town Manager
Town of Berwick
11 Sullivan Street
Berwick, Maine 03901

Subject: **Soil and Groundwater Management Plan**
Prime Tanning Facility, Lots 130 and 133
35 and 34 Sullivan Street, Berwick, Maine

Dear Mr. Eldridge:

The following Soil and Groundwater Management Plan (SGMP) describes methods and procedures to be used during remediation activities at the Prime Tanning Facility Lots 130 and 133, located at 35 and 34 Sullivan Street, respectively, in Berwick, Maine (Site). The activities and practices described below will be implemented in conjunction with the associated Analysis of Brownfields Cleanup Alternatives developed for the Site. These activities are necessary to fulfill the applicable provisions of the December 3, 2010 Maine Department of Environmental Protection (DEP) Voluntary Response Action Program (VRAP) No Action Assurance letter (NAAL) for the Site which have been designed to be protective against potential risk to human and environmental receptors associated with contaminated soil and groundwater. Included in this SGMP are:

- A description of soil conditions and associated regulatory applicability
- A listing of proper health and safety work practices and protective equipment for use during Site work activities
- A description of onsite soil management procedures including soil handling, stockpiling, and dust control for use during Site work activities
- A description of the onsite soil reuse procedures including the soil engineered barrier system
- A description of procedures necessary to perform supplemental characterization of groundwater associated with buried leather hides
- A summary of the methods to be used for the proper transport and disposal of excess soil that may be generated during redevelopment
- A basic summary of procedures for management groundwater if encountered during construction activities

1. INTRODUCTION AND APPLICABILITY

1.1 Site Description

The Site is comprised of two parcels (Lots 130 and 133), totaling 3.48 acres. The main former Prime Tanning Facility and vacant Prime Tanning Lot 95 adjoin the Site to the south. The Site is located within a mixed residential and commercial area of Berwick.

Lot 130 is 0.68 acres and improved with one Site building (referred to as the Blue Sort Building) totaling 14,341 square feet. The Blue Sort Building is currently used as storage space and heated using fuel oil-fired air handlers. Water service is provided by the Berwick Water Department and wastewater services are provided by the Berwick Sewer Commission. Electrical service is provided by Central Maine Power.

Lot 133 is 2.8 acres and is developed as a parking lot. The parking lot occupies the southern portion of Lot 133 and was formerly used for Prime Tanning employee parking. The remainder of the Site is comprised of dense vegetation. There are no water/sewer connections serving this lot, but a temporary electric service drop is evident along the western property boundary (along Sullivan Street).

Figure 1 shows the location of the Site in Berwick, and **Figure 2** shows pertinent Site features.

1.2 Site History

The Town of Berwick acquired the Site in 2014, along with the other Prime Tanning Facility parcels in a public-private partnership with the Fund of Jupiter (FOJ). The Prime Tanning facility has a long history of industrial use including as a tannery dating back to the late 1800's. This history of the Site has been documented in numerous other environmental reports. Excerpts of the history as they relate to the two Site parcels are summarized below:

Lot 130 – 35 Sullivan Street

Manufacturing operations began on Lot 130 as early as 1887 and included shoe manufacturing, planing mill operations, and building materials and lumber supplier until at least 1965. The former buildings on this parcel were removed and the Blue Sort Building was constructed sometime before 1974, presumably at the same time or shortly after Prime Tanning acquired the property. The Blue Sort Building was used for storage related to the main Prime Tanning Facility. The building also housed hide shaving operations until the Prime Tanning facility closed in 2008. Since that time the building has only been intermittently used for the storage of lawn care equipment.

Lot 133 – 34 Sullivan Street

Lot 133 previously contained residential buildings and stables beginning by at least 1887 until circa 1965. By 1974 the lot was owned and operated by Prime Tanning and was principally used as an employee parking lot. The parking lot was paved in 1989 and is currently deteriorated condition. A garage/shed structure was reportedly located in the northwestern portion lot circa

1979 until approximately 2004. Records also indicate that from at least 1981 to 1984, an office building was also located on the Site and used by Prime Tanning.

1.3 Summary of Prior Environmental Reports

The only documented contamination at the Site includes polycyclic aromatic hydrocarbons (PAHs) and lead in the surface soil in limited portions of both Site parcels, identified in a September 2010 Phase II Environmental Site Assessment (ESA) completed by St. Germain-Collins (SGC). SGC concluded these results were considered representative of the urban environment. Groundwater samples were also collected from the Site during this Phase II ESA, but no contaminants were identified in Site groundwater in the limited areas assessed.

Unassessed portions of the Site include the subsurface across the Site and beneath the Blue Sort Building except for the eastern portion of Lot 133. A test pit program implemented by Tewhey Associates in 2009 revealed no observed subsurface contamination along the eastern portion of Lot 133. In addition, the sediment of an unnamed brook that traverses through Lot 133 has not been assessed.

A limited hazardous building material assessment was previously completed on the Blue Sort Building. Of the ten suspect polychlorinated biphenyl (PCB)-containing caulking samples and three suspect asbestos-containing material (ACM) samples, no PCBs or ACM were identified. However, these surveys were very limited in scope and are not considered representative of all building materials present in the Blue Sort Building.

1.4 Potential Receptors

Based on the proposed redevelopment of the Site for mixed use residential and commercial (retail, office) development, potential receptors at the Site include construction/excavation workers during construction of the new Site building(s) and utility work, employees and patrons of the commercial businesses, and residents. Based on these receptors, the expected exposure pathways to contaminants of potential concern (COPCs) include:

- Possible inhalation of vapors in open excavations or via vapor intrusion into future Site building(s);
- Active ingestion by construction workers using poor hygiene practices during construction or by children;
- Dermal absorption through direct contact with impacted soil by construction workers, patrons, commercial works, or residents; and,
- Incidental uptake of impacted soil in the form of dust by patrons, commercial workers, and construction workers.

2. GENERAL HEALTH AND SAFETY PLAN DURING SOIL EXCAVATION AND HANDLING

The following serves as guidelines for health and safety procedures to be employed during general construction activities at the Site involving exposure to impacted soil. It is the responsibility of

each individual contractor to develop and implement their own health and safety plan specific to the work to be performed.

Based on previous investigations at the Site and south adjoining main Prime Tanning facility parcel, the following COPCs were identified in soil and/or groundwater for the Site:

- PAHs in soil
- Lead in soil
- Potential volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), PAHs, and Resource Conservation and Recovery Act (RCRA) 8 metals in subsurface soils
- Potential VOCs, SVOCs, RCRA 8 metals, extractable petroleum hydrocarbons (EPH), and volatile petroleum hydrocarbons (VPH) in brook sediment
- Hexavalent chromium in groundwater associated with any areas of buried leather hides

As this SGMP is only applicable through completion of construction at the Site, potential receptors include construction/excavation workers, utility workers, and environmental contractors during cleanup and redevelopment. Based on these receptors, the expected exposure pathways to COPCs include:

- Possible inhalation of vapors in open excavations if VOC/VPH contamination is identified in subsurface soils associated with former use of the Site as a tannery, beneath the Site building, or along the brook in the sediment
- Active ingestion by construction workers using poor hygiene practices during construction
- Dermal absorption through direct contact with impacted soil
- Incidental uptake of impacted soil in the form of dust

As such, the utilization of basic personal protective equipment (PPE) and periodic monitoring will minimize the potential for human exposure while conducting remediation/redevelopment activities at the Site.

Training

All personnel who will be directly handling or otherwise may be exposed to impacted soil shall have 40 hour Occupational Safety & Health Administration (OSHA) CFR 1910.120 training, 3 days of supervised field experience, and current 8-hour OSHA refresher training.

Personal Protective Equipment

Based on the hazard evaluation, Level D PPE has been initially designated for all personnel who will be directly handling or otherwise may be exposed to impacted soil at the Site. The contractor's Health and Safety Officer may upgrade PPE to Level C or higher if additional hazards are identified during Site work.

Specific Level D PPE to be used at the Site includes the following:

- Steel toe work boots with latex over boots as required
- Safety glasses with side shields
- Work gloves
- Nitrile inner gloves
- Hard hat
- Coveralls (optional)

Work Zone Monitoring

Considering the urban nature of the project, the property boundaries should be monitored for ambient dust levels to ensure fugitive dust is not migrating from the Site onto adjoining or nearby properties. As a general rule of thumb, visible ambient dust should be controlled using wet suppressant methods and any stockpiles should be covered with polyethylene plastic during down times. Access should be limited to applicable personnel during periods when impacted soil is exposed at the surface.

Due to the potential for impacts to ambient air during construction, the work zone should be monitored periodically using a photoionization detector (PID), particularly when petroleum impacted soil and/or groundwater is exposed or disturbed. Ambient air should not exceed 10 parts per million by volume (ppm_v) sustained for a 15 minute period.

General Operating Procedures

In addition to the above basic health and safety guidelines, the following procedures should be followed during activities conducted at the Site which create the potential for exposure to impacted soil:

- Work involving excavation or management of environmentally impacted soil conducted at the Site shall be directed by a Qualified Environmental Professional (QEP).
- The Site shall be surveyed and cleared by DigSafe.
- All equipment used during excavation activities shall be properly cleaned and decontaminated prior to leaving the Site.
- Any indication of conditions more hazardous than those anticipated, or the observation of circumstances that would render the above basic health and safety procedures inappropriate, shall result in the evacuation of the work area and a reassessment of health and safety procedures by a QEP.

3. SOIL AND/OR LEATHER HIDE MANAGEMENT

The following section provides procedures for the excavation, re-use, storage, and disposal of excess soil and/or discarded leather hides discovered or generated during redevelopment activities at the Site.

Management of Leather Hides

Buried tannery waste is known to contain elevated concentration of chromium. With respect to Prime Tanning, hexavalent chromium is a concern because it is the most mobile and toxic form of this metal. As such, hexavalent chromium may be leaching from any accumulations of hides present on Lot 130 or 133 relative to the nearby Salmon Falls River. Site soils are not a concern for hexavalent chromium because a Maine DEP required Declaration of Environmental Covenant (DEC) will be established requiring a cover system. It addition, the DEC will also limit groundwater withdrawals.

In order to assess if hides require removal, the QEP will sample groundwater in areas where more than 1-foot thick accumulations of hides are observed. This will be done to quantify if hexavalent chromium has leached from hides and impacted the groundwater and require removal. The assessment of each hide area will involve the collection of groundwater samples from directly beneath any hides areas that are discovered and from a minimum of 50 feet downgradient (if possible). Credere's August 2018 SSQAPP details other required sampling procedures.

Hides that are identified to be leaching (i.e., groundwater concentrations of hexavalent chromium exceeding the applicable regulatory criteria) using this process shall be removed and properly disposed. Any identified leaching hides may first be temporarily stockpiled onsite on and under 6-mil polyethylene plastic prior to waste disposal characterization and acceptance at an appropriately licensed receiving facility. Sampling of the removed hides shall be done in accordance with the identified disposal facility's requirements.

Soil Stockpiling and Storage

Soil relocation is planned for Lot 130 and portions of Lot 133. All excavated materials will be moved to a centralized location on Lot 133 and covered with asphalt. This asphalt area will be reused as a parking lot to support the future redevelopment of the Site. As such, the designed cover system will serve as a permanent engineered barrier system separating future users of the Site from identified contaminants. Removal of soil will only become necessary if there is an excess of soil that will not be suitable for future use of the cover system as a parking lot.

Any excess impacted soil excavated from Lot 130 or at portions of Lot 133 will be temporarily stockpiled onsite on and under 6-mil polyethylene plastic prior to waste disposal characterization and acceptance at an appropriately licensed receiving facility. To manage stormwater, berms shall be constructed around the edges of the stockpiles, the base shall be sloped to create leachate collection points, and storm water runoff will be diverted away from any soil stockpile or storage area wherever feasible. Excess soil to be removed may be more conveniently live loaded into trucks for off-Site disposal at an appropriately licensed facility or temporarily stored within secure, water resistant, Department of Transportation (DOT)-approved bulk containers. Stockpiled or containerized soil will be stored within a secure area of the Site and properly labeled to minimize potential contact. In addition, soil stockpiled or otherwise stored at the Site will be inspected daily for tears, holes, or other failures in the polyethylene sheeting or storage container.

Dust Control

Dust control requirements will be a contractual responsibility of the contractor for the Site and will be documented by the Owner's QEP during remediation activities. Dust control measures shall be employed by the contractor during excavation and grading and to control dust around stockpiles, haul roads, and any other exposed soils.

- At a minimum, wet suppression shall be used to provide temporary control of dust. Wet suppression will be applied on a routine basis and/or as directed by the Owner's QEP to adequately control dust. Depending upon weather conditions and work activity, several wet suppression applications per day, and/or the use of granular calcium chloride or similar commercially manufactured dust control agents may be necessary to adequately control dust.
- Water runoff generated by dust control will be retained and disposed in accordance with the requirements of the appropriate regulatory agencies.
- Vehicles leaving the Site shall have no mud or dirt on the vehicle body or wheels. Any foreign matter on the vehicle body or wheels will be physically removed prior to vehicles entering a public roadway or adjoining mill driveways. Vehicles will not be permitted to leave the Site with exterior mud or dirt that has the potential to be deposited on public roadways.

On-Site Reuse of Soil

The engineered barrier system will cover the soil consolidation areas on Lot 133 and will consists of the following in each of the areas:

- Hardscape Cover System: Areas planned for impermeable construction (e.g., asphalt parking area) will be installed directly over the impacted soil. A separate marker layer will not be necessary below impermeable surfaces since these materials will serve as the marker layer. However, an appropriate lift of asphalt subgrade can be used at the discretion of the environmental contractor.
- Landscaped Areas: A permeable geotextile fabric or similar material, such as snow fence will be placed as a marker layer directly over the impacted soil to indicate the distinction between the clean fill cover and the underlying impacted soil to remain at the Site. A minimum of 1 foot of clean fill will be placed as cover material over the marker layer. Two (2) feet of clean fill shall be used in any areas designed specifically for child outdoor play that is not covered with well-established grass or hardscape (e.g., mulched or tire chipped play areas where digging could result). The source of fill will be documented to be a local native source or will be documented to be clean through analytical testing. The covered areas will be loamed, seeded, mulched, or otherwise permanently stabilized to prevent erosion and damage to the soil cover. If the marker layer must be compromised to facilitate landscape installation, a replacement marker layer shall be installed prior to the placement of any new non-impacted material.

Each covered area will be graded so that the stormwater runoff is directed to an appropriate area. Additional sub-base materials may be necessary beyond the minimum cover requirements discussed herein to maintain the structural integrity of the proposed site features.

An engineered barrier system schematic is included as **Figure 3**. Because no impacted soils will be left on Lot 130 and the uncovered areas of Lot 133, no engineered barrier system will be required for those areas.

Off-Site Soil Disposal/Recycling

Excess impacted soil that cannot be reused will be transported and disposed off-Site in accordance with applicable federal and state regulations. The following subsections provide appropriate procedures for the characterization and offsite disposal of special waste soil.

Waste Characterization Sampling

Waste characterization sampling is required in order to meet facility acceptance requirements. As such, the QEP will collect representative samples from the special waste soil for analysis by an independent, Maine-certified laboratory. At a minimum, and in accordance with disposal facility requirements, laboratory criteria will include, but may not be limited to, the following analyses:

- Total petroleum hydrocarbons (TPH)
- VOC
- SVOC
- PCB
- RCRA 8 Metals
- Pesticides
- Herbicides
- pH
- Ignitibility, conductivity, and reactivity (sulfide and cyanide)
- Additional toxicity characteristics leaching procedure (TCLP) analysis, where necessary

Following receipt of the results of the above analyses, an appropriate disposal or recycling method will be selected and a waste profile will be prepared and submitted to the facility for acceptance prior to shipping. The facility will be licensed to accept special waste and acceptance will be based on the waste characterization sample results. Possible licensed facilities for recycling or disposal based on the existing analytical results include CPRC Group in Scarborough, Maine (recycling, preferred); Aggregate Recycling Corporation (ARC) in Eliot, Maine (recycling, preferred); Waste Management in Norridgewock, Maine (landfill disposal); or Juniper Ridge in Old Town, Maine (landfill disposal).

Soil Transport and Recycling/Disposal

Following facility acceptance, impacted soil will be removed from the Site for proper recycling or disposal. The loading of impacted soil will be conducted in accordance with the requirements of this SGMP. Impacted soil loading and transport activities will be overseen by the Owner's QEP.

Equipment used for the transport of impacted soil will be properly licensed in accordance with applicable state and federal regulations. Haul truck cargo areas shall be securely and completely covered during material transport on public roadways.

Each shipment of impacted soil will be accompanied by appropriate transport documentation, such as a hazardous waste manifest or bill of lading. An official record of each shipment of impacted soil from the Site, including tonnage, will be presented to the owner's QEP following delivery to the receiving facility.

Backfill Materials

Backfill materials shall be sourced from a local native source and will be documented as clean fill.

4. GROUNDWATER MANAGEMENT

The use of groundwater at the Site as a potable water source or otherwise (e.g., hand washing, etc.) is prohibited and all potable water should be provided to the Site via a public water source.

While no impacted groundwater was identified at the Site during previous assessment activities, impacted groundwater was identified on the south-adjoining main Prime Tanning Facility parcel. Therefore, as part of Site redevelopment, any excess groundwater generated during excavation activities for utilities, foundations, and other subsurface structures will be collected and managed in accordance with this section.

General Dewatering of Excavations

- Surface water will be prevented from flowing into excavations at the Site and trench excavations will not be used as temporary drainage ditches.
- Pumps, well points, sumps, hoses, filters, and all other dewatering system components will be provided and maintained as necessary to convey water away from excavations.
- The suspended solids content in the water shall be minimized during dewatering activities by lining the excavation collection area with crushed stone and placing the pump intake in a perforated bucket.
- Water removed from excavations shall be conveyed to an on-Site frac tank.
- **Silt laden or untreated water shall not be discharged directly to the storm, sanitary or combined sewer without first receiving appropriate approvals and meeting appropriate state and municipal pretreatment and permitting requirements.**

Collection and Disposal at Treatment/Disposal Facility

The preferred method of groundwater management is collection, testing, and disposal at the Berwick Sewer Commission in Berwick, Maine, or other appropriately licensed facility based on testing results. These methods require approval prior to discharge. The methods for storage, testing, and disposal are described below:

- Water removed from excavations shall be stored in a fractionation (frac) tank to allow settling of solids and testing prior to discharge. The frac tank inlet shall be placed at the opposite end from the tank outlet.
- If needed for additional detention or storage volume, additional tanks shall be placed in series for secondary settlement.
- The contractor shall obtain any local, state, and federal approvals necessary for the discharge of the water to the Berwick Sewer Commission.
- Prior to discharge of the initial tank load, the contractor shall collect water samples for laboratory analysis in accordance with the applicable requirements of the Berwick Sewer Commission. Test results will be provided to the Owner's QEP and the Town of Berwick Town Manager.
- Once sampled, no water or other materials shall be added to the frac tank.
- All additional frac tank loads shall be tested in accordance with Berwick Sewer Commission requirements prior to discharge.
- Bag filters will be installed on the discharge piping and water will meet the Town of Berwick's discharge limitations prior to discharge. Groundwater determined to have contaminant levels exceeding the Town of Berwick's limits shall be treated prior to discharge or disposed at another licensed disposal facility (e.g., NRC in South Portland, Maine).
- Water shall be transferred from each tank by suspending the intake line immediately below the water level to minimize disturbance of sediment at the bottom of the tank.
- The contractor will cease discharge immediately upon discovery through testing or other means that discharge is not in compliance with the requirements of local, state, or federal regulations or permits.
- Following the discharge of water from the frac tank(s), any accumulated sediment or other solid materials will be managed in accordance with **Section 3** of this SGMP.

Incidental Groundwater

Groundwater may percolate up to the ground surface during the installation of piles and/or during the compaction of soils. This groundwater may be allowed to infiltrate back into the subsurface environment; however, it must be prevented from entering the stormwater system.

5. PROJECT CONTACTS

Depending on the complexity of the issue, the following people will be able to answer questions or refer inquiries to the correct person.

Prime Tanning Lots 130 and 133 – Contact Information Site Soil and Groundwater Management Plan		
Organization	**Person**	**Phone Number**
Property Owner Town of Berwick	James Bellissimo Steve Eldridge	(207) 698-1101
Qualified Environmental Professional (QEP) Credere Associates, LLC	Rick Vandenberg	(207) 828-1272 x30
Maine DEP Project Manager	Rick Currie	(207) 287-3136

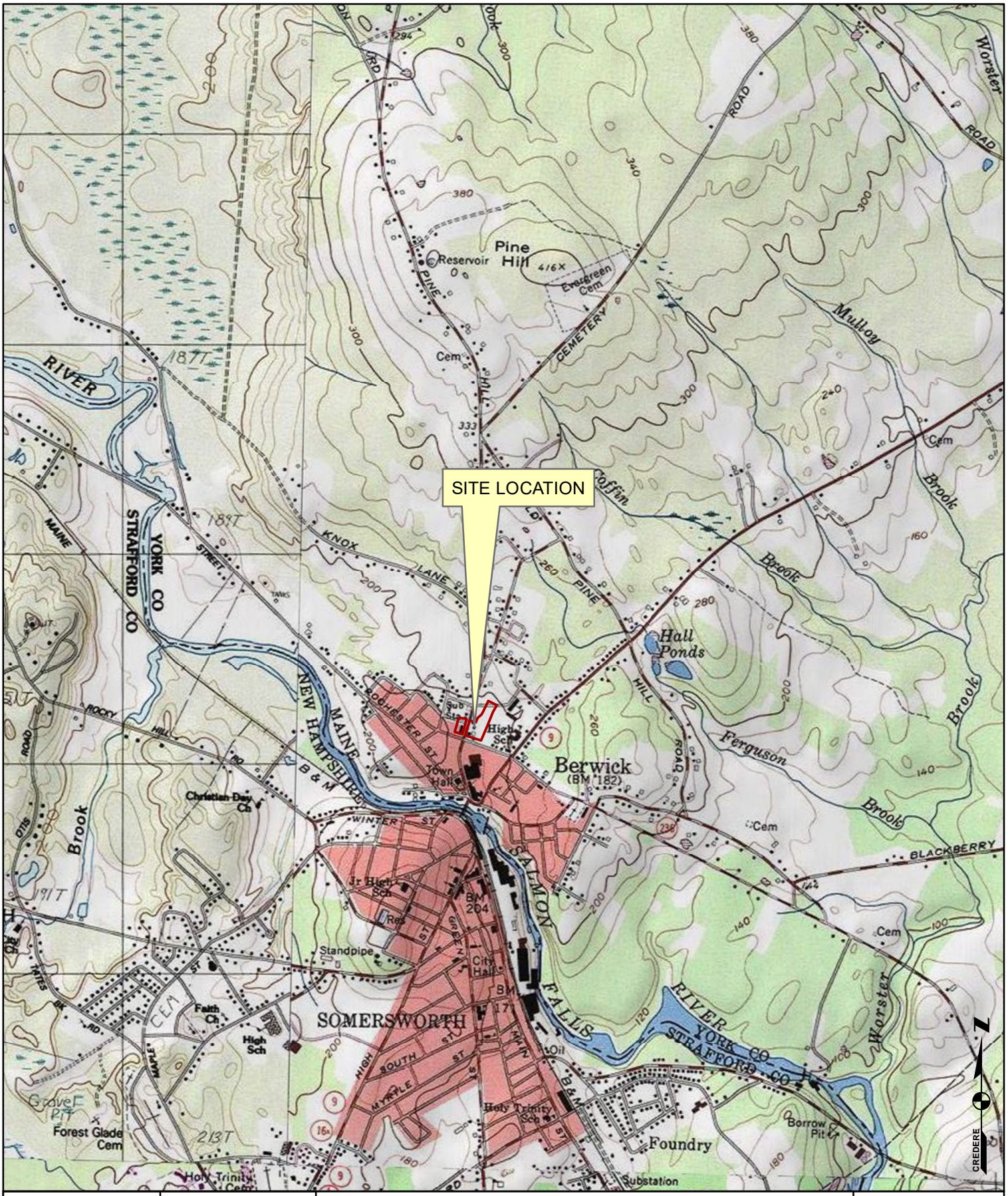
If there are any questions, please contact the undersigned.

Sincerely,
Credere Associates, LLC

Rick Vandenberg, CG, PG
Senior Project Manager

Rip Patten, PE, LSP, LEED-AP
Vice President

Attachments: Figure 1 – Site Location Plan
Figure 2 – Detailed Site Plan
Figure 3 – Engineered Barrier System Schematic



DRAWN BY: **SAF**	DATE: **6/1/2018**
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FIGURE 1
SITE LOCATION PLAN

PRIME TANNING LOTS 130 AND 133
35 AND 34 SULLIVAN STREET
BERWICK, MAINE

1,000 0 2,000 Feet
1 INCH = 2,000 FEET

Topographic Map Data Copyright© 2013 National Geographic Society, i-cubed

8 GOODWIN STREET
9 SULLIVAN STREET
45 SULLIVAN STREET
46 SULLIVAN STREET
GOODWIN STREET
9 GOODWIN STREET
LOT 130
44 SULLIVAN STREET
BLUE SORT BUILDING
SULLIVAN STREET
LOT 133
8 JORDAN STREET
JORDAN STREET
20 WILSON STREET
11 JORDAN STREET
29 SULLIVAN STREET (FORMER PRIME TANNING)
WILSON STREET
20 SULLIVAN STREET (PRIME TANNING FACILITY MAIN PARCEL)
80 0 160 Feet
1 INCH = 80 FEET
CREDERE

DRAWN BY: **SAF**	DATE: **8/10/2018**
CHECKED BY: **RSV**	PROJECT: **18001444**

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FIGURE 2
DETAILED SITE PLAN

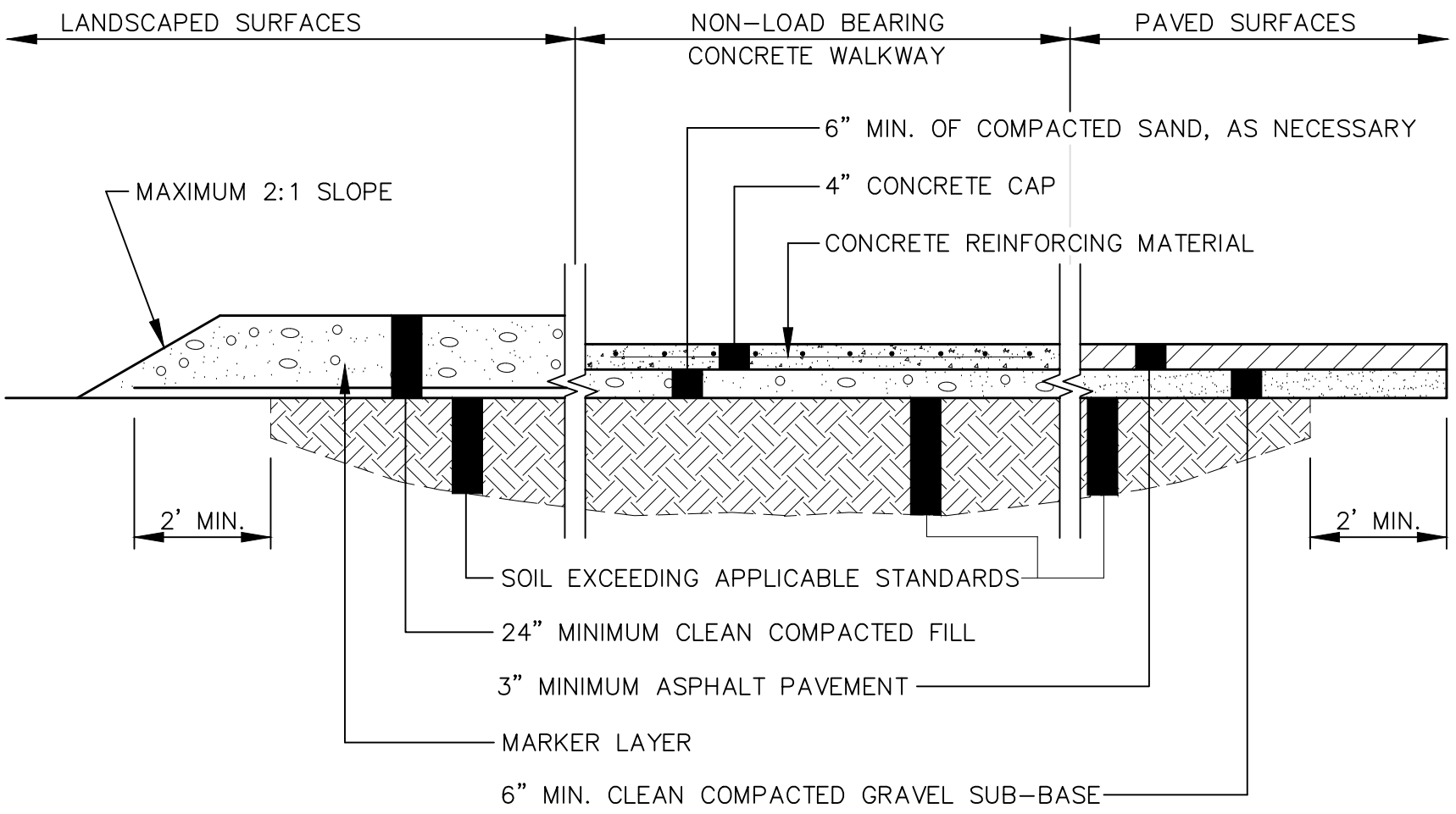
PRIME TANNING LOTS 130 AND 133
35 AND 34 SULLIVAN STREET
BERWICK, MAINE

- APPROXIMATE PATH OF UNNAMED BROOK
- SITE ACCESS POINT
- DELINEATED WETLAND AREA
- SITE BOUNDARY
- SITE BUILDING FOOTPRINT
- EXISTING ASPHALT PARKING LOT
- PROPOSED PARKING AREA/PRIMARY SOIL CONSOLIDATION AREA
- PROPOSED ADDITIONAL SOIL CONSOLIDATION AREA
- PROPOSED NEW BUILDING FOOTPRINT
- PARCEL BOUNDARY

NOTES:
EXISTING CONDITIONS AND FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE AND ARE BASED ON INFORMATION OBTAINED FROM THE TOWN OF BERWICK ONLINE GIS DATA, PREVIOUS ENVIRONMENTAL REPORTS, MAINE GIS PARCEL LAYER, AND 2012 ORTHO PHOTOS.

Ortho Image

Document Path: T:\Data\ME\Town\Berwick\18001444 - Prime Tanning Lots 130 and 133\SGMP Figure 2.mxd



NOTE

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

SKETCH NO: FIGURE 3

SCALE: N.T.S.

ENGINEERED BARRIER SYSTEM SCHEMATIC

PRIME TANNING, LOTS 130 AND 133
35 AND 34 SULLIVAN STREET
BERWICK, MAINE

DRAWN BY: MTG/SAF | DATE: 08/10/2018
CHECKED BY: RSV | PROJECT: 18001444

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Economy Community Environment

J:\CREDERE\18001444 – Prime Tanning Lots 130 & 133\2018 Cover System Schematic.dwg plot date: 8/10/2018 2:57 PM