Analysis of Brownfield Cleanup Alternatives

Former Theis Precision Steel Inc

300 Broad Street Property LLC

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This document has been prepared by SLR International Corporation (SLR). The material and data in this report were prepared under the supervision and direction of the undersigned.

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Acronyms and Abbreviations

ABCA	Analysis of Brownfield Cleanup Alternatives
AOC	Area of Concern
AST	Aboveground storage tank
bgs	below ground surface
CFR	Code of Federal Regulations
CGS	Connecticut General Statues
COC	Contaminant of Concern
CTA	Connecticut Transfer Act
CT DEP	Connecticut Department of Environmental Protection
CT DEEP	Connecticut Department of Energy & Environmental Protection
DEC	Direct Exposure Criteria
ECAF	Environmental Condition Assessment Form
ESA	Environmental Site Assessment
EUR	Environmental Use Restriction
Ft	feet
GWVC	Groundwater Volatilization Criteria
HRP	HRP Associates, Inc.
I/C DEC	Industrial/Commercial Direct Exposure Criteria
I/C GWVC	Industrial/Commercial Groundwater Volatilization Criteria
I/C SVVC	Industrial/Commercial Soil Vapor Volatilization Criteria
LEP	Licensed Environmental Professional
LNAPL	Light non-aqueous phase liquids
mg/Kg	milligrams per kilogram
NVCOG	Naugatuck Valley Council of Governments
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PMC	Pollutant Mobility Criteria
QAPP	quality assurance project plan
RDEC	Residential Direct Exposure Criteria
R GWVC	Residential Groundwater Volatilization Criteria
RSR	Remediation Standards Regulations
R SVVC	Residential Soil Vapor Volatilization Criteria
SLR	SLR International Corporation

SVVC	Soil Vapor Volatilization Criteria
SWPC	Surface Water Protection Criteria
TPH	Total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
UST	underground storage tank
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
WES	Williams Environmental Services, LLC
WWTP	Wastewater treatment plant

1.0 Introduction and Purpose

On behalf of 300 Broad Street Property LLC, SLR International Corporation (SLR) has prepared this Analysis of Brownfield Cleanup Alternatives (ABCA) for the property located at 300 Broad Street in Bristol, Connecticut (the Site). The ABCA presents the remedial alternatives proposed to address soils exceeding Remediation Standards Regulations (RSRs; Regulations of the State Agencies) [Sections 22a-133k-1 through 22a-133k-3] numerical criteria in Areas of Concern (AOCs) at the Site. A Site Location map is provided as Figure 1.

The goal of the remediation of the property is to revitalize the Site for productive manufacturing use, occupied by business ranging from light to medium manufacturing and multi-industry storage and distribution centers. The Site is currently zoned for industrial use, and the future use of the Site is anticipated to be similar.

Based on analytical results and observations from Phase II and Phase II Environmental Site Assessments (ESA's) conducted by SLR and others there are several AOCs for which releases of Site Contaminants of Concern (COCs) have been identified and remediation is necessary to achieve compliance with applicable RSR prior to the redevelopment of the Site.

2.0 Site Setting and History

2.1 Site Location and Description

The Site is known in municipal and state regulatory files as 300 Broad Street, and is identified as Lot 100, Block 43, Parcel 1446 on the City of Bristol's Tax Map online application. The property is comprised of approximately 22.67-acres. The Site has generally been occupied by various steel milling companies since initial development in 1915.

The Site is developed with four buildings, described below:

- Building A (formerly identified as Building #100): Rectangular single-story building totaling 176,092 square feet located to the north of Building B. The building was constructed in its current configuration in 1948.
- Building B (formerly identified as Building #5): One single-story building totaling 75,711 square feet located immediately north and interconnected with Building C. The initial portion of the building was constructed in 1917 with expansion to the east and west in 1923, 1929, 1935, 1936, and 1938.
- Building C (formerly identified as Building #1): One single-story building totaling 46,521 square feet on the southern portion of the Site. The initial portion of the building was constructed in 1915, and was expanded westward with expansions in 1924, 1934, 1936, and to its current extend with additional expansions in 1950, 1964, and 1968.
- The natural gas service interconnect, an access drive, and a grass area are located to the north of Building A. An out-of-service cooling tower, an access drive and two shipping and receiving docks are located outside of the east wall of Building A. Two former 10,000-gallon No. 4 oil underground storage tank (UST) vaults and a compactor are located to the south of Building A.
- Powerhouse (formerly identified as Building #101): Rectangular high-ceiling former boiler house totaling 5,576 square feet located on the northwestern corner of the Site. The building was constructed concurrent with Building A in 1948. A concrete pad and two vent pipes are present in the location of two former 20,000-gallon No. 6 fuel oil USTs to the west of the building.

In addition to the features noted above, a tunnel runs from east to west between the Site and the western adjoining facility and continues below Building A running east/west the length of the building and a single north/south running section centrally located beneath the building. The tunnel also runs north/south under the adjacent 340 Broad Street property and terminates beneath the Powerhouse. The tunnel formerly served as a utility conduit between the buildings and the two properties, 300 Broad Street and 340 Broad Street were identified as one parcel prior to a lot line revision recorded in July, 2021. A paved parking lot located to the north of the Pequabuck River is also part of the Site.

2.1.1 Adjacent Land Use

The Site is bound to the north and east by the Pequabuck River, to the south by Broad Street, and to the west by the former Theis facility located at 340 Broad Street, now owned and operated by CM Properties LLC. Access to the Site is provided via a driveway which runs along the western boundary from Broad Street. The majority of the eastern portion of the Site consists

of undeveloped wooded land and a manmade drainage swale, which receives surface water from catch basins prior to discharge to the Pequabuck River.

2.2 Previous Uses of the Site

The property operated as a specialty steel manufacturing facility form 1915 through 2019. Operations remained largely consistent under various owners throughout the operational years of the facility, with the exception of the operation of a nickel-plating line and associated wastewater treatment plant (WWTP) in Building A, which was installed in a former carbon annealing area in approximately 2016/2017. Operations ceased in 2019. 300 Broad Street Property LLC obtained title to the Site in 2022 through a debt purchase and foreclosure action. The Site was vacant from 2019 through 2022 and is currently underutilized.

2.3 Regulatory History

2.3.1 Connecticut Transfer Act

Phase I and Phase II ESAs (2013 ESAs) were conducted at the Site (and the western adjoining property at 340 Broad Street) by HRP Associates, Inc. (HRP) in 2013 to evaluate environmental conditions at the Site, and to support the transfer of the property and business pursuant to the Connecticut Transfer Act (Connecticut General Statues [CGS] Sections 22a-134 through 22a-134e, or ("CTA"). The CTA and the related investigation and remediation requirements set forth under the RSRs, currently apply to the Site as of the January 2014 property transfer.

Based on these ESA's 24 AOCs were identified. Of these 24 AOCs, 20 AOCs were specific to the Site with the remaining AOCs on the western side pertaining to the adjoining 340 Broad Street property. SLR's Phase I ESA, conducted in 2021, identified an additional 6 AOCs specific to the Site, totaling 26 AOCs associated with the 300 Broad Street property.

According to the Connecticut Department of Energy & Environmental Protection (CT DEEP), the Site has been subject to two property transfer filings pursuant to the CTA. Both filings appear to have included the western adjoining property at 340 Broad Street.

Date	Type of Transfer	Seller	Buyer	Certifying Party
10/14/86	Form II Negative Declaration (Real Estate)	Barnes Group, Inc.	Theis Precision Steel	Not listed
1/20/14	Form III (Real Estate)	Friedr. Gustav Theis Kaltwalzwerke GmbH	TPS Acquisition, LLC	TPS Acquisition, LLC

A Verification recording the completion of the remediation of the Establishment as defined the 2014 Form III and Environmental Condition Assessment Form (ECAF) has not been filed as of the date of this report and thus the prior Certifying Party is not in compliance with the CTA deadlines.

The CTA generally applies to any change in ownership of an establishment, but numerous transactions are exempt from the CTA, including but not limited to the acquisition of an establishment through foreclosure, which is the case of 300 Broad Street Property LLC (Property Owner) acquisition of the property.

2.3.2 Toxic Substances Control Act (TSCA)

Based on investigations activities conducted by SLR and others, two AOCs (AOC-8 and 22) have identified polychlorinated biphenyl (PCB) impacts to soil and/or concrete at concentrations greater than 50 milligrams per kilogram (mg/kg). Based on these findings, the as-found concentrations exceed the applicability criteria of the United States Environmental Protection Agency (USEPA) TSCA Regulations (40 CFR §761). These areas will require remediation in accordance with TSCA as well as the RSRs.

3.0 Regulatory Framework

3.1 Regulatory Model

Based on the Phase I ESA conducted by SLR in November 2021, the former operator of the Site, Theis Precision Steel Corporation generated 100 kilograms/220 pounds of hazardous waste per month, and therefore meets the definition of an "Establishment" as defined by the CTA. Thus, the Site is subject to investigation and remediation requirements as established in the RSRs.

SLR considered the following factors in selecting the criteria used to evaluate COC levels in soil and groundwater at the Site:

- The Site is currently zoned for industrial use, and the future use of the Site is anticipated to be similar.
- According to the CT DEEP Water Quality Classification Map, the Site is within an area where groundwater quality has been classified as GB, meaning the water quality has been degraded by historical land use and/or industrial activity. Such groundwater may not be suitable for human consumption without treatment due to waste discharge, spills or leaks of chemicals or land use impacts.
- The nearest surface water body is Pequabuck River (Class B), portions of which bound the northern and eastern Site boundary (Figure 1).
- The Site has also been connected to a public sewer.
- Depth to groundwater generally ranges between 3 and 8 feet below ground surface (ftbgs) across the Site.

3.2 Soil Criteria

Based upon the information listed above, this section describes RSR criteria applicable to the remedial evaluation of soil at the Site.

- **Direct Exposure Criteria (DEC)** – The DEC were developed to protect human health in the event of direct contact with soil impacted by COCs. Regardless of the use or zoning of the property, the Residential DEC (RDEC) apply to all properties in Connecticut. The RSRs also contain another set of DEC that can be applied to properties used for non-residential purposes. The Industrial/Commercial DEC (I/C DEC) can be used on non-residential properties if an Environmental Use Restriction (EUR) is placed on the property. An EUR would restrict the property from residential uses, as defined in the RSRs (§ 22a-133k-1(53)). The DEC apply to all soil within 15 feet of the ground surface, regardless of the relative elevation of the water table. For the purposes of this assessment, both the RDEC and I/C DEC have been considered.
- **Pollutant Mobility Criteria (PMC)**—The PMC were developed to protect groundwater resources from soil-bound COCs that could mobilize and degrade groundwater quality. Because groundwater in the area surrounding the Site has been classified by the CT DEEP as Class GB, the GB PMC have been used to assess available soil data. These criteria apply to all soils at or above the seasonal high water table (estimated at 3 to 5 feet bgs).

3.3 Groundwater Criteria

Based on the information listed above, this section describes RSR criteria applicable to the remedial evaluation of groundwater at the Site.

- **Surface Water Protection Criteria (SWPC)** —The SWPC apply to groundwater that discharges to surface water bodies and are intended to be protective of aquatic organisms and human health. Compliance with the SWPC is demonstrated at the point where a plume discharges to a surface water body, or at the downgradient property line. As such, exceedances of the SWPC within the Site boundary do not necessarily indicate noncompliance.
- **Groundwater Volatilization Criteria (GWVC)** —The GWVC are intended to protect human health in the event that volatile organic compounds (VOCs) in groundwater under a building partition into the vapor phase, migrate upward through the soil column, and enter occupied buildings. The Residential GWVC (R GWVC) apply to all properties regardless of use or zoning, but the Industrial/Commercial VC (I/C GWVC) may be employed on non-residential properties with the emplacement of an EUR. For the purposes of this assessment, both the R GWVC and I/C GWVC have been considered.

3.4 Soil Vapor Criteria

Based on the information listed above, this section describes RSR criteria applicable to the remedial evaluation of soil vapor at the Site.

- **Soil Vapor Volatilization Criteria (SVVC)** —The SVVC are intended to be protective of human health in the event that VOCs from the underlying groundwater migrate through the vapor phase upward through the floor and enter occupied buildings. These criteria may be used as an alternative to demonstrating compliance with the GWVC. The Residential SVVC (R SVVC) applies to all properties regardless of use of zoning, but the Industrial/Commercial SVVC (I/C SVVC) may be employed on non-residential properties with the placement of an EUR. For the purpose of this assessment, both the R SVVC and the I/C SVVC have been considered.

4.0 Site Investigation Summary

4.1 Site Contaminants of Concern

4.1.1 Total Petroleum Hydrocarbons (TPH)

Sources of TPH known to have been used on the Site are lubricating oil, hydraulic oil, compressor oil, and #2 heating oil. These petroleum products are organic mixtures composed of various hydrocarbons, such as aromatic and aliphatic fractions. Potential mechanisms of release include leaking aboveground and underground storage tanks (ASTs and USTs). Material discharges from manufacturing operations could have also reached the floor drain/trench system, and, depending on the construction, leakage through joints, breaks or damaged sections could have potentially provided a pathway for TPH to enter sub-slab soils and groundwater.

Petroleum hydrocarbons are relatively insoluble in water and tend to adsorb onto organic material in soil. Therefore, two mechanisms for transport of TPH exist at the Site: movement of light non-aqueous phase liquids (LNAPL) (if present) through soil above the water table and along the groundwater surface, and downgradient transport of dissolved-phase petroleum hydrocarbons in overburden groundwater.

4.1.2 Polycyclic Aromatic Hydrocarbons (PAH)

PAHs are a semi-volatile subgroup of petroleum hydrocarbons. The most likely source of PAHs at the Site are lubricating and cutting oils and #2 heating oil. Potential mechanisms of release include leaking ASTs and USTs and discharges of materials from operations that may have reached the floor drain/trench system.

Similar to petroleum hydrocarbons, PAHs are relatively insoluble in water and tend to adsorb onto organic material in soil. Mechanisms of PAH transport include movement of LNAPL (if present) and downgradient transport of dissolved phase petroleum hydrocarbons in overburden groundwater.

4.1.3 Metals

Based on investigation activities at the Site, the following list of metals are considered Site metals: arsenic, barium, cadmium, chromium, lead, mercury, nickel, selenium, and zinc. Sources of metals may include metal cuttings associated with production operations and cleaning/degreasing wastes. Releases to the concrete floor and/or wood block flooring may have reached the drain/trench system and/or soils within or adjacent to AOCs may have resulted in metals being transported into the soil and groundwater. Leachability of various metals varies based on physical characteristics of the metals released, such as particle size, and groundwater geochemical characteristics, such as pH and oxidation-reduction conditions.

The primary means of metal transport at the Site is dissolution into and transport within groundwater. Arsenic compounds can adsorb strongly to soils and do not tend to migrate over long distances in groundwater, depending on groundwater geochemistry and redox conditions. In general, arsenic mobilization occurs in reducing conditions.

4.1.4 Polychlorinated Biphenyls (PCBs)

PCBs bound to soil or sediment particles are insoluble, stable, generally persistent in the environment, and do not break down for long periods of time. Transport of PCBs at the Site would be through particulate transport (during rainfall run-off conditions), or very limited transport of the dissolved phase in groundwater.

PCBs are regulated by the CT DEEP and in some cases by the USEPA under the Toxic Substances Control Act (Title 40 of the Code of Federal Regulations, Section 761). SLR identified PCBs at concentrations regulated by the Toxic Substances Control Act during the Phase II and Phase III investigation. PCBs were detected in areas adjacent to hydraulic trash compactor and former transformers.

4.1.5 Volatile Organic Compounds (VOCs)

Based on investigation activities at the Site, the VOCs detected have been limited to petroleum related VOCs including naphthalene, isopropyl benzene, n-butylbenzene, n-propyl benzene and sec-butylbenzene. Sources of VOCs may include cutting and hydraulic oils associated with production operations and cleaning/degreasing wastes. Releases may have occurred due to leaking storage tank(s) and/or transfer lines, or spills to the concrete floors which may have reached the drain/trench system and/or soils within or adjacent to AOCs. VOCs could reach the soils under the slab through cracks or seams in the floor and can also directly penetrate concrete.

Similar to petroleum hydrocarbons, petroleum related VOCs are relatively insoluble in water and tend to adsorb onto organic material in soil. Mechanisms of transport include movement of NAPL (if present) and downgradient transport of dissolved phase VOCs in overburden groundwater. Due to their higher volatility, VOCs can readily partition into the vapor phase and the resulting vapors can then migrate into indoor air if they are beneath a building. Volatilization can also serve as a mechanism of mass removal and attenuation from the subsurface.

4.2 AOC Identification

Environmental investigations were completed by HRP in 2013-2014 and SLR between 20121-2024. These findings of these investigations are summarized below. As a result of the environmental investigation reports, twenty-nine AOCs have been identified. It should be noted that prior investigations conducted in 2013 reference the Site as 300 and 340 Broad Street, the western adjoining property. Therefore, four AOCs (9, 17, 19, and 20) identified to be on the adjacent property are excluded from the below list of AOCs pertaining to 300 Broad Street project Site. It should also be noted that AOC-29 is a duplicate area which has been evaluated as AOC-6 in SLR's Phase II and Phase III investigations. Refer to Figure 2 for AOC locations.

The following AOCs have been identified for the Site:

- **AOC-1 — 500-Gallon Kerosene Tank**, Depicted in 1948 site plan west of Building C. No removal or closure documentation was identified.
- **AOC-2 — 1,000-Gallon Lubricating Oil Tank,** Depicted in 1948 site plan between Building B/C. No removal or closure documentation was identified.
- **AOC-3 — 2,000-Gallon Sulfuric Acid Tank**, Depicted in 1948 site plan between Building A/B. No removal or closure documentation was identified.

- **AOC-4 — 10,000-Gallon Heating Oil Tank**, Depicted in 1948 site plan in southeastern Portion of Building C. No removal or closure documentation was identified.
- **AOC-5 — 10,000-Gallon Water-Soluble Oil Tank & Former 10,000-Gallon Water-Soluble Oil Tank (Abandoned-In-Place)**, The first tank was depicted in the 1948 site plan. The second tank (B1) was reportedly abandoned-in-place in 1989. No removal or closure documentation was identified for the USTs.
- **AOC-6/29 — Former Coal Storage and Drying Beds,** two piles up to 10 feet tall (420 tons and 300 tons) were depicted to the east of Building C in the 1948 site plan.
- **AOC-7 — Former 1,500-Gallon Gasoline UST**, formerly located east of Powerhouse
- **AOC-8 — Oil-Filled Transformers South of Building C**, Staining was observed on the transformer pads. during the 2013 Phase I ESA.
- **AOC-10 — Rolling Mills in Building C**, rolling mills within Building C used significant quantities of hydraulic and mineral oils, which are stored adjacent to the machines. Staining and oil was observed in the concrete pits and trenches for the machines.
- **AOC-11 — Building C East Loading Dock**, Hydraulic oil was stored in 330-gallon bins at the dock along the east wall of Building C.
- **AOC-12 — Used Oil Handling and Emergency Generator**, Waste oil and other waste liquids were stored in a 5,000-gallon UST in the south area of Building B. The UST was located within the shell of a former 10,000-gallon UST (G1). An emergency generator and hydraulic oil reclaimer were also operated in this area. Staining was observed by HRP throughout the area.
- **AOC-13 — Building C Parts Washers**, two parts washers utilizing kerosene and mineral oil were observed by HRP in the western portion of Building C. Floor staining was observed throughout the area.
- **AOC-14 — Building A Parts Washer**, A parts washer utilizing “solvents” was observed by HRP in the southern portion of Building A. Floor staining was observed throughout the area
- **AOC-15 — Building C Satellite Hazardous Waste Storage Area**, Filter pads containing chromium-contaminated grinding swarf was stored in drums in the western portion of Building C.
- **AOC-16 — Building A Satellite Hazardous Waste Storage Area**, Lead-contaminated solid waste was stored in drums adjacent to the quench machine in the north-central portion of Building A.
- **AOC-18 — #4 Heating Oil USTs (C1R1 and D1R1)**, Two USTs were located in concrete bunkers outside of the south wall of Building A.
- **AOC-21 — Former 1,000-Gallon Waste Oil UST**, A former waste oil UST (E1) was formerly located to the south of Building C. No closure sampling data was identified.
- **AOC-22 — Hydraulic Trash Compactor**, A compactor for general waste was observed by HRP to the south of Building A.
- **AOC-23 — Former Mineral Oil and Hydraulic Oil ASTs**, formerly located on concrete pads to the south of Building B.

- **AOC-24 — Two USTs Northwest of Building A**, two side-by-side UST-like anomalies were detected during a June 2013 GPR survey to the northwest of Building A.
- **AOC-25 — 160-Gallon Gasoline UST**, 1948 Site plan identified a UST East of Building C.
- **AOC-26 — Four Former 20,000-Gallon No. 6 Heating Oil USTs**, West of Powerhouse according to 1948 plan.
- **AOC-27 — Drainage swale**, located on the eastern side of the property and is the primary stormwater discharge point for the Site.
- **AOC-28 — Nickel Plating Line and WWTP,** Nickel plating line located in the southcentral portion of Building A
- **AOC-30 — Tunnel**, Utility tunnel located below Building A running east/west the length of the building and a single north/south running section centrally located beneath the building.

4.3 Previous Site Activities (1986)

On October 14, 1986, a Form II – Negative Declaration (Real Estate) was submitted to the then Connecticut Department of Environmental Protection (DEP). Theis acquired the Site following the submission of the Form II Negative Declaration.

4.4 Previous Site Activities (2013-2014)

- In 2013 HRP conducted Phase I and Phase II ESAs, including investigations of soil and groundwater. HRP's Phase I Environmental Site Assessment Report identified 24 AOCs in including four offsite AOCs on the western adjoining property, 340 Broad Street. HRP recommended further evaluation of onsite characteristics to delineate contamination.
- Between June – July 2013, HRP was contracted to remove a 5,000-gallon waste oil UST from the interior of Building B, formerly known as Building 5. The UST was constructed of steel and was installed within a historical 10,000-gallon steel UST, which was formerly used for waste oil storage and functioned as secondary containment for the 5,000-gallon UST. Both USTs were situated within a concrete vault. Investigatory samples collected prior to removal identified soil in excess of GB PMC for both lead and ETPH and ETPH in excess of Res DEC. Arsenic, ETPH, and PAHs were detected above their respective SWPC. In response CT DEEP assigned case #2013-03128 to the identified release. Following the investigation, the 5,000-gallon UST was subsequently removed on July 2, 2013. The 10,000-gallon UST was unable to be removed due to the concrete encapsulating its west end, as such the 10,000-gallon UST was abandoned-in-place after cleaning.
- On January 20, 2014, a Transfer of Establishment - Form III (Real Estate) and an ECAF were filed. CT DEEP delegated oversight of the investigation and remediation to a Licensed Environmental Professional (LEP), Eric Boswel (LEP #922) of HRP.
- In late 2014, Williams Environmental Services, LLC (WES) was contracted to remove two 10,000-gallon #4 fuel oil USTs on the south side of Building A, formerly Building 100.

SLR notes that although the status of the spill cases and UST removals as “closed”, these USTS and their associated exceedances were evaluated as AOC-12 and AOC-18 in SLR’s Phase II and Phase III ESA activities.

4.5 Recent Site Activities (2021-2023)

Following the completion of a Phase I ESA in 2021, SLR Implemented Phase II (2021) and Phase III Environmental Site Assessment Activities (2022-2024). The Phase III activities were funded by a Brownfield Grant through Naugatuck Valley Council of Governments (NVCOG) and were conducted in accordance with a USEPA approved Site-Specific Quality Assurance Project Plan (QAPP). The following soil and groundwater investigation activities were conducted at the Site by SLR.

4.5.1 SLR Phase II Activities: August – September 2021

- Advanced 19 soil borings focused within AOCs 2, 5, 6, 8, 10, 12, 22, and 23 and collected one to two soil samples from each boring for a total of 37 samples (including QA/QC duplicate samples). Soil boring locations were decided based on previously identified AOCs and areas most likely to represent significant environmental liability based on historic investigations.
- Installed two monitoring wells (MW-100 and MW-101) to close a data gap and characterize upgradient groundwater coming onto the Site from the west and characterize groundwater downgradient of Building C.
- Collected groundwater samples from seven monitoring wells (TPSMW-10, TPSMW-11, TPSMW-13, TPSMW-14, MW-16, MW-100 and MW-101).
- Conduct a limited sub-slab soil vapor survey in areas where the historic parts-washing operations took place.

4.5.2 SLR Phase III Activities: October 2022 – January 2023

- Advanced 66 soil borings focused within AOCs 5, 6, 7, 8, 10, 12, 14, 15, 16, 18, 22, 24, 27, 28 and collected one to three samples from each boring for a total of 104 soil samples (including QA/QC duplicate samples). Soil boring locations were decided based on the determination from SLR’s Phase II to further investigate the extent of known or suspected petroleum and/or other hazardous substance related impacts.
- Collected two concrete samples were collected within AOC-8 and AOC-16.
- Installed four monitoring wells (MW-102, MW-103, MW-104S, MW-104I). MW-102 was installed to replace MW-12 which was not found and believed to be destroyed. The other monitoring wells were installed in down-gradient areas at the Site to supplement the existing monitoring well network. MW-104I was installed at an intermediate depth to evaluate the vertical extent of identified impacts in groundwater at the Site.

4.5.3 SLR March 2024 Limited Investigation:

- Advanced 14 soil borings focused within AOCs 5, 10, 12, 18, and 27 and collected two samples from each boring for a total of 25 (including QA/QC duplicate samples). Soil boring locations were decided based on the determination from SLR’s Phase III to

further investigate the extent of known or suspected petroleum and/or hazardous substance related impacts.

4.6 AOCs Requiring Remediation

Based on environmental samples collected by SLR and others from 2013 through 2024, the following AOCs had detections of COCs in excess of applicable RSR numerical criteria. Therefore, these AOCs are concluded to have had releases of hazardous substances and/or petroleum and are recommended for remediation. The results of the soil and groundwater investigations completed by SLR are summarized below.

- In AOC -2 ETPH impacts in Site soils is generally confined to the groundwater table between 5-10 ft bgs.
- Isolated “hot spots” of ETPH impacts in soil beneath the Site buildings were observed in AOC-5, AOC-10, and AOC-12.
- AOC-8 and AOC-22 have PCB impacts above RSR and TSCA applicability criteria and require remediation under both programs.
- AOC-6, AOC-16 and AOC-23 require remediation for As and Pb impacted soils and/or concrete.
- AOC-27 will require remediation and a screening level ecological risk assessment.

Refer to Figure 2 for a summarized visual of the remedial actions and compliance strategy for the AOCs requiring remediation.

5.0 Analysis of Brownfield Cleanup Alternatives

The following sections provide a summary of remedial options for the site based upon the AOCs investigated. The overall compliance strategy for the Site is as follows:

- Remediate soil contamination through the use of excavation and off-Site disposal where land use restrictions cannot be applied
- Placement of an EUR limiting the property to non-residential use.
- Incorporate the placement of additional EURs as necessary.
- Post-remedial compliance monitoring of groundwater (required under CT RSRS)

The recording of EURs that prohibit the use of the property for residential purposes are appropriate for this setting, as future development in this industrial area is unlikely to be residential in nature.

In general, the remedial actions intend to achieve the following remedial goals:

- TPH and PAH exceedances in soil below GB PMC and I/C DEC.
- Metal exceedances in soil below GB PMC and I/C DEC.
- COCs in groundwater (ETPH, Arsenic) below the SWPC.

In order to achieve the above remedial goals, the following remedial alternatives have been evaluated:

- Alternative #1 – No action
- Alternative #2 – Excavation with relocation and off-site disposal; Administrative Control
- Alternative #3 – Excavation and off-site disposal; Administrative control

These remedial alternatives have been evaluated based on the following criteria:

1. Effectiveness
2. Ease of Implementation
3. Cost

5.1 Alternative #1 – No Action

This alternative considers leaving the Site in its current condition with no remedial action.

5.1.1 Effectiveness/Applicability

This alternative is not considered to be effective in controlling or preventing the exposure of receptors to environmental impacts identified at the Site. If no action is taken, the Site would not be compliance with RSRs.

5.1.2 Ease of Implementation

No action is easy to implement, as no action will be conducted, however this is not recommended.

5.1.3 Estimated Cost

There is no immediate cost associated with this alternative. However, landscaping and maintenance costs might be incurred to keep the property grounds in acceptable condition by the City of Bristol standards.

5.2 Alternative #2 – Excavation with Relocation, Off-Site Disposal and Administrative Controls

5.2.1 Effectiveness/Applicability

This alternative is an effective method of mitigating risks to human health and the environment through the combination of administrative controls and excavation and relocation of impacted soil. This alternative will achieve compliance with the RSRs following groundwater monitoring.

5.2.2 Ease of Implementation

Collectively the implementation of the above remedial strategies would be straightforward to implement. Below is the proposed implementation for each AOC requiring remediation:

Soil Excavation and Relocation

- AOC-6 and AOC-23 – Excavate soil within the area delineated by investigatory borings and perform post-excavation compliance sampling in accordance with current guidance. Excavated soil will be relocated to the open pits in Building B, adjacent to AOC-5. These pits will be covered with an impermeable surface matching existing elevations. The EUR placed in AOC-5 will extend to cover the soils placed in these pits, rendering them inaccessible and environmentally isolated.
- AOC-18 – Excavate soil to the area delineated by investigatory borings and perform post-excavation compliance sampling in accordance with current guidance. Excavated soil with ETPH and PAH concentrations exceeding criteria will be relocated to the open pits in Building B, adjacent to AOC-5. Given the impacts extend below the groundwater table some dewatering may be required as part of the remediation. Depending on results of post excavation samples an EUR may be placed in this AOC rendering soils greater than 4 feet inaccessible. Following excavation, the area will be restored to match existing conditions.

Soil Excavation and Off-site Disposal

- AOC-8 and AOC-22 – Preparation of a Self Implementing Cleanup Plan (SICP) to be submitted to EPA and CTDEEP for review and comment. The SICP will include details on the remediation, post-excavation sampling and cleanup goal. The remedial approach will include concrete and asphalt removal and limited soil excavation. Remedial activities will not begin until the EPA and CTDEEP are in agreement with SICP. Following excavation, the area will be restored to match existing conditions. No EURs are anticipated for these areas.

- AOC-16 – Remove the impacted concrete and transport impacted material offsite for disposal. Post excavation samples will be collected in the underlying soil. If post-excavation soil sampling identifies Pb impacted soil above applicable RSR criteria it will be excavated and sent offsite for disposal. Following excavation, the area will be restored to match existing conditions. No EURs are anticipated for this area.
- AOC-27 – Excavate shallow impacted soil and sediment within drainage swale for off-site disposal. Due to the location of the drainage swale and proximity to the Pequabuck River, a permit issued by the Bristol Inland Wetlands and Watercourse Commission (IWWC) will be required prior to any remedial actions. Following excavation, the area will be restored to match existing conditions. No EURs are anticipated for this area.

Administrative Control (EUR)

- Placement of an EUR limiting the Site to non-residential use.
- AOC-2 – Place an EUR rendering the soil inaccessible to obtain compliance with the DEC. The impacted soil is greater than 4 ftbgs making it inaccessible pursuant to RCSA Section 22a-133k-1(a)(39). The PMC do not apply to soils below the seasonal high-water table in areas with a GB groundwater classification per section 22a-133k-2(c)(A).
- AOC-5, 10, and 12 – Place an EUR rendering the soil inaccessible and environmentally isolated as the releases are located beneath Building B and C.

Groundwater

Current Site data indicates no impacts to groundwater above applicable RSR criteria. Although to achieve compliance with the RSR four quarters of groundwater sampling will be required following the completion of remediation.

5.2.3 Estimated Cost

The estimated cost for this alternative is $1,090,000. This cost includes the excavation of estimated 1,500 cubic yards of impacted material with the relocation of approximately 900 cubic yards of non-hazardous soil to within the pits in Building B. The remaining impacted soils will be sent offsite for disposal.

5.3 Alternative #3 – Excavation with Off-site Disposal and Administrative Control

5.3.1 Effectiveness/Applicability

This alternative is an effective method of mitigating risks to human health and the environment through the combination of administrative controls and excavation of impacted soil. This alternative will achieve compliance with the RSRs following groundwater monitoring.

5.3.2 Ease of Implementation

The only difference between remedial approach of Remedial Alternative #2 and Alternative #3 is that this alternative does not propose to relocate any of the excavated soil form AOC-6/23. As such the shallow soil impacts will be excavated to the area delineated by investigatory borings and disposed of off-site. Post excavation compliance sampling will be conducted in accordance with current guidance. In addition, groundwater sampling will be conducted as noted for Alternative #2.

No other changes to the above-described remedial activities are proposed in Alternative #3.

5.3.3 Estimated Cost

The estimated cost for this alternative is $1,450,000. This cost includes the excavation and offsite disposal of an estimated 1,500 cubic yards of impacted soil.

5.4 Recommended Remedial Alternative

The recommended remedial alternative is Alternative #2: Excavation with soil relocation, off-site disposal and Administrative Controls. The combination of all three remedial actions presented by this alternative is determined to the be the most cost effective and viable option to successfully meet the remedial action objectives for the Site. Furthermore, Alternative #2 is the most streamlined approach for achieving compliance with applicable RSR criteria prior to the redevelopment of the Site.

Figures

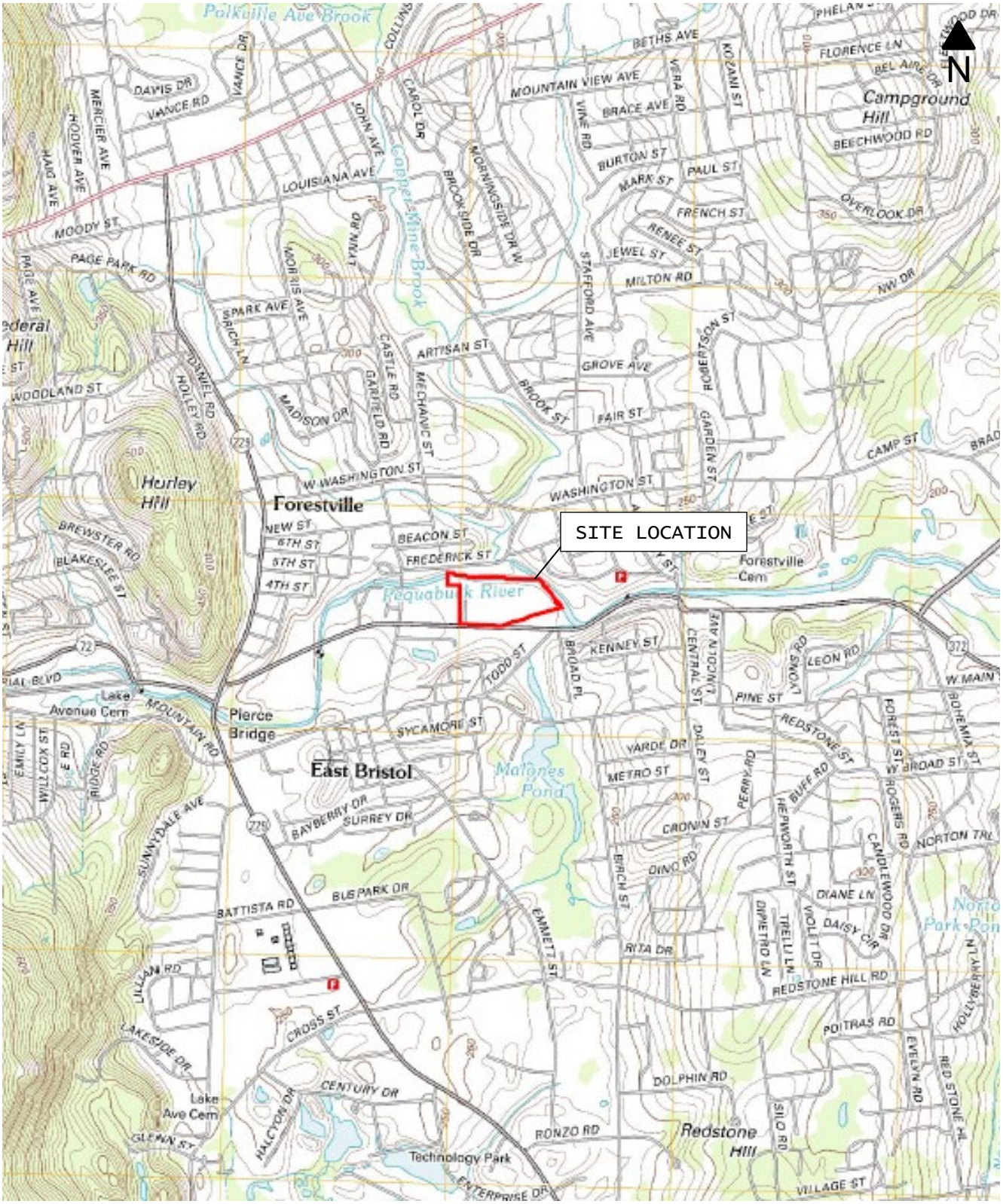
Analysis of Brownfield Cleanup Alternatives

Former Theis Precision Steel Inc

300 Broad Street Property LLC

SLR Project No.: 126.20476.00001

June 10, 2024



REFERENCED FROM: USGS 7.5 MINUTE QUADRANGLE (Bristol, CT - 2012)

SLR

FIGURE 1
SITE LOCATION MAP

300 Broad Street
Bristol, Connecticut
Project No: 126.20476.00001

AOC-7
AOC-24
AOC-16
AOC-28
AOC-22
AOC-14
AOC-18
AOC-3
AOC-5
AOC-12
AOC-2
AOC-1
AOC-10
AOC-15
AOC-11
AOC-23
AOC-13
AOC-8
AOC-04
AOC-6
AOC-21
AOC-27

BUILDING #100
BUILDING #5
BUILDING #1
COMPACTOR
SWITCH HOUSE
Electrical
Sign
Gravel
Loading
Bit. Drive
PROPERTY LINE (TYP.)
MATCHLINE A-A'
OUTFALL
WETLAND DELINEATION LINE
N/F Pan Am Southern
BROAD STREET
ROUTE 72

LEGEND

- ADMINISTRATIVE CONTROL/ELUR
- PRE-REMEDIAL INVESTIGATION FOLLOWED BY ADMIN CONTROL
- SOIL EXCAVATION
- LIMITED SOIL AND CONCRETE/ASPHALT REMOVAL FOR PCB IMPACTED AREA UNDER TSCA WORK PLAN
- CONCRETE REMOVAL
- AREA OF CONCERN

SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

REVISIONS

FIGURE 2 - REMEDIAL ACTIONS & COMPLIANCE STRATEGY

FORMER THEIS PRECISION STEEL INC

300 BROAD STREET
BRISTOL, CONNECTICUT

--	RYE	RYE
DESIGNED	DRAWN	CHECKED

SCALE: 1"=80'
DATE: APRIL 7, 2023
PROJECT NO.: 13211.00036
SHEET NO.: 2

Appendix A Limitations

Analysis of Brownfield Cleanup Alternatives

Former Theis Precision Steel Inc

300 Broad Street Property LLC

SLR Project No.: 126.20476.00001

June 10, 2024

Limitations

The services described in this work product were performed in accordance with generally accepted professional consulting principles and practices. No other representations or warranties, expressed or implied, are made. These services were performed consistent with our agreement with our client. This work product is intended solely for the use and information of our client unless otherwise noted. Any reliance on this work product by a third party is at such party's sole risk.

Opinions and recommendations contained in this work product are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. The data reported and the findings, observations, and conclusions expressed are limited by the scope of work. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this work product.

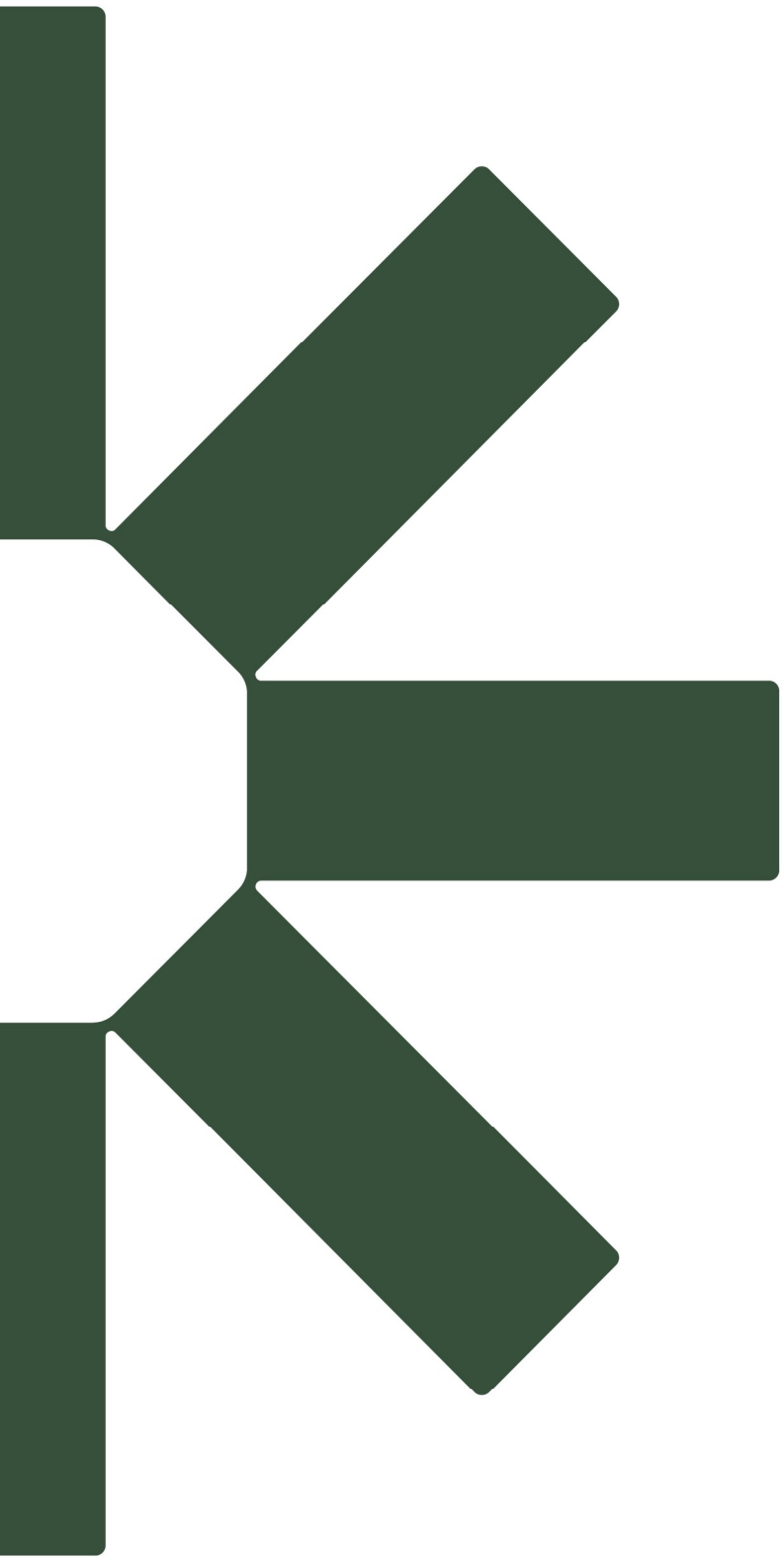
The purpose of an environmental assessment is to reasonably evaluate the potential for, or actual impact of, past practices on a given site area. In performing an environmental assessment, it is understood that a balance must be struck between a reasonable inquiry into the environmental issues and an appropriate level of analysis for each conceivable issue of potential concern. The following paragraphs discuss the assumptions and parameters under which such an opinion is rendered.

No investigation can be thorough enough to exclude the presence of hazardous materials at a given site. If hazardous conditions have not been identified during the assessment, such a finding should not therefore be construed as a guarantee of the absence of such materials on the site, but rather as the result of the services performed within the scope, practical limitations, and cost of the work performed.

Environmental conditions that are not apparent may exist at the site. Our professional opinions are based in part on interpretation of data from a limited number of discrete sampling locations and therefore may not be representative of the actual overall site environmental conditions.

The passage of time, manifestation of latent conditions, or occurrence of future events may require further study at the site, analysis of the data, and/or reevaluation of the findings, observations, and conclusions in the work product.

This work product presents professional opinions and findings of a scientific and technical nature. The work product shall not be construed to offer legal opinion or representations as to the requirements of, nor the compliance with, environmental laws rules, regulations, or policies of federal, state or local governmental agencies.



Making Sustainability Happen