



Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

REMEDIAL INVESTIGATION WORK PLAN

For

**Proposed Development
34 State Street
Block 2, Lots 17, 18 and 68
Ossining, Westchester County, NY**

Prepared for:
WB 34 State LLC
June 2025

SESI Contact:

Fuad Dahan
fd@sesi.org

SESI Project No:

13968

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LIST OF ACRONYMS

Acronym	Definition
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BER	Business Environmental Risks
CAMP	Community Air Monitoring Plan
cis-1,2-DCE	cis-1,2-Dichloroethene
COC	Contaminant of Concern
DUSR	Data Usability Summary Report
ELAP	Environmental Laboratory Accreditation Program
ESA	Environmental Site Assessment
ft bgs	feet below ground surface
FWIA	Fish and Wildlife Impact Analysis
HASP	Health and Safety Plan
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PGSCO	Protection of Groundwater Soil Cleanup Objectives
PHC	Petroleum Hydrocarbon
PCE	Tetrachloroethylene
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
REC	Recognized Environmental Conditions
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
RRSCO	Restricted Residential Soil Cleanup Objectives
RSCO	Residential Soil Cleanup Objectives
SESI	SESI Consulting Engineers, Inc.
SCG	Standards Criteria and Guidance
SVOC	Semi-volatile Organic Compound
TIC	Tentatively Identified Compound
TCE	Trichloroethene
TCL	Target Compound List
VOC	Volatile Organic Compound
USEPA	United States Environmental Protection Agency

Acronym	Definition
USCO	Unrestricted Use Soil Cleanup Objectives

1.0 INTRODUCTION

WB 34 State LLC has submitted an application as the Volunteer for the property located at 34 State Street, Block 2, Lots 17, 18 and 68 ("Site") and has submitted this Remedial Investigation Work Plan with the Brownfield Cleanup Program (BCP) application. A Site Location Map is presented as **Figure 1.1**.

This document comprises a draft Remedial Investigation Work Plan (RIWP) to be conducted at the Site after NYSDEC approval, as part of the Site's planned remedial investigation. It includes a description of the Site, summary of the Site history and previous environmental investigations, a description of the Site's physical, geologic, hydrogeologic setting and subsurface features and a plan of action for further investigation of the areas of concern identified previously.

This RIWP has been prepared to establish a plan to achieve the following objectives:

- To complete the horizontal and vertical delineation of the nature and extent of contamination on the Site,
- To identify any potential source areas of contamination,
- To determine the remedial action needed to protect human health and the environment, and
- To collect sufficient data to advance the remediation of the Site.

This RIWP is developed in general accordance with the Department's Remediation Technical Guidance for Site Investigation and Remediation (DER-10).

2.0 PROJECT BACKGROUND

2.1 SITE DESCRIPTION

The Site consists of an approximately 5.858-acre area parcel and is located at 34 State Street, Ossining, Westchester County, New York (Site). The Site is identified as Block 2, Lots 17, 18 and 68 as noted by the Town of Ossining and discussed in the BCP application. The Site is improved with an asphalt lot, former building footprints, demolition debris, one (1) large three (3) story residential historic house building, one (1) shed and wooded areas. These buildings are currently vacant and abandoned. The Site has been developed since prior to 1892 and historically has been residences, a community center (circa 1929), a printing company (Printex Corporation of

America circa 1940-1981) and a woodworking facility (1981-2006). The Site has been vacant since 2006 for approximately 19 years. **Figure 2.1** presents a Site Plan.

The Site is located in a residential and commercial area and is bounded by a day care center to the north, residential to the south, residential/commercial uses to the east, and residential to the west. **Figure 2.1** presents a Site Plan.

Adjacent properties are summarized on **Table 2.1** below:

Table 2.1: Summary of Surrounding Properties

<u>Direction</u>	<u>Adjacent Property</u>
North	Day Care Center
South	Residential Dwellings
East	Residential Dwellings, Garage, Parking Areas
West	Residential Dwellings

The proposed Site redevelopment is anticipated to consist of two (2) primarily residential buildings, one for 100 affordable housing units and the other for 50 market rate apartments with commercial components on the ground floor. There will also be a public park created on the property in roughly the same area as the first historically segregated African American park in Westchester County. Formal Site Plans are anticipated to be developed during the design phase of the project.

2.2 SITE HISTORY

The Site has historically been occupied by residences and a community center (circa 1929), a printing company (Printex Corporation of America circa 1940-1981) and Hudson River Inlay, Inc a/k/a Creative Designs circa 1981-2006. The Site has been vacant since 2006 for approximately 19 years.

2.3 PREVIOUS ENVIRONMENTAL INVESTIGATION

The following environmental reports are attached in **Appendix A** and summarized below:

- Phase I ESA, 34 State Street, Ossining, NY, prepared by Team Environmental Consultants, Inc, date unknown
- Phase II ESA, 34 State Street, Ossining, NY, prepared by DT Consulting Services, dated May 31, 2005
- Phase I ESA, 34 State Street, 17-25 James Street & Hunter Street (Lots 17, 18 and 68), Ossining, NY, prepared by EBI Consulting, dated January 18, 2016
- Phase I Environmental Site Assessment, 34 State Street, Ossining, NY, prepared by SESI Consulting Engineers. (SESI), dated June 2025
- Phase II Environmental Site Assessment, 34 State Street, Ossining, NY, prepared by SESI Consulting Engineers. (SESI), dated June 2025

2.3.1 PHASE I ESA, TEAM ENVIRONMENTAL CONSULTANTS, INC.

The following is a summary review of the reports referenced in this Phase I as well as the conclusions therein:

- Phase I ESA, January 21, 1994, prepared by Dames & More
 - Closed in place 10,000-gallon UST at the western portion of the property. Backfilled and covered with concrete.
 - Noted that a previous Phase II by SSI advanced soil samples and identified total petroleum hydrocarbons (TPH) concentrations of 30-114 parts per million (ppm).
 - Closed in place two (2) other USTs after a ground penetrating radar sweep (1,000 and 3,000-gallon USTs with oil/water mix)
 - Centerline samples noted to be collected and reportedly did not indicate TPH
 - Waste treatment lagoon at the southeast was noted not to adversely impact the quality of the property.
- Phase I ESA, May 7, 2003, prepared by EES
 - Recommended ACM survey
 - Recommended identifying tanks, concrete storage lagoons and garage area in a Phase II
- Phase II ESA, May 16, 2003, prepared by EES

- Nine (9) soil borings within the western area of the 10,000-gallon UST and storage garage areas
- No samples were collected for laboratory analysis. Just screened with a photoionization detector (PID) and did not identify observable contamination.

No further investigations are recommended.

The above RECs are presented on **Figure 2.2**. Note: The 1994 Dames & Moore report and the two 2003 EES reports referred to in this undated Teams Phase I were not attached and could not be obtained by the current owner from the prior recalcitrant owner.

2.3.2 PHASE II ESA, DT CONSULTING SERVICES, MAY 31, 2005

The following is a summary review of this Phase II ESA as well as the conclusions therein:

- History: Original building erected in 1840 as residential; 2 additions built in 1929 as a community center; 1940-1981 it was the Printex Corporation of America as a clothing printing and textile design facility. Another additional constructed in 1968.
- Site is identified in CERCLIS and PBS
 - Known PBS in the north; three (3) USTs identified on figure
 - Waste treatment lagoon in the southeast corner
 - General equipment and storage at the west
- Seven (7) soil borings
 - Advanced eight (8) to 12 ft feet below ground surface (bgs)
 - Characterization: light brown sandy loam (fill) with traces of gravel - approximately 0 to four (4) feet bgs, underlain by fine-medium sand with clay and schist fragments.
 - Bedrock encountered between eight (8) and nine (9) feet bgs
 - Groundwater not encountered
 - No visual or olfactory or PID observations/ readings
- Seven (7) borings were composited to form only three (3) sample sets
 - Volatile organic compounds, semi-volatile organic compounds, Metals; Detections of low levels
- Determined no further investigation based on the results

2.3.3 PHASE I ESA, EBI CONSULTING, JANUARY 18, 2016

The following is a summary review of this Phase I ESA as well as the conclusions therein:

- REC - USTs:
 - The USTs documented by Creative Design, a former Tenant are as follows:
 - 1x 10,000-gallon UST, closed in place on September 1, 1986.
 - 1x 1,000-gallon UST, removed on December 1, 2003.
 - 1x 3,000-gallon UST, removed on December 1, 2003.
 - No LUST releases were reported. However, no closure reports were identified.
 - Identifying closure documents in a record review or a Phase II were recommended.
- ACM:
 - EBI conducted a preliminary screening of ACM in the building and identified some suspect ACM. This is out of scope of the Phase I ASTM, and is not considered a REC; however, a full ACM survey was recommended.

2.3.4 PHASE I ESA, SESI, JUNE 2025

In June 2025, SESI conducted a Phase I ESA and identified the following RECs and BERS:

- **REC 1 – Subject Property Historic Operations:** The original historic house estate building was erected in 1840 as residential estate; two (2) additions were built in 1929 as a community center; and in 1940-1981 the footprints of the buildings were expanded to accommodate the Printex Corporation of America, which operated as a scarf printing and textile design facility. Another addition was constructed in 1968. The facility utilized a wastewater treatment lagoon at the southeast. The presence of the lagoon led to the listing of the property as a State Superfund program (Site ID No. 360002). However, the property was classified as a Class N No further action site based on comments from the Westchester County Department of Health (WC DOH) which indicated the lagoons were used for on-site wastewater treatment and not hazardous waste disposal associated with the former Printex operations. Furthermore, there were some laundry operations at the center of the Subject Property circa 1911. Finally, the Hudson River Inlay woodworking company utilized USTs and its woodworking operation from approximately the 1980s to 2006 also could have resulted in contamination. **Based on this history observed from the Sanborn maps and previous reports, the historic operations from the textile,**

woodworking and laundry facilities may have adversely impacted the Subject Property and warrant further investigation.

- **REC 2 – Underground Storage Tanks:** The following USTs were identified to be either closed in place or removed: 1x 10,000-gallon UST, closed in place on September 1, 1986; 1x 1,000-gallon UST, removed or closed in place on December 1, 2003; and 1x 3,000-gallon UST, removed or closed in place on December 1, 2003. No leaking underground storage tank (LUST) releases were reported. **However, no closure reports were identified. Identifying closure documents in a record review or a Phase II is recommended.**
- **REC 3 – Historic Fill:** Historic fill has reportedly been identified at the Subject Property during geotechnical and environmental investigations. **Additional subsurface soil sampling is recommended to characterize fill material should special handling and/or disposal of disturbed soil be required during Subject Property redevelopment.**
- **BER 1 – Historic Land Use:** The historic 2006 aerial imagery identified clearing of vegetation on Lot 68; however, this vegetation returned in 2011 per the next available aerial. It was unclear if this area had been regraded or there were former operations on this lot that may have adversely impacted the Subject Property. **Further investigation is recommended into the use of Lot 68 and the reasoning for clearing. Additional soil investigation is recommended to determine if historic fill is present.**
- **BER 2 – Aboveground Storage Tank (AST):** SESI identified one (1) yellow steel aboveground storage tank adjacent to several unused items at the southwest of Lot 17. This tank appeared to not be in use and was intact, with no evidence of staining. **Therefore, no further investigation is warranted; however, proper disposal of this AST is recommended. No closure documentation is required.**

- **BER 3 – Drum:** There was one (1) plastic 55-gallon tote identified to the south of the northern shed. This tote appeared to contain soil and was unlabeled. **Therefore, SESI recommends proper removal/disposal of this tote.**
- **BER 4 – Stockpiles:** There were several stockpiles of building materials scattered throughout the Subject Property, around building footprints, and on the periphery of the vegetated area of Lot 68. These stockpiles were not observed to have exhibited petroleum impacts. **Therefore, SESI recommends the proper testing and disposal of these demolition debris prior to or during redevelopment.**
- **BER 5 – Hazardous Building Materials:** An asbestos containing material (ACM), lead-based paint (LBP), polychlorinated biphenyl (PCB) caulk and universal waste survey was not conducted as part of this Phase I Environmental Site Assessment. Based on the age of the structures located on the Subject Property, the presence of these materials cannot be ruled out. **Therefore, a comprehensive hazardous material survey is recommended prior to demolition or redevelopment.**

2.3.5 PHASE II ESA, SESI, JUNE 2025

The following is a summary review of this Phase II ESA as well as the conclusions therein:

Soil

The complete soil analytical results are presented as **Table 2.2**. A summary table of the analytical results exceedances compared to NYSDEC Unrestricted Use Soil Cleanup Objectives (USCOs), Residential Soil Cleanup Objectives (RSCOs), Restricted Residential Soil Cleanup Objectives (RRSCOs) and (Protection of Groundwater Soil Cleanup Objectives) PGSCOs is presented in **Table 2.3** below.

Table 2.3 Summary of Soil Exceedances

SAMPLE ID:			UST-1 (7-7.5)	UST-2 (8-8.5)	UST-3 (9-9.5)	HF-1 (6.5-7)	HF-2 (2-2.5)	HF-3 (3.5-4)
SAMPLE DATE:			1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025
SAMPLE DEPTH (FT):			7.0-7.5	8.0-8.5	9.0-9.5	6.5-7.0	2.0-2.5	3.5-4.0
ANALYTE	NY-RESRR	NY-UNRES	Conc	Conc	Conc	Conc	Conc	Conc
Metals (mg/kg)								
Copper	50	270	20.6	15.3	19.9	46.3	28.2	25.1
Lead	63	400	13.6	10	10.7	67.7	326	67.9
Manganese	1600	2000	382	338	601	425	406	435
Mercury	0.18	0.81	<0.035	0.14	<0.035	0.12	0.41	0.29
Nickel	30	310	12.5	14.9	17.4	14.2	12	30.7
Zinc	109	10000	44.2	32.6	40.4	77.8	139	92
SVOCs (mg/kg)								
Benzo(a)anthracene	1	1	ND	ND	ND	0.0337 J	0.0976	0.0785
Benzo(a)pyrene	1	1	ND	ND	ND	0.0305 J	0.123	0.0828
Benzo(b)fluoranthene	1	1	ND	ND	ND	0.0396	0.191	0.107
Benzo(k)fluoranthene	0.8	3.9	ND	ND	ND	ND	0.0751	0.0416
Chrysene	1	3.9	ND	ND	ND	0.033 J	0.137	0.0742
Dibenzo(a,h)anthracene	0.33	0.33	ND	ND	ND	ND	0.0293 J	ND
Indeno(1,2,3-cd)pyrene	0.5	0.5	ND	ND	ND	0.02 J	0.0938	0.0382
Pesticides (mg/kg)								
Dieldrin	0.005	0.2	ND	ND	ND	ND	ND	ND
4,4'-DDE	0.0033	8.9	ND	ND	ND	0.00085	0.0012 ^d	ND
4,4'-DDT	0.0033	7.9	ND	ND	ND	0.0021	0.005	ND
PCBs (mg/kg)								
Aroclor 1254	0.1	1	ND	ND	ND	0.0298 J ^a	ND	ND
Aroclor 1260	0.1	1	ND	ND	ND	ND	0.0168 J	ND

SAMPLE ID:			HF-4 (0.5-1)	HF-5 (0.5-1)	HF-6 (1.5-2)	HF-7 (1-1.5)	HF-8 (4-4.5)	HF-9 (1-1.5)
SAMPLE DATE:			1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025
SAMPLE DEPTH (FT):			0.5-1.0	0.5-1.0	1.5-2.0	1.0-1.5	4.0-4.5	1.0-1.5
ANALYTE	NY-RESRR	NY-UNRES	Conc	Conc	Conc	Conc	Conc	Conc
Metals (mg/kg)								
Copper	50	270	21.9	17.7	18	7.4	11.5	15.8
Lead	63	400	278	37.8	126	12.3	70.3	6.2
Manganese	1600	2000	618	277	584	146	404	321
Mercury	0.18	0.81	0.15	0.032	0.12	<0.027	0.088	<0.033
Nickel	30	310	14.3	10.4	12.8	4.9	13.7	13.5
Zinc	109	10000	124	35.6	63.7	14.2	43.1	27.4
SVOCs (mg/kg)								
Benzo(a)anthracene	1	1	2.25	0.114	0.0193 J	0.0292 J	ND	0.367
Benzo(a)pyrene	1	1	3.06	0.116	0.0211 J	0.0204 J	ND	0.304
Benzo(b)fluoranthene	1	1	3.35	0.134	0.0294 J	0.0289 J	ND	0.351
Benzo(k)fluoranthene	0.8	3.9	1.16	0.0535	ND	ND	ND	0.138
Chrysene	1	3.9	2.13	0.117	0.0214 J	0.0291 J	ND	0.338
Dibenzo(a,h)anthracene	0.33	0.33	0.524	0.025 J	ND	ND	ND	0.0399
Indeno(1,2,3-cd)pyrene	0.5	0.5	1.91	0.073	ND	ND	ND	0.141
Pesticides (mg/kg)								
Dieldrin	0.005	0.2	ND	ND	ND	ND	ND	ND
4,4'-DDE	0.0033	8.9	0.0142	ND	0.0098	0.00078	ND	ND
4,4'-DDT	0.0033	7.9	0.0296	0.0008	0.00096	0.00085	ND	ND
PCBs (mg/kg)								
Aroclor 1254	0.1	1	ND	ND	ND	ND	ND	ND
Aroclor 1260	0.1	1	0.0194 J ^a	ND	ND	ND	ND	ND

SAMPLE ID:	HF-10 (1-1.5)		HF-11 (0.5-1)	HF-12 (4-4.5)	HPO-1 (13.5-14)	HPO-2 (1.5-2)
SAMPLE DATE:	1/31/2025		1/31/2025	1/31/2025	1/31/2025	1/31/2025
SAMPLE DEPTH (FT):	1.0-1.5		0.5-1.0	4.0-4.5	13.5-14.0	1.5-2.0
ANALYTE	NY-RESRR	NY-UNRES	Conc	Conc	Conc	Conc
Metals (mg/kg)						
Copper	50	270	17.7	4.3	29.7	3840
Lead	63	400	60.2	24.5	352	2180
Manganese	1600	2000	511	496	415	19400
Mercury	0.18	0.81	0.21	0.16	0.96	1.5
Nickel	30	310	12.4	5.6	15.5	38.1
Zinc	109	10000	205	20.9	159	214
SVOCs (mg/kg)						
Benzo(a)anthracene	1	1	0.694	ND	0.0287 J	ND
Benzo(a)pyrene	1	1	0.642	ND	0.0388 J	ND
Benzo(b)fluoranthene	1	1	0.755	ND	0.0563	ND
Benzo(k)fluoranthene	0.8	3.9	0.287	ND	ND	ND
Chrysene	1	3.9	0.616	ND	0.028 J	ND
Dibenzo(a,h)anthracene	0.33	0.33	0.128	ND	ND	ND
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.328	ND	0.0263 J	ND
Pesticides (mg/kg)						
Dieldrin	0.005	0.2	0.0119 ^d	ND	ND	ND
4,4'-DDE	0.0033	8.9	ND	ND	0.0014 ^d	0.0014
4,4'-DDT	0.0033	7.9	0.0426 ^d	ND	0.0018	0.00091
PCBs (mg/kg)						
Aroclor 1254	0.1	1	2.32	ND	ND	ND
Aroclor 1260	0.1	1	0.245	ND	ND	ND

SAMPLE ID:	SB201 (0.5-1)		SB202 (0.5-1)	SB203 (1-1.5)	SB204 (0.5-1)	SB205 (0.5-1)	SB206 (0.5-1)
COLLECTION DATE:	3/20/2025		3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025
SAMPLE DEPTH:	0.5-1.0		0.5-1.0	1.0-1.5	0.5-1.0	0.5-1.0	0.5-1.0
ANALYTE	NY-RESRR	NY-UNRES	Conc	Q	Conc	Q	Conc
VOCs (mg/kg)							
Xylenes, Total	100	0.26	ND		ND		6.5
2-Butanone	100	0.12	ND		ND		0.26 J
1,2,4-Trimethylbenzene	52	3.6	ND		ND		9.3
SVOCs (mg/kg)							
Benzo(a)anthracene	1	1	0.024 J	0.059 J	0.033 J	ND	4.7
Benzo(a)pyrene	1	1	ND	0.065 J	ND	ND	3.9
Benzo(b)fluoranthene	1	1	0.033 J	0.084 J	0.034 J	ND	5
Benzo(k)fluoranthene	3.9	0.8	ND	ND	ND	ND	1.8
Chrysene	3.9	1	0.027 J	0.063 J	0.026 J	ND	4.5
Dibenzo(a,h)anthracene	0.33	0.33	ND	ND	ND	ND	0.58 J
Indeno(1,2,3-cd)pyrene	0.5	0.5	ND	0.042 J	ND	ND	2.2
Pesticides (mg/kg)							
4,4'-DDE	8.9	0.0033	ND	0.00095 J	ND	0.00961	0.00429
4,4'-DDT	7.9	0.0033	ND	ND	ND	0.00359	0.0172 IP
PCBs (mg/kg)							
Aroclor 1260	1	0.1	ND	ND	ND	ND	0.174
PCBs, Total	1	0.1	ND	ND	ND	ND	0.29 J
Metals (mg/kg)							
Barium, Total	400	350	80.7	104	68.4	116	1160
Cadmium, Total	4.3	2.5	0.15 J	0.094 J	ND	0.056 J	4.99
Copper, Total	270	50	24.8	20.7	9.94	17.6	2700
Lead, Total	400	63	18.4	214	186	430	3400
Mercury, Total	0.81	0.18	ND	0.233	0.1	0.12	0.103
Silver, Total	180	2	ND	ND	ND	ND	18.7
Zinc, Total	10000	109	39.5	94.7	55.6	404	2640

SAMPLE ID:	SB207 (0.5-1)		SB208 (0.5-1)		SB209 (0.5-1)		SB210 (0.5-1)		SB211 (0.5-1)		SB212 (0.5-1)	
COLLECTION DATE:	3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025	
SAMPLE DEPTH:	0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0	
ANALYTE	NY-RESRR	NY-UNRES	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
VOCs (mg/kg)												
Xylenes, Total	100	0.26	ND		ND		ND		0.0017	J	ND	
2-Butanone	100	0.12	ND		ND		ND		ND		ND	
1,2,4-Trimethylbenzene	52	3.6	ND		ND		ND		ND		ND	
SVOCs (mg/kg)												
Benzo(a)anthracene	1	1	ND		ND		6		ND		ND	0.32 J
Benzo(a)pyrene	1	1	ND		ND		6.2		ND		ND	
Benzo(b)fluoranthene	1	1	ND		ND		8.2		ND		ND	0.36 J
Benzo(k)fluoranthene	3.9	0.8	ND		ND		2.5		ND		ND	
Chrysene	3.9	1	ND		ND		5.8		0.098	J	ND	0.53 J
Dibenzo(a,h)anthracene	0.33	0.33	ND		ND		0.94		ND		ND	
Indeno(1,2,3-cd)pyrene	0.5	0.5	ND		ND		4.2		ND		ND	
Pesticides (mg/kg)												
4,4'-DDE	8.9	0.0033	0.00131	J	ND		ND		ND		ND	
4,4'-DDT	7.9	0.0033	0.00218		ND		ND		ND		ND	
PCBs (mg/kg)												
Aroclor 1260	1	0.1	ND		ND		0.0421	J	2.48		0.0163	J
PCBs, Total	1	0.1	ND		ND		0.0978	J	2.48		0.0261	J
Metals (mg/kg)												
Barium, Total	400	350	72.2		37		48.1		62.5		27.3	
Cadmium, Total	4.3	2.5	ND		0.419	J	0.379	J	0.336	J	ND	0.235 J
Copper, Total	270	50	12.7		72.3		34.5		38.9		27.4	
Lead, Total	400	63	20.2		13.6		64.4		164		16.4	J
Mercury, Total	0.81	0.18	ND		ND		0.126		0.169		0.06	J
Silver, Total	180	2	ND		ND		ND		ND		ND	
Zinc, Total	10000	109	29.8		64		319		85.8		65.6	

SAMPLE ID:	SB213 (0.5-1)		SB214 (0.5-1)		SB215 (0.5-1)	
COLLECTION DATE:	3/20/2025		3/20/2025		3/20/2025	
SAMPLE DEPTH:	0.5-1.0		0.5-1.0		0.5-1.0	
ANALYTE	NY-RESRR	NY-UNRES	Conc	Q	Conc	Q
VOCs (mg/kg)						
Xylenes, Total	100	0.26	ND		ND	
2-Butanone	100	0.12	ND		ND	
1,2,4-Trimethylbenzene	52	3.6	ND		ND	
SVOCs (mg/kg)						
Benzo(a)anthracene	1	1	0.066	J	0.11	J
Benzo(a)pyrene	1	1	0.066	J	0.12	J
Benzo(b)fluoranthene	1	1	0.087	J	0.16	J
Benzo(k)fluoranthene	3.9	0.8	ND		0.042	J
Chrysene	3.9	1	0.068	J	0.12	J
Dibenzo(a,h)anthracene	0.33	0.33	ND		ND	
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.045	J	0.08	J
Pesticides (mg/kg)						
4,4'-DDE	8.9	0.0033	ND		0.00245	
4,4'-DDT	7.9	0.0033	ND		ND	
PCBs (mg/kg)						
Aroclor 1260	1	0.1	ND		0.0323	J
PCBs, Total	1	0.1	ND		0.0552	J
Metals (mg/kg)						
Barium, Total	400	350	144		49.9	
Cadmium, Total	4.3	2.5	0.277	J	0.666	J
Copper, Total	270	50	52.3		85.4	
Lead, Total	400	63	260		40.8	
Mercury, Total	0.81	0.18	0.381		ND	
Silver, Total	180	2	0.303	J	0.363	J
Zinc, Total	10000	109	175		96.2	

SAMPLE ID:			EB-01 (2-2.5)		EB-02 (3-3.5)		EB-03 (2.5-3)		EB-04 (1.5-2)		EB-05 (4.5-5)		EB-06 (7-7.5)	
LAB ID:			L2525183-01		L2525183-02		L2525183-03		L2525183-04		L2525183-05		L2525183-06	
COLLECTION DATE:			4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025	
SAMPLE DEPTH (FT):			2.0-2.5		3.0-3.5		2.5-3.0		1.5-2.0		4.5-5.0		7.0-7.5	
SAMPLE MATRIX:			SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Pesticides (mg/kg)														
4,4'-DDE	8.9	0.0033	ND	0.00176	0.00244	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	0.00109J	0.00165
4,4'-DDT	7.9	0.0033	ND	0.00176	0.00494	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	ND	0.00165
PCBs (mg/kg)														
Aroclor 1260	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516
PCBs, Total	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516
SVOCs (mg/kg)														
Benzo(a)anthracene	1	1	ND	0.11	0.04J	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11
Benzo(a)pyrene	1	1	ND	0.15	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.14
Benzo(b)fluoranthene	1	1	ND	0.11	0.045J	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11
Chrysene	3.9	1	ND	0.11	0.036J	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11
Indeno(1,2,3-cd)pyrene	0.5	0.5	ND	0.15	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.14
Metals (mg/kg)														
Copper, Total	270	50	29.7	0.855	19.6	0.872	10.7	0.841	13.3	1.7	12.8	8.03	13.5	3.31
Lead, Total	400	63	162	4.27	78.1	4.36	17.4	4.2	20.6	8.49	117	40.1	14.2J	16.5
Mercury, Total	0.81	0.18	0.178	0.088	0.159	0.073	ND	0.08	ND	0.077	ND	0.071	ND	0.07
Zinc, Total	10000	109	118	4.27	33.1	4.36	40.5	4.2	35.6	8.49	57	40.1	58.3	16.5
VOCs (mg/kg)														
Acetone	100	0.05	ND	0.0092	ND	0.013	ND	0.01	ND	0.0094	0.0057J	0.011	0.031	0.011

SAMPLE ID:			EB-07 (4-4.5)		EB-08 (3.5-4)		EB-09 (4.5-5)		EB-10 (4.5-5.0')		EB-11 (6.5-7.0')		EB-12 (4.5-5.0')	
LAB ID:			L2525183-07		L2525183-08		L2525183-09		L2525476-01		L2525476-02		L2525476-03	
COLLECTION DATE:			4/23/2025		4/23/2025		4/23/2025		4/24/2025		4/24/2025		4/24/2025	
SAMPLE DEPTH (FT):			4.0-4.5		3.5-4.0		4.5-5.0		4.5-5.0		6.5-7.0		4.5-5.0	
SAMPLE MATRIX:			SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Pesticides (mg/kg)														
4,4'-DDE	8.9	0.0033	0.00713	0.00194	ND	0.00169	0.000884J	0.00176	0.00261	0.00175	ND	0.00176	ND	0.00183
4,4'-DDT	7.9	0.0033	0.00196	0.00194	ND	0.00169	ND	0.00176	0.000814	0.00175	ND	0.00176	ND	0.00183
PCBs (mg/kg)														
Aroclor 1260	1	0.1	ND	0.0606	0.665	0.0528	0.0671	0.0555	ND	0.0544	ND	0.0525	ND	0.0589
PCBs, Total	1	0.1	ND	0.0606	0.665	0.0528	0.0671	0.0555	ND	0.0544	ND	0.0525	ND	0.0589
SVOCs (mg/kg)														
Benzo(a)anthracene	1	1	0.026J	0.12	0.89J	3.2	ND	2.2	0.45	0.11	ND	0.11	ND	0.12
Benzo(a)pyrene	1	1	ND	0.16	ND	4.3	ND	3	0.44	0.15	ND	0.15	ND	0.16
Benzo(b)fluoranthene	1	1	0.036J	0.12	ND	3.2	ND	2.2	0.47	0.11	ND	0.11	ND	0.12
Chrysene	3.9	1	0.03J	0.12	0.75J	3.2	ND	2.2	0.4	0.11	ND	0.11	ND	0.12
Indeno(1,2,3-cd)pyrene	0.5	0.5	ND	0.16	ND	4.3	ND	3	0.23	0.15	ND	0.15	ND	0.16
Metals (mg/kg)														
Copper, Total	270	50	13.4	0.935	23.3	0.83	29.3	0.865	23.7	0.892	16.9	0.859	22	0.967
Lead, Total	400	63	6.52	4.67	82.6	4.15	93.8	4.33	113	4.46	18.5	4.29	42.6	4.84
Mercury, Total	0.81	0.18	ND	0.087	0.194	0.076	0.104	0.071	0.051J	0.074	ND	0.083	ND	0.082
Zinc, Total	10000	109	22.3	4.67	59.4	4.15	80.4	4.33	85.4	4.46	43.8	4.29	42.7	4.84
VOCs (mg/kg)														
Acetone	100	0.05	ND	0.012	ND	0.014	ND	0.0099	ND	0.011	ND	0.01	0.058	0.011

SAMPLE ID:			EB-13 (2.5-3.0')		EB-14 (2.5-3.0')		EB-15 (4.5-5.0')		EB-16 (0.5-1.0')		EB-17 (4.5-5.0')		EB-18 (4.5-5.0')	
LAB ID:			L2525476-04		L2525476-05		L2525476-06		L2525476-07		L2525476-08		L2525476-09	
COLLECTION DATE:			4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025	
SAMPLE DEPTH (FT):			2.5-3.0		2.5-3.0		4.5-5.0		0.5-1.0		4.5-5.0		4.5-5.0	
SAMPLE MATRIX:			SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Pesticides (mg/kg)														
4,4'-DDE	8.9	0.0033	ND	0.0021	0.00198	0.00192	ND	0.00231	0.00805	0.00191	0.00152J	0.00188	ND	0.00191
4,4'-DDT	7.9	0.0033	ND	0.0021	ND	0.00192	ND	0.00231	0.00304	0.00191	ND	0.00188	ND	0.00191
PCBs (mg/kg)														
Aroclor 1260	1	0.1	ND	0.0641	ND	0.0597	ND	0.0717	ND	0.0616	ND	0.0597	0.0284J	0.0599
PCBs, Total	1	0.1	ND	0.0641	ND	0.0597	ND	0.0717	0.00701J	0.0616	ND	0.0597	0.0683J	0.0599
SVOCs (mg/kg)														
Benzo(a)anthracene	1	1	ND	0.13	ND	0.12	ND	0.15	0.052J	0.12	ND	0.12	1.2	0.12
Benzo(a)pyrene	1	1	ND	0.18	ND	0.16	ND	0.2	0.062J	0.17	ND	0.16	1.2	0.16
Benzo(b)fluoranthene	1	1	ND	0.13	ND	0.12	ND	0.15	0.076J	0.12	ND	0.12	1.6	0.12
Chrysene	3.9	1	ND	0.13	0.024J	0.12	ND	0.15	0.056J	0.12	ND	0.12	1.2	0.12
Indeno(1,2,3-cd)pyrene	0.5	0.5	ND	0.18	ND	0.16	ND	0.2	0.04J	0.17	ND	0.16	0.64	0.16
Metals (mg/kg)														
Copper, Total	270	50	17.9	1.05	27	0.946	126	1.14	19.4	0.969	14.2	0.935	16.7	0.932
Lead, Total	400	63	12.5	5.26	74.5	4.73	7.93	5.72	29.7	4.85	39.4	4.67	38.9	4.66
Mercury, Total	0.81	0.18	ND	0.086	0.069J	0.084	ND	0.099	0.074J	0.08	0.114	0.08	0.07J	0.081
Zinc, Total	10000	109	41.3	5.26	86.3	4.73	131	5.72	41.5	4.85	57.2	4.67	44	4.66
VOCs (mg/kg)														
Acetone	100	0.05	ND	0.012	ND	0.012	ND	0.018	ND	0.012	ND	0.014	ND	0.0082

Notes

Exceedance of NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06) >=

Exceedance of NY SCO - Restricted Residential w /CP-51 (10/10) (6 NYCRR 375-6 12/06) >=

a = Reported from the 1st signal. The %D of the CCV on the 2nd signal exceeds the method criteria of 20%, so it being used for confirmation only.

b = Associated CCV outside of control limits high, sample was ND.

c = Associated CCV outside of control limits high. Estimated value, due to corresponding failure in the batch associated CCV.

d = More than 40 % RPD for detected concentrations between the two GC columns.

e = Elevated detection limit due to dilution required for high interfering element.

f = Reported from the 1st signal. The %D of the CCV on the 2nd signal exceeds the method criteria of 20%, so it being used for confirmation only. More than 40% RPD for detected concentrations between the two GC columns.

g = This compound in blank spike is outside in house QC limits bias high.

J = Estimated

ND = Not Detected

A total of nine (9) borings exhibited exceedances of the RRSCOs for polycyclic aromatic hydrocarbons (PAHs), metals and/or PCBs. Other borings exhibited exceedances of the USCOs for VOCs, SVOCs, Metals, PCBs and Pesticides.

Groundwater

Groundwater boreholes were advanced to bedrock which was encountered at 10 ft-bgs or shallower within the former building's footprint adjacent to the existing building as well as farther to the east near the shed. No overburden groundwater was detected. SESI then further advanced the borehole near the building and identified weathered bedrock from 10-15 ft-bgs and competent bedrock from 15-25 ft-bgs. After purging the well and allowing for a couple days of recharge, no groundwater was encountered at this temporary well. Therefore, no groundwater sampling was completed as part of this investigation.

Soil Vapor

A summary table of the analytical results is presented in **Table 2.4**. A summary table of the analytical results detections compared to the New York State Department of Health (NYSDOH) Decision Matrices is presented as **Table 2.5** below.

Table 2.5 Summary of Soil Vapor Detections

SAMPLE ID:											SV-1	SV-2	SSSV-1	IA-1	SSSV-2
SAMPLE DATE:											1/31/2025	1/31/2025	1/31/2025	1/31/2025	3/20/2025
SAMPLE MATRIX:											Soil Vapor	Soil Vapor	Soil Vapor	Indoor Air	Soil Vapor
VOCs (ug/m ³)	SSC-A	IAC-A	SSC-B	IAC-B	SSC-D	IAC-D	SSC-E	IAC-E	SSC-F	IAC-F	Conc	Conc	Conc	Conc	Conc
Acetone (2-Propanone)											285	257	34.2	6.4	63.2
Benzene											4.2	3.8	1	0.86	2.79
Carbon disulfide											5.3	3.7	ND	ND	ND
Chloromethane											ND	0.85	0.52	0.89	0.531
Carbon tetrachloride	6	0.2									ND	ND	ND	0.5	ND
Cyclohexane					60	2					0.83	2	ND	ND	ND
Dichlorodifluoromethane											1.9	1.9	1.9	2.7	2.19
Ethanol											14	8.1	1.3	4	31.5
Ethylbenzene					60	2					13	3.2	3.6	ND	NA
Ethyl Acetate											7.2	ND	1.1	5	ND
4-Ethyltoluene											5.9	0.98	3.4	ND	3.7
Heptane							200	6			3.5	13	0.74 J	ND	2.51
Hexane							200	6			3.5	48.6	1.7	1.1	4.02
2-Hexanone											2.5	ND	ND	ND	ND
Isopropyl Alcohol											2.3	3.4	0.37 J	2.2	104
Methylene chloride			100	3							3.8	3.5	1.6	1.1	1.91
Methyl ethyl ketone											17	8.6	1.9	0.53	NA
Methyl Isobutyl Ketone											3.4	0.74 J	ND	ND	NA
Naphthalene					60	2					0.68 J	ND	ND	ND ⁹	ND
Propylene											3.6	79.2	ND	ND	NA
1,2,4-Trimethylbenzene					60	2					15	2.6	11	0.54 J	13.4
1,3,5-Trimethylbenzene					60	2					4.3	0.74 J	2.2	ND	3.86
2,2,4-Trimethylpentane					60	2					0.79 J	1.4	ND	0.41 J	ND
Tertiary Butyl Alcohol											2.8	5.8	0.36 J	ND	ND
Tetrachloroethylene			100	3							88.8	1.5	1	ND	ND
Tetrahydrofuran											0.56 J	ND	ND	ND	ND
Toluene									300	10	42.2	17	9.8	1.1	21.7
Trichloroethylene	6	0.2									1.6	0.91	ND	ND	NA
Trichlorofluoromethane											2.8	3.1	1.4	1.7	NA
Vinyl Acetate											ND	ND	0.67 J	ND	NA
m,p-Xylene							200	6			55.2	11	17	0.91	142
o-Xylene					60	2					20	3.9	6.1	0.34 J	53
Xylenes (total)											75.2	15	23	1.3	NA

A total of 33 VOCs were detected in the vapor samples. Based on a comparison of the soil vapor results to the NYSDOH Soil Vapor/Indoor Air Matrices, the elevated concentration of Carbon tetrachloride in the indoor air is not raised to a level of action and is likely due to an interior interferant. There was a relatively high level of tetrachloroethylene (PCE) as well. As a result, due to the former uses of the property, it is recommended that a more detailed investigation be completed prior to redevelopment to then determine the need for mitigation following redevelopment.

2.4 GEOLOGIC SETTING

Regional surface topography slopes to the west. Based on the U.S. Geological Survey – 2019 Ossining/Haverstraw, New York, 7.5-minute Quadrangle map, the Property is approximately 161.83 feet above the North American Datum. Based on the Phase II investigation conducted by SESI, the stratigraphy of the Site, from the surface down, consists of historic fill. Historic fill generally consisted of brown coarse to fine sand, coarse to fine gravel, with brick, concrete and organics. The historic fill materials were encountered to a maximum of 17 ft-bgs with many borings encountering refusal at bedrock.

2.5 HYDROGEOLOGIC SETTING

As per the USDA National Cooperative Soil Survey (NCSS) map for the area, the soils at the Subject Property are characterized as Uf (Urban Land) with the sloped area to the west containing CsD (Chatfield-Charlton complex), which is classified as containing 15 to 35 percent slopes and is noted as very rocky. Groundwater was not encountered at the Subject Property, despite installing wells 25 ft bgs. The 2025 Phase II investigation did not encounter groundwater to a depth of 25 ft bgs in the one groundwater well installed on the eastern, higher elevation, portion of the Subject Property. The groundwater flow direction is expected to be in the west direction following topography towards the Hudson River to the west.

2.6 SUBSURFACE FEATURES

The following USTs were identified to be either closed in place or removed: 1x 10,000-gallon UST, closed in place on September 1, 1986; 1x 1,000-gallon UST, removed or closed in place on December 1, 2003; and 1x 3,000-gallon UST, removed or closed in place on December 1, 2003. No leaking underground storage tank (LUST) releases were reported. However, no closure reports were identified. Therefore, this was considered REC 2.

2.7 SUMMARY OF ENVIRONMENTAL ASSESSMENT

Based on the investigations conducted to date, the primary contaminants of concern (COCs) are (PAHs, Metals and PCBs) in soil and chlorinated and petroleum vapors in soil vapor. COCs will be refined based on the RIR results.

Soil: (maximum concentrations).

- **PAHs:** benzo(a)anthracene (6.0 mg/kg), benzo(a)pyrene (6.2 mg/kg), benzo(b)fluoranthene (8.2 mg/kg), chrysene (5.8 mg/kg), dibenzo(a,h)anthracene (0.94 mg/kg), and indeno(1,2,3-cd)pyrene (4.2 mg/kg)
- **PCBs:** Aroclor 1260 (2.48 mg/kg) and total PCBs (2.48 mg/kg)
- **Metals:** Barium (1,160 mg/kg), cadmium (4.99 mg/kg), copper (3,840 mg/kg), lead (2,180 mg/kg), manganese (19,400 mg/kg) and mercury (1.5 mg/kg)

Soil Vapor:

- Carbon tetrachloride was the only compound detected in indoor air above the upper threshold limit of the NYSDOH Matrices concentrations in one sample. However, there are a number of chlorinated solvent, including but not limited to PCE at 88.8 ug/m³ and petroleum hydrocarbon (PHC) compounds detected in soil vapor across the Site.

3.0 FIELD REMEDIAL INVESTIGATION

Soil borings, soil vapor borings, and groundwater monitoring wells are proposed below based on the following rationale to complete the nature and extent delineation of contaminated soil, groundwater and soil vapor on the Site. The applicable standards criteria and guidance (SCGs) for the Site soil are the unrestricted use soil cleanup objectives (SCOs). The applicable criteria for sub-slab vapor are the NYSDOH Decision Matrices (May 2017). The applicable SCGs for the Site groundwater are the Groundwater Effluent Limitations Class GA standards (cf. Section 703.6) and the screening levels for PFOA and PFOS (NYSDEC Guidelines for Sampling and Analysis of PFAS, April 2023).

3.1 SOIL REMEDIAL INVESTIGATION

Surface soil samples are not being collected because the proposed redevelopment is anticipated to remove surface soil and cover the entire site. If the anticipated future conditions change and existing soil is to remain exposed at the site a plan addendum to this RIWP for surface soil sample collection and analysis will be submitted to the NYSDEC.

To further evaluate the soils, 106 soil borings will be performed on the Site in an approximate (50)-foot grid pattern to evaluate and delineate soil contamination from historical operations, and other potential sources. In addition, waste characterization samples will be collected from the borings for disposal approval. The proposed soil boring locations are shown on **Figure 3.1**.

The borings will be advanced using direct-push or other drilling methods as needed. The borings will extend to a depth of 20 ft-bgs or until native material or bedrock is encountered. Soil samples will be at a minimum of one sample per 5-foot depth interval biased based on field screening that includes visual observations, PID readings and olfactory observations. Boring logs documenting soil classifications, PID readings, and visual observations will be provided in the final report.

Upon retrieval of the sampling barrel, the collected sample shall be placed in glass jars and labeled, stored on site (on ice in a cooler if necessary), and transmitted to the NYSDOH ELAP-certified testing laboratory. Chain-of-custody procedures will be practiced following Section 15, EPA-600/4-82-029, Handbook for Sampling and Sample Preservation of Water and Waste Waters. Soil samples for VOC analysis will be collected in Encore ® vials.

The drilling contractor will be responsible for obtaining accurate and representative samples, informing the geologist of changes in drilling pressure, keeping a separate general log of soils encountered and installing monitoring wells to levels directed by the supervising geologist following specifications further outlined in this protocol.

Up to an estimated 424 soil samples will be collected from the 106 boring locations and will be analyzed by a NYSDOH ELAP certified laboratory for TCL+30/TAL including VOCs by EPA Method 8260C, SVOCs by EPA Method 8270D, pesticides by EPA Method 8081B, PCBs by EPA Method 8082A, TAL metals by EPA Methods 6010C, 7471B, and 9012, the 41 PFASs compounds by EPA Method 1633, and 1,4-dioxane by EPA Method 8270. Category B deliverables will be requested on each sample chain of custody.

The proposed soil sample locations and the rationale for their locations are presented in **Table 3.1** below.

Table 3.1 – Proposed Soil Sample Locations

Soil Boring Name	Proposed Sample Depths	Boring Location Rationale	Analysis
RI-SB-01 through RI-SB-106	1 sample every 5 feet with 1 sample in native material or until bedrock refusal	Horizontal / Vertical Delineation	TCL+30/TAL, 1,4-Dioxane, PFAS

A geologist or engineer will be on site during the drilling operations to fully describe each soil sample, following the New York State Soil Description Procedure, and to retain representative portions of each sample.

A summary of the parameters to be tested, the analytical methods and the holding times for the samples is shown on **Table 3.2**.

Table 3.2 – Soil Analyses Summary

Parameter and Analytical Method	Holding Time
Volatile Organic Compounds (VOCs) – USEPA 8260C	14 days
SVOCs (BNAs) and 1,4-Dioxane – USEPA 8270D or E	14 days (until extraction, 40 days extracted)
Pesticides – USEPA 8081B	14 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082A	None
Metals - Method 6010D, 7470A for mercury, and 9012B for cyanide	180 days Cyanide: 14 days
PFAS – USEPA 1633	28 days

Quality assurance/quality control (QA/QC) samples will be collected and analyzed as specified in the QAPP. The number of duplicate, spiked and blank samples analyzed will be collected at a frequency of one (1) duplicate for every 20 samples. The inclusion and frequency of analysis of field blanks will be on the order of one (1) per every 20 soil samples but not more than one (1) per day. Samples to be analyzed for volatile organic compounds will be accompanied by a field blank for all matrix types and trip blank for water matrices. SESI's field sampling procedures are described in the quality assurance project plan (QAPP) presented in **Appendix B**. The Sampling Plan for Emerging Contaminants is included as **Appendix C**.

3.2 GROUNDWATER REMEDIAL INVESTIGATION

To investigate the Site groundwater, a total of five (5) permanent groundwater monitoring wells will be installed as shown on **Figure 3.2**. The wells will be installed to a depth of 10 feet below the groundwater table, or refusal on bedrock, whichever occurs first. The groundwater table is anticipated to be greater than 25 feet below ground surface based on the lack of groundwater encountered at this depth. Wells are anticipated to be installed in the bedrock. Well depths and screen placement will be evaluated based on observed groundwater table.

Each monitoring well will be constructed with two (2)-inch diameter well screens. The well screening will intersect the water table and extend to the bottom of the well boring. The annular space of each well will be filled with well sand to at least two (2) feet above the screening and will be sealed with hydrated bentonite or cement grout. Finally, each monitoring well will be completed with a flush-mount road-box or stickup as necessary. A typical boring and well construction log is provided in **Appendix D**.

The Groundwater RI will be conducted to achieve the following:

- delineate the nature and extent of AOC-specific contaminants in the Site groundwater;
- identify actual or potential impacts to sensitive receptors, e.g. surface water;
- determine whether a contaminant plume exists;
- gather sufficient data to determine groundwater flow direction and contour map and evaluate groundwater Remedial alternatives, including, as appropriate, monitored natural attenuation (MNA), and
- provide information on the background quality of the groundwater flowing into the Site.

All the wells will be surveyed for location and elevation. The survey data will be provided pursuant to the DER-10 requirements in an acceptable format (e.g., North America Datum 83 [NAD83]). The wells will be gauged for groundwater depth to determine the groundwater elevation. The Site-specific groundwater flow direction and gradient will be determined based on the latest elevation data and summarized in the Remedial Investigation Report (RIR). The proposed well locations are shown on **Figure 3.2**.

Two (2) rounds of sampling will be conducted from the newly installed wells, with the second round of sampling completed within one (1) month of the start of remedial work. The data will be analyzed to determine whether groundwater contamination exists, the magnitude and the extent of the potential contaminant plume. In addition to the analytical data, field measurements and chemical analyses will be conducted to characterize the impacted groundwater.

All the wells will be sampled for TCL+30/TAL metals, PFAS, and 1-4 dioxane. The VOCs will be analyzed by EPA Method 8260C, SVOCs by EPA Method 8270D, pesticides by EPA Method 8081B, PCBs by EPA Method 8082A, TAL metals by EPA Methods 6010C, 7471B, and 9012, PFAS compounds by EPA Method 1633, and 1-4 dioxane by EPA Method 8270 SIM. The QAPP,

which describes all field sampling procedures, is included as **Appendix B**, and the Sampling Plan for Emerging Contaminants is included as **Appendix C**. The proposed groundwater monitoring wells and the rationale for their locations are presented in **Table 3.2** below.

Table 3.3 – Proposed Groundwater Monitoring Wells

Well Name	Proposed Sample Depths	Well Location Rationale	Analysis
RI-MW-01	Center of Water Column feet below groundwater table	Horizontal / Vertical Delineation	TCL+30/TAL, 1,4-Dioxane, PFAS
RI-MW-02	10 feet below groundwater table	Horizontal / Vertical Delineation	TCL+30/TAL, 1,4-Dioxane, PFAS
RI-MW-03	10 feet below groundwater table	Horizontal / Vertical Delineation	TCL+30/TAL, 1,4-Dioxane, PFAS
RI-MW-04	10 feet below groundwater table	Horizontal / Vertical Delineation	TCL+30/TAL, 1,4-Dioxane, PFAS
RI-MW-05	10 feet below groundwater table	Horizontal / Vertical Delineation	TCL+30/TAL, 1,4-Dioxane, PFAS

All groundwater samples will be analyzed by a NYSDOH ELAP certified laboratory and Category B deliverables will be requested on each sample chain of custody. In addition, QA/QC samples will be collected and analyzed as specified in the QAPP. Specifically, the number of duplicate, spiked and blank samples analyzed will be a minimum of one (1) duplicate for every 20 samples. For the aqueous matrix field blanks will be collected at a frequency of one (1) per day. Samples to be analyzed for volatile organic compounds will be accompanied by a trip blank for each shipment and field blanks water matrix.

The wells will be sampled using the low flow technique, when possible. A flow rate of 100 ml to 250 ml per minute is used to purge the wells. Drawdown will not exceed 0.3 feet. At the initiation of low flow purging a water level is recorded as well as field parameters. Field parameters are then monitored every five minutes during low flow purging using a flow through cell. When three (3) consecutive measurements of pH differ by 0.1 units or less, with ORP within 10 mv or less, turbidity varies 10 percent or less, conductivity differs by 3 percent or less and dissolved oxygen by 10 percent or less, sampling may begin. Flow through cells are used so continuous real time readings are made. When the parameters stabilize the flow through cell is disconnected and sample bottles are filled directly from the tubing. If the parameters of a well do not stabilize in a

timely manner, the groundwater sample will be collected after emptying three (3) well volumes from the well being sampled.

In addition to water samples collected from the monitoring wells, two types of "blanks" will be collected and submitted to the chemical laboratory for analyses. The blanks will consist of 40 ml VOA vials, as follows:

- A trip blank will be prepared before the sample bottles are sent by the laboratory. It consists of a sample of distilled, deionized water which accompanies the other sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of samples where sampling and analysis for TCL volatiles is planned (water matrix only). The trip blank will be analyzed for TCL VOCs as a measure of potential contamination from background sources and their effect on the results.
- In order to check for contaminant carryover when non-dedicated sampling equipment is used, a rinsate blank will be submitted to the laboratory. This blank will also be analyzed for TCL VOCs.

3.3 SOIL VAPOR INVESTIGATION

SESI will collect six (6) soil vapor samples from soil vapor points in the footprint of the proposed buildings. The proposed soil vapor point locations are shown on **Figure 3.3**. The purpose of the soil vapor points is to assess the potential for vapor intrusion into future buildings. All soil vapor points will be installed within two (2) feet below the proposed foundation elevation.

The soil gas samples will be collected in accordance with the procedures of the NYS Department of Health October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York as amended in May 2017 and February 2024. Specifically, the soil vapor probes will be advanced using direct push sampling equipment and samples will be collected by installing vapor implants. The soil vapor depth will be based on the final construction and development plan. A sacrificial vapor point connected to flexible tubing will be inserted into the borehole. The annular space of the borehole will be filled with sand and the surface will be sealed with bentonite to seal the surface. Prior to sampling the tubing system will be purged of ambient air with a low-flow pump.

The soil vapor samples will be collected into laboratory supplied one (1)-liter, stainless-steel, summa canisters. The summa canisters will be equipped with a manometer to verify the canister

is under vacuum, and a flow controller set to a flow rate of <200 ml/min. A sample log sheet will be maintained summarizing sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, soil vapor purge volumes, volume of the soil vapor extracted, vacuum of canisters before and after the samples are collected, apparent moisture content of the sampling zone, and chain of custody protocols. The vapor samples will be sent to a certified laboratory for analysis of VOCs in accordance with EPA Method TO-15. In addition to the soil vapor, one (1) ambient air sample will be collected with a 1-liter summa canister set to a flow rate of <200 ml/min outside the building. The field sampling procedures are described in the QAPP, which is included as **Appendix B**.

As part of the vapor sampling, a tracer gas will be used to serve as a QA/QC device to verify the integrity of the soil vapor probe seal. Helium will be used as the tracer gas and a box will serve to keep it in contact with the probe during testing. A portable monitoring device will be used to analyze a sample of soil vapor for the tracer prior to sampling. If the tracer sample results show a significant presence of the tracer, the probe seals will be adjusted to prevent infiltration. At the conclusion of the sampling round, tracer monitoring will be performed a second time to confirm the integrity of the probe seals.

Table 3.4 Proposed Soil Vapor Sample Locations

Soil Vapor/Indoor Air/Ambient Air Point Name	Sample Type	Proposed Sample Depths	Analysis
RI-SV-01	Soil Vapor	2 feet below grade	VOCs (TO-15)
RI-SV-02	Soil Vapor	2 feet below grade	VOCs (TO-15)
RI-SV-03	Soil Vapor	2 feet below grade	VOCs (TO-15)
RI-SV-04	Soil Vapor	2 feet below grade	VOCs (TO-15)
RI-SV-05	Soil Vapor	2 feet below grade	VOCs (TO-15)

Soil Vapor/Indoor Air/Ambient Air Point Name	Sample Type	Proposed Sample Depths	Analysis
RI-SV-06	Soil Vapor	2 feet below grade	VOCs (TO-15)
RI-AA-01	Ambient Air	3 feet above grade	VOCs (TO-15)

4.0 DECONTAMINATION AND IDW

Reusable equipment utilized for ground intrusive activities (i.e. borings and wells) will be decontaminated between each boring. Equipment utilized for sample collection (i.e. spoons, trowels) will be decontaminated between each sample unless disposable equipment is utilized. Appropriate decontamination areas will be established to support work being conducted in each area of the Site. PFAS free certified deionized water, supplied from the laboratory, will be used for the decontamination of the sampling tools if needed. Locally supplied water, if available, or water supplied by the driller in a tank will be used to decontaminate the equipment.

All investigative derived waste (IDW) of soil cuttings and purged groundwater will be containerized, sampled, and properly disposed of pursuant to DER-10 requirements. Disposable sampling equipment, including macro core liners, spoons, gloves, bags, paper towels, and PPE that contacts environmental media, will be double bagged and disposed of as municipal trash in a facility trash dumpster as non-hazardous refuse.

5.0 WASTE CHARACTERIZATION

Waste characterization will be completed in conjunction with the remedial investigation to obtain data for facility approvals. It is anticipated that twenty waste characterization samples will be collected, each from a five-point composite, and analyzed for TCL+30/TAL, however, the exact quantity and parameters will be determined based on disposal facility requirements.

6.0 SURVEY

After the RI sampling scope is completed, a survey will be completed, which includes the locations and elevations of all the monitoring wells, soil borings, and soil vapor points.

7.0 HUMAN HEALTH EXPOSURE ASSESSMENT

A qualitative human health exposure assessment will be performed for the Site in accordance with the New York State Department of Health's Qualitative Human Health Exposure Assessment guidance document. Sampling data will be reviewed along with the physical conditions of the contaminant sources or physical hazards near the Site. Potential on-Site and off-Site exposures will be evaluated. The Exposure Assessment will describe the nature and size of the population exposed, or potentially exposed, to the contaminants that are present at, or migrating from the Site, and will characterize the exposure setting, identify exposure pathways and evaluate contaminant fate and transport.

Several objectives will be met by the exposure assessment. First, applicable Site information and characterization data for environmental media of concern will be evaluated. Applicable SCGs including Part 375 SCOs and CP-51 SCOs for soil, and AWQS for groundwater and surface water will be applied.

An assessment of current and future Site activities and Site use will be conducted in relation to potential human exposure. Next, potential exposure pathways will be identified, and each aspect of the potential exposure pathway will be evaluated. Soil and groundwater contamination will be addressed and the impact of remediation on future exposure scenarios will be analyzed.

8.0 FISH AND WILDLIFE IMPACT ANALYSIS

A Fish and Wildlife Impact Analysis (FWIA) Decision Key will be completed prior to the excavation work to determine if a FWIA is needed. Contaminant migration pathways and any fish and wildlife exposure pathways will be identified. As stated in the FWIA, "if no resources are associated with the site or if there is no potential for contaminant migration to the resources, then only the necessary information to support that conclusion should be provided."

If resources are identified, or migration pathways exist, a FWIA will be completed and submitted as part of the RI Report. The FWIA would include qualitative estimates of the following: 1) the routes, intensity, frequency, and duration of actual or potential exposures to chemicals; 2) the

nature and size of the population exposed to the contaminants that are present at or migrating from the Site; 3) the exposure setting and possible exposure pathways; and 4) contaminant fate and transport.

A Fish & Wildlife assessment is not required for this Site due to its urban location and distance from surface water bodies and wildlife areas. Even though the Site is located less than a ½ mile from the Hudson River, the distance of 760 feet and higher elevation is still too far given the non-migratory nature of the contamination on this Site. Therefore, the Site is unlikely to be impacting the Hudson River water body and will otherwise be remediated as part of the planned remediation and redevelopment project.

9.0 DUSR

Following the completion of the laboratory analysis program, a Data Usability Summary Report (DUSR) will be completed for the lab data and included as part of the RI Report. The DUSR will include available datasets from previous investigations, as well as data from this phase of Site characterization. The DUSR is carried out as specified in DER-10 to evaluate the quality control measures that were implemented during the field and laboratory analytical programs, with the objective of determining whether the reported analytical data are representative and usable for decision making. The DUSR will evaluate whether the data are technically defensible (i.e. were all analytical data requirements met and documented?). Data usability analysis reviews the Site data to determine whether they are adequate to draw conclusions regarding the nature and extent of contamination.

The items that will be reviewed as part of the DUSR will include the following:

- Completeness (number of samples collected and analyzed compared to plans)
- Chains of custody are complete and accurate
- Holding times
- Instrument calibration
- Relative percent difference between field duplicates
- Reasonableness of data (e.g. relationships between total and soluble analytes)

- Blank contamination

The DUSR will be conducted in accordance with guidelines provided under Appendix 2B of DER-10. The site-specific Quality Assurance Project Plan (QAPP) is included in **Appendix B**.

10.0 REMEDIAL INVESTIGATION REPORT (RIR)

Following the completion of the RI activities and the receipt of sample results, an RIR will be prepared. The RIR report will summarize the activities completed during the RIR including analytical results, well construction and sampling logs, waste characterization information for disposal purposes, conclusions from the FWIA if necessary, a Data Usability Summary Report (DUSR) and laboratory data packages. Scaled figures showing the sample locations and areas of contamination exceeding applicable standards will be prepared for soil, soil vapor, and groundwater. Sampling results will be summarized and discussed and the need for additional investigation and remediation will be evaluated. In addition, analytical summary tables will be prepared for soil, soil vapor, and groundwater compared to applicable standards.

The RIR will also include: 1) a summary of the site history and previous investigations, 2) a description of current site conditions, 3) the identification of exposure pathways via a Qualitative Human Health Exposure Assessment; an analysis of the results, 4) a description of the nature and extent of the contamination; and 5) a detailed conclusion with recommendations.

Analytical data collected during the Remedial Investigation and previous data used for the selection of the remedy will be submitted in the NYSDEC approved Electronic Data Deliverable (EDD) format. EDDs will be prepared using the DEC's Environmental Information Management System (EIMS) database software application EQUIS™ for submission.

10.0 QUALITY ASSURANCE/QUALITY CONTROL

Quality Assurance and Quality Control (QA/QC) is addressed in the Quality Assurance Project Plan (QAPP) included as **Appendix B**. The QAPP outlines procedures to be followed for sampling and analysis to ensure quality of the results. A DUSR will be prepared with the final reports to document the reliability of the sample results.

11.0 HEALTH AND SAFETY PLAN

A Site-specific Health and Safety Plan (HASP) has been prepared and is included as **Appendix E**. All on-site personnel and visitors involved in the RI will be required to read and sign the HASP prior to entry of the Site.

11.0 COMMUNITY AIR MONITORING

A Community Air Monitoring Plan (CAMP) is provided as **Appendix F**, in accordance with DER-10 requirements for remedial investigation. The CAMP sets forth air monitoring procedures that will be utilized to measure airborne emissions during the RI, in order to minimize the release of contaminants to off-Site areas.

12.0 CITIZEN PARTICIPATION

Citizen participation activities will be performed throughout the RI process to involve and inform the public. The specific citizen participation activities to be performed will be outlined in the Citizen Participation Plan (CPP), included as **Appendix G**.

13.0 REMEDIAL INVESTIGATION SCHEDULE

The proposed remedial investigation schedule is presented on **Table 13.1** below.

Table 13.1: Proposed Remedial Investigation Schedule

Activity	Duration
Remedial Investigation with first round of RI groundwater samples	2 weeks
Prepare and Submit Draft RIR	2 months
Second Round of RI Groundwater Samples	2 weeks (2 months after first round)

Tables

Table 2.2 - Summary of Soil Analytical Results

SAMPLE ID:				UST-1 (7-7.5)	UST-2 (8-8.5)	UST-3 (9-9.5)	HF-1 (6.5-7)	HF-2 (2-2.5)	HF-3 (3.5-4)	HF-4 (0.5-1)	HF-5 (0.5-1)	HF-6 (1.5-2)	HF-7 (1-1.5)	HF-8 (4-4.5)	HF-9 (1-1.5)	HF-10 (1-1.5)	HF-11 (0.5-1)	HF-12 (4-4.5)	HPO-1 (13.5-14)	HPO-2 (1.5-2)	
LAB ID:				JE4905-1	JE4905-2	JE4905-3	JE4905-4	JE4905-5	JE4905-6	JE4905-7	JE4905-8	JE4905-9	JE4905-10	JE4905-11	JE4905-12	JE5000-1	JE5000-2	JE5000-3	JE5000-4	JE5000-5	
SAMPLE DATE:				1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/31/2025	1/31/2025	1/31/2025	1/31/2025	1/31/2025
SAMPLE DEPTH (FT):				7.0-7.5	8.0-8.5	9.0-9.5	6.5-7.0	2.0-2.5	3.5-4.0	0.5-1.0	0.5-1.0	1.5-2.0	1.0-1.5	4.0-4.5	1.0-1.5	1.0-1.5	0.5-1.0	4.0-4.5	13.5-14.0	1.5-2.0	
SAMPLE MATRIX:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
ANALYTE	CAS	NY-RESRR	NY-UNRES	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	
Metals (mg/kg)																					
Aluminum	7429-90-5			13200	21100	14100	11500	10500	20000	12600	6560	11100	1760	12500	8980	10500	5030	13400	11000	10200	
Antimony	7440-36-0			<2.4	<2.3	<2.4	<2.2	<2.3	<2.3	<2.4	<2.1	<2.3	<2.1	<2.2	<2.2	<2.1	<2.3	<2.3	<2.8	<2.1	
Arsenic	7440-38-2	16	13	<2.4	<2.3	<2.4	3.7	4.7	3.4	5.4	2.4	3.8	2.3	3.4	<2.2	4	<2.3	5.9	6	4.5	
Barium	7440-39-3	400	350	66.6	88.1	69.1	76.1	134	78.9	116	50.4	84	46.5	65.4	59	72.5	45.9	195	197	27.8	
Beryllium	7440-41-7	72	7.2	0.63	0.98	0.68	0.53	0.59	0.86	0.65	0.33	0.58	<0.21	0.57	0.45	0.51	0.31	0.65	1.5	0.4	
Cadmium	7440-43-9	4.3	2.5	<0.59	<2.9 °	<0.61	<0.55	<2.8 °	<0.58	<0.61	<2.6 °	<2.9 °	<5.2 °	<0.55	<0.55	<2.7	<5.7 °	<2.8 °	<7.1 °	<0.54	
Calcium	7440-70-2			1490	84700	6660	15000	62100	7810	6980	40000	40200	159000	1480	1500	82100	174000	52900	46200	16800	
Chromium	7440-47-3			14.8	18.1	18.8	13.9	13.2	25.1	15.9	9.6	13.8	3.5	14.7	14.7	15.5	5.4	18.5	26	10.6	
Cobalt	7440-48-4			6.7	6.9	13.5	8.5	5.8	15.2	7.5	5.7	6.2	<5.2	7.4	7.9	5.5	<5.7	7.8	15.9	9.4	
Copper	7440-50-8	270	50	20.6	15.3	19.9	46.3	28.2	25.1	21.9	17.7	18	7.4	11.5	15.8	17.7	4.3	29.7	3840	24.4	
Iron	7439-89-6			16000	15400	20000	17500	14500	21500	17700	11300	15600	5550	18500	14800	13500	5880	15300	36100	23700	
Lead	7439-92-1	400	63	13.6	10	10.7	67.7	326	67.9	278	37.8	126	12.3	70.3	6.2	60.2	24.5	352	2180	15.5 °	
Magnesium	7439-95-4			8210	47200	8490	13500	37400	29400	8640	23400	25300	80300	5000	3560	40000	104000	36900	8440	8540	
Manganese	7439-96-5	2000	1600	382	338	601	425	406	435	618	277	584	146	404	321	511	496	415	19400	791	
Mercury	7439-97-6	0.81	0.18	<0.035	0.14	<0.035	0.12	0.41	0.29	0.15	0.032	0.12	<0.027	0.088	<0.033	0.21	0.16	0.96	1.5	<0.028	
Nickel	7440-02-0	310	30	12.5	14.9	17.4	14.2	12	30.7	14.3	10.4	12.8	4.9	13.7	13.5	12.4	5.6	15.5	38.1	20.2	
Potassium	7440-09-7			<1200	13900	2610	1130	1310	4850	<1200	1460	1230	<1000	1120	2360	1480	<1100	3480	2090	<1100	
Selenium	7782-49-2	180	3.9	<2.4	<2.3	<2.4	<2.2	<2.3	<2.3	<2.4	<2.1	<2.3	<21 °	<2.2	<2.2	<2.1	<2.3	<2.3	<85 °	<4.3 °	
Silver	7440-22-4	180	2	<0.59	<0.58	<0.61	<0.55	<0.57	<0.58	<0.61	<0.53	<0.58	<0.52	<0.55	<0.55	<0.54	<0.57	<0.57	<21 °	<0.54	
Sodium	7440-23-5			<1200	<1200	<1200	<1100	<1100	<1200	<1200	<1100	<1200	<1000	<1100	<1100	<1100	<1100	<1100	<1400	<1100	
Thallium	7440-28-0			<1.2	<1.2	<1.2	<1.1	<1.1	<1.2	<1.2	<1.1	<5.8 °	<1.0	<1.1	<1.1	<5.4 °	<1.1	<5.7 °	<43 °	<2.1 °	
Vanadium	7440-62-2			20.8	27.9	25.7	35	27.6	32.5	25.5	22.4	22.5	5.7	23.1	19.7	21.1	7.7	27.5	50.1	11.2	
Zinc	7440-66-6	10000	109	44.2	32.6	40.4	77.8	139	92	124	35.6	63.7	14.2	43.1	27.4	205	20.9	159	214	58.6	
VOCs (mg/kg)																					
Acetone	67-64-1	100	0.05	ND	ND	0.0067 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0095 J	ND	ND	
Benzene	71-43-2	4.8	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromochloromethane	74-97-5			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromodichloromethane	75-27-4			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromoform	75-25-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromomethane	74-83-9			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2-Butanone (MEK)	78-93-3	100	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Carbon disulfide	75-15-0			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Carbon tetrachloride	56-23-5	2.4	0.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chlorobenzene	108-90-7	100	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloroethane	75-00-3			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	
Chloroform	67-66-3	49	0.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloromethane	74-87-3			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Cyclohexane	110-82-7			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dibromo-3-chloropropane	96-12-8			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dibromochloromethane	124-48-1			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dibromoethane	106-93-4			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichlorobenzene	95-50-1	100	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,3-Dichlorobenzene	541-73-1	49	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,4-Dichlorobenzene	106-46-7	13	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dichlorodifluoromethane	75-71-8			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethane	75-34-3	26	0.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichloroethane	107-06-2	3.1	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethene	75-35-4	100	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
cis-1,2-Dichloroethene	156-59-2	100	0.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
trans-1,2-Dichloroethene	156-60-5	100	0.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichloropropane	78-87-5			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				UST-1 (7-7.5)	UST-2 (8-8.5)	UST-3 (9-9.5)	HF-1 (6.5-7)	HF-2 (2-2.5)	HF-3 (3.5-4)	HF-4 (0.5-1)	HF-5 (0.5-1)	HF-6 (1.5-2)	HF-7 (1-1.5)	HF-8 (4-4.5)	HF-9 (1-1.5)	HF-10 (1-1.5)	HF-11 (0.5-1)	HF-12 (4-4.5)	HPO-1 (13.5-14)	HPO-2 (1.5-2)
LAB ID:				JE4905-1	JE4905-2	JE4905-3	JE4905-4	JE4905-5	JE4905-6	JE4905-7	JE4905-8	JE4905-9	JE4905-10	JE4905-11	JE4905-12	JE5000-1	JE5000-2	JE5000-3	JE5000-4	JE5000-5
SAMPLE DATE:				1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/31/2025	1/31/2025	1/31/2025	1/31/2025	1/31/2025
SAMPLE DEPTH (FT):				7.0-7.5	8.0-8.5	9.0-9.5	6.5-7.0	2.0-2.5	3.5-4.0	0.5-1.0	0.5-1.0	1.5-2.0	1.0-1.5	4.0-4.5	1.0-1.5	1.0-1.5	0.5-1.0	4.0-4.5	13.5-14.0	1.5-2.0
SAMPLE MATRIX:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
ANALYTE	CAS	NY-RESRR	NY-UNRES	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc
cis-1,3-Dichloropropene	10061-01-5			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10061-02-6			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	100-41-4	41	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00078 J	0.0096	ND	ND	ND
Freon 113	76-13-1			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	591-78-6			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	98-82-8			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Acetate	79-20-9			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylcyclohexane	108-87-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tert Butyl Ether	1634-04-4	100	0.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone(MIBK)	108-10-1			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	75-09-2	100	0.05	0.0035 J	ND	ND	ND	ND	0.0035 J	ND	0.0038 J	0.0029 J	ND	ND	0.003 J	ND	0.0033 J	0.0034 J	ND	ND
Styrene	100-42-5			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	79-34-5			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	127-18-4	19	1.3	ND	ND	0.0006 J	ND	ND	0.0082	ND	ND	ND	ND	ND	ND	ND	ND	0.0059	0.0021 J	ND
Toluene	108-88-3	100	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	71-55-6	100	0.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	79-00-5			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	79-01-6	21	0.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	75-69-4			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	75-01-4	0.9	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	M,P-XYLENE	100	0.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0028	0.0389	ND	ND	ND
o-Xylene	95-47-6	100	0.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.001 J	0.0131	ND	ND	ND
Xylene (total)	1330-20-7	100	0.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0038	0.052	ND	ND	ND
SVOCs (mg/kg)																				
2-Chlorophenol	95-57-8			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methyl phenol	59-50-7			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b
2,4-Dichlorophenol	120-83-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	105-67-9			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	51-28-5			ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b
4,6-Dinitro-o-cresol	534-52-1			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b
2-Methylphenol	95-48-7	100	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3&4-Methylphenol	M+P-CRESOLS			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	88-75-5			ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND	ND	ND	ND	ND
4-Nitrophenol	100-02-7			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b
Pentachlorophenol	87-86-5	6.7	0.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	108-95-2	100	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,3,4,6-Tetrachlorophenol	58-90-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b
2,4,5-Trichlorophenol	95-95-4			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	88-06-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	83-32-9	100	20	ND	ND	ND	ND	ND	ND	0.0692	ND	ND	ND	ND	0.158	0.143	ND	ND	ND	ND
Acenaphthylene	208-96-8	100	100	ND	ND	ND	ND	0.0517	ND	0.0351 J	ND	ND	ND	ND	ND	ND	ND	0.0206 J	ND	ND
Acetophenone	98-86-2			ND	ND	ND	ND	ND	ND	0.0244 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	120-12-7	100	100	ND	ND	ND	ND	ND	ND	0.308	0.021 J	ND	ND	ND	0.211	0.267	ND	ND	ND	ND
Atrazine	1912-24-9			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	56-55-3	1	1	ND	ND	ND	0.0337 J	0.0976	0.0785	2.25	0.114	0.0193 J	0.0292 J	ND	0.367	0.694	ND	0.0287 J	ND	ND
Benzo(a)pyrene	50-32-8	1	1	ND	ND	ND	0.0305 J	0.123	0.0828	3.06	0.116	0.0211 J	0.0204 J	ND	0.304	0.642	ND	0.0388 J	ND	ND
Benzo(b)fluoranthene	205-99-2	1	1	ND	ND	ND	0.0396	0.191	0.107	3.35	0.134	0.0294 J	0.0289 J	ND	0.351	0.755	ND	0.0563	ND	ND
Benzo(g,h,i)perylene	191-24-2	100	100	ND	ND	ND	0.0244 J	0.126	0.0531	2.56	0.0999	0.0182 J	ND	ND	0.167	0.394	ND	0.0428	ND	ND
Benzo(k)fluoranthene	207-08-9	3.9	0.8	ND	ND	ND	ND	0.0751	0.0416	1.16	0.0535	ND	ND	ND	0.138	0.287	ND	ND	ND	ND
4-Bromophenyl phenyl ether	101-55-3			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	85-68-7			ND ^b	ND ^b	ND ^b	ND ^b	0.0356 J ^c	ND ^b	0.0206 J ^c	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	0.0284 J	ND	ND	ND	ND
1,1'-Biphenyl	92-52-4			ND	ND	ND	ND	ND	ND	0.0072 J	ND	ND	ND	ND	0.0064 J	0.0066 J	ND	ND	ND	ND
Benzaldehyde	100-52-7			ND	ND	ND	ND	ND	ND	0.0259 J	ND	ND	ND	ND	0.0171 J	ND	ND	ND	0.0784 J	ND
2-Chloronaphthalene	91-58-7			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline	106-47-8			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	86-74-8			ND	ND	ND	ND	0.0125 J	ND	0.152	0.0085 J	ND	ND	ND	0.131	0.151	ND	ND	ND	ND

Table 2.2 - Summary of Soil Analytical Results

SAMPLE ID:				UST-1 (7-7.5)	UST-2 (8-8.5)	UST-3 (9-9.5)	HF-1 (6.5-7)	HF-2 (2-2.5)	HF-3 (3.5-4)	HF-4 (0.5-1)	HF-5 (0.5-1)	HF-6 (1.5-2)	HF-7 (1-1.5)	HF-8 (4-4.5)	HF-9 (1-1.5)	HF-10 (1-1.5)	HF-11 (0.5-1)	HF-12 (4-4.5)	HPO-1 (13.5-14)	HPO-2 (1.5-2)	
LAB ID:				JE4905-1	JE4905-2	JE4905-3	JE4905-4	JE4905-5	JE4905-6	JE4905-7	JE4905-8	JE4905-9	JE4905-10	JE4905-11	JE4905-12	JE5000-1	JE5000-2	JE5000-3	JE5000-4	JE5000-5	
SAMPLE DATE:				1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/31/2025	1/31/2025	1/31/2025	1/31/2025	1/31/2025
SAMPLE DEPTH (FT):				7.0-7.5	8.0-8.5	9.0-9.5	6.5-7.0	2.0-2.5	3.5-4.0	0.5-1.0	0.5-1.0	1.5-2.0	1.0-1.5	4.0-4.5	1.0-1.5	1.0-1.5	0.5-1.0	4.0-4.5	13.5-14.0	1.5-2.0	
SAMPLE MATRIX:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
ANALYTE	CAS	NY-RESRR	NY-UNRES	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	
Caprolactam	105-60-2			ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND	ND	ND	ND	ND	
Chrysene	218-01-9	3.9	1	ND	ND	ND	0.033 J	0.137	0.0742	2.13	0.117	0.0214 J	0.0291 J	ND	0.338	0.616	ND	0.028 J	ND	ND	
bis(2-Chloroethoxy)methane	111-91-1			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
bis(2-Chloroethyl)ether	111-44-4			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2,2'-Oxybis(1-chloropropane)	108-60-1			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
4-Chlorophenyl phenyl ether	7005-72-3			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2,4-Dinitrotoluene	121-14-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	
2,6-Dinitrotoluene	606-20-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	
3,3'-Dichlorobenzidine	91-94-1			ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND	ND	ND	ND	ND	
1,4-Dioxane	123-91-1	13	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	ND	ND	ND	ND	0.0293 J	ND	0.524	0.025 J	ND	ND	ND	0.0399	0.128	ND	ND	ND	ND	
Dibenzofuran	132-64-9	59	7	ND	ND	ND	ND	ND	ND	0.034 J	ND	ND	ND	ND	0.068 J	0.0622 J	ND	ND	ND	ND	
Di-n-butyl phthalate	84-74-2			ND	ND	ND	ND	0.008 J	ND	0.0078 J	ND	ND	ND	ND	ND	0.0079 J	ND	ND	ND	ND	
Di-n-octyl phthalate	117-84-0			ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND	ND	ND	ND	ND	
Diethyl phthalate	84-66-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dimethyl phthalate	131-11-3			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
bis(2-Ethylhexyl)phthalate	117-81-7			ND ^b	ND ^b	0.0109 J ^c	0.0217 J ^c	0.0352 J ^c	0.0181 J ^c	0.0317 J ^c	0.013 J ^c	ND ^b	0.0249 J ^c	ND ^b	0.0153 J ^c	0.0673 J	ND	ND	ND	0.0132 J	
Fluoranthene	206-44-0	100	100	ND	ND	ND	0.0509	0.185	0.103	3.52	0.226	0.024 J	0.0485	ND	0.823	1.55	ND	0.0283 J	ND	ND	
Fluorene	86-73-7	100	30	ND	ND	ND	ND	ND	ND	0.0567	ND	ND	ND	ND	0.118	0.115	ND	ND	ND	ND	
Hexachlorobenzene	118-74-1	1.2	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Hexachlorobutadiene	87-68-3			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	
Hexachlorocyclopentadiene	77-47-4			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Hexachloroethane	67-72-1			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	0.5	ND	ND	ND	0.02 J	0.0938	0.0382	1.91	0.073	ND	ND	ND	0.141	0.328	ND	0.0263 J	ND	ND	
Isophorone	78-59-1			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2-Methylnaphthalene	91-57-6			ND	ND	ND	ND	0.0177 J	ND	0.0107 J	ND	ND	ND	ND	0.025 J	0.0187 J	ND	ND	ND	ND	
2-Nitroaniline	88-74-4			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
3-Nitroaniline	99-09-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
4-Nitroaniline	100-01-6			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Naphthalene	91-20-3	100	12	ND	ND	ND	ND	0.0171 J	ND	0.0279 J	0.0256 J	ND	ND	ND	0.0712	0.0383	ND	ND	ND	ND	
Nitrobenzene	98-95-3	15		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
N-Nitroso-di-n-propylamine	621-64-7			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
N-Nitrosodiphenylamine	86-30-6			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Phenanthrene	85-01-8	100	100	ND	ND	ND	0.0238 J	0.0632	0.0248 J	1.26	0.101	0.0137 J	0.0433	ND	0.88	1.06	ND	ND	ND	ND	
Pyrene	129-00-0	100	100	ND	ND	ND	0.0526	0.153	0.122	3.08	0.192	0.0314 J	0.051	ND	0.781	1.1	ND	0.027 J	ND	ND	
1,2,4,5-Tetrachlorobenzene	95-94-3			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
General Chemistry (mg/kg)																					
Cyanide	57-12-5	27	27	<0.24	<0.24	<0.25	<0.24	<0.23	<0.33	<0.26	<0.27	<0.33	<0.23	<0.24	<0.25	<0.26	<0.25	<0.24	<0.30	<0.25	
Pesticides (mg/kg)																					
Aldrin	309-00-2	0.097	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
alpha-BHC	319-84-6	0.48	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
beta-BHC	319-85-7	0.36	0.036	ND	ND	ND	ND	ND	ND	0.0058 ^f	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
delta-BHC	319-86-8	100	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
gamma-BHC (Lindane)	58-89-9	1.3	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
alpha-Chlordane	5103-71-9	4.2	0.094	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
gamma-Chlordane	5103-74-2			ND	ND	ND	0.00098	ND	0.0019 ^d	0.00096 ^d	0.0009	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dieldrin	60-57-1	0.2	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0119 ^d	ND	ND	ND	ND	
4,4'-DDD	72-54-8	13	0.0033	ND	ND	ND	ND	ND	ND	0.0027 ^f	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
4,4'-DDE	72-55-9	8.9	0.0033	ND	ND	ND	0.00085	0.0012 ^d	ND	0.0142	ND	0.0098	0.00078	ND	ND	ND	ND	0.0014 ^d	ND	0.0014	
4,4'-DDT	50-29-3	7.9	0.0033	ND	ND	ND	0.0021	0.005	ND	0.0296	0.0008	0.00096	0.00085	ND	ND	0.0426 ^d	ND	0.0018	ND	0.00091	
Endrin	72-20-8	11	0.014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Endosulfan sulfate	1031-07-8	24	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Endrin aldehyde	7421-93-4			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Endosulfan-I	959-98-8	24	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Endosulfan-II	33213-65-9	24	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0137 ^d	ND	ND	ND	ND	
Heptachlor	76-44-8	2.1	0.042	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Heptachlor epoxide	1024-57-3			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0194 ^d	ND	ND	ND	ND	
Methoxychlor	72-43-5			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				UST-1 (7-7.5)	UST-2 (8-8.5)	UST-3 (9-9.5)	HF-1 (6.5-7)	HF-2 (2-2.5)	HF-3 (3.5-4)	HF-4 (0.5-1)	HF-5 (0.5-1)	HF-6 (1.5-2)	HF-7 (1-1.5)	HF-8 (4-4.5)	HF-9 (1-1.5)	HF-10 (1-1.5)	HF-11 (0.5-1)	HF-12 (4-4.5)	HPO-1 (13.5-14)	HPO-2 (1.5-2)
LAB ID:				JE4905-1	JE4905-2	JE4905-3	JE4905-4	JE4905-5	JE4905-6	JE4905-7	JE4905-8	JE4905-9	JE4905-10	JE4905-11	JE4905-12	JE5000-1	JE5000-2	JE5000-3	JE5000-4	JE5000-5
SAMPLE DATE:				1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/30/2025	1/31/2025	1/31/2025	1/31/2025	1/31/2025	1/31/2025
SAMPLE DEPTH (FT):				7.0-7.5	8.0-8.5	9.0-9.5	6.5-7.0	2.0-2.5	3.5-4.0	0.5-1.0	0.5-1.0	1.5-2.0	1.0-1.5	4.0-4.5	1.0-1.5	1.0-1.5	0.5-1.0	4.0-4.5	13.5-14.0	1.5-2.0
SAMPLE MATRIX:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
ANALYTE	CAS	NY-RESRR	NY-UNRES	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc	Conc
Endrin ketone	53494-70-5			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	8001-35-2			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs (mg/kg)																				
Aroclor 1016	12674-11-2	1	0.1	ND ^b	ND ^b	ND ^b	ND	ND	ND ^b	ND	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND	ND	ND	ND
Aroclor 1221	11104-28-2	1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1232	11141-16-5	1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1242	53469-21-9	1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1248	12672-29-6	1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1254	11097-69-1	1	0.1	ND	ND	ND	0.0298 J ^a	ND	ND	ND	ND	ND	ND	ND	ND	2.32	ND	ND	ND	ND
Aroclor 1260	11096-82-5	1	0.1	ND	ND	ND	ND	0.0168 J	ND	0.0194 J ^a	ND	ND	ND	ND	ND	0.245	ND	ND	ND	ND
Aroclor 1268	11100-14-4	1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1262	37324-23-5	1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes

Exceedance of NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06) >=

Exceedance of NY SCO - Restricted Residential w/CP-51 (10/10) (6 NYCRR 375-6 12/06) >=

a = Reported from the 1st signal. The %D of the CCV on the 2nd signal exceeds the method criteria of 20%, so it being used for confirmation only.

b = Associated CCV outside of control limits high, sample was ND.

c = Associated CCV outside of control limits high. Estimated value, due to corresponding failure in the batch associated CCV.

d = More than 40 % RPD for detected concentrations between the two GC columns.

e = Elevated detection limit due to dilution required for high interfering element.

f = Reported from the 1st signal. The %D of the CCV on the 2nd signal exceeds the method criteria of 20%, so it being used for confirmation only. More than 40% RPD for detected concentrations between the two GC columns.

g = This compound in blank spike is outside in house QC limits bias high.

J = Estimated

ND = Not Detected

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				SB201 (0.5-1)	SB202 (0.5-1)	SB203 (1-1.5)	SB204 (0.5-1)	SB205 (0.5-1)	SB206 (0.5-1)	SB207 (0.5-1)	SB208 (0.5-1)	SB209 (0.5-1)	SB210 (0.5-1)	SB211 (0.5-1)	SB212 (0.5-1)	SB213 (0.5-1)	SB214 (0.5-1)	SB215 (0.5-1)	
LAB ID:				L2516452-01	L2516452-02	L2516452-03	L2516452-04	L2516452-05	L2516452-06	L2516452-07	L2516452-08	L2516452-09	L2516452-10	L2516452-11	L2516452-12	L2516452-13	L2516452-14	L2516452-15	
COLLECTION DATE:				3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	
SAMPLE DEPTH (FT):				0.5-1.0	0.5-1.0	1.0-1.5	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
ANALYTE	CAS	NY-RESRR	NY-UNRES	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
VOCs (mg/kg)																			
Methylene chloride	75-09-2	100	0.05	ND		ND		ND		ND		ND		ND		ND		ND	
1,1-Dichloroethane	75-34-3	26	0.27	ND		ND		ND		ND		ND		ND		ND		ND	
Chloroform	67-66-3	49	0.37	ND		ND		ND		ND		ND		ND		ND		ND	
Carbon tetrachloride	56-23-5	2.4	0.76	ND		ND		ND		ND		ND		ND		ND		ND	
1,2-Dichloropropane	78-87-5			ND		ND		ND		ND		ND		ND		ND		ND	
Dibromochloromethane	124-48-1			ND		ND		ND		ND		ND		ND		ND		ND	
1,1,2-Trichloroethane	79-00-5			ND		ND		ND		ND		ND		ND		ND		ND	
Tetrachloroethene	127-18-4	19	1.3	ND		ND		ND		ND		ND		0.00029	J	ND		0.0004	J
Chlorobenzene	108-90-7	100	1.1	ND		ND		ND		ND		ND		ND		ND		ND	
Trichlorofluoromethane	75-69-4			ND		ND		ND		ND		ND		ND		ND		ND	
1,2-Dichloroethane	107-06-2	3.1	0.02	ND		ND		ND		ND		ND		ND		ND		ND	
1,1,1-Trichloroethane	71-55-6	100	0.68	ND		ND		ND		ND		ND		ND		ND		ND	
Bromodichloromethane	75-27-4			ND		ND		ND		ND		ND		ND		ND		ND	
trans-1,3-Dichloropropene	10061-02-6			ND		ND		ND		ND		ND		ND		ND		ND	
cis-1,3-Dichloropropene	10061-01-5			ND		ND		ND		ND		ND		ND		ND		ND	
1,3-Dichloropropene, Total	542-75-6			ND		ND		ND		ND		ND		ND		ND		ND	
1,1-Dichloropropene	563-58-6			ND		ND		ND		ND		ND		ND		ND		ND	
Bromoform	75-25-2			ND		ND		ND		ND		ND		ND		ND		ND	
1,1,2,2-Tetrachloroethane	79-34-5			ND		ND		ND		ND		ND		ND		ND		ND	
Benzene	71-43-2	4.8	0.06	ND		ND		ND		0.015	J	ND		ND		ND		ND	
Toluene	108-88-3	100	0.7	ND		ND		ND		0.31		ND		ND		ND		ND	
Ethylbenzene	100-41-4	41	1	ND		ND		ND		0.46		ND		ND		0.00031	J	ND	
Chloromethane	74-87-3			ND		ND		ND		ND		ND		ND		ND		ND	
Bromomethane	74-83-9			ND		ND		ND		ND		ND		ND		ND		ND	
Vinyl chloride	75-01-4	0.9	0.02	ND		ND		ND		ND		ND		ND		ND		ND	
Chloroethane	75-00-3			ND		ND		ND		ND		ND		ND		ND		ND	
1,1-Dichloroethene	75-35-4	100	0.33	ND		ND		ND		ND		ND		ND		ND		ND	
trans-1,2-Dichloroethene	156-60-5	100	0.19	ND		ND		ND		ND		ND		ND		ND		ND	
Trichloroethene	79-01-6	21	0.47	ND		ND		ND		ND		ND		ND		ND		ND	
1,2-Dichlorobenzene	95-50-1	100	1.1	ND		ND		ND		ND		ND		ND		ND		ND	
1,3-Dichlorobenzene	541-73-1	49	2.4	ND		ND		ND		ND		ND		ND		ND		ND	
1,4-Dichlorobenzene	106-46-7	13	1.8	ND		ND		ND		ND		ND		ND		ND		ND	
Methyl tert butyl ether	1634-04-4	100	0.93	ND		ND		ND		ND		ND		ND		ND		ND	
p/m-Xylene	179601-23-1			ND		ND		ND		ND		ND		ND		0.0013	J	ND	
o-Xylene	95-47-6			ND		ND		ND		ND		ND		ND		0.00043	J	ND	
Xylenes, Total	1330-20-7	100	0.26	ND		ND		ND		ND		6.5		ND		0.0017	J	ND	
cis-1,2-Dichloroethene	156-59-2	100	0.25	ND		ND		ND		ND		ND		ND		ND		ND	
1,2-Dichloroethene, Total	540-59-0			ND		ND		ND		ND		ND		ND		ND		ND	
Dibromomethane	74-95-3			ND		ND		ND		ND		ND		ND		ND		ND	
Styrene	100-42-5			ND		ND		ND		ND		0.015	J	ND		ND		ND	
Dichlorodifluoromethane	75-71-8			ND		ND		ND		ND		ND		ND		ND		ND	
Acetone	67-64-1	100	0.05	0.012		ND		ND		ND		0.0049	J	ND		ND		0.0064	J
Carbon disulfide	75-15-0			ND		ND		ND		ND		ND		ND		ND		ND	
2-Butanone	78-93-3	100	0.12	ND		ND		ND		ND		0.26	J	ND		ND		ND	
Vinyl acetate	108-05-4			ND		ND		ND		ND		ND		ND		ND		ND	
4-Methyl-2-pentanone	108-10-1			ND		ND		ND		ND		ND		ND		ND		ND	
1,2,3-Trichloropropane	96-18-4			ND		ND		ND		ND		ND		ND		ND		ND	
2-Hexanone	591-78-6			ND		ND		ND		ND		ND		ND		ND		ND	
Bromochloromethane	74-97-5			ND		ND		ND		ND		ND		ND		ND		ND	
2,2-Dichloropropane	594-20-7			ND		ND		ND		ND		ND		ND		ND		ND	
1,2-Dibromoethane	106-93-4			ND		ND		ND		ND		ND		ND		ND		ND	
1,3-Dichloropropane	142-28-9			ND		ND		ND		ND		ND		ND		ND		ND	
1,1,1,2-Tetrachloroethane	630-20-6			ND		ND		ND		ND		ND		ND		ND		ND	
Bromobenzene	108-86-1			ND		ND		ND		ND		ND		ND		ND		ND	
n-Butylbenzene	104-51-8	100	12	ND		ND		ND		ND		1.1		ND		ND		ND	
sec-Butylbenzene	135-98-8	100	11	ND		ND		ND		ND		1.5		ND		ND		ND	
tert-Butylbenzene	98-06-6	100	5.9	ND		ND		ND		ND		0.035	J	ND		ND		ND	
o-Chlorotoluene	95-49-8			ND		ND		ND		ND		ND		ND		ND		ND	
p-Chlorotoluene	106-43-4			ND		ND		ND		ND		ND		ND		ND		ND	
1,2-Dibromo-3-chloropropane	96-12-8			ND		ND		ND		ND		ND		ND		ND		ND	
Hexachlorobutadiene	87-68-3			ND		ND		ND		ND		ND		ND		ND		ND	
Isopropylbenzene	98-82-8			ND		ND		ND		ND		0.48		ND		ND		ND	
p-Isopropyltoluene	99-87-6			ND		ND		ND		ND		1.2		ND		ND		ND	
Naphthalene	91-20-3	100	12	ND		ND		ND		ND		1.8		ND		ND		ND	
Acrylonitrile	107-13-1			ND		ND		ND		ND		ND		ND		ND		ND	
n-Propylbenzene	103-65-1	100	3.9	ND		ND		ND		ND		0.91		ND		ND		ND	
1,2,3-Trichlorobenzene	87-61-6			ND		ND		ND		ND		ND		ND		ND		ND	
1,2,4-Trichlorobenzene	120-82-1			ND		ND		ND		ND		ND		ND		ND		ND	
1,3,5-Trimethylbenzene	108-67-8	52	8.4	ND		ND		ND		ND		5.8		ND		ND		ND	
1,2,4-Trimethylbenzene	95-63-6	52	3.6	ND		ND		ND		ND		9.3		ND		ND		ND	
1,4-Dioxane	123-91-1	13	0.1	ND		ND		ND		ND		ND		ND		ND		ND	
p-Diethylbenzene	105-05-5			ND		ND		ND		ND		18		ND		ND		ND	

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				SB201 (0.5-1)	SB202 (0.5-1)	SB203 (1-1.5)	SB204 (0.5-1)	SB205 (0.5-1)	SB206 (0.5-1)	SB207 (0.5-1)	SB208 (0.5-1)	SB209 (0.5-1)	SB210 (0.5-1)	SB211 (0.5-1)	SB212 (0.5-1)	SB213 (0.5-1)	SB214 (0.5-1)	SB215 (0.5-1)	
LAB ID:				L2516452-01	L2516452-02	L2516452-03	L2516452-04	L2516452-05	L2516452-06	L2516452-07	L2516452-08	L2516452-09	L2516452-10	L2516452-11	L2516452-12	L2516452-13	L2516452-14	L2516452-15	
COLLECTION DATE:				3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	3/20/2025	
SAMPLE DEPTH (FT):				0.5-1.0	0.5-1.0	1.0-1.5	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	
SAMPLE MATRIX:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
ANALYTE	CAS	NY-RESRR	NY-UNRES	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
1,2,4-Trichlorobenzene	120-82-1			ND		ND		ND		ND		ND		ND		ND		ND	
Hexachlorobenzene	118-74-1	1.2	0.33	ND		ND		ND		ND		ND		ND		ND		ND	
Bis(2-chloroethyl)ether	111-44-4			ND		ND		ND		ND		ND		ND		ND		ND	
2-Chloronaphthalene	91-58-7			ND		ND		ND		ND		ND		ND		ND		ND	
1,2-Dichlorobenzene	95-50-1	100	1.1	ND		ND		ND		ND		ND		ND		ND		ND	
1,3-Dichlorobenzene	541-73-1	49	2.4	ND		ND		ND		ND		ND		ND		ND		ND	
1,4-Dichlorobenzene	106-46-7	13	1.8	ND		ND		ND		ND		ND		ND		ND		ND	
3,3'-Dichlorobenzidine	91-94-1			ND		ND		ND		ND		ND		ND		ND		ND	
2,4-Dinitrotoluene	121-14-2			ND		ND		ND		ND		ND		ND		ND		ND	
2,6-Dinitrotoluene	606-20-2			ND		ND		ND		ND		ND		ND		ND		ND	
Fluoranthene	206-44-0	100	100	0.071	J	0.11	J	0.041	J	ND		12		ND		12	E	0.12	J
4-Chlorophenyl phenyl ether	7005-72-3			ND		ND		ND		ND		ND		ND		ND		ND	
4-Bromophenyl phenyl ether	101-55-3			ND		ND		ND		ND		ND		ND		ND		ND	
Bis(2-chloroisopropyl)ether	108-60-1			ND		ND		ND		ND		ND		ND		ND		ND	
Bis(2-chloroethoxy)methane	111-91-1			ND		ND		ND		ND		ND		ND		ND		ND	
Hexachlorobutadiene	87-68-3			ND		ND		ND		ND		ND		ND		ND		ND	
Hexachlorocyclopentadiene	77-47-4			ND		ND		ND		ND		ND		ND		ND		ND	
Hexachloroethane	67-72-1			ND		ND		ND		ND		ND		ND		ND		ND	
Isophorone	78-59-1			ND		ND		ND		ND		ND		ND		ND		ND	
Naphthalene	91-20-3	100	12	0.032	J	ND		ND		ND		2.1		ND		0.23		ND	
Nitrobenzene	98-95-3			ND		ND		ND		ND		ND		ND		ND		ND	
NDPA/DPA	86-30-6			ND		ND		ND		ND		ND		ND		ND		ND	
n-Nitrosodi-n-propylamine	621-64-7			ND		ND		ND		ND		ND		ND		ND		ND	
Bis(2-ethylhexyl)phthalate	117-81-7			ND		ND		ND		ND		ND		0.12	J	ND		ND	
Butyl benzyl phthalate	85-68-7			ND		ND		ND		ND		ND		ND		ND		ND	
Di-n-butylphthalate	84-74-2			ND		ND		ND		ND		ND		0.04	J	ND		ND	
Di-n-octylphthalate	117-84-0			ND		ND		ND		ND		ND		ND		ND		ND	
Diethyl phthalate	84-66-2			ND		ND		ND		ND		ND		ND		ND		ND	
Dimethyl phthalate	131-11-3			ND		ND		ND		ND		ND		ND		ND		ND	
Benzo(a)anthracene	56-55-3	1	1	0.024	J	0.059	J	0.033	J	ND		4.7		ND		6		ND	
Benzo(a)pyrene	50-32-8	1	1	ND		0.065	J	ND		ND		3.9		ND		6.2		ND	
Benzo(b)fluoranthene	205-99-2	1	1	0.033	J	0.084	J	0.034	J	ND		5		ND		8.2		ND	
Benzo(k)fluoranthene	207-08-9	3.9	0.8	ND		ND		ND		ND		1.8		ND		2.5		ND	
Chrysene	218-01-9	3.9	1	0.027	J	0.063	J	0.026	J	ND		4.5		ND		5.8		0.098	J
Acenaphthylene	208-96-8	100	100	ND		ND		0.11	J	ND		ND		0.61		ND		ND	
Anthracene	120-12-7	100	100	ND		ND		ND		ND		2.7		ND		1.9		ND	
Benzo(ghi)perylene	191-24-2	100	100	0.023	J	0.041	J	ND		ND		2.1		ND		4		0.12	J
Fluorene	86-73-7	100	30	ND		ND		ND		ND		1.8		ND		0.7		ND	
Phenanthrene	85-01-8	100	100	0.067	J	0.059	J	0.027	J	ND		12		ND		6.4		ND	
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	ND		ND		ND		ND		0.58	J	ND		0.94		ND	
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	0.5	ND		0.042	J	ND		ND		2.2		ND		4.2		ND	
Pyrene	129-00-0	100	100	0.054	J	0.091	J	0.042	J	ND		9.2		ND		11		0.11	J
Biphenyl	92-52-4			ND		ND		ND		ND		1.1	J	ND		0.033	J	ND	
4-Chloroaniline	106-47-8			ND		ND		ND		ND		ND		ND		ND		ND	
2-Nitroaniline	88-74-4			ND		ND		ND		ND		ND		ND		ND		ND	
3-Nitroaniline	99-09-2			ND		ND		ND		ND		ND		ND		ND		ND	
4-Nitroaniline	100-01-6			ND		ND		ND		ND		ND		ND		ND		ND	
Dibenzofuran	132-64-9	59	7	ND		ND		ND		ND		1.1		ND		0.28		ND	
2-Methylnaphthalene	91-57-6			ND		ND		ND		ND		4.3		ND		0.075	J	ND	
1,2,4,5-Tetrachlorobenzene	95-94-3			ND		ND		ND		ND		ND		ND		ND		ND	
Acetophenone	98-86-2			ND		ND		ND		ND		ND		ND		ND		ND	
2,4,6-Trichlorophenol	88-06-2			ND		ND		ND		ND		ND		ND		ND		ND	
p-Chloro-m-cresol	59-50-7			ND		ND		ND		ND		ND		ND		ND		ND	
2-Chlorophenol	95-57-8			ND		ND		ND		ND		ND		ND		ND		ND	
2,4-Dichlorophenol	120-83-2			ND		ND		ND		ND		ND		ND		ND		ND	
2,4-Dimethylphenol	105-67-9			ND		ND		ND		ND		ND		ND		ND		ND	
2-Nitrophenol	88-75-5			ND		ND		ND		ND		ND		ND		ND		ND	
4-Nitrophenol	100-02-7			ND		ND		ND		ND		ND		ND		ND		ND	
2,4-Dinitrophenol	51-28-5			ND		ND		ND		ND		ND		ND		ND		ND	
4,6-Dinitro-o-cresol	534-52-1			ND		ND		ND		ND		ND		ND		ND		ND	
Pentachlorophenol	87-86-5	6.7	0.8	ND		ND		ND		ND		ND		ND		ND		ND	
Phenol	108-95-2	100	0.33	ND		ND		ND		ND		ND		ND		ND		ND	
2-Methylphenol	95-48-7	100	0.33	ND		ND		ND		ND		ND		ND		ND		ND	
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	100	0.33	ND		ND		ND		ND		ND		ND		ND		ND	
2,4,5-Trichlorophenol	95-95-4			ND		ND		ND		ND		ND		ND		ND		ND	
Benzoic Acid	65-85-0			ND		ND		ND		ND		ND		ND		ND		ND	
Benzyl Alcohol	100-51-6			ND		ND		ND		ND		ND		0.14	J	ND		ND	
Carbazole	86-74-8			ND		ND		ND		1.7		ND		ND		0.82		ND	
1,4-Dioxane	123-91-1	13	0.1	ND		ND		ND		ND		ND		ND		ND		ND	
Total SVOCs				0.331	-	0.614	-	0.333	-	-	-	75.08	-	-	-	71.418	-	0.448	-
Pesticides (mg/kg)																			
Delta-BHC	319-86-8	100	0.04	ND		ND		ND		ND		ND		ND		ND		ND	
Lindane	58-89-9	1.3	0.1	ND		ND		ND		ND		ND		ND		ND		ND	
Alpha-BHC	319-84-6	0.48	0.02	ND		ND		ND		ND		ND		ND		ND		ND	
Beta-BHC	319-85-7	0.36	0.036	ND		ND		ND		ND		ND		ND		ND		ND	
Heptachlor	76-44-8	2.1	0.042	ND		ND		ND		ND		ND		ND		ND		ND	
Aldrin	309-00-2	0.097	0.005	ND		ND		ND		ND		ND		ND		ND		ND	
Heptachlor epoxide	1024-57-3			ND		ND		ND		ND		0.00223	JIP	ND		ND		ND	
Endrin	72-20-8	11	0.014	ND		ND		ND		ND		ND		ND		ND		ND	
Endrin aldehyde	7421-93-4			ND		ND		ND		ND		ND		ND		ND		ND	

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				SB201 (0.5-1)		SB202 (0.5-1)		SB203 (1-1.5)		SB204 (0.5-1)		SB205 (0.5-1)		SB206 (0.5-1)		SB207 (0.5-1)		SB208 (0.5-1)		SB209 (0.5-1)		SB210 (0.5-1)		SB211 (0.5-1)		SB212 (0.5-1)		SB213 (0.5-1)		SB214 (0.5-1)		SB215 (0.5-1)	
LAB ID:				L2516452-01		L2516452-02		L2516452-03		L2516452-04		L2516452-05		L2516452-06		L2516452-07		L2516452-08		L2516452-09		L2516452-10		L2516452-11		L2516452-12		L2516452-13		L2516452-14		L2516452-15	
COLLECTION DATE:				3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025		3/20/2025	
SAMPLE DEPTH (FT):				0.5-1.0		0.5-1.0		1.0-1.5		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0		0.5-1.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
ANALYTE	CAS	NY-RESRR	NY-UNRES	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q	Conc	Q
Endrin ketone	53494-70-5			ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Dieldrin	60-57-1	0.2	0.005	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
4,4'-DDE	72-55-9	8.9	0.0033	ND		0.00095	J	ND		0.00961		ND		0.00429		0.00131	J	ND		ND		ND		ND		ND		ND		0.00245		ND	
4,4'-DDD	72-54-8	13	0.0033	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.00261		ND	
4,4'-DDT	50-29-3	7.9	0.0033	ND		ND		ND		0.00359		ND		0.0172	IP	0.00218		ND		ND		ND		ND		ND		ND		ND		ND	
Endosulfan I	959-98-8	24	2.4	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Endosulfan II	33213-65-9	24	2.4	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Endosulfan sulfate	1031-07-8	24	2.4	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Methoxychlor	72-43-5			ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Toxaphene	8001-35-2			ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
cis-Chlordane	5103-71-9	4.2	0.094	ND		ND		ND		ND		ND		0.0246		ND		ND		ND		ND		ND		ND		ND		0.00606	IP	ND	
trans-Chlordane	5103-74-2			ND		ND		ND		0.00128	J	ND		0.014		0.000632	JIP	ND		ND		ND		ND		ND		ND		0.00667	IP	ND	
Chlordane	57-74-9			ND		ND		ND		ND		ND		0.125		ND		ND		ND		ND		ND		ND		ND		0.0492		ND	
PCBs (mg/kg)																																	
Aroclor 1016	12674-11-2	1	0.1	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Aroclor 1221	11104-28-2	1	0.1	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Aroclor 1232	11141-16-5	1	0.1	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Aroclor 1242	53469-21-9	1	0.1	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Aroclor 1248	12672-29-6	1	0.1	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Aroclor 1254	11097-69-1	1	0.1	ND		ND		ND		ND		ND		0.0748		ND		ND		0.0413	J	ND		0.00978	J	ND		ND		0.0229	J	ND	
Aroclor 1260	11096-82-5	1	0.1	ND		ND		ND		ND		ND		0.174		ND		ND		0.0421	J	2.48		0.0163	J	0.0204	J	ND		0.0323	J	ND	
Aroclor 1262	37324-23-5	1	0.1	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Aroclor 1268	11100-14-4	1	0.1	ND		ND		ND		ND		ND		0.0409	J	ND		ND		0.0144	J	ND		ND		ND		ND		ND		ND	
PCBs, Total	1336-36-3	1	0.1	ND		ND		ND		ND		ND		0.29	J	ND		ND		0.0978	J	2.48		0.0261	J	0.0204	J	ND		0.0552	J	ND	
Metals (mg/kg)																																	
Aluminum, Total	7429-90-5			7650		12700		9430		19000		10300		25600		7700		9140		6320		6120		3530		4230		11300		13000		11200	
Antimony, Total	7440-36-0			ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Arsenic, Total	7440-38-2	16	13	2.56		3.63		2.18		3.56		3.66		4.98		3.91		1.99		7.69		4.6		8.43		5.96		5.78		2.51		1.85	
Barium, Total	7440-39-3	400	350	80.7		104		68.4		116		62.1		1160		72.2		37		48.1		62.5		27.3		23.8		144		49.9		53.3	
Beryllium, Total	7440-41-7	72	7.2	0.193	J	0.559		0.544		0.69	J	0.346	J	0.206	J	0.266	J	0.178	J	0.294	J	0.221	J	ND		0.226	J	0.409	J	0.269	J	0.195	J
Cadmium, Total	7440-43-9	4.3	2.5	0.15	J	0.094	J	ND		ND		0.056	J	4.99		ND		0.419	J	0.379	J	0.336	J	ND		0.235	J	0.277	J	0.666	J	0.615	J
Calcium, Total	7440-70-2			5620		55000		82600		123000		34900		62000		91000		20600		104000		14500		189000		19500		27200		15300		10400	
Chromium, Total	7440-47-3			14.8		14.4		10.8		17.5		14		106		11.4		7.33		17.9		13.6		6.7		5.55		16.5		12.2		7.31	
Cobalt, Total	7440-48-4			6.36		6.57		3.58		6.54		5.42		13		5.07		13.4		4.69		5.57		2.62	J	3.59		7.5		18.8		17.1	
Copper, Total	7440-50-8	270	50	24.8		20.7		9.94		17.6		16.6		2700		12.7		72.3		34.5		38.9		27.4		33.5		52.3		85.4		143	
Iron, Total	7439-89-6			15600		17100		11000		16600		14400		33900		12200		20000		14400		12400		6870		12200		15900		29700		25700	
Lead, Total	7439-92-1	400	63	18.4		214		186		430		44.2		3400		20.2		13.6		64.4		164		16.4	J	103		260		40.8		11.4	
Magnesium, Total	7439-95-4			6390		39500		50600		87500		25600		35400		50800		15900		59400		9290		112000		12700		21200		12700		10900	
Manganese, Total	7439-96-5	2000	1600	514		597		542		643		462		606		616		296		280		232		172		118		377		372		389	
Mercury, Total	7439-97-6	0.81	0.18	ND		0.233		0.1		0.12		0.072	J	0.103		ND		ND		0.126		0.169		0.06	J	0.18		0.381		ND		ND	
Nickel, Total	7440-02-0	310	30	14		12.8		6.92		13.5		11.6		21.7		9.97		14.9		14.1		12.2		7.23	J	6.06		14.1		20.4		16.8	
Potassium, Total	7440-09-7			1980		953		1390		6450		1530		792		1330		684		679		1360		249	J	330		1880		942		926	
Selenium, Total	7782-49-2	180	3.9	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.325	J	ND		ND	
Silver, Total	7440-22-4	180	2	ND		ND		ND		ND		ND		18.7		ND		ND		ND		ND		ND		ND		0.303	J	0.363	J	0.429	
Sodium, Total	7440-23-5			ND		ND		ND		ND		ND		962		ND		297		ND		ND		129	J	ND		131	J	125	J	314	
Thallium, Total	7440-28-0			ND		1.2	J	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Vanadium, Total	7440-62-2			18.6		24.8		17.2		27.8		23.7		24.1		16.3		46.2		22.8		25.8		16.9		26.3		28.8		65.6		62.4	
Zinc, Total	7440-66-6	10000	109	39.5		94.7		55.6		404		40.2		2640		29.8		64		319		85.8		65.6		66.2		175		96.2		83.8	
GENERAL CHEMISTRY																																	
Solids, Total	NONE			88.1		73.5		84.4		72.1		86.6		82.4		95.2		93.9		88.2		89.9		88.7		91.6		85		77.8		91	
Cyanide, Total	57-12-5	27	27	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	

Notes
NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria, New York Restricted use Criteria per 6 NYCRR Part 375 Environmental Remediation Programs, effective December 14, 2006.
NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria Criteria per 6 NYCRR Part 375 Environmental Remediation Programs, effective December 14, 2006.
Exceedance of NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06) >=
Exceedance of NY SCO - Restricted Residential w/CP-51 (10/10) (6 NYCRR 375-6 12/06) >=
a = Reported from the 1st signal. The %D of the CCV on the 2nd signal exceeds the method criteria of 20%, so it being used for confirmation only.
d = More than 40 % RPD for detected concentrations between the two GC columns.
e = Elevated detection limit due to dilution required for high interfering element.
J = Estimated
I = The lower value for the two columns has been reported due to obvious interference.
P = The RPD between the results for the two columns exceeds the method-specified criteria.

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				EB-01 (2-2.5)		EB-02 (3-3.5)		EB-03 (2.5-3)		EB-04 (1.5-2)		EB-05 (4.5-5)		EB-06 (7-7.5)		EB-07 (4-4.5)		EB-08 (3.5-4)		EB-09 (4.5-5)		EB-10 (4.5-5.0')	
LAB ID:				L2525183-01		L2525183-02		L2525183-03		L2525183-04		L2525183-05		L2525183-06		L2525183-07		L2525183-08		L2525183-09		L2525476-01	
COLLECTION DATE:				4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/24/2025	
SAMPLE DEPTH (FT):				2.0-2.5		3.0-3.5		2.5-3.0		1.5-2.0		4.5-5.0		7.0-7.5		4.0-4.5		3.5-4.0		4.5-5.0		4.5-5.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	CasNum	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
General Chemistry																							
Solids, Total (%)	NONE			89.8	0.1	89.4	0.1	89.8	0.1	91.4	0.1	96.5	0.1	93.2	0.1	80.8	0.1	92.7	0.1	88.2	0.1	87.7	0.1
Cyanide, Total (mg/kg)	57-12-5	27	27	ND	1.1	ND	1.1	ND	1.1	ND	1	ND	1	ND	1	ND	1.2	ND	1.1	ND	1	ND	1.1
Pesticides (mg/kg)																							
Delta-BHC	319-86-8	100	0.04	ND	0.00176	ND	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	ND	0.00165	ND	0.00194	ND	0.00169	ND	0.00176	ND	0.00175
Lindane	58-89-9	1.3	0.1	ND	0.000734	ND	0.000714	ND	0.000739	ND	0.000717	ND	0.000676	ND	0.000688	ND	0.000807	ND	0.000703	ND	0.000731	ND	0.00073
Alpha-BHC	319-84-6	0.48	0.02	ND	0.000734	ND	0.000714	ND	0.000739	ND	0.000717	ND	0.000676	ND	0.000688	ND	0.000807	ND	0.000703	ND	0.000731	ND	0.00073
Beta-BHC	319-85-7	0.36	0.036	ND	0.00176	ND	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	ND	0.00165	ND	0.00194	ND	0.00169	ND	0.00176	ND	0.00175
Heptachlor	76-44-8	2.1	0.042	ND	0.00088	ND	0.000857	ND	0.000887	ND	0.000861	ND	0.000811	ND	0.000825	ND	0.000969	ND	0.000843	ND	0.000878	ND	0.000875
Aldrin	309-00-2	0.097	0.005	ND	0.00176	ND	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	ND	0.00165	ND	0.00194	ND	0.00169	ND	0.00176	ND	0.00175
Heptachlor epoxide	1024-57-3			ND	0.0033	ND	0.00321	ND	0.00333	ND	0.00323	ND	0.00304	ND	0.0031	ND	0.00363	ND	0.00316	ND	0.00329	ND	0.00328
Endrin	72-20-8	11	0.014	ND	0.000734	ND	0.000714	ND	0.000739	ND	0.000717	ND	0.000676	ND	0.000688	ND	0.000807	ND	0.000703	ND	0.000731	ND	0.00073
Endrin aldehyde	7421-93-4			ND	0.0022	ND	0.00214	ND	0.00222	ND	0.00215	ND	0.00203	ND	0.00206	ND	0.00242	ND	0.00211	ND	0.00219	ND	0.00219
Endrin ketone	53494-70-5			ND	0.00176	ND	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	ND	0.00165	ND	0.00194	ND	0.00169	ND	0.00176	ND	0.00175
Dieldrin	60-57-1	0.2	0.005	ND	0.0011	ND	0.00107	ND	0.00111	ND	0.00108	ND	0.00101	ND	0.00103	ND	0.00121	ND	0.00105	ND	0.0011	ND	0.00109
4,4'-DDE	72-55-9	8.9	0.0033	ND	0.00176	0.00244	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	0.00109J	0.00165	0.00713	0.00194	ND	0.00169	0.000884J	0.00176	0.00261	0.00175
4,4'-DDD	72-54-8	13	0.0033	ND	0.00176	ND	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	ND	0.00165	0.00126J	0.00194	ND	0.00169	ND	0.00176	0.000944J	0.00175
4,4'-DDT	50-29-3	7.9	0.0033	ND	0.00176	0.00494	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	ND	0.00165	0.00196	0.00194	ND	0.00169	ND	0.00176	0.00814	0.00175
Endosulfan I	959-98-8	24	2.4	ND	0.00176	ND	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	ND	0.00165	ND	0.00194	ND	0.00169	ND	0.00176	ND	0.00175
Endosulfan II	33213-65-9	24	2.4	ND	0.00176	ND	0.00171	ND	0.00177	ND	0.00172	ND	0.00162	ND	0.00165	ND	0.00194	ND	0.00169	ND	0.00176	ND	0.00175
Endosulfan sulfate	1031-07-8	24	2.4	ND	0.000734	ND	0.000714	ND	0.000739	ND	0.000717	ND	0.000676	ND	0.000688	ND	0.000807	ND	0.000703	ND	0.000731	ND	0.00073
Methoxychlor	72-43-5			ND	0.0033	ND	0.00321	ND	0.00333	ND	0.00323	ND	0.00304	ND	0.0031	ND	0.00363	ND	0.00316	ND	0.00329	ND	0.00328
Toxaphene	8001-35-2			ND	0.033	ND	0.0321	ND	0.0333	ND	0.0323	ND	0.0304	ND	0.031	ND	0.0363	ND	0.0316	ND	0.0329	ND	0.0328
cis-Chlordane	5103-71-9	4.2	0.094	ND	0.0022	0.00106J	0.00214	ND	0.00222	ND	0.00215	ND	0.00203	ND	0.00206	0.00203JIP	0.00242	ND	0.00211	ND	0.00219	0.00689IP	0.00219
trans-Chlordane	5103-74-2			ND	0.0022	ND	0.00214	ND	0.00222	ND	0.00215	ND	0.00203	ND	0.00206	ND	0.00242	ND	0.00211	ND	0.00219	0.00829	0.00219
Chlordane	57-74-9			ND	0.0147	ND	0.0143	ND	0.0148	ND	0.0143	ND	0.0135	ND	0.0138	ND	0.0161	ND	0.014	ND	0.0146	0.0612	0.0146
PCBs (mg/kg)																							
Aroclor 1016	12674-11-2	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	ND	0.0528	ND	0.0555	ND	0.0544
Aroclor 1221	11104-28-2	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	ND	0.0528	ND	0.0555	ND	0.0544
Aroclor 1232	11141-16-5	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	ND	0.0528	ND	0.0555	ND	0.0544
Aroclor 1242	53469-21-9	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	ND	0.0528	ND	0.0555	ND	0.0544
Aroclor 1248	12672-29-6	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	ND	0.0528	ND	0.0555	ND	0.0544
Aroclor 1254	11097-69-1	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	ND	0.0528	ND	0.0555	ND	0.0544
Aroclor 1260	11096-82-5	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	0.665	0.0528	0.0671	0.0555	ND	0.0544
Aroclor 1262	37324-23-5	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	ND	0.0528	ND	0.0555	ND	0.0544
Aroclor 1268	11100-14-4	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	ND	0.0528	ND	0.0555	ND	0.0544
PCBs, Total	1336-36-3	1	0.1	ND	0.0514	ND	0.0533	ND	0.0538	ND	0.0518	ND	0.0493	ND	0.0516	ND	0.0606	0.665	0.0528	0.0671	0.0555	ND	0.0544
SVOCs (mg/kg)																							
Acenaphthene	83-32-9	100	20	ND	0.15	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	4.3	ND	3	0.19	0.15
1,2,4-Trichlorobenzene	120-82-1			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Hexachlorobenzene	118-74-1	1.2	0.33	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	ND	0.12	ND	3.2	ND	2.2	ND	0.11
Bis(2-chloroethyl)ether	111-44-4			ND	0.16	ND	0.17	ND	0.16	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	4.8	ND	3.3	ND	0.17
2-Chloronaphthalene	91-58-7			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
1,2-Dichlorobenzene	95-50-1	100	1.1	ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
1,3-Dichlorobenzene	541-73-1	49	2.4	ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
1,4-Dichlorobenzene	106-46-7	13	1																				

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				EB-01 (2-2.5)		EB-02 (3-3.5)		EB-03 (2.5-3)		EB-04 (1.5-2)		EB-05 (4.5-5)		EB-06 (7-7.5)		EB-07 (4-4.5)		EB-08 (3.5-4)		EB-09 (4.5-5)		EB-10 (4.5-5.0')	
LAB ID:				L2525183-01		L2525183-02		L2525183-03		L2525183-04		L2525183-05		L2525183-06		L2525183-07		L2525183-08		L2525183-09		L2525476-01	
COLLECTION DATE:				4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/24/2025	
SAMPLE DEPTH (FT):				2.0-2.5		3.0-3.5		2.5-3.0		1.5-2.0		4.5-5.0		7.0-7.5		4.0-4.5		3.5-4.0		4.5-5.0		4.5-5.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	CasNum	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Nitrobenzene	98-95-3			ND	0.16	ND	0.17	ND	0.16	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	4.8	ND	3.3	ND	0.17
NDPA/DPA	86-30-6			ND	0.15	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	4.3	ND	3	ND	0.15
n-Nitrosodi-n-propylamine	621-64-7			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Bis(2-ethylhexyl)phthalate	117-81-7			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Butyl benzyl phthalate	85-68-7			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Di-n-butylphthalate	84-74-2			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Di-n-octylphthalate	117-84-0			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Diethyl phthalate	84-66-2			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Dimethyl phthalate	131-11-3			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Benzo(a)anthracene	56-55-3	1	1	ND	0.11	0.04J	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	0.026J	0.12	0.89J	3.2	ND	2.2	0.45	0.11
Benzo(a)pyrene	50-32-8	1	1	ND	0.15	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	4.3	ND	3	0.44	0.15
Benzo(b)fluoranthene	205-99-2	1	1	ND	0.11	0.045J	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	0.036J	0.12	ND	3.2	ND	2.2	0.47	0.11
Benzo(k)fluoranthene	207-08-9	3.9	0.8	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	ND	0.12	ND	3.2	ND	2.2	0.2	0.11
Chrysene	218-01-9	3.9	1	ND	0.11	0.036J	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	0.03J	0.12	0.75J	3.2	ND	2.2	0.4	0.11
Acenaphthylene	208-96-8	100	100	ND	0.15	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	4.3	ND	3	ND	0.15
Anthracene	120-12-7	100	100	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	ND	0.12	ND	3.2	ND	2.2	0.3	0.11
Benzo(ghi)perylene	191-24-2	100	100	ND	0.15	0.024J	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.14	0.026J	0.16	ND	4.3	ND	3	0.24	0.15
Fluorene	86-73-7	100	30	ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	0.14J	0.19
Phenanthrene	85-01-8	100	100	ND	0.11	0.029J	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	ND	0.12	0.69J	3.2	ND	2.2	0.88	0.11
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	ND	0.12	ND	3.2	ND	2.2	0.056J	0.11
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	0.5	ND	0.15	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	4.3	ND	3	0.23	0.15
Pyrene	129-00-0	100	100	ND	0.11	0.055J	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	0.033J	0.12	1.2J	3.2	ND	2.2	0.78	0.11
Biphenyl	92-52-4			ND	0.42	ND	0.42	ND	0.42	ND	0.4	ND	0.39	ND	0.41	ND	0.46	ND	12	ND	8.5	ND	0.43
4-Chloroaniline	106-47-8			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
2-Nitroaniline	88-74-4			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
3-Nitroaniline	99-09-2			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
4-Nitroaniline	100-01-6			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Dibenzofuran	132-64-9	59	7	ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	0.078J	0.19
2-Methylnaphthalene	91-57-6			ND	0.22	ND	0.22	ND	0.22	ND	0.21	ND	0.21	ND	0.21	ND	0.24	ND	6.4	ND	4.5	0.036J	0.22
1,2,4,5-Tetrachlorobenzene	95-94-3			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
Acetophenone	98-86-2			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
2,4,6-Trichlorophenol	88-06-2			ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.1	ND	0.11	ND	0.12	ND	3.2	ND	2.2	ND	0.11
p-Chloro-m-cresol	59-50-7			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
2-Chlorophenol	95-57-8			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
2,4-Dichlorophenol	120-83-2			ND	0.16	ND	0.17	ND	0.16	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	4.8	ND	3.3	ND	0.17
2,4-Dimethylphenol	105-67-9			ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
2-Nitrophenol	88-75-5			ND	0.39	ND	0.4	ND	0.4	ND	0.38	ND	0.37	ND	0.38	ND	0.44	ND	12	ND	8	ND	0.4
4-Nitrophenol	100-02-7			ND	0.26	ND	0.26	ND	0.26	ND	0.25	ND	0.24	ND	0.25	ND	0.28	ND	7.5	ND	5.2	ND	0.26
2,4-Dinitrophenol	51-28-5			ND	0.88	ND	0.89	ND	0.88	ND	0.85	ND	0.83	ND	0.86	ND	0.97	ND	26	ND	18	ND	0.9
4,6-Dinitro-o-cresol	534-52-1			ND	0.48	ND	0.48	ND	0.48	ND	0.46	ND	0.45	ND	0.46	ND	0.52	ND	14	ND	9.7	ND	0.49
Pentachlorophenol	87-86-5	6.7	0.8	ND	0.15	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	4.3	ND	3	ND	0.15
Phenol	108-95-2	100	0.33	ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
2-Methylphenol	95-48-7	100	0.33	ND	0.18	ND	0.18	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	5.4	ND	3.7	ND	0.19
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	100	0.33	ND	0.26	ND	0.27	ND	0.26	ND	0.26	ND	0.25	ND	0.26	ND	0.29	ND	7.7	ND	5.4	ND	0.27
2,4,5-Trichlorophenol	95-95-4			ND	0.18	ND	0.18	ND	0.18	ND	0.18												

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				EB-01 (2-2.5)		EB-02 (3-3.5)		EB-03 (2.5-3)		EB-04 (1.5-2)		EB-05 (4.5-5)		EB-06 (7-7.5)		EB-07 (4-4.5)		EB-08 (3.5-4)		EB-09 (4.5-5)		EB-10 (4.5-5.0')	
LAB ID:				L2525183-01		L2525183-02		L2525183-03		L2525183-04		L2525183-05		L2525183-06		L2525183-07		L2525183-08		L2525183-09		L2525476-01	
COLLECTION DATE:				4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/24/2025	
SAMPLE DEPTH (FT):				2.0-2.5		3.0-3.5		2.5-3.0		1.5-2.0		4.5-5.0		7.0-7.5		4.0-4.5		3.5-4.0		4.5-5.0		4.5-5.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	CasNum	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Copper, Total	7440-50-8	270	50	29.7	0.855	19.6	0.872	10.7	0.841	13.3	1.7	12.8	8.03	13.5	3.31	13.4	0.935	23.3	0.83	29.3	0.865	23.7	0.892
Iron, Total	7439-89-6			13900	4.27	10700	4.36	16300	4.2	14000	8.49	5380	40.1	17200	16.5	9400	4.67	9470	4.15	9850	4.33	18800	4.46
Lead, Total	7439-92-1	400	63	162	4.27	78.1	4.36	17.4	4.2	20.6	8.49	117	40.1	14.2J	16.5	6.52	4.67	82.6	4.15	93.8	4.33	113	4.46
Magnesium, Total	7439-95-4			18800	8.55	1990	8.72	5110	8.41	55400	17	113000	80.3	96500	33.1	13200	9.35	6020	8.3	26900	8.65	6310	8.92
Manganese, Total	7439-96-5	2000	1600	365	0.855	181	0.872	340	0.841	401	1.7	1030	8.03	532	3.31	189	0.935	152	0.83	126	0.865	826	0.892
Mercury, Total	7439-97-6	0.81	0.18	0.178	0.088	0.159	0.073	ND	0.08	ND	0.077	ND	0.071	ND	0.07	ND	0.087	0.194	0.076	0.104	0.071	0.051J	0.074
Nickel, Total	7440-02-0	310	30	12.8	2.14	10.6	2.18	12.2	2.1	8.92	4.25	ND	20.1	6.68J	8.27	13.2	2.34	8.94	2.08	8.12	2.16	16.4	2.23
Potassium, Total	7440-09-7			1160	214	1140	218	908	210	884	425	ND	2010	1240	827	1700	234	1110	208	495	216	2170	223
Selenium, Total	7782-49-2	180	3.9	ND	1.71	ND	1.74	ND	1.68	ND	3.4	ND	16	ND	6.62	ND	1.87	ND	1.66	ND	1.73	ND	1.78
Silver, Total	7440-22-4	180	2	ND	0.427	ND	0.436	ND	0.42	ND	0.849	ND	4.01	ND	1.65	ND	0.467	ND	0.415	ND	0.433	ND	0.446
Sodium, Total	7440-23-5			ND	171	ND	174	ND	168	ND	340	ND	1600	ND	662	128J	187	118J	166	158J	173	ND	178
Thallium, Total	7440-28-0			ND	1.71	ND	1.74	ND	1.68	ND	3.4	ND	16	ND	6.62	ND	1.87	ND	1.66	ND	1.73	ND	1.78
Vanadium, Total	7440-62-2			22.3	0.855	18.6	0.872	20.9	0.841	16.4	1.7	17.5	8.03	19.2	3.31	15.3	0.935	17.5	0.83	26.4	0.865	26.4	0.892
Zinc, Total	7440-66-6	10000	109	118	4.27	33.1	4.36	40.5	4.2	35.6	8.49	57	40.1	58.3	16.5	22.3	4.67	59.4	4.15	80.4	4.33	85.4	4.46
VOCs (mg/kg)																							
Methylene chloride	75-09-2	100	0.05	ND	0.0046	ND	0.0065	ND	0.005	ND	0.0047	ND	0.0055	ND	0.0054	ND	0.0058	ND	0.0068	ND	0.0049	ND	0.0054
1,1-Dichloroethane	75-34-3	26	0.27	ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
Chloroform	67-66-3	49	0.37	ND	0.0014	ND	0.002	ND	0.0015	ND	0.0014	ND	0.0016	ND	0.0016	ND	0.0017	ND	0.002	ND	0.0015	ND	0.0016
Carbon tetrachloride	56-23-5	2.4	0.76	ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
1,2-Dichloropropane	78-87-5			ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
Dibromochloromethane	124-48-1			ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
1,1,2-Trichloroethane	79-00-5			ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
Tetrachloroethene	127-18-4	19	1.3	ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	0.00056J	0.00068	ND	0.00049	ND	0.00054
Chlorobenzene	108-90-7	100	1.1	ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	ND	0.00068	ND	0.00049	ND	0.00054
Trichlorofluoromethane	75-69-4			ND	0.0037	ND	0.0052	ND	0.004	ND	0.0037	ND	0.0044	ND	0.0043	ND	0.0046	ND	0.0054	ND	0.004	ND	0.0044
1,2-Dichloroethane	107-06-2	3.1	0.02	ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
1,1,1-Trichloroethane	71-55-6	100	0.68	ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	0.00033J	0.00068	ND	0.00049	ND	0.00054
Bromodichloromethane	75-27-4			ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	ND	0.00068	ND	0.00049	ND	0.00054
trans-1,3-Dichloropropene	10061-02-6			ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
cis-1,3-Dichloropropene	10061-01-5			ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	ND	0.00068	ND	0.00049	ND	0.00054
1,3-Dichloropropene, Total	542-75-6			ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	ND	0.00068	ND	0.00049	ND	0.00054
1,1-Dichloropropene	563-58-6			ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	ND	0.00068	ND	0.00049	ND	0.00054
Bromoform	75-25-2			ND	0.0037	ND	0.0052	ND	0.004	ND	0.0037	ND	0.0044	ND	0.0043	ND	0.0046	ND	0.0054	ND	0.004	ND	0.0044
1,1,2,2-Tetrachloroethane	79-34-5			ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	ND	0.00068	ND	0.00049	ND	0.00054
Benzene	71-43-2	4.8	0.06	ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	ND	0.00068	ND	0.00049	ND	0.00054
Toluene	108-88-3	100	0.7	ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
Ethylbenzene	100-41-4	41	1	ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
Chloromethane	74-87-3			ND	0.0037	ND	0.0052	ND	0.004	ND	0.0037	ND	0.0044	ND	0.0043	ND	0.0046	ND	0.0054	ND	0.004	ND	0.0044
Bromomethane	74-83-9			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
Vinyl chloride	75-01-4	0.9	0.02	ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
Chloroethane	75-00-3			ND	0.0018	ND	0.0026	ND><															

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				EB-01 (2-2.5)		EB-02 (3-3.5)		EB-03 (2.5-3)		EB-04 (1.5-2)		EB-05 (4.5-5)		EB-06 (7-7.5)		EB-07 (4-4.5)		EB-08 (3.5-4)		EB-09 (4.5-5)		EB-10 (4.5-5.0')	
LAB ID:				L2525183-01		L2525183-02		L2525183-03		L2525183-04		L2525183-05		L2525183-06		L2525183-07		L2525183-08		L2525183-09		L2525476-01	
COLLECTION DATE:				4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/23/2025		4/24/2025	
SAMPLE DEPTH (FT):				2.0-2.5		3.0-3.5		2.5-3.0		1.5-2.0		4.5-5.0		7.0-7.5		4.0-4.5		3.5-4.0		4.5-5.0		4.5-5.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	CasNum	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Vinyl acetate	108-05-4			ND	0.0092	ND	0.013	ND	0.01	ND	0.0094	ND	0.011	ND	0.011	ND	0.012	ND	0.014	ND	0.0099	ND	0.011
4-Methyl-2-pentanone	108-10-1			ND	0.0092	ND	0.013	ND	0.01	ND	0.0094	ND	0.011	ND	0.011	ND	0.012	ND	0.014	ND	0.0099	ND	0.011
1,2,3-Trichloropropane	96-18-4			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
2-Hexanone	591-78-6			ND	0.0092	ND	0.013	ND	0.01	ND	0.0094	ND	0.011	ND	0.011	ND	0.012	ND	0.014	ND	0.0099	ND	0.011
Bromochloromethane	74-97-5			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
2,2-Dichloropropane	594-20-7			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
1,2-Dibromoethane	106-93-4			ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
1,3-Dichloropropane	142-28-9			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
1,1,1,2-Tetrachloroethane	630-20-6			ND	0.00046	ND	0.00065	ND	0.0005	ND	0.00047	ND	0.00055	ND	0.00054	ND	0.00058	ND	0.00068	ND	0.00049	ND	0.00054
Bromobenzene	108-86-1			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
n-Butylbenzene	104-51-8	100	12	ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
sec-Butylbenzene	135-98-8	100	11	ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
tert-Butylbenzene	98-06-6	100	5.9	ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
o-Chlorotoluene	95-49-8			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
p-Chlorotoluene	106-43-4			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
1,2-Dibromo-3-chloropropane	96-12-8			ND	0.0028	ND	0.0039	ND	0.003	ND	0.0028	ND	0.0033	ND	0.0032	ND	0.0035	ND	0.0041	ND	0.003	ND	0.0033
Hexachlorobutadiene	87-68-3			ND	0.0037	ND	0.0052	ND	0.004	ND	0.0037	ND	0.0044	ND	0.0043	ND	0.0046	ND	0.0054	ND	0.004	ND	0.0044
Isopropylbenzene	98-82-8			ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
p-Isopropyltoluene	99-87-6			ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
Naphthalene	91-20-3	100	12	ND	0.0037	ND	0.0052	ND	0.004	ND	0.0037	ND	0.0044	ND	0.0043	ND	0.0046	0.0012J	0.0054	ND	0.004	ND	0.0044
Acrylonitrile	107-13-1			ND	0.0037	ND	0.0052	ND	0.004	ND	0.0037	ND	0.0044	ND	0.0043	ND	0.0046	ND	0.0054	ND	0.004	ND	0.0044
n-Propylbenzene	103-65-1	100	3.9	ND	0.00092	ND	0.0013	ND	0.001	ND	0.00094	ND	0.0011	ND	0.0011	ND	0.0012	ND	0.0014	ND	0.00099	ND	0.0011
1,2,3-Trichlorobenzene	87-61-6			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
1,2,4-Trichlorobenzene	120-82-1			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
1,3,5-Trimethylbenzene	108-67-8	52	8.4	ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
1,2,4-Trimethylbenzene	95-63-6	52	3.6	ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
1,4-Dioxane	123-91-1	13	0.1	ND	0.074	ND	0.1	ND	0.08	ND	0.075	ND	0.088	ND	0.086	ND	0.092	ND	0.11	ND	0.079	ND	0.087
p-Diethylbenzene	105-05-5			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
p-Ethyltoluene	622-96-8			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
1,2,4,5-Tetramethylbenzene	95-93-2			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
Ethyl ether	60-29-7			ND	0.0018	ND	0.0026	ND	0.002	ND	0.0019	ND	0.0022	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0022
trans-1,4-Dichloro-2-butene	110-57-6			ND	0.0046	ND	0.0065	ND	0.005	ND	0.0047	ND	0.0055	ND	0.0054	ND	0.0058	ND	0.0068	ND	0.0049	ND	0.0054

Notes

York Restricted use Criteria per 6 NYCRR Part 375 Environmental Remediation

Criteria per 6 NYCRR Part 375 Environmental Remediation Programs, effective

Exceedance of NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06) >=

Exceedance of NY SCO - Restricted Residential w/CP-51 (10/10) (6 NYCRR 375-6 12/06) >=

ND = Not Detected

J = Estimated

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				EB-11 (6.5-7.0')		EB-12 (4.5-5.0')		EB-13 (2.5-3.0')		EB-14 (2.5-3.0')		EB-15 (4.5-5.0')		EB-16 (0.5-1.0')		EB-17 (4.5-5.0')		EB-18 (4.5-5.0')		EB-19 (2.5-3.0')	
LAB ID:				L2525476-02		L2525476-03		L2525476-04		L2525476-05		L2525476-06		L2525476-07		L2525476-08		L2525476-09		L2525476-10	
COLLECTION DATE:				4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025	
SAMPLE DEPTH (FT):				6.5-7.0		4.5-5.0		2.5-3.0		2.5-3.0		4.5-5.0		0.5-1.0		4.5-5.0		4.5-5.0		2.5-3.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	CasNum	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
General Chemistry																					
Solids, Total (%)	NONE			87.8	0.1	82.2	0.1	75.2	0.1	82.8	0.1	67.6	0.1	80.1	0.1	83.2	0.1	81.3	0.1	89.6	0.1
Cyanide, Total (mg/kg)	57-12-5	27	27	ND	1.1	ND	1.1	ND	1.3	ND	1.1	ND	1.4	ND	1.2	ND	1.1	ND	1.2	ND	1.1
Pesticides (mg/kg)																					
Delta-BHC	319-86-8	100	0.04	ND	0.00176	ND	0.00183	ND	0.0021	ND	0.00192	ND	0.00231	ND	0.00191	ND	0.00188	ND	0.00191	ND	0.00177
Lindane	58-89-9	1.3	0.1	ND	0.000732	ND	0.000764	ND	0.000874	ND	0.000799	ND	0.000962	ND	0.000795	ND	0.000781	ND	0.000796	ND	0.000739
Alpha-BHC	319-84-6	0.48	0.02	ND	0.000732	ND	0.000764	ND	0.000874	ND	0.000799	ND	0.000962	ND	0.000795	ND	0.000781	ND	0.000796	ND	0.000739
Beta-BHC	319-85-7	0.36	0.036	ND	0.00176	ND	0.00183	ND	0.0021	ND	0.00192	ND	0.00231	ND	0.00191	ND	0.00188	ND	0.00191	ND	0.00177
Heptachlor	76-44-8	2.1	0.042	ND	0.000878	ND	0.000916	ND	0.00105	ND	0.000958	ND	0.00115	ND	0.000954	ND	0.000938	ND	0.000955	ND	0.000887
Aldrin	309-00-2	0.097	0.005	ND	0.00176	ND	0.00183	ND	0.0021	ND	0.00192	ND	0.00231	ND	0.00191	ND	0.00188	ND	0.00191	ND	0.00177
Heptachlor epoxide	1024-57-3			ND	0.00329	ND	0.00344	ND	0.00393	ND	0.00359	ND	0.00433	ND	0.00358	ND	0.00352	ND	0.00358	ND	0.00333
Endrin	72-20-8	11	0.014	ND	0.000732	ND	0.000764	ND	0.000874	ND	0.000799	ND	0.000962	ND	0.000795	ND	0.000781	ND	0.000796	ND	0.000739
Endrin aldehyde	7421-93-4			ND	0.00219	ND	0.00229	ND	0.00262	ND	0.0024	ND	0.00288	ND	0.00238	ND	0.00234	ND	0.00239	ND	0.00222
Endrin ketone	53494-70-5			ND	0.00176	ND	0.00183	ND	0.0021	ND	0.00192	ND	0.00231	ND	0.00191	ND	0.00188	ND	0.00191	ND	0.00177
Dieldrin	60-57-1	0.2	0.005	ND	0.0011	ND	0.00114	ND	0.00131	ND	0.0012	ND	0.00144	ND	0.00119	ND	0.00117	ND	0.00119	ND	0.00111
4,4'-DDE	72-55-9	8.9	0.0033	ND	0.00176	ND	0.00183	ND	0.0021	0.00198	0.00192	ND	0.00231	0.00805	0.00191	0.00152J	0.00188	ND	0.00191	0.00286	0.00177
4,4'-DDD	72-54-8	13	0.0033	ND	0.00176	ND	0.00183	ND	0.0021	ND	0.00192	ND	0.00231	0.00123JIP	0.00191	ND	0.00188	ND	0.00191	ND	0.00177
4,4'-DDT	50-29-3	7.9	0.0033	ND	0.00176	ND	0.00183	ND	0.0021	ND	0.00192	ND	0.00231	0.00304	0.00191	ND	0.00188	ND	0.00191	0.0088	0.00177
Endosulfan I	959-98-8	24	2.4	ND	0.00176	ND	0.00183	ND	0.0021	ND	0.00192	ND	0.00231	ND	0.00191	ND	0.00188	ND	0.00191	ND	0.00177
Endosulfan II	33213-65-9	24	2.4	ND	0.00176	ND	0.00183	ND	0.0021	ND	0.00192	ND	0.00231	ND	0.00191	ND	0.00188	ND	0.00191	ND	0.00177
Endosulfan sulfate	1031-07-8	24	2.4	ND	0.000732	ND	0.000764	ND	0.000874	ND	0.000799	ND	0.000962	ND	0.000795	ND	0.000781	ND	0.000796	ND	0.000739
Methoxychlor	72-43-5			ND	0.00329	ND	0.00344	ND	0.00393	ND	0.00359	ND	0.00433	ND	0.00358	ND	0.00352	ND	0.00358	ND	0.00333
Toxaphene	8001-35-2			ND	0.0329	ND	0.0344	ND	0.0393	ND	0.0359	ND	0.0433	ND	0.0358	ND	0.0352	ND	0.0358	ND	0.0333
cis-Chlordane	5103-71-9	4.2	0.094	ND	0.00219	ND	0.00229	ND	0.00262	0.00121J	0.0024	ND	0.00288	0.00108JIP	0.00238	ND	0.00234	0.00108JIP	0.00239	0.00393	0.00222
trans-Chlordane	5103-74-2			ND	0.00219	ND	0.00229	ND	0.00262	0.0024	0.0024	ND	0.00288	0.0018J	0.00238	ND	0.00234	0.00218JIP	0.00239	0.00305	0.00222
Chlordane	57-74-9			ND	0.0146	ND	0.0153	ND	0.0175	ND	0.016	ND	0.0192	ND	0.0159	ND	0.0156	ND	0.0159	ND	0.0148
PCBs (mg/kg)																					
Aroclor 1016	12674-11-2	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	ND	0.0616	ND	0.0597	ND	0.0599	ND	0.0536
Aroclor 1221	11104-28-2	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	ND	0.0616	ND	0.0597	ND	0.0599	ND	0.0536
Aroclor 1232	11141-16-5	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	ND	0.0616	ND	0.0597	ND	0.0599	ND	0.0536
Aroclor 1242	53469-21-9	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	ND	0.0616	ND	0.0597	ND	0.0599	ND	0.0536
Aroclor 1248	12672-29-6	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	ND	0.0616	ND	0.0597	0.0165J	0.0599	0.0208J	0.0536
Aroclor 1254	11097-69-1	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	0.00701J	0.0616	ND	0.0597	0.0234J	0.0599	0.0324J	0.0536
Aroclor 1260	11096-82-5	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	ND	0.0616	ND	0.0597	0.0284J	0.0599	ND	0.0536
Aroclor 1262	37324-23-5	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	ND	0.0616	ND	0.0597	ND	0.0599	ND	0.0536
Aroclor 1268	11100-14-4	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	ND	0.0616	ND	0.0597	ND	0.0599	ND	0.0536
PCBs, Total	1336-36-3	1	0.1	ND	0.0525	ND	0.0589	ND	0.0641	ND	0.0597	ND	0.0717	0.00701J	0.0616	ND	0.0597	0.0683J	0.0599	0.0532J	0.0536
SVOCs (mg/kg)																					
Acenaphthene	83-32-9	100	20	ND	0.15	ND	0.16	0.029J	0.18	ND	0.16	ND	0.2	ND	0.17	ND	0.16	0.17	0.16	ND	1.4
1,2,4-Trichlorobenzene	120-82-1			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Hexachlorobenzene	118-74-1	1.2	0.33	ND	0.11	ND	0.12	ND	0.13	ND	0.12	ND	0.15	ND	0.12	ND	0.12	ND	0.12	ND	1.1
Bis(2-chloroethyl)ether	111-44-4			ND	0.17	ND	0.18	ND	0.2	ND	0.18	ND	0.22	ND	0.19	ND	0.18	ND	0.18	ND	1.6
2-Chloronaphthalene	91-58-7			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
1,2-Dichlorobenzene	95-50-1	100	1.1	ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
1,3-Dichlorobenzene	541-73-1	49	2.4	ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
1,4-Dichlorobenzene	106-46-7	13	1.8	ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
3,3'-Dichlorobenzidine	91-94-1			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
2,4-Dinitrotoluene	121-14-2			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
2,6-Dinitrotoluene	606-20-2			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Fluoranthene	206-44-0	100	100	ND	0.11	ND	0.12	ND	0.13	0.032J	0.12	ND	0.15	0.078J	0.12	ND	0.12	3.2	0.12	0.79J	1.1
4-Chlorophenyl phenyl																					

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				EB-11 (6.5-7.0')		EB-12 (4.5-5.0')		EB-13 (2.5-3.0')		EB-14 (2.5-3.0')		EB-15 (4.5-5.0')		EB-16 (0.5-1.0')		EB-17 (4.5-5.0')		EB-18 (4.5-5.0')		EB-19 (2.5-3.0')	
LAB ID:				L2525476-02		L2525476-03		L2525476-04		L2525476-05		L2525476-06		L2525476-07		L2525476-08		L2525476-09		L2525476-10	
COLLECTION DATE:				4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025	
SAMPLE DEPTH (FT):				6.5-7.0		4.5-5.0		2.5-3.0		2.5-3.0		4.5-5.0		0.5-1.0		4.5-5.0		4.5-5.0		2.5-3.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	CasNum	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Nitrobenzene	98-95-3			ND	0.17	ND	0.18	ND	0.2	ND	0.18	ND	0.22	ND	0.19	ND	0.18	ND	0.18	ND	1.6
NDPA/DPA	86-30-6			ND	0.15	ND	0.16	ND	0.18	ND	0.16	ND	0.2	ND	0.17	ND	0.16	ND	0.16	ND	1.4
n-Nitrosodi-n-propylamine	621-64-7			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Bis(2-ethylhexyl)phthalate	117-81-7			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Butyl benzyl phthalate	85-68-7			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Di-n-butylphthalate	84-74-2			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Di-n-octylphthalate	117-84-0			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Diethyl phthalate	84-66-2			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Dimethyl phthalate	131-11-3			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Benzo(a)anthracene	56-55-3	1	1	ND	0.11	ND	0.12	ND	0.13	ND	0.12	ND	0.15	0.052J	0.12	ND	0.12	1.2	0.12	0.51J	1.1
Benzo(a)pyrene	50-32-8	1	1	ND	0.15	ND	0.16	ND	0.18	ND	0.16	ND	0.2	0.062J	0.17	ND	0.16	1.2	0.16	0.51J	1.4
Benzo(b)fluoranthene	205-99-2	1	1	ND	0.11	ND	0.12	ND	0.13	ND	0.12	ND	0.15	0.076J	0.12	ND	0.12	1.6	0.12	0.59J	1.1
Benzo(k)fluoranthene	207-08-9	3.9	0.8	ND	0.11	ND	0.12	ND	0.13	ND	0.12	ND	0.15	ND	0.12	ND	0.12	0.48	0.12	ND	1.1
Chrysene	218-01-9	3.9	1	ND	0.11	ND	0.12	ND	0.13	0.024J	0.12	ND	0.15	0.056J	0.12	ND	0.12	1.2	0.12	0.48J	1.1
Acenaphthylene	208-96-8	100	100	ND	0.15	ND	0.16	ND	0.18	ND	0.16	ND	0.2	ND	0.17	ND	0.16	0.1J	0.16	ND	1.4
Anthracene	120-12-7	100	100	ND	0.11	ND	0.12	ND	0.13	ND	0.12	ND	0.15	ND	0.12	ND	0.12	0.42	0.12	ND	1.1
Benzo(ghi)perylene	191-24-2	100	100	ND	0.15	ND	0.16	ND	0.18	ND	0.16	ND	0.2	0.05J	0.17	ND	0.16	0.91	0.16	0.36J	1.4
Fluorene	86-73-7	100	30	ND	0.19	ND	0.2	0.03J	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	0.2	0.2	ND	1.8
Phenanthrene	85-01-8	100	100	ND	0.11	ND	0.12	ND	0.13	ND	0.12	ND	0.15	0.029J	0.12	ND	0.12	2.3	0.12	0.39J	1.1
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	ND	0.11	ND	0.12	ND	0.13	ND	0.12	ND	0.15	ND	0.12	ND	0.12	0.19	0.12	ND	1.1
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	0.5	ND	0.15	ND	0.16	ND	0.18	ND	0.16	ND	0.2	0.04J	0.17	ND	0.16	0.64	0.16	0.28J	1.4
Pyrene	129-00-0	100	100	ND	0.11	ND	0.12	ND	0.13	0.028J	0.12	ND	0.15	0.069J	0.12	ND	0.12	2.6	0.12	0.75J	1.1
Biphenyl	92-52-4			ND	0.43	ND	0.46	ND	0.5	ND	0.46	ND	0.56	ND	0.47	ND	0.44	0.033J	0.46	ND	4.1
4-Chloroaniline	106-47-8			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
2-Nitroaniline	88-74-4			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
3-Nitroaniline	99-09-2			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
4-Nitroaniline	100-01-6			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Dibenzofuran	132-64-9	59	7	ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	0.2	0.2	ND	1.8
2-Methylnaphthalene	91-57-6			ND	0.22	ND	0.24	0.038J	0.26	ND	0.24	ND	0.3	ND	0.25	ND	0.23	0.12J	0.24	ND	2.2
1,2,4,5-Tetrachlorobenzene	95-94-3			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Acetophenone	98-86-2			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
2,4,6-Trichlorophenol	88-06-2			ND	0.11	ND	0.12	ND	0.13	ND	0.12	ND	0.15	ND	0.12	ND	0.12	ND	0.12	ND	1.1
p-Chloro-m-cresol	59-50-7			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
2-Chlorophenol	95-57-8			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
2,4-Dichlorophenol	120-83-2			ND	0.17	ND	0.18	ND	0.2	ND	0.18	ND	0.22	ND	0.19	ND	0.18	ND	0.18	ND	1.6
2,4-Dimethylphenol	105-67-9			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
2-Nitrophenol	88-75-5			ND	0.41	ND	0.43	ND	0.48	ND	0.43	ND	0.53	ND	0.45	ND	0.42	ND	0.44	ND	3.9
4-Nitrophenol	100-02-7			ND	0.26	ND	0.28	ND	0.31	ND	0.28	ND	0.34	ND	0.29	ND	0.27	ND	0.28	ND	2.5
2,4-Dinitrophenol	51-28-5			ND	0.9	ND	0.97	ND	1	ND	0.96	ND	1.2	ND	1	ND	0.93	ND	0.98	ND	8.7
4,6-Dinitro-o-cresol	534-52-1			ND	0.49	ND	0.52	ND	0.57	ND	0.52	ND	0.64	ND	0.54	ND	0.5	ND	0.53	ND	4.7
Pentachlorophenol	87-86-5	6.7	0.8	ND	0.15	ND	0.16	ND	0.18	ND	0.16	ND	0.2	ND	0.17	ND	0.16	ND	0.16	ND	1.4
Phenol	108-95-2	100	0.33	ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
2-Methylphenol	95-48-7	100	0.33	ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
3-Methylphenol/4-Methylphenol	108-39-4/106-44-5	100	0.33	ND	0.27	ND	0.29	ND	0.32	ND	0.29	ND	0.35	ND	0.3	ND	0.28	ND	0.29	ND	2.6
2,4,5-Trichlorophenol	95-95-4			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Benzoic Acid	65-85-0			ND	0.61	ND	0.65	ND	0.72	ND	0.65	ND	0.8	ND	0.67	ND	0.63	ND	0.66	ND	5.9
Benzyl Alcohol	100-51-6			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	ND	0.2	ND	1.8
Carbazole	86-74-8			ND	0.19	ND	0.2	ND	0.22	ND	0.2	ND	0.25	ND	0.21	ND	0.19	0.36	0.2	ND	1.8
1,4-Dioxane	123-91-1	13	0.1	ND	0.028	ND	0.03	ND	0.033	ND	0.03	ND	0.037	ND	0.031	ND	0.029	ND	0.03	ND	0.27
Metals (mg/kg)																					
Aluminum, Total	7429-90-5			11600	8.59	14100	9.67	11300	10.5												

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				EB-11 (6.5-7.0')		EB-12 (4.5-5.0')		EB-13 (2.5-3.0')		EB-14 (2.5-3.0')		EB-15 (4.5-5.0')		EB-16 (0.5-1.0')		EB-17 (4.5-5.0')		EB-18 (4.5-5.0')		EB-19 (2.5-3.0')	
LAB ID:				L2525476-02		L2525476-03		L2525476-04		L2525476-05		L2525476-06		L2525476-07		L2525476-08		L2525476-09		L2525476-10	
COLLECTION DATE:				4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025	
SAMPLE DEPTH (FT):				6.5-7.0		4.5-5.0		2.5-3.0		2.5-3.0		4.5-5.0		0.5-1.0		4.5-5.0		4.5-5.0		2.5-3.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	CasNum	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Copper, Total	7440-50-8	270	50	16.9	0.859	22	0.967	17.9	1.05	27	0.946	126	1.14	19.4	0.969	14.2	0.935	16.7	0.932	36.6	0.875
Iron, Total	7439-89-6			17500	4.29	21500	4.84	18200	5.26	27600	4.73	34900	5.72	11100	4.85	17600	4.67	10200	4.66	14300	4.37
Lead, Total	7439-92-1	400	63	18.5	4.29	42.6	4.84	12.5	5.26	74.5	4.73	7.93	5.72	29.7	4.85	39.4	4.67	38.9	4.66	89.4	4.37
Magnesium, Total	7439-95-4			4380	8.59	4860	9.67	4100	10.5	39200	9.46	91200	22.9	12200	9.69	6730	9.35	10300	9.32	17500	8.75
Manganese, Total	7439-96-5	2000	1600	419	0.859	412	0.967	392	1.05	853	0.946	881	1.14	278	0.969	718	0.935	236	0.932	283	0.875
Mercury, Total	7439-97-6	0.81	0.18	ND	0.083	ND	0.082	ND	0.086	0.069J	0.084	ND	0.099	0.074J	0.08	0.114	0.08	0.07J	0.081	0.324	0.075
Nickel, Total	7440-02-0	310	30	13.4	2.15	16.6	2.42	13.8	2.63	20	2.37	18.8	2.86	14.4	2.42	13.8	2.34	11.8	2.33	24.9	2.19
Potassium, Total	7440-09-7			536	215	856	242	602	263	621	237	548	286	1640	242	537	234	1320	233	2660	219
Selenium, Total	7782-49-2	180	3.9	ND	1.72	ND	1.93	ND	2.1	ND	1.89	ND	2.29	ND	1.94	ND	1.87	ND	1.86	ND	1.75
Silver, Total	7440-22-4	180	2	0.276J	0.429	ND	0.484	ND	0.526	0.5	0.473	0.524J	0.572	ND	0.485	0.371J	0.467	0.289J	0.466	0.283J	0.437
Sodium, Total	7440-23-5			ND	172	ND	193	ND	210	ND	189	ND	229	ND	194	ND	187	ND	186	ND	175
Thallium, Total	7440-28-0			ND	1.72	ND	1.93	ND	2.1	ND	1.89	1.28J	2.29	ND	1.94	ND	1.87	ND	1.86	ND	1.75
Vanadium, Total	7440-62-2			19.7	0.859	24.9	0.967	20.4	1.05	53.7	0.946	70.6	1.14	20.4	0.969	22.7	0.935	18.8	0.932	25.4	0.875
Zinc, Total	7440-66-6	10000	109	43.8	4.29	42.7	4.84	41.3	5.26	86.3	4.73	131	5.72	41.5	4.85	57.2	4.67	44	4.66	77.1	4.37
VOCs (mg/kg)																					
Methylene chloride	75-09-2	100	0.05	ND	0.0051	ND	0.0054	ND	0.0062	ND	0.0059	ND	0.0089	ND	0.0062	ND	0.0068	ND	0.0041	ND	0.0059
1,1-Dichloroethane	75-34-3	26	0.27	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
Chloroform	67-66-3	49	0.37	ND	0.0015	ND	0.0016	ND	0.0018	ND	0.0018	ND	0.0027	ND	0.0019	ND	0.002	ND	0.0012	ND	0.0018
Carbon tetrachloride	56-23-5	2.4	0.76	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
1,2-Dichloropropane	78-87-5			ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
Dibromochloromethane	124-48-1			ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
1,1,2-Trichloroethane	79-00-5			ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
Tetrachloroethene	127-18-4	19	1.3	ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
Chlorobenzene	108-90-7	100	1.1	ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
Trichlorofluoromethane	75-69-4			ND	0.0041	ND	0.0043	ND	0.0049	ND	0.0047	ND	0.0071	ND	0.005	ND	0.0054	ND	0.0033	ND	0.0047
1,2-Dichloroethane	107-06-2	3.1	0.02	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
1,1,1-Trichloroethane	71-55-6	100	0.68	ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
Bromodichloromethane	75-27-4			ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
trans-1,3-Dichloropropene	10061-02-6			ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
cis-1,3-Dichloropropene	10061-01-5			ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
1,3-Dichloropropene, Total	542-75-6			ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
1,1-Dichloropropene	563-58-6			ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
Bromoform	75-25-2			ND	0.0041	ND	0.0043	ND	0.0049	ND	0.0047	ND	0.0071	ND	0.005	ND	0.0054	ND	0.0033	ND	0.0047
1,1,2,2-Tetrachloroethane	79-34-5			ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
Benzene	71-43-2	4.8	0.06	ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
Toluene	108-88-3	100	0.7	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
Ethylbenzene	100-41-4	41	1	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	0.00043J	0.00082	ND	0.0012
Chloromethane	74-87-3			ND	0.0041	ND	0.0043	ND	0.0049	ND	0.0047	ND	0.0071	ND	0.005	ND	0.0054	ND	0.0033	ND	0.0047
Bromomethane	74-83-9			ND	0.002	0.0019J	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
Vinyl chloride	75-01-4	0.9	0.02	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
Chloroethane	75-00-3			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
1,1-Dichloroethene	75-35-4	100	0.33	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
trans-1,2-Dichloroethene	156-60-5	100	0.19	ND	0.0015	ND	0.0016	ND	0.0018	ND	0.0018	ND	0.0027	ND	0.0019	ND	0.002	ND	0.0012	ND	0.0018
Trichloroethene	79-01-6	21	0.47	ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
1,2-Dichlorobenzene	95-50-1	100	1.1	ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027				

Table 2.2 - Summary of Soil Analytical Results
34 State Street, Ossining, NY

SAMPLE ID:				EB-11 (6.5-7.0')		EB-12 (4.5-5.0')		EB-13 (2.5-3.0')		EB-14 (2.5-3.0')		EB-15 (4.5-5.0')		EB-16 (0.5-1.0')		EB-17 (4.5-5.0')		EB-18 (4.5-5.0')		EB-19 (2.5-3.0')	
LAB ID:				L2525476-02		L2525476-03		L2525476-04		L2525476-05		L2525476-06		L2525476-07		L2525476-08		L2525476-09		L2525476-10	
COLLECTION DATE:				4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025		4/24/2025	
SAMPLE DEPTH (FT):				6.5-7.0		4.5-5.0		2.5-3.0		2.5-3.0		4.5-5.0		0.5-1.0		4.5-5.0		4.5-5.0		2.5-3.0	
SAMPLE MATRIX:				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	CasNum	NY-RESRR	NY-UNRES	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Vinyl acetate	108-05-4			ND	0.01	ND	0.011	ND	0.012	ND	0.012	ND	0.018	ND	0.012	ND	0.014	ND	0.0082	ND	0.012
4-Methyl-2-pentanone	108-10-1			ND	0.01	ND	0.011	ND	0.012	ND	0.012	ND	0.018	ND	0.012	ND	0.014	ND	0.0082	ND	0.012
1,2,3-Trichloropropane	96-18-4			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
2-Hexanone	591-78-6			ND	0.01	ND	0.011	ND	0.012	ND	0.012	ND	0.018	ND	0.012	ND	0.014	ND	0.0082	ND	0.012
Bromochloromethane	74-97-5			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
2,2-Dichloropropane	594-20-7			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
1,2-Dibromoethane	106-93-4			ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
1,3-Dichloropropane	142-28-9			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
1,1,1,2-Tetrachloroethane	630-20-6			ND	0.00051	ND	0.00054	ND	0.00062	ND	0.00059	ND	0.00089	ND	0.00062	ND	0.00068	ND	0.00041	ND	0.00059
Bromobenzene	108-86-1			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
n-Butylbenzene	104-51-8	100	12	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
sec-Butylbenzene	135-98-8	100	11	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	ND	0.00082	ND	0.0012
tert-Butylbenzene	98-06-6	100	5.9	ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
o-Chlorotoluene	95-49-8			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
p-Chlorotoluene	106-43-4			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
1,2-Dibromo-3-chloropropane	96-12-8			ND	0.003	ND	0.0032	ND	0.0037	ND	0.0035	ND	0.0054	ND	0.0038	ND	0.0041	ND	0.0025	ND	0.0035
Hexachlorobutadiene	87-68-3			ND	0.0041	ND	0.0043	ND	0.0049	ND	0.0047	ND	0.0071	ND	0.005	ND	0.0054	ND	0.0033	ND	0.0047
Isopropylbenzene	98-82-8			ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	0.00012J	0.00082	ND	0.0012
p-Isopropyltoluene	99-87-6			ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	0.00014J	0.00082	ND	0.0012
Naphthalene	91-20-3	100	12	ND	0.0041	ND	0.0043	ND	0.0049	ND	0.0047	ND	0.0071	ND	0.005	ND	0.0054	ND	0.0033	ND	0.0047
Acrylonitrile	107-13-1			ND	0.0041	ND	0.0043	ND	0.0049	ND	0.0047	ND	0.0071	ND	0.005	ND	0.0054	ND	0.0033	ND	0.0047
n-Propylbenzene	103-65-1	100	3.9	ND	0.001	ND	0.0011	ND	0.0012	ND	0.0012	ND	0.0018	ND	0.0012	ND	0.0014	0.0004J	0.00082	ND	0.0012
1,2,3-Trichlorobenzene	87-61-6			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
1,2,4-Trichlorobenzene	120-82-1			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
1,3,5-Trimethylbenzene	108-67-8	52	8.4	ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	0.0029	0.0016	ND	0.0024
1,2,4-Trimethylbenzene	95-63-6	52	3.6	ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	0.0023	0.0016	ND	0.0024
1,4-Dioxane	123-91-1	13	0.1	ND	0.081	ND	0.086	ND	0.099	ND	0.094	ND	0.14	ND	0.1	ND	0.11	ND	0.066	ND	0.094
p-Diethylbenzene	105-05-5			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	0.00066J	0.0016	ND	0.0024
p-Ethyltoluene	622-96-8			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	0.0017	0.0016	ND	0.0024
1,2,4,5-Tetramethylbenzene	95-93-2			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
Ethyl ether	60-29-7			ND	0.002	ND	0.0021	ND	0.0025	ND	0.0023	ND	0.0036	ND	0.0025	ND	0.0027	ND	0.0016	ND	0.0024
trans-1,4-Dichloro-2-butene	110-57-6			ND	0.0051	ND	0.0054	ND	0.0062	ND	0.0059	ND	0.0089	ND	0.0062	ND	0.0068	ND	0.0041	ND	0.0059

Notes

York Restricted use Criteria per 6 NYCRR Part 375 Environmental Remediation

Criteria per 6 NYCRR Part 375 Environmental Remediation Programs, effective

Exceedance of NY SCO - Unrestricted Use (6 NYCRR 375-6 12/06) >=

Exceedance of NY SCO - Restricted Residential w/CP-51 (10/10) (6 NYCRR 375-6 12/06) >=

ND = Not Detected

J = Estimated

Table 2.4 - Summary of Soil Vapor Analytical Results
34 State Street, Ossining, NY

LAB ID:													JE5018-1	JE5018-2	JE5018-3	JE5018-4
SAMPLE ID:													SV-1	SV-2	SSSV-1	IA-1
SAMPLE DATE:													1/31/2025	1/31/2025	1/31/2025	1/31/2025
SAMPLE MATRIX:													Soil Vapor	Soil Vapor	Soil Vapor	indoor Air
VOCs (ug/m3)	IAC-A	SSC-A	IAC-B	SSC-B	IAC-C	SSC-C	IAC-D	SSC-D	IAC-E	SSC-E	IAC-F	SSC-F	Conc	Conc	Conc	Conc
Acetone (2-Propanone)													285	257	34.2	6.4
1,3-Butadiene													ND	ND	ND	ND
Benzene													4.2	3.8	1	0.86
Bromodichloromethane													ND	ND	ND	ND
Bromoform													ND	ND	ND	ND
Bromomethane													ND	ND	ND	ND
Bromoethene													ND	ND	ND	ND
2-Butanone													NA	NA	NA	NA
Benzyl Chloride													ND	ND	ND	ND
Carbon disulfide													5.3	3.7	ND	ND
Chlorobenzene													ND	ND	ND	ND
Chloroethane													ND	ND	ND	ND
Chloroform													ND	ND	ND	ND
Chloromethane													ND	0.85	0.52	0.89
3-Chloropropene													ND	ND	ND	ND
2-Chlorotoluene													ND	ND	ND	ND
Carbon tetrachloride	6	0.2											ND	ND	ND	0.5
Cyclohexane							60	2					0.83	2	ND	ND
1,1-Dichloroethane													ND	ND	ND	ND
1,1-Dichloroethylene	6	0.2											ND	ND	ND	ND
1,2-Dibromoethane (EDB)													ND	ND	ND	ND
1,2-Dichloroethane	6	0.2											ND	ND	ND	ND
1,2-Dichloropropane													ND	ND	ND	ND
1,4-Dioxane													ND	ND	ND	ND
Dichlorodifluoromethane													1.9	1.9	1.9	2.7
Dibromochloromethane													ND	ND	ND	ND
trans-1,2-Dichloroethylene													ND	ND	ND	ND
cis-1,2-Dichloroethylene													ND	ND	ND	ND
cis-1,3-Dichloropropene													ND	ND	ND	ND
m-Dichlorobenzene													ND	ND	ND	ND
o-Dichlorobenzene													ND	ND	ND	ND
p-Dichlorobenzene													ND	ND	ND	ND
trans-1,3-Dichloropropene													ND	ND	ND	ND
1,3-Dichlorobenzene													NA	NA	NA	NA
1,4-Dichlorobenzene													NA	NA	NA	NA
Ethanol													14	8.1	1.3	4
Ethylbenzene							60	2					13	3.2	3.6	ND
Ethyl Acetate													7.2	ND	1.1	5
4-Ethyltoluene													5.9	0.98	3.4	ND
Freon 113													ND	ND	ND	ND
Freon 114													ND	ND	ND	ND
Heptane									200	6			3.5	13	0.74 J	ND
Hexachlorobutadiene													ND	ND	ND	ND
Hexane									200	6			3.5	48.6	1.7	1.1
2-Hexanone													2.5	ND	ND	ND
Isopropyl Alcohol													2.3	3.4	0.37 J	2.2
Methylene chloride			100	3									3.8	3.5	1.6	1.1
4-Methyl-2-pentanone													NA	NA	NA	NA
Methyl ethyl ketone													17	8.6	1.9	0.53
Methyl Isobutyl Ketone													3.4	0.74 J	ND	ND
Methyl Tert Butyl Ether													ND	ND	ND	ND

Table 2.4 - Summary of Soil Vapor Analytical Results
34 State Street, Ossining, NY

LAB ID:													JE5018-1	JE5018-2	JE5018-3	JE5018-4
SAMPLE ID:													SV-1	SV-2	SSSV-1	IA-1
SAMPLE DATE:													1/31/2025	1/31/2025	1/31/2025	1/31/2025
SAMPLE MATRIX:													Soil Vapor	Soil Vapor	Soil Vapor	indoor Air
VOCs (ug/m3)	IAC-A	SSC-A	IAC-B	SSC-B	IAC-C	SSC-C	IAC-D	SSC-D	IAC-E	SSC-E	IAC-F	SSC-F	Conc	Conc	Conc	Conc
Methylmethacrylate													ND	ND	ND	ND
Naphthalene							60	2					0.68 J	ND	ND	ND ⁹
Propylene													3.6	79.2	ND	ND
Styrene													ND	ND	ND	ND
1,1,1-Trichloroethane			100	3									ND	ND	ND	ND
1,1,2,2-Tetrachloroethane													ND	ND	ND	ND
1,1,2-Trichloroethane													ND	ND	ND	ND
1,2,4-Trichlorobenzene													ND	ND	ND	ND
1,2,4-Trimethylbenzene							60	2					15	2.6	11	0.54 J
1,3,5-Trimethylbenzene							60	2					4.3	0.74 J	2.2	ND
2,2,4-Trimethylpentane							60	2					0.79 J	1.4	ND	0.41 J
Tertiary Butyl Alcohol													2.8	5.8	0.36 J	ND
Tetrachloroethylene			100	3									88.8	1.5	1	ND
Tetrahydrofuran													0.56 J	ND	ND	ND
Toluene											300	10	42.2	17	9.8	1.1
Trichloroethylene	6	0.2											1.6	0.91	ND	ND
Trichlorofluoromethane													2.8	3.1	1.4	1.7
Vinyl chloride					6	0.2							ND	ND	ND	ND
Vinyl bromide													NA	NA	NA	NA
Vinyl Acetate													ND	ND	0.67 J	ND
m,p-Xylene									200	6			55.2	11	17	0.91
o-Xylene							60	2					20	3.9	6.1	0.34 J
Xylenes (total)													75.2	15	23	1.3

ND = Not Detected

NA = Not Analyzed

J = Estimated

ug/m³: Micrograms per cubic meter

Bold: Elevated Concentration

Action Required by NYSDOH Decision Matrix

NY-IAC-A: New York DOH Matrix A Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.

NY-IAC-B: New York DOH Matrix B Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.

NY-IAC-C: New York DOH Matrix C Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.

NY-IAC-D: New York DOH Matrix D Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February, 2024.

NY-IAC-E: New York DOH Matrix E Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February, 2024.

NY-IAC-F: New York DOH Matrix F Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February, 2024.

NY-SSC-A: New York DOH Matrix A Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.

NY-SSC-B: New York DOH Matrix B Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.

NY-SSC-C: New York DOH Matrix C Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.

NY-SSC-D: New York DOH Matrix D Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February, 2024.

NY-SSC-E: New York DOH Matrix E Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February, 2024.

NY-SSC-F: New York DOH Matrix F Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February, 2024.

Table 2.4 - Summary of Soil Vapor Analytical Results
34 State Street, Ossining, NY

[illegible]

Table 2.4 - Summary of Soil Vapor Analytical Results
34 State Street, Ossining, NY

LAB ID:													L2516429-01
SAMPLE ID:													SSSV-2
SAMPLE DATE:													3/20/2025
SAMPLE MATRIX:													Soil Vapor
VOCs (ug/m3)	IAC-A	SSC-A	IAC-B	SSC-B	IAC-C	SSC-C	IAC-D	SSC-D	IAC-E	SSC-E	IAC-F	SSC-F	Conc
Methylmethacrylate													NA
Naphthalene							60	2					ND
Propylene													NA
Styrene													ND
1,1,1-Trichloroethane			100	3									ND
1,1,2,2-Tetrachloroethane													ND
1,1,2-Trichloroethane													ND
1,2,4-Trichlorobenzene													ND
1,2,4-Trimethylbenzene							60	2					13.4
1,3,5-Trimethylbenzene							60	2					3.86
2,2,4-Trimethylpentane							60	2					ND
Tertiary Butyl Alcohol													ND
Tetrachloroethylene			100	3									ND
Tetrahydrofuran													ND
Toluene											300	10	21.7
Trichloroethylene	6	0.2											NA
Trichlorofluoromethane													NA
Vinyl chloride					6	0.2							ND
Vinyl bromide													ND
Vinyl Acetate													NA
m,p-Xylene									200	6			142
o-Xylene							60	2					53
Xylenes (total)													NA

ND = Not Detected
NA = Not Analyzed
J = Estimated
ug/m³: Micrograms per cubic meter
Bold: Elevated Concentration

Action Required by NYSDOH Decision Matrix

NY-IAC-A: New York DOH Matrix A Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, §
NY-IAC-B: New York DOH Matrix B Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, §
NY-IAC-C: New York DOH Matrix C Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, §
NY-IAC-D: New York DOH Matrix D Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February, 2024.
NY-IAC-E: New York DOH Matrix E Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February, 2024.
NY-IAC-F: New York DOH Matrix F Indoor Air Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February, 2024.
NY-SSC-A: New York DOH Matrix A Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October :
NY-SSC-B: New York DOH Matrix B Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October :
NY-SSC-C: New York DOH Matrix C Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October :
NY-SSC-D: New York DOH Matrix D Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February
NY-SSC-E: New York DOH Matrix E Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February
NY-SSC-F: New York DOH Matrix F Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, February,

Figures

Y:\GIS\Project_Numbers\13968\APRX_STANDARD_Fig_Prf_No.aprx, 6/10/2025 3:07 PM, Kim Vanderklein, LAYOUT: FIG-3.1



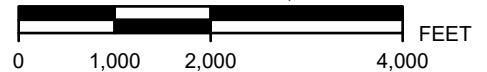
REFERENCE:

UNITED STATES GEOLOGICAL SURVEY (USGS)
OSSINING, NY USGS QUADRANGLE - 2023

LEGEND:

SITE LOCATION

SCALE: 1" = 2,000'



34 STATE STREET
BLOCK 2, LOT 17, 18, AND 68
OSSINING, WESTCHESTER, NY

SITE LOCATION MAP

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FIG-1.1

DRAWN BY: KBV

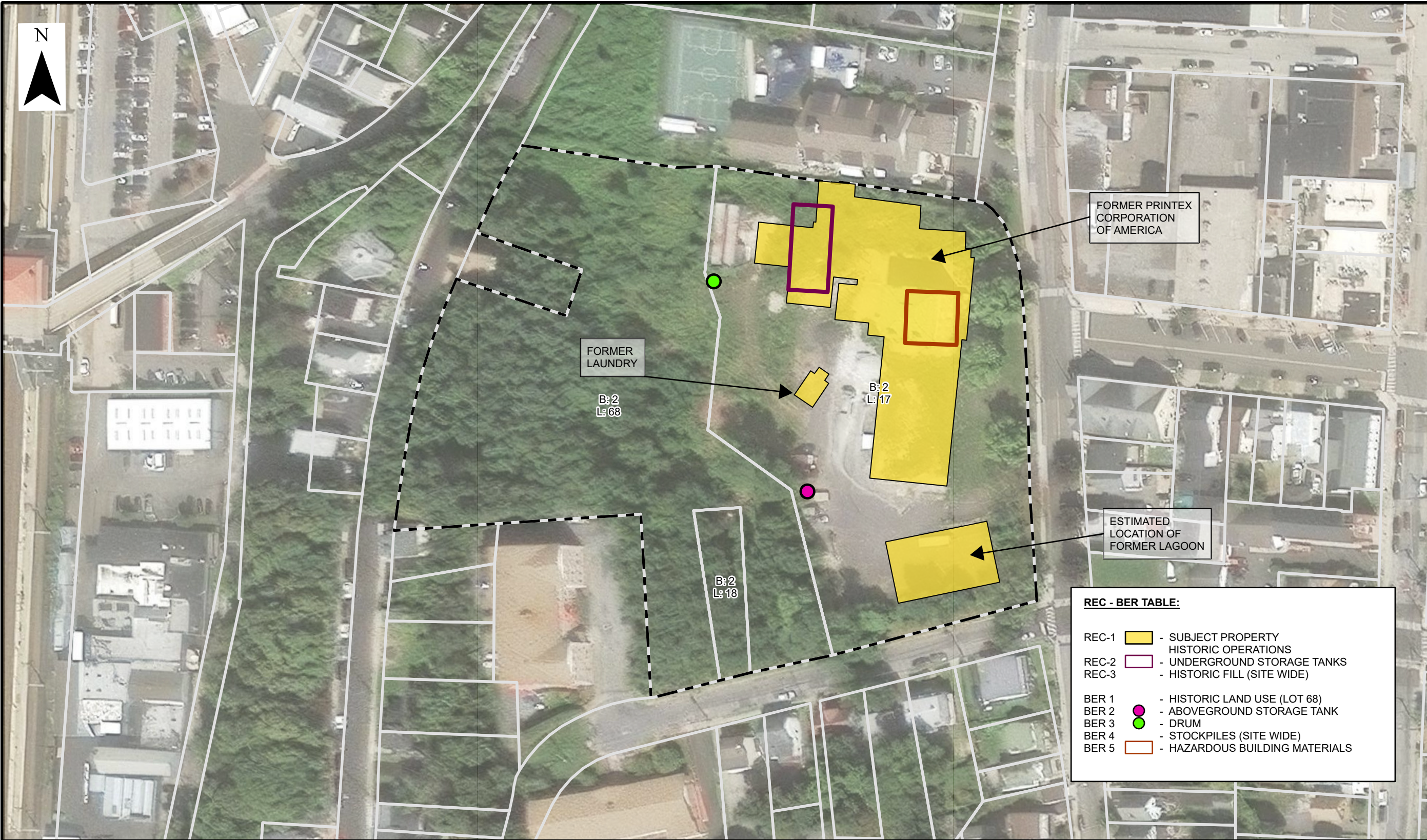
CHECKED BY: CM

SCALE: AS NOTED

DATE: 6/10/2025

JOB NO: 13968

Y:\GIS\Project_Numbers\13968\APRX_PROJECT\APRX_Phase1_Pt1_No.aprx, 6/10/2025 3:08 PM, Kim Vanderklein, LAYOUT: FIG-10.1



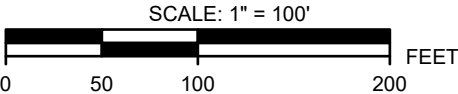
REC - BER TABLE:	
REC-1	SUBJECT PROPERTY
REC-2	UNDERGROUND STORAGE TANKS
REC-3	HISTORIC FILL (SITE WIDE)
BER 1	HISTORIC LAND USE (LOT 68)
BER 2	ABOVEGROUND STORAGE TANK
BER 3	DRUM
BER 4	STOCKPILES (SITE WIDE)
BER 5	HAZARDOUS BUILDING MATERIALS

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REFERENCE:
PARCELS: NYS OFFICE OF INFORMATION TECHNOLOGY SERVICES - GIS PROGRAM OFFICE, NYS DEPT OF TAXATION AND FINANCE'S OFFICE OF REAL PROPERTY TAX SERVICES; AERIAL IMAGERY: MAXAR, MICROSOFT

LEGEND:
SUBJECT PROPERTY LOCATION
NY TAX PARCELS



dwg by: KBV
chk by: CM
scale: AS NOTED
date: 6/10/2025

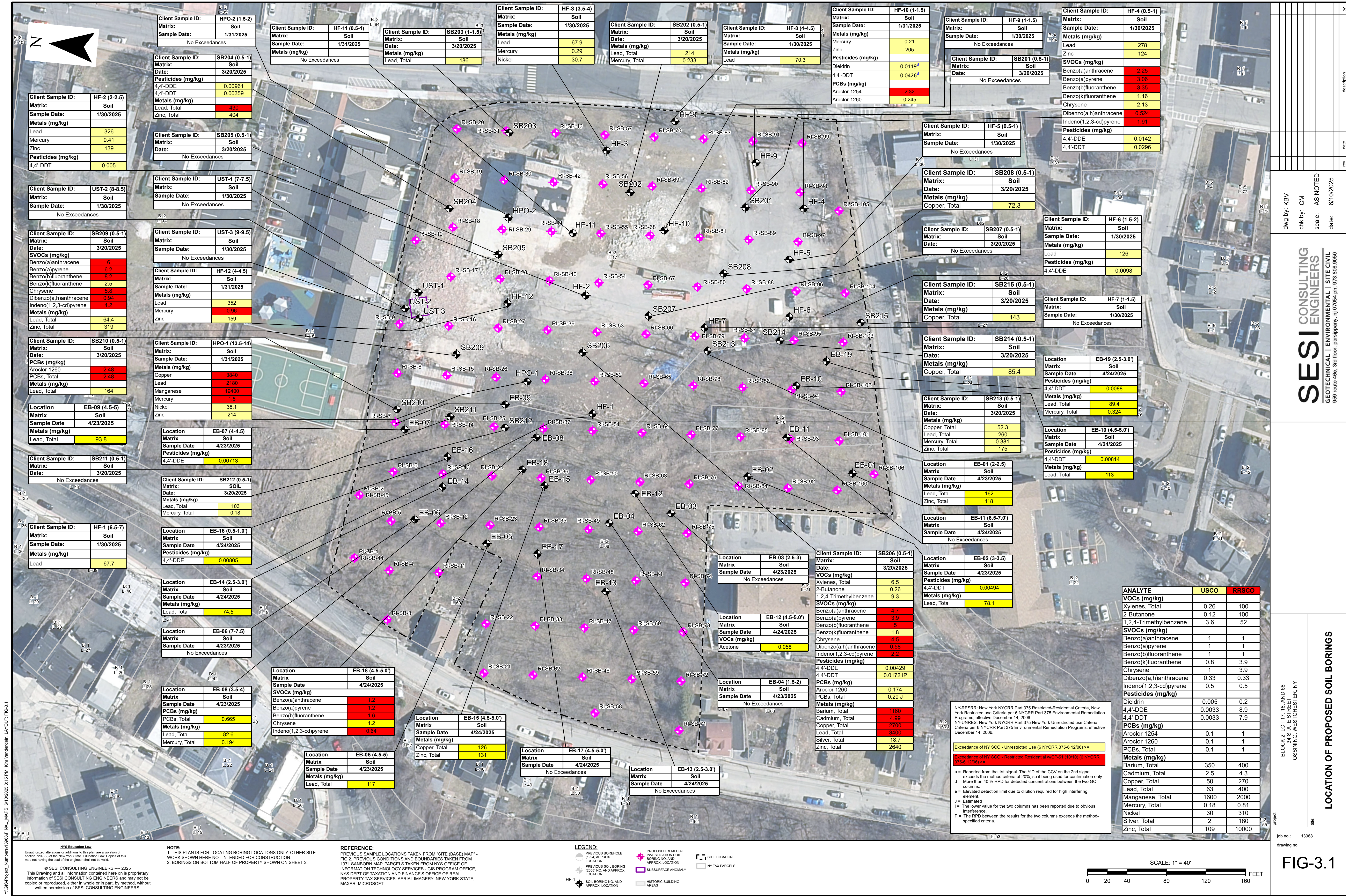
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959 route 46e, 3rd floor, parsippany, nj 07054 ph: 973.808.9050

project:
34 STATE STREET
BLOCK 2, LOT 17, 18, AND 68
OSSINING, WESTCHESTER, NY

title:
REC/BER LOCATION MAP

job no.: 13968
drawing no:

FIG-2.2



Y:\GIS\Projects_Northern\13068\FINAL_MAPS_6/10/2025 3:13 PM_Kim Vanderkolk_LAYOUT FIG-1



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NOTE:
THIS PLAN IS FOR LOCATING SOIL VAPOR SAMPLE LOCATIONS ONLY. OTHER SITE WORK SHOWN HERE NOT INTENDED FOR CONSTRUCTION

REFERENCE:
PREVIOUS SAMPLE LOCATIONS TAKEN FROM "SITE (BASE) MAP" - FIG 2. PREVIOUS CONDITIONS AND BOUNDARIES TAKEN FROM 1971 SANBORN MAP. PARCELS TAKEN FROM NYS OFFICE OF INFORMATION TECHNOLOGY SERVICES - GIS PROGRAM OFFICE, NYS DEPT OF TAXATION AND FINANCE'S OFFICE OF REAL PROPERTY TAX SERVICES. AERIAL IMAGERY: NEW YORK STATE, MAXAR, MICROSOFT

LEGEND:

TW-1	SOIL VAPOR NO. AND APPROX. LOCATION	HISTORIC BUILDING AREAS	NY TAX PARCELS
RI-GW-01	PROPOSED REMEDIAL INVESTIGATION SOIL VAPOR NO. AND APPROX. LOCATION	SITE LOCATION	

SCALE: 1" = 40'

0 20 40 80 120 160 FEET

Project: BLOCK 2, LOT 17, 18, AND 68 34 STATE STREET OSSINING, WESTCHESTER, NY		Job no.: 13068	
Title: LOCATION OF PROPOSED GROUNDWATER MONITORING POINTS		Drawing no.:	
dwg by: KBV		chk by: CM	
scale: AS NOTED		date: 6/10/2025	
rev		date	
description		by	

CERT. OF AUTH. #245427834700

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959 route 48e, 3rd floor, passapatan, nj 07064 ph: 973.808.9050



Appendix A:

Previous Environmental Reports

Jonathan Kloos

From: S Malter <malter@gmail.com>
Sent: Wednesday, September 20, 2017 12:42 PM
To: Jonathan Kloos
Subject: Fwd: ossining - 34 state street phase 1
Attachments: Phase I ESA - Ossining 34 State Street.pdf

attached is the report we received and got reliance letters for

the review of the phase 2 gave us and the lender sufficient comfort that the 10k gallon tank had been dealt with in an appropriate manner

i believe that it is our intent to excavate and remove it as part of our site work

----- Forwarded message -----

1.0 EXECUTIVE SUMMARY

Team Environmental Consultants, Inc. (TEAM), was authorized by Union State Bank to conduct a Phase I Environmental Site Assessment (ESA) for a commercial property located at 34 State Street in Ossining, New York. The objective of this effort was to identify significant environmental impairments and liability issues associated with the subject properties. The requested scope of work included the following tasks: 1) Review of previously conducted Phase I and II ESA reports; 2) Performance of site interviews and a walk-through property inspection; 3) Review of a federal and state environmental database report; and 4) Documentation of findings in a Phase I ESA Report.

Based on the commercial site setting, availability of a municipal water supply, review of available information, performance of site interviews, and findings of the property walk-through inspection, no significant and immediate environmental liability issues associated with the subject property were identified.

2.0 PROPERTY DESCRIPTION

2.1 Site Description

The subject property is located along the western side of State Street, approximately one-quarter mile west of U.S. Route 9 (South Highland Avenue), in the Village and Town of Ossining, Westchester County, New York (Figures 1 and 2). The site is bordered to the north by a funeral home and private residences, to the east by State Street, residential properties, commercial businesses, and Broad Avenue, to the south by James Street and private residences, and to the west by an undeveloped wooded property (proposed location of a 46-unit condominium complex) and a residential apartment house structure located along James Street. The site topography rises gradually to moderately upwards from State Street and then slopes downwards towards the west/southwest. Photographs obtained during performance of the site inspection are presented within Attachment A.

The irregularly shaped 2.90-acre (~126,000-ft²) property is currently operated as Creative Design, Inc. (CDI), a specialty woodworking (inlaid wood pictures) manufacturing business. The property is improved with a one, two, and part three-story approximately 60,000-ft² building which was reportedly constructed in three stages. The original three-story structure (~10,000-ft²) was built circa 1840 as a private residence (current administrative office area). In 1929, an approximate

29,000-ft² three-story addition was completed and operated as a community club. The third building addition (~20,000-ft² two-story office/manufacturing area) was constructed in 1968. No documentation detailing historic site development or the performance of building renovation efforts was available for TEAM review. Proposed site development plans call for the demolition of portions of the current building and construction of a 54-unit residential townhouse complex. No site development plans were available for review.

CDI woodworking manufacturing operations are conducted on the first floor level. Also located within the ground floor building sections are assorted warehouse areas and utility rooms. The upper two-stories contain product storage/shipping facilities and office space. Two one-story garage structures are found within the western portion of the site. Paved parking areas are located within the southern and western sections of the property.

The site is located within a Town of Ossining Zoning Class WD-2 (Waterfront Development) district. The property is provided with a municipal water supply and sanitary waste treatment service (Village of Ossining and Westchester County Sewer District, respectively). Electrical service and natural gas are supplied by Consolidated Edison Utilities (ConEd). No site or regulatory information concerning the current onsite presence of any underground petroleum storage tanks was available. Non-hazardous solid waste is removed for offsite disposal by a private hauler. Utility connections are located both aboveground and underground.

2.2 Property Ownership

Information obtained from the Town of Ossining Tax Assessor's Office indicates the subject parcel (Tax Map Section 3.12, Block 27, Lot 20) to be owned by Creative Designs International. The property was reportedly formerly owned by Hudson River Inlay. No previously conducted title searches or documentation detailing historic property ownership was available for TEAM review.

2.3 Previously Conducted Environmental Site Assessments

TEAM was provided with the following three environmental reports associated with the 34 State Street property.

- January 21, 1994 - Dames & Moore Phase I Environmental Assessment
- May 7, 2003 - Elite Environmental Services Phase I Environmental Assessment
- May 16, 2003 - Elite Environmental Services Phase II Investigative Report

Summarized below for each document are the various findings, conclusions, and recommendations TEAM determined to be of a significant nature. Copies of these reviewed reports (text portions only) are provided within Attachment B.

January 21, 1994 - Phase I Environmental Site Assessment

This report was prepared by Dames & Moore (D&M), of Pearl River, New York, on behalf of Creative Design, Inc. (CDI). The Phase I ESA scope of work included a site description, review of property history and previously conducted 1992 Subsurface Investigations, Inc., Phase I and II environmental reports, performance of a site walkthrough inspection, and review of Sanborn Fire Insurance Maps and a federal/state environmental database report. The following findings and conclusions were presented in the D&M report:

- An asbestos survey was noted to have been conducted by Asbestos Research & Environmental Associates, Inc. (AREA) on September 24, 1992. The D&M report states that, "Based on the findings of this survey, an asbestos removal effort was undertaken by AREA to remove friable asbestos at the site. AREA, a licensed NYS asbestos abatement company, has determined that areas of known friable asbestos have been remediated." The D&M building inspection noted the presence of two areas of suspected asbestos containing materials (ACM), specifically the exterior wall tiles (observed to be in good condition) and sheetrock wallboard (indicated to be deteriorated due to moisture intrusion). D&M recommended that these materials be "managed" during future renovations or demolition;
- A closed in-place 10,000-gallon capacity underground fuel oil storage tank (UST) is situated within the western section of the property. The D&M report indicated that, "Subsequent to the purchase of the property, CDI uncovered and emptied the tank and abandoned it by filling with sand. The area was then back filled and covered with concrete. A subsurface investigation of the UST and other areas of concern was undertaken by Subsurface Investigations Inc. (SII) in a previous Phase II Environmental Assessment prepared for CitiBank. During the investigation of the UST, two borings were advanced to obtain soil samples. These samples were screened for volatile organic chemicals (VOC's) on site and were analyzed for Total Petroleum Hydrocarbons (TPH) by a NYS licensed laboratory. SII stated that the results of this analysis indicated that TPH concentrations were present in the range from 30 ppm to 114 ppm. Subsequently, Dames & Moore was retained by CDI to register this UST with the NYSDEC and apply for formal closure of the tank;"

- In an attempt to locate additional USTs, D&M conducted a ground penetrating radar (GPR) survey in October of 1993. Based on the findings of this investigation, "...two USTs (one 1,000 gallon and one 3,000 gallon) which contained a fuel oil/water mix were identified. In December of 1993, CDI retained Elmendorf Environmental Inc. of Elmsford, New York to perform an in-place closure of these tanks. In addition, CDI retained Dames & Moore to register the tanks with the NYSDEC, conduct the necessary soil sampling for tank closure and apply for tank closure with the NYSDEC. Results of soil sample analyses collected beneath the centerline of these tanks did not indicate the presence of petroleum hydrocarbon constituents in excess of NYSDEC soil cleanup criteria. Both of these USTs are found within the western section of the main manufacturing building;

- A waste treatment lagoon which was utilized by Printex Corp., was reportedly located within the southeastern section of the property. To identify issues of potential environmental concern associated with former use of this lagoon, SII performed a subsurface sampling investigation within this area. D&M indicated that based on review of an SII December 1992 Phase II report that, "SII concluded that the treatment lagoon had not adversely impacted the environmental quality of the property." TEAM was unable to obtain a copy of the SII report;

- The subject property is noted to have been placed on the CERCLIS (Comprehensive Environmental Response, Compensation, and Liability System - Potential hazardous waste sites that U.S. EPA is investigating for an existing or threatened release of hazardous substances) list for potential inclusion on the NPL (National Priority List - National listing of abandoned or uncontrolled hazardous waste sites). A site screening investigation and preliminary assessment of the site were reportedly conducted. The D&M report stated that, "At this time, the regulatory agency data base search lists that no further action has been taken by Federal or State agencies regarding this site. However, based upon information provided by CDI personnel, this site was delisted in 1983 after NYSDEC and EPA investigations failed to identify any potential hazards; and

- During the D&M building inspection, floor drains were identified at various locations. CDI personnel indicated that these drains and all generated wastewater streams discharge to the municipal sewer system. A paint/lacquer spray booth (vented to the outside of the building) and several dust collection devices were also observed. CDI manufacturing operations utilize paint thinners, wood stains, sealants, and glue products. No indications of improper storage or product leakage/spillage were referenced in the D&M report.

May 7, 2003 - Phase I Environmental Site Assessment

This report was prepared by Elite Environmental Services, Inc. (EES), of Thornwood, New York, on behalf of proposed property purchaser, Daniel Beaton. The Phase I ESA scope of work included a site description, review of property history and historic Sanborn Fire Insurance Maps (1886-1971), performance of a property walkthrough inspection, and review of a federal/state environmental database report. The following findings and conclusions were presented in the EES report:

- During performance of the EES property inspection, no water supply wells, aboveground petroleum/chemical storage tanks, active underground petroleum storage tanks, septic systems, PCB-containing equipment, hazardous substance use, or suspected onsite wetland areas were identified. A visual asbestos survey noted the presence of suspected asbestos containing floor tiles within the "work areas in the site building." These tiles were reported to be in "good condition at the time of inspection." EES recommended performance of an asbestos survey prior to the performance of any renovation or demolition activities;
- The EES report stated that, "According to the environmental database, concrete storage lagoons for the treatment of process water were located on-site. During the inspection, storage lagoons were not located;" and
- Based on historic site use and the presence of three closed in-place underground petroleum storage tanks, EES recommended performance of a Phase II subsurface investigation. Identified "target areas" included: 1) location of underground storage tanks, 2) areas of concrete storage lagoons, and 3) garage area where automobile and truck repair work is performed.

May 16, 2003 - Phase II Environmental Site Assessment

Based on the findings of the Elite Environmental Services, Inc. (EES) Phase I ESA, property purchaser, Daniel Beaton authorized EES to perform a Phase II site investigation. The scope of work included the installation of nine soil borings within the western (vicinity of closed in-place 10,000-gallon UST and storage garages) section of the property utilizing a van mounted Geoprobe system.

Field activities were conducted on May 14, 2003. Collected soil samples were field screened utilizing a portable Mini Rae Photo Ionization Detector (PID) to provide a "direct reading of the

concentration of volatile organic vapors in the sample, reported in ppm" (parts per million). The EES report stated that, "Field screening results indicate no volatile organic vapor compounds were found in the soil samples collected during the soil boring program" No samples are indicated to have been collected for laboratory analysis.

3.0 SITE INSPECTION

On April 28, 2005, TEAM together with proposed property purchaser, Dan Beaton (34 State Street, LLC), conducted an inspection of accessible portions of the site building and surrounding property. The requested scope of work did not include performance of any field sampling activities (e.g., asbestos, soil, radon, or groundwater) or completion of a formal regulatory compliance audit, as it would relate to the use, handling, storage, permitting, or disposal of regulated materials and waste products.

3.1 Property Inspection

Inspection of accessible property surrounding the building (extremely difficult due to the property terrain and presence of parked vehicles, stored equipment, leaf litter, and vegetation) revealed no unusual odors or visual evidence of significant surface staining that could be indicative of leaking petroleum storage tanks, chemical spills, or industrial waste disposal. No PCB-labeled electrical equipment, aboveground petroleum storage tanks, suspected underground petroleum storage tank fill ports or vent pipes, water supply or groundwater monitoring wells, or industrial waste storage or disposal facilities within the exterior property confines were observed.

No surface water bodies or significant freshwater wetland habitat areas were observed within or proximate to the subject property. The Hudson River is situated approximately one-quarter mile to the west. The requested Phase I ESA scope of work did not include performance of formal wetland or flood plain delineation surveys.

During the April 28, 2005 site inspection, TEAM observed performance of a test pit investigation in the vicinity of the closed in-place 10,000-gallon UST by Elite Environmental Services, Inc. (EES). As part of this investigation, EES uncovered the top portion of the tank and excavated sand/gravel located within the UST. In addition, test pits were advanced on two sides of the tank (below the bottom of the UST). No petroleum odors or visual evidence of soil staining were noted by either TEAM or EES field personnel. At the completion of this effort, the tank and excavated test pits were subsequently backfilled to grade.

3.2 Building Inspection

Inspection of accessible interior building sections (extremely difficult due to the size of the structure and the presence of woodworking equipment and supplies) revealed no unusual odors or visual evidence of underground or aboveground petroleum/chemical storage tanks, PCB-labeled electrical equipment, significant chemical spillage/surface stains, or industrial waste storage facilities. According to CDI representatives no commercial vehicle servicing or maintenance operations are conducted onsite. Generally good housekeeping practices were observed throughout the facility.

No exposed suspected friable asbestos containing materials (e.g., pipe wrap, electrical or boiler insulation) were observed during performance of the facility walkthrough inspection. Due to the age of the building, asbestos containing materials (ACM) may be associated within the site structure. The requested scope of work did not include performance of a formal asbestos or lead-based paint sampling survey.

3.3 DTCS Phase II Environmental Site Assessment

Based on historic site use and proposed property development plans, TEAM recommended performance of a property-wide Phase II ESA site investigation. Property purchaser, Dan Beaton (34 State Street, LLC) subsequently retained DT Consulting Services (DTCS) to perform a subsurface investigation of the 34 State Street property. DTCS concentrated its investigation in the following areas:

- Known PBS locations found in the northern quadrant of the site;
- Reported location of waste treatment lagoon (utilized by Printex Corp.) situated within the southeastern corner of the property; and
- General equipment maintenance and storage area located within the western portion of the site.

As part of this May 10, 2005 site investigation, a track mounted Geoprobe drill rig installed soil borings at seven property locations to depths ranging from approximately eight to twelve feet below grade. A DTCS geologist performed soil screening and classification immediately following collection of subsurface soil samples. Samples were screened for volatile organic compounds

(VOCs) utilizing an HNu photoionization detector (PID). Three composite soil samples were also collected for laboratory analysis of volatile/semi-volatile organic compounds (VOC's/SVOC's) and priority pollutant metals. Groundwater was not encountered during performance of the Phase II field investigation. A May 31, 2005 DTCS Phase II ESA report (copy found in Attachment C) presented the following field observations and conclusions.

- "While performing this investigation, headspace screening yield the non-detect total petroleum hydrocarbons in parts-per-million within each soil profile analyzed. In addition, no visual or olfactory signs of subsurface contamination were encountered while field testing soils from each borehole location;
- Based upon field observations and testing, DTCS can conclude that noticeable signs of subsurface contamination were not detected while collecting samples from each borehole location. Although laboratory analysis revealed the presence of some targeted VOC's/SVOC's and priority metals, all were within New York State Department of Environmental Conservation (NYSDEC) Soil Quality Guidance Values (TAGM #4046, January 1994); and
- Currently, the need to perform additional investigative and/or remedial measures does not appear warranted based upon the findings of this Phase II ESA. Therefore, it is DTCS's opinion that no further action is required at this time within the area of study."

4.0 RECORDS REVIEW AND DOCUMENTATION

4.1 Federal and State Database Report

TEAM has obtained an Environmental FirstSearch Network (EFSN) Site Assessment Report which provides information concerning the target property and those sites located within an ASTM established radius and listed in any of the following Federal and State databases:

- National Priority List (NPL);
- Resource Conservation and Recovery Information System (RCRIS),
Large Quantity Generators and TSD Facilities,
Small Quantity Generators and Transporters;
- State Spills Database (SPILLS);

- Comprehensive Environmental Response, Compensation, and Liability System (CERCLIS);
- Emergency Response Notification System (ERNS);
- Leaking Storage Tanks (LUST);
- Active Solid Waste Facility Register (SWL); and
- Registered Bulk Storage Tanks (UST/AST).

The EFSN Database Report presented in Attachment D, identifies no NPL, CERCLIS, or SWL sites within the ASTM established survey radius. Two LUST, fourteen SPILLS, one NFRAP, and one STATE site are located within a one-eighth to one-quarter mile distance. The subject 34 State Street property (Printex Corp./Hudson River Inlay) is identified in the NFRAP, RCRIS, and STATE Databases. The NFRAP listing notes performance of a Preliminary Assessment and Site Inspection on November 1, 1980. The STATE Database site description states that, "Westchester County Department of Health investigation has determined that this site has not used lagoons to dispose of hazardous waste, but rather concrete storage lagoons for treatment of process water...No known disposal of hazardous wastes at this time." The RCRIS Database notes the Hudson River Inlay facility to be a small quantity hazardous waste generator. No violations are noted for this business.

The nearest SPILLS site (private residence) is situated approximately 200-feet to the northeast at 6 Broad Avenue. The Spill Date for this property is listed as April 24, 1997 (5-gallon No. 2 fuel oil tank overflow). The remedial status is indicated to be "closed." The closest LUST site (Descon Woodworking) is found approximately 600-feet to the northeast at 100 Spring Street. The Spill Date is identified as October 11, 2002 (gasoline tank failure). The remedial status is noted to be "closed." The proximity of EFSN identified sites would not appear to impact or pose significant environmental liabilities with respect to current property use or water quality issues.

4.2 Regulatory Review - NYSDEC/Westchester County Health Department

The requested Phase I ESA Update scope of work did not include submittal of Freedom of Information Legislation (FOIL) requests to Region 3 of the New York State Department of Environmental Conservation (NYSDEC) or Westchester County Health Department Office of Environmental Health Risk Control, which administers the NYSDEC Petroleum Bulk Storage Program in Westchester County.


5.0 CONCLUSIONS

Based on the commercial site setting, availability of a municipal water supply, review of available information, performance of site interviews, and findings of the property walk-through inspection, no significant and immediate environmental liability issues associated with the subject property were identified. No additional environmental site investigations are recommended at this time.

6.0 LIMITATIONS

The conclusions stated are based on the limits of the investigation described herein. TEAM can offer no assurances and assumes no responsibility for site conditions or activities which were outside the scope of the inquiry requested. In performing its investigations, TEAM has used reasonable care and has performed its work in keeping with industry standards and standard engineering practice, as appropriate. It should be understood that TEAM has relied on the accuracy of documents, oral information, and other material and information provided by sources documented in this report. There can be no assurance, and TEAM offers no assurance, that site conditions do not exist or could not exist in the future which were undetected and which could lead to liability in connection with the site. Similarly, past and present activities on the site indicating potential environmental concerns may not have been discovered by TEAM's inquiries.

The Phase I Environmental Site Assessment Update was prepared for Union State Bank in accordance with all regulatory and good management standards, and to the best of our knowledge, is complete and accurate.



Martin C. Wodka
President

Phase I Environmental Site Assessment

34 State Street, 17-25 James Street, & 27 Hunter Street

34 State Street, 17-25 James Street, & 27 Hunter Street - (Sec.
97.07; Lots 17, 18, 68)
Ossining, New York

EBI Project No. 1117000093

January 18, 2016



Prepared for:

Ossining Land Holdings LLC
421 Hudson Street
New York, NY 10014

Prepared by:



January 18, 2016

Mr. Stefan Malter
Ossining Land Holdings LLC
421 Hudson Street
New York, NY 10014

Subject: Phase I Environmental Site Assessment
34 State Street, 17-25 James Street, & 27 Hunter Street - (Sec. 97.07; Lots 17, 18, 68)
Ossining, New York
EBI Project No. 1117000093

Dear Mr. Stefan Malter:

Attached please find our *Phase I Environmental Site Assessment* (the report) for the above-mentioned asset (the Subject Property). During the survey and research, our surveyor met with agents representing the Subject Property, or agents of the owner, and reviewed the Subject Property and its history. The report was completed according to the terms and conditions authorized by you. This report has been completed in general conformance with the ASTM Standard E 1527-13.

The purpose of this report is to assist *Ossining Land Holdings LLC* in its underwriting of a proposed mortgage loan on the Subject Property described herein.

This report is addressed to *Ossining Land Holdings LLC* and their respective successors and assigns.

Reliance on the report and the information contained herein shall mean (i) the report may be relied upon by *Ossining Land Holdings LLC*, in determining whether to make a loan evidenced by a note secured by the Subject Property ("the Mortgage Loan"); (ii) the report may be relied upon by any loan purchaser in determining whether to purchase the Mortgage Loan from *Ossining Land Holdings LLC*, or an interest in the Mortgage Loan or securities backed or secured by the Mortgage Loan, and any rating agency rating securities representing an interest in the Mortgage Loan or backed or secured by the Mortgage Loan; (iii) the report may be referred to in and included, in whole or in part, with materials offering for sale the Mortgage Loan or an interest in the Mortgage Loan or securities backed or secured by the Mortgage Loan; and (iv) the report speaks only as of its date in the absence of a specific written update of the report signed and delivered by EBI Consulting.

There are no intended or unintended third party beneficiaries to this report, except as expressly stated herein.

EBI is an independent contractor, not an employee of either the issuer or the borrower, and its compensation was not based on the findings or recommendations made in the report or on the closing of any business transaction.

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312 and we have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject Property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Thank you very much for the opportunity to provide environmental consulting services to *Ossining Land Holdings LLC*. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Respectfully submitted,
EBI CONSULTING



Herb Spitz, P.G.
Author / Senior Scientist



David V. Maglietta, P.G.
Reviewer / Program Director
dmaglietta@ebiconsulting.com

410.499.8833

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EXECUTIVE SUMMARY

At the request of Ossining Land Holdings LLC, EBI has performed a Phase I Environmental Site Assessment (ESA) of the property located at 34 State Street, 17-25 James Street, & 27 Hunter Street - (Sec. 97.07; Lots 17, 18, 68) in Ossining, New York, herein referred to as the Subject Property. The main objective of this ESA was to identify *recognized environmental conditions* in connection with the Subject Property, defined in ASTM Practice E 1527-13 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: 1) due to any release to the environment, 2) under conditions indicative of a release to the environment, or 3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions. This ESA also includes a preliminary evaluation of certain potential environmental conditions that are outside the scope of ASTM Practice E 1527-13.

The Subject Property includes three contiguous irregular-shaped parcels cumulatively totaling approximately 5.9 acres. The Subject Property is currently improved with two, three-story, former manufacturing buildings. There is a basement beneath the northern building and a crawl space beneath the southern building. The original part of the northern building was constructed in the 1830s and expanded in the 1920s. The southern building was constructed in the 1950s. Three small single-story outbuildings are located west of the northern building, and a single-car garage building is located to southwest.

At the time of assessment, the buildings at the Subject Property were vacant. The western part of the site, west of the developed portion, is undeveloped wooded land. There are currently no manufacturing or industrial operations conducted at the Subject Property.

Below is the Assessment Summary Table presenting our recommended actions for the Subject Property. EBI's Findings and Opinions are presented in Section 8.0, and recommendations for further action or investigation are presented in Section 9.0.

ASSESSMENT SUMMARY TABLE 34 STATE STREET, 17-25 JAMES STREET, & 27 HUNTER STREET - (SEC. 97.07; LOTS 17, 18, 68) OSSINING, NEW YORK								
ASSESSMENT COMPONENT	SECTION	NO FURTHER ACTION	REC	HREC	CREC	OTHER	RECOMMENDED ACTION	ESTIMATED COST
Current Occupants/ Operations	2.3, 5.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Historical Review	4.3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Regulatory Review	4.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See(1) below	See (1) below
Potential Off-site Sources	2.5, 4.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Hazardous Substances/ Petroleum Products	5.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Other Suspect Containers	5.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Waste Generation	5.3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
USTs	5.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See(1) below	See (1) below
ASTs	5.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
PCBs	5.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Additional Site Conditions	5.6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Asbestos Containing Materials	7.1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See (2) below	Action Item
Radon	7.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Lead-based Paint	7.3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Lead in Drinking Water	7.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	
Vapor Migration	4.1.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No Further Action	

- (1) All available documentation regarding the USTs removed from the Property or closed in-place at the Property should be provided to EBI for review to further determine if environmental concerns remain. If this additional information is inconclusive or if no additional information is available, then a review of the State files for these tanks is recommended to gather additional information. Cost to review any additional information provided and to review any regulatory files will be \$100 per hour, not to exceed \$1,000 without prior client approval. If information from the State is inconclusive or if no additional pertinent information is available, then a Phase II subsurface investigation is recommended to determine if these tanks have adversely impacted the environmental integrity of the Property. The scope of work for a subsurface investigation could be influenced by the findings of the document review, therefore a cost for subsurface investigation activities is not available at this time.
- (2) It is recommended that an asbestos inspection be performed in accordance with all applicable federal, state, and local regulatory requirements prior to renovation, demolition, or other activities that could cause a material disturbance. Any removal or disturbance of ACM or suspect ACM should be performed by properly trained personnel and in compliance with federal, state, and local regulations.

I.0 INTRODUCTION

This report documents the findings, opinions, and conclusions of a Phase I Environmental Site Assessment (ESA) of the property located at 34 State Street, 17-25 James Street, & 27 Hunter Street - (Sec. 97.07; Lots 17, 18, 68) in Ossining, New York.

I.1 PURPOSE

The purpose of this ESA was to identify *recognized environmental conditions* and certain environmental conditions outside the scope of ASTM Practice E 1527-13 in connection with the property at the time of the property reconnaissance.

I.2 SCOPE-OF-SERVICES

This ESA was conducted utilizing a standard of good commercial and customary practice that was consistent with the ASTM Practice E 1527-13. Any significant scope-of-work additions, deletions or deviations to ASTM Practice E 1527-13 are noted below or in the corresponding sections of this report. The scope-of-work for this assessment included an evaluation of the following:

- Physical characteristics of the Subject Property through a review of referenced sources for topographic, geologic, soils and hydrologic data.
- Subject Property history through a review of referenced sources such as land deeds, fire insurance maps, city directories, aerial photographs, prior reports, and interviews.
- Current Subject Property conditions, including observations and interviews regarding the following: the presence or absence of hazardous substances or petroleum products; generation, treatment, storage, or disposal of hazardous, regulated, or biomedical waste; equipment that utilizes oils which potentially contain PCBs; and storage tanks (aboveground and underground).
- Usage of surrounding area properties and the likelihood for releases of hazardous substances and petroleum products (if known and/or suspected) to migrate onto the Subject Property.
- Information in referenced environmental agency databases and local environmental records, within specified minimum search distances.
- Past ownership through a review of available prior reports and local municipal file review.

The scope-of-work also included consideration of the following potential environmental conditions that are outside the scope of ASTM Practice E 1527-13: asbestos-containing materials (ACM), lead-based paint (LBP), lead in drinking water, and radon.

I.3 ASSUMPTIONS, LIMITATIONS AND EXCEPTIONS

This Phase I Environmental Site Assessment (the report) has been prepared for the use of Ossining Land Holdings LLC, in accordance with our Standard Conditions for Engagement and Authorization Letter and Agreement for Environmental Services approved and signed by Ossining Land Holdings LLC (the Agreement), and with the limitations described below, all of which are integral parts of this report. A copy of the signed Standard Conditions For Engagement and Authorization Letter and Agreement for Environmental Services is maintained at the EBI Consulting office in Burlington, Massachusetts. To the

extent any provisions of this report conflict with the terms of the Agreement, the Agreement will control.

EBI has performed this Phase I Environmental Site Assessment in conformance with the scope and limitations of *ASTM Standard E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. This report was prepared with no exceptions or deletions from ASTM Standard E 1527-13.

This Phase I Environmental Site Assessment has been prepared to assess a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. §9601) and petroleum products. As such, this practice is intended to permit Ossining Land Holdings LLC to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on CERCLA liability: that is, the practices that constitute “all appropriate inquiry into the previous ownership and uses of the Subject Property consistent with good commercial or customary practice” as defined in 42 U.S.C. § 9601(35)(B).

In defining a standard of good commercial and customary practice for conducting an environmental site assessment of a parcel of property, the goal of the processes established by this practice is to identify *recognized environmental conditions*. The term recognized environmental conditions means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property (1) due to a release to the environment, (2) under conditions that indicate an existing release or a past release, or (3) under conditions that pose a material threat of a future release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term does not include *de minimis conditions* that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

The information reported was obtained through sources deemed reasonably ascertainable, as defined in ASTM Standard E 1527-13; a visual site survey of areas readily observable, easily accessible or made accessible by the Subject Property contact and interviews with owners, agents, occupants, or other appropriate persons involved with the Subject Property and a review of standard federal, state, and tribal environmental record sources. Municipal information was obtained through review of reasonably ascertainable standard government record sources and interviews with the authorities having jurisdiction over the Subject Property. Findings, conclusions, and recommendations included in the report are based on our visual observations in the field, the standard environmental record sources and municipal information reasonably obtained, information provided by the Client, and/or a review of readily available and supplied documents and drawings. EBI relies completely on the information, whether written, graphic, or verbal, provided by the Subject Property contact or as shown on any documents reviewed or received from the Subject Property contact, owner or agent, or municipal source, and assumes that information to be true and correct unless the information is known to be inaccurate or if it is obvious, based on other information obtained as part of the assessment, that the information is not accurate. Although there may have been some degree of overlap in the information provided by these various sources, EBI did not attempt to verify independently the accuracy or completeness of all information reviewed or received during the course of these environmental services.

The information reported, as well as EBI's findings, conclusions, and recommendations are based upon sources deemed reasonably ascertainable, as defined in ASTM Standard E 1527-13; a visual site survey of areas readily observable, easily accessible or made accessible by the Subject Property contact and interviews with owners, agents, occupants, or other appropriate persons involved with the Subject

Property and a review of standard federal, state, and tribal environmental record sources. Municipal information was obtained through review of reasonably ascertainable standard government record sources and interviews with authorities having jurisdiction over the Subject Property. Ossining Land Holdings LLC agrees that EBI has no obligation to independently verify the accuracy or completeness of the information reviewed or received during the course of these environmental services.

EBI renders no opinion as to the presence of hazardous substances or petroleum products in, on or under un-surveyed and/or inaccessible portions of the Subject Property. Unsurveyed and inaccessible portions of the Subject Property are described below. In addition, EBI renders no opinion as to the presence of hazardous substances or petroleum products in, on or under the Subject Property where direct observation of the interior walls, floor, or ceiling of a structure was obstructed by objects or coverings on or over these surfaces.

EBI Services and opinions are based on the scientific or technical tests or procedures specifically set forth in the scope of the Services described in this report. The ASTM Standard E 1527-13 does not encompass analytical testing to evaluate asbestos containing materials, radon, lead-based paint, drinking water quality, indoor air quality, stored chemicals, debris, fill materials, surface water, or subsurface samples (soil and groundwater) as part of a Phase I ESA. Because geologic and soil formations are inherently random, variable, and indeterminate in nature, the Services and opinions provided under this Agreement are not guaranteed to be a representation of actual conditions on the Subject Property, which are also subject to change with time as a result of natural or man-made processes, including water permeation. In performing the Services, EBI used that degree of care and skill ordinarily exercised by environmental consultants or engineers performing similar services in the same or similar locality at the same time and under similar circumstances. No other representation, expressed or implied, and no warranty or guarantee is included or intended. The report speaks only as of its date, in the absence of a specific written update of the report, signed and delivered by EBI. Additional information that becomes available after our survey and draft submission concerning the Subject Property should be provided to EBI so that our conclusions may be revised and modified if necessary, at additional cost.

Client and EBI agree that to the fullest extent permitted by law, EBI shall not be liable to Client for any special, indirect, consequential, punitive, exemplary, incidental or indirect damages or losses whatsoever, whether caused by EBI's negligence, errors, omissions, strict liability, breach of contract, breach of warranty or other cause or causes whatsoever.

The assessment was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession, and in accordance with generally accepted practices of other consultants currently practicing in the same locality under similar conditions.

I.4 SPECIAL TERMS AND CONDITIONS

This Phase I Environmental Site Assessment (the report) has been prepared to assist Ossining Land Holdings LLC in its underwriting of a proposed mortgage loan on the Subject Property. This report can be relied upon by only the parties stated in the transmittal letter at the front of this report. In the event that EBI provides a purchaser written permission to use this report, EBI's liability to such purchaser is limited to the cost of the report. Amendments to EBI's limitations as stated herein that may occur after issuance of the report are considered to be included in this report. Payment for the report is made by, and EBI's contract and report extends to Ossining Land Holdings LLC only, in accordance with our Standard Conditions For Engagement and, Authorization Letter and Agreement for Environmental Services.

I.5 DATA GAPS

Any data gaps identified herein, as defined by ASTM Practice E 1527-13 § 3.2.20, are not considered to have significantly affected the ability to identify recognized environmental conditions in connection with the Subject Property and do not alter the conclusions of this report. It should be noted that at the time this report was issued EBI had not received responses to requests for information from the Village of Ossining Building Department and Fire Department, and the Westchester County Department of Health. However, based on the historical information obtained through other sources, this historical data gap is not considered to have significantly impacted the ability to identify recognized environmental conditions and does not alter the conclusions of this report.

2.0 SUBJECT PROPERTY DESCRIPTION

2.1 OWNERSHIP AND LOCATION

According to the Westchester County Assessor's Office, the Subject Property is currently owned by Ossining Land LLC and Hunter James Associates LLC.

The Subject Property is located at 34 State Street, 17-25 James Street, & 27 Hunter Street - (Sec. 97.07; Lots 17, 18, 68) in Ossining, Westchester County, New York. The Subject Property includes three contiguous irregular-shaped parcels, identified by the Westchester County Assessor's Office as Tax ID 97.07-2-17, -18 and -68, cumulatively totaling approximately 5.9 acres. The Subject Property is located in the northwest quadrant of the intersection of State Street and James Street. Figure 1 - Location Map depicts the location of the Subject Property on a street map of Ossining, New York. Figure 2 - Locus Map depicts the location of the Subject Property on the Ossining, New York United States Geological Survey (USGS) 7.5 Minute Topographic Quadrangle. Figure 3 - Site Plan depicts the configuration of the Subject Property and adjoining properties.

2.2 SUBJECT PROPERTY IMPROVEMENTS

The Subject Property is currently improved with two, three-story, former manufacturing buildings. There is a basement beneath the northern building and a crawl space beneath the southern building. The original part of the northern building was constructed in the 1830s and expanded in the 1920s. The southern building was constructed in the 1950s. Three small single-story outbuildings are located west of the northern building, and a single-car garage building is located to southwest.

The existing buildings are located on the northeastern and eastern portion of the property. An asphalt-paved surface parking area is located to south. The western portion of the Subject Property is undeveloped land. Land and building areas are as follows:

SUBJECT PROPERTY IMPROVEMENTS				
Address	Floors	Basement	DOC	Lot Size (Acres)
North building	3	Yes	1830-1920s	5.9
South building	3	No (crawl space)	1950s	Inclusive

SF: Gross Square Feet (estimated)

DOC: Date of Construction

2.3 CURRENT USE OF THE SUBJECT PROPERTY

At the time of assessment, the buildings at the Subject Property were unoccupied. The western part of the site, west of the developed portion, is undeveloped wooded land. There are currently no manufacturing or industrial operations conducted at the Subject Property.

Please refer to Section 5.2 for discussion regarding hazardous substances and petroleum products at the Subject Property.

2.4 MUNICIPAL SERVICES & UTILITIES

The Subject Property is serviced by the following municipal services and utilities:

MUNICIPAL SERVICES AND UTILITIES	
Utility	Provider/Source
Potable Water Supply	Town of Ossining
Sewage Disposal System	Town of Ossining
Electrical Service	Consolidated Edison
Natural Gas Service	Not applicable
Oil Service	Not applicable
Heating/Cooling Systems	None observed
Emergency Power	Not applicable

2.5 ADJOINING PROPERTIES

Property use in the vicinity of the Subject Property is primarily characterized by residential and retail/commercial development, as well as undeveloped, wooded land.

ADJOINING PROPERTIES	
North	The eastern part of the Subject Property is bound to the north by the Leech & Thomas Funeral Home (32 State Street) while the western part of the Subject Property is bound to the north by undeveloped land.
South	The central and eastern part of the Subject Property is bound to the south by James Street, beyond which are single-family homes. The western part of the Subject Property is bound to the south by an apartment complex, Oxford House Apartments (15 and 16 James Street) and by single-family homes that front on Hunter Street to west.
East	The Subject Property is bound to the east by State Street, beyond which are single-family homes, apartments and a convenience store (Nunez Mini Mart, (9 Broad Avenue).
West	The Subject Property is bound to the west by Hunter Street, with single-family homes beyond. One single-family home is present on the east side of Hunter Street but is not a part of the site.

No visual evidence of adverse environmental conditions was observed during the survey of the adjoining properties.

3.0 USER PROVIDED INFORMATION

The following section summarizes information provided by Ossining Land Holdings LLC with regard to this Phase I Environmental Site Assessment. Additionally, a User Questionnaire was forwarded to the designated Client contact. The User Questionnaire has been completed and returned to our offices. The information requested in the User Questionnaire is intended to assist in gathering information that may be material to identifying recognized environmental conditions in connection with the Subject Property. The User Questionnaire and any additional documentation referenced below is presented in Appendix C.

3.1 TITLE RECORDS

Title record information associated with the Subject Property has not been provided to EBI by Ossining Land Holdings LLC. A detailed discussion regarding review of information obtained from other sources is presented in Section 4.3.5 of this report.

3.2 ENVIRONMENTAL LIENS AND ACTIVITY AND USE LIMITATIONS

Ossining Land Holdings LLC provided no information regarding environmental liens or activity and use limitations in connection with the Subject Property. A discussion regarding environmental liens is presented in Section 4.3.7 of this report. A detailed discussion regarding activity and use limitations is presented in Sections 4.1.1 and 4.1.2 of this report.

3.3 SPECIALIZED KNOWLEDGE

Ossining Land Holdings LLC provided no specialized knowledge that is material to recognized environmental conditions in connection with the Subject Property. EBI was not provided with or made aware of previous environmental assessments or other documentation that is material to recognized environmental conditions in connection with the Subject Property, except as presented in Section 4.3.8 of this report.

3.4 COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION

Ossining Land Holdings LLC provided no commonly known or reasonably ascertainable information within the local community about the Subject Property that is material to recognized environmental conditions in connection with the Subject Property.

3.5 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES

Ossining Land Holdings LLC provided no information regarding valuation reduction for environmental issues in connection with the Subject Property.

3.6 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION

Ossining Land Holdings LLC provided contact information for the Subject Property owner, manager and/or occupants.

3.7 REASON FOR PERFORMING PHASE I ESA

Ossining Land Holdings LLC retained EBI to complete this Phase I Environmental Site Assessment in connection with a real estate transaction.

4.0 RECORDS REVIEW

4.1 STANDARD ENVIRONMENTAL RECORDS

A review of standard environmental databases maintained by Federal, state, and tribal offices was completed through Environmental Data Resources, Inc. (EDR) of Shelton, Connecticut. The databases were searched for properties with reported environmental conditions located within approximate minimum search distances as specified by ASTM Standard E 1527-13, by using geocoding information that identified the coordinates of the properties in the databases or by checking the street addresses of practically reviewable non-geocoded “orphan” properties within the same zip code. The database report is presented in Appendix E.

The database report identified three “orphan” sites. Orphan sites are those sites that could not be accurately mapped or geocoded due to inadequate location information. EBI attempted to locate these sites via vehicular reconnaissance and interviews with personnel familiar with the area. Based on this research, EBI did not identify listed orphan sites within the approximate minimum search distances that may be considered likely to have impacted conditions at the Subject Property.

It should be noted that plotted locations of listed sites are not always accurate. With regard to listings that are determined or suspected to be inaccurate, based on information from other sources such as direct observation or consultation with individuals familiar with the property, EBI uses the best available data when evaluating the location of listed sites discussed below.

The following table provides a summary of the findings of the environmental database report. Specific properties identified within the database report are further discussed below.

SUMMARY OF FEDERAL, STATE, AND TRIBAL AGENCY DATABASE FINDINGS			
Regulatory Database	Approximate Minimum Search Distance	Subject Property Listed	Off-site Listings Within Search Distance
Federal NPL Sites	1.0 mile	No	1
Federal Delisted NPL Sites	0.5 mile	No	0
Federal SEMS Sites	0.5 mile	No	1
Federal SEMS-ARCHIVE Sites	0.5 mile	Yes	1
Federal RCRA CORRACTS Sites	1.0 mile	No	0
Federal RCRA non-CORRACTS TSD Sites	0.5 mile	No	0
Federal RCRA Generators Sites	Property & Adjoining	Yes	0
Federal Engineering / Institutional Control Sites	0.5 mile	No	1
Federal ERNS Sites	Property	No	NA
Federal FINDS Sites	Property	Yes	NA
State and Tribal equivalent NPL / CERCLIS Sites	1.0 / 0.5 mile	Yes	0
State and Tribal Spills Sites	Property	No	NA
State and Tribal Landfill or Solid Waste Disposal Sites	0.5 mile	No	2
State and Tribal Leaking Storage Tank Sites	0.5 mile	No	70
State and Tribal Registered Storage Tank Sites	Property & Adjoining	Yes	1
State and Tribal Engineering / Institutional Control Sites	0.5 mile	No	1
State and Tribal Voluntary Cleanup Sites	0.5 mile	No	2
State and Tribal Brownfield Sites	0.5 mile	No	1

4.1.1 Federal Agency Database Records

National Priority List (NPL)

The NPL database, also known as the Superfund List, is a subset of CERCLIS and identifies sites that are ranked as high priority for remedial action under the Federal Superfund Act. The Subject Property was not identified on the NPL database. However, one site located within 1.0 mile of the Subject Property was identified on the NPL database. Information regarding the listed site is presented in the following table:

NPL			
Site	Distance / Direction / Gradient*	EPA ID No.	Regulatory Status
Hudson River PCBs No Street Applicable Hudson River, New York	700 feet / West / Downgradient	NYD980763841	Discovery: 07/01/1983 Proposed: 09/08/1983 Status: Final 09/21/1984 Contaminants: PCBs Media Impacted: Surface water, sediments

* Presumed hydrogeologic gradient based upon regional topography

The Hudson River PCBs Site includes a nearly 200 river-mile stretch of the Hudson River in eastern New York State from the Village of Hudson Falls to the Battery in New York City. This federal Superfund Record of Decision (ROD) addresses the risks to people and ecological receptors associated with polychlorinated biphenyls (PCBs) in the in-place sediments of the Upper Hudson River. The Site is divided into the Upper Hudson River, which is the length of river between Hudson Falls and the Federal Dam at Troy, New York and the Lower Hudson River, which is the length of river between Federal Dam at Troy and the Battery. EPA further divided the Upper Hudson River area into three main sections known as River Section 1, River Section 2, and River Section 3. The Site also includes five Remnant Deposits, which are areas of PCB-contaminated sediment that became exposed after the river water level dropped following removal of the Fort Edward Dam in 1973. The Upper Hudson River portion of the Site extends from the Fennimore Bridge in Hudson Falls to the Federal Dam at Troy, a distance of just over 43 river miles. The Lower Hudson River extends from the Federal Dam to the southern tip of Manhattan at the Battery in New York City. The Mid-Hudson River, which is primarily a subset of the Lower Hudson River, extends from the Federal Dam at Troy to just south of Poughkeepsie.

The predominant sources of PCB contamination to the Upper Hudson River were two capacitor manufacturing plants owned and operated by GE. The plants are located adjacent to or near the Hudson River in the Village of Hudson Falls and the Town of Fort Edward. Over a 30-year period, the plants discharged a substantial amount of PCBs into the river. At the GE Hudson Falls plant, leakage of non-aqueous phase PCB-bearing oils through bedrock to the river continues to be a source of PCB contamination. Regarding the former outfall to the Hudson River from the GE Fort Edward plant, New York State Department of Environmental Conservation (NYDEC) issued a ROD in January 2000 that calls for the excavation of PCB-contaminated soil and sediment in this area of the Upper Hudson River shoreline in order to eliminate this source of PCBs to the river. EPA's analysis assumes a significantly reduced PCB loading to the river from these sources once the State's plans for remediation are implemented. PCBs, the chemicals of concern addressed in this decision document, have been classified by EPA as probable human carcinogens. They are also linked to other serious non-cancer adverse health effects based on observations in animals and emerging evidence in humans. Once discharged from the GE plants, the PCBs adhered to river sediment and accumulated downstream as they settled in impounded pools and other depositional areas.

Historic fish and sediment data indicated PCBs were accumulating downstream of the old Fort Edward Dam as well as accumulating behind the dam. The removal of the dam in 1973 resulted in a remobilization and downstream distribution of PCBs that had accumulated behind the dam. Historically, the highest PCB sediment concentrations have been detected in the cohesive sediments within the Upper Hudson River. River scouring and erosion and other mechanisms have mobilized PCB contaminated sediments from the extensive cohesive deposits, redepositing them farther downstream all the way to the Battery. The preponderance of data indicates that burial of contaminated sediment by cleaner materials is not universally or uniformly occurring. Data also indicate that contaminated sediments in River Sections 1, 2 and 3 continue to serve as the major source of PCBs to the water column and the fish within the Upper Hudson River. During an approximate 30-year period ending in 1977, PCBs were used in capacitor manufacturing operations Hudson Falls and Fort Edward, New York facilities. PCB oils were discharged both directly and indirectly from these plants into the Hudson River. This included both non-permitted and permitted discharges. Even after permits were received in 1975, permit exceedances occurred. Estimates of the total quantity of PCBs discharged directly from the two plants into the river from the 1940s to 1977 are as high as 1,330,000 pounds (about 605,000 kg). The Site passes through 14 different counties as the river flows to its final discharge point in New York Harbor. Four counties (Albany, Washington, Rensselaer, and Saratoga) lie adjacent to the more highly contaminated portions (areas of proposed active remediation in River Sections 1, 2 and 3) of the Upper Hudson River between Troy (Federal Dam) and Hudson Falls. Within these four counties, forests and farmlands surround urban centers and historic villages. A Record of Decision (ROD) addressing operable unit 1 (OU 01) was completed in September 1984. A Record of Decision addressing OU 2 was completed in February 2002.

Based upon the nature of the contamination, the ongoing remediation activities and distance/presumed hydrogeologic gradient relative to the Subject Property, it is considered unlikely that conditions associated with the identified NPL facility represent an environmental concern to the Subject Property.

Delisted National Priority List (NPL)

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425(e), sites may be deleted from the NPL where no further response is appropriate. Neither the Subject Property nor any sites located within 0.5 mile of the Subject Property were identified on the Delisted NPL database.

Superfund Enterprise Management System (SEMS)

SEMS tracks federal hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of the USEPA's Superfund Program. The list was formerly known as CERCLIS and was renamed at the end of 2015. The list contains data regarding potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies, and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). SEMS also contains sites that are either proposed to or on the National Priority List (NPL), as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The Subject Property was not identified on the SEMS database. However, one site located within 0.5 mile of the Subject Property was identified on the SEMS database. Information regarding the listed site is presented in the following table:

SEMS			
Site	Distance / Direction / Gradient*	EPA ID No.	Regulatory Status
Hudson River PCBs No Street Applicable Hudson River, New York	700 feet / West / Downgradient	NYD980763841	Discovery: 07/01/1983 Proposed: 09/08/1983 NPL Status: Final NPL Listing 09/21/1984 Contaminants: PCBs Media Impacted: Surface water, sediments

* Presumed hydrogeologic gradient based upon regional topography

The Hudson River PCBs Site was discussed previously as an NPL site.

SEMS – ARCHIVE

SEMS-ARCHIVE tracks sites that have been removed from the SEMS list. This list was formerly known as the CERCLIS- NFRAP list and was renamed SEMS-Archive at the end of 2015. SEMS-ARCHIVE sites may be sites where, following an initial investigation, no contamination was found, contamination was removed without the need for the site to be placed on the NPL, or the contamination was not considered sufficient to warrant Federal Superfund action or NPL consideration. The Subject Property and one site located within 0.5 mile of the Subject Property were identified on the SEMS-ARCHIVE database. Information regarding the listed sites is presented in the following table:

SEMS-ARCHIVE			
Site	Distance / Direction / Gradient*	EPA ID No.	Regulatory Status
Printex Corp 34 State St Ossining, New York	Subject Property	NYD013008446	Discovery: 04/01/1980 Preliminary Assessment: 11/01/1980 Status: SEMS-ARCHIVE
Ossining Historical Society 36 South Highland Ave Ossining, New York	0.26 mile / East-Northeast / Crossgradient	NYD987001450	Discovery: 05/05/1992 Preliminary Assessment: 12/26/1992 Status: SEMS-ARCHIVE

* Presumed hydrogeologic gradient based upon regional topography

According to our review of historical records Printex Corp was a tenant at the Subject Property from the 1940s through the 1990s and was a silk screening operation. Based upon the current regulatory status, it was determined that this facility didn't qualify for the NPL.

Based upon the distance and presumed hydrogeologic gradient relative to the Subject Property, it is considered unlikely that conditions associated with the identified SEMS-ARCHIVE facility represent an environmental concern to the Subject Property.

Resource Conservation and Recovery Act (RCRA) – Corrective Action Tracking System (CORRACTS)
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information regarding sites that generate, transport, store, treat, and/or dispose of hazardous waste as defined by RCRA. The RCRA-CORRACTS database identifies TSD facilities that have conducted, or are currently conducting, corrective action(s) as regulated under RCRA. Neither the Subject Property nor any sites located within 1.0 mile of the Subject Property were identified on the RCRA CORRACTS database.

RCRA non-CORRACTS Treatment, Storage and/or Disposal (TSD) Facilities

RCRA non-CORRACTS Treatment, Storage and/or Disposal (TSD) facilities are required to register hazardous waste activity under the Resource Conservation and Recovery Act (RCRA). Neither the Subject Property nor any sites located within 0.5 mile of the Subject Property were identified on the RCRA non-CORRACTS TSD database.

RCRA Hazardous Waste Generators

Hazardous waste generators tracked under the Resource Conservation and Recovery Act (RCRA) are classified as either Large Quantity Generators (LQGs), Small Quantity Generators (SQGs), or Conditionally Exempt Small Quantity Generators (CESQG). A RCRA-LQG is defined as a facility that generates over 1,000 kilograms (Kg) of hazardous waste, or over 1 Kg of acutely hazardous waste per month. A RCRA-SQG is defined as a facility that generates between 100 Kg and 1,000 Kg of hazardous waste per month. A RCRA-CESQG is defined as a facility that generates less than 100 Kg of hazardous waste, or less than 1 Kg of acutely hazardous waste per month. The Subject Property was identified on the RCRA Generator database. Information regarding the listing is presented in the following table:

RCRA GENERATORS			
Site	Distance / Direction / Gradient*	EPA ID No.	Regulatory Status
Hudson Steppe 34 State St Ossining, New York	Subject Property	NYR000119529	RCRA SQG as of 07/27/2016 No violations found

* Presumed hydrogeologic gradient based upon regional topography

The Subject Property (Hudson Steppe) is listed as a RCRA Small Quantity generator. Based upon information presented in the environmental database report, Hudson Steppe generated hazardous waste (lead), presumably during abatement of lead-based paint that was reportedly performed at the existing buildings in 2016. No violations were reported for Hudson Steppe. The regulatory database shows that a former tenant of the Subject Property, Hudson River Inlay, was listed as a RCRA Small Quantity Generator from 1979 through 2006 and generated ignitable waste. No violations are listed. Another former tenant, Con Edison, is listed as a RCRA Non-Generator as of 2008. No violations are listed. Based upon the absence of reported violations and the site conditions observed at the time of EBI's reconnaissance, the RCRA-SQG database listings for Hudson Steppe and Hudson River Inlay are not considered to represent an existing release, past release, or material threat of release of hazardous substances or petroleum products on the Subject Property.

Federal Engineering Control / Institutional Control Registries

The completion of site cleanup activities may include the implementation of engineering controls or institutional controls as part of the response action. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls. The Subject Property was not identified on Federal Engineering Control or Institutional Control Registries. However, two sites located within 0.5 mile of the Subject Property were identified on Federal Engineering Control or Institutional Control Registries. Information regarding the listed sites is presented in the following table:

FEDERAL ENGINEERING CONTROL AND INSTITUTIONAL CONTROL REGISTRIES			
Site	Distance / Direction / Gradient*	EPA ID No.	Regulatory Status
Hudson River PCBs No Street Applicable Hudson River, New York	700 feet / West / Downgradient	NYD980763841	Agency: USEPA Engineering Control: Sediment/SW dewatering, excavation, disposal, & treatment Institutional Control: NA Status: Final 09/21/1984 Contaminants: PCBs Media Impacted: Surface water, sediments

* Presumed hydrogeologic gradient based upon regional topography

The Hudson River PCBs Site was discussed previously as an NPL site.

Emergency Response Notification System (ERNS)

ERNS is a national database used to collect information regarding reported releases of petroleum products and/or hazardous substances. The database contains information from spill reports submitted to Federal agencies, including the EPA, the U.S. Coast Guard, the National Response Center, and the U.S. Department of Transportation. A review of this database was conducted in order to determine whether any spills or incidents involving releases of hazardous substances or petroleum products have occurred at the Subject Property. The Subject Property was not identified on the ERNS database.

Facility Index System/Facility Registry System (FINDS)

FINDS is a centrally managed database by the EPA that identifies facilities, sites or places subject to environmental regulations or of environmental interest. The database provides information regarding environmental activities that may affect air, water, and land in the United States. It is usually a cross-reference to other sources/databases that contain more detail. Two former tenants of the Subject Property (Hudson River Inlay and Con Edison) are listed on the FINDS database on the Environmental Interest/Information System. No violations are reported. Based on our observations during the site reconnaissance, it is considered unlikely that conditions associated with the FINDS listing represent an environmental concern to the Subject Property.

4.1.2 State and Tribal Agency Database Records

State and Tribal equivalent NPL Sites and CERCLIS Sites

State and tribal equivalent NPL and CERCLIS databases were searched for sites located within 1.0 mile and 0.5 mile of the Subject Property, respectively. The Subject Property was identified on state and/or tribal equivalent NPL and CERCLIS databases. Information regarding the listing is presented in the following table:

STATE AND TRIBAL EQUIVALENT NPL SITES AND CERCLIS SITES			
Site	Distance / Direction / Gradient	ID No.	Regulatory Status
Printer Corp 34 State St Ossining, New York	Subject Property	NYD013008446	Notification Date: Not reported Contaminants: Not reported Media Impacted: NA Status Date: 12/16/2003 Date of Closure: NA

According to the database report, a former tenant of the Subject Property, Printer Corp, is listed on the New York SHWS database. The database indicates the Subject Property was investigation by the Westchester Department of Health (DOH) which determined the tenant did not use lagoons to dispose of hazardous waste, but used concrete storage lagoons for the treatment of process water. The listing also indicates “no known disposal of hazardous wastes at this site.” Based upon the current regulatory status and EBI’s observations during our site reconnaissance, there do not appear to be any releases reported and it is considered unlikely that conditions associated with the identified listing represent an environmental concern to the Subject Property.

State and Tribal Spills Sites (Spills)

A review of available Spills databases was conducted in order to determine whether any spills or incidents involving releases of hazardous substances or petroleum products have occurred at the Subject Property. The Subject Property was not identified on the Spills database.

State and Tribal Landfill Sites and Solid Waste Disposal Sites

The state and tribal landfill and solid waste disposal site databases identify active or inactive landfill and transfer station facilities, as well as open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites. The Subject Property was not identified on state or tribal landfill and solid waste disposal site databases. However, two sites located within 0.5 mile of the Subject Property were identified on state or tribal landfill and solid waste disposal site databases. Information regarding the listed sites is presented in the following table:

STATE AND TRIBAL LANDFILL SITES AND SOLID WASTE DISPOSAL SITES			
Site	Distance / Direction / Gradient*	ID No.	Facility Status
North Water Street Organic Transfer Station 30 Water St Ossining, New York	0.114 mile / North- northwest / Crossgradient to Downgradient	60R24	Facility Type: Transfer Station Facility Status: Active No Reported Violations
Paradise Heating Oil I Quimby St Ossining, New York	0.135 mile / Northwest / Crossgradient to Downgradient	60O01	Facility Type: Waste Oil Storage, reprocessing or re-refining facility Facility Status: Active No Reported Violations

* Presumed hydrogeologic gradient based upon regional topography

Based upon the absence of reported violations and distance/presumed hydrogeologic gradient relative to the Subject Property, it is considered unlikely that conditions associated with the identified sites represent an environmental concern to the Subject Property.

State and Tribal Leaking Storage Tank Sites

Leaking Storage Tank Sites are properties where releases of hazardous substances or petroleum products from underground storage tanks (USTs) and/or aboveground storage tanks (ASTs) have been identified and reported to state, tribal, or local agencies. The Subject Property was not identified on state or tribal Leaking Storage Tank databases. However, 70 sites located within 0.5 mile of the Subject Property were identified on state or tribal Leaking Storage Tank databases. The 70 listed sites are all listed with a regulatory status of “closed,” and because the Subject Property is located on a hilltop none of the listed sites are upgradient of the Subject Property. Based upon the regulatory status and hydrogeologic position relative to the Subject Property, these sites are considered unlikely to represent

an existing release, past release, or material threat of release of hazardous substances or petroleum products on the Subject Property.

State and Tribal Registered Storage Tanks

The Subject Property and one adjoining property were identified on state or tribal Registered Storage Tank databases. Information regarding the listed sites is presented in the following table:

STATE AND TRIBAL REGISTERED STORAGE TANKS				
Location	Distance / Direction / Gradient*	Capacity / Contents	Year Installed	Status
Creative Design Inc 34 State St Ossining, New York	Subject Property	(1) 3,000-gallon UST / Contents not reported	Not reported	Removed (1993)
		(1) 1,000-gallon UST / Contents not reported	Not reported	Removed (1993)
		(1) 10,000-gallon UST / Contents not reported	Not reported	Closed in place (1988)
15-16 James Street 15-16 James Street Ossining, New York	Adjacent / South / Crossgradient	(2) 2,000- gallon UST / Contents not reported	Not reported	Removed (1999)
		(2) 2,000- gallon UST / Fuel Oil	2008	Removed (2015)

* Presumed hydrogeologic gradient based upon regional topography

Creative Design is a former tenant of the Subject Property and is listed as having three USTs. According to the database, a 10,000-gallon UST was closed in place at the Subject Property on September 1, 1986. Two more USTs, a 1,000-gallon capacity tank and a 3,000-gallon tank, were removed on December 1, 2003. No releases (LUSTs) were reported. EBI was not provided with any prior reports or closure documents regarding the UST removals/abandonment, or any plans or other documents indicating the location of the former USTs. Because it isn't known if they adversely impacted the Subject Property, these former USTs are considered a *recognized environmental condition (REC)*.

15-16 James Street are the two apartment buildings (Oxford House Apartments) that bound the western part of the Subject Property to south. The apartments are listed as having two 2,000-gallon UST removed in 1999, with two additional USTs removed in 2015. No releases (LUST cases) were reported. Based upon the absence of reported releases and presumed hydrogeologic gradient relative to the Subject Property, it is considered unlikely that conditions associated with this identified state or tribal Registered Storage Tank site represent an environmental concern to the Subject Property.

State and Tribal Engineering Control / Institutional Control Registries

The completion of site cleanup activities may include the implementation of engineering controls or institutional controls as part of the response action. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls. The Subject Property was not identified on state or tribal Engineering Control or Institutional Control Registries. However, one site located within 0.5 mile of the Subject Property was identified on state or tribal Engineering Control or Institutional Control Registries. Information regarding the listed site is presented in the following table:

STATE AND TRIBAL ENGINEERING CONTROL / INSTITUTIONAL CONTROL REGISTRIES			
Site	Distance / Direction / Gradient*	ID No.	Regulatory Status
Hudson Intl Conductors 62 Water St Ossining, New York	0.202 mile / North-northwest / Crossgradient to Downgradient	57382	Notification Date: Not reported Contaminants: Cadmium, chromium, zinc, cyanide, chlorinated solvents Media Impacted: Soil & GW Status: Closed, with ongoing monitoring Date of Closure: 12/2010

* Presumed hydrogeologic gradient based upon regional topography

Based upon the current regulatory status and presumed hydrogeologic gradient relative to the Subject Property, it is considered unlikely that conditions associated with the identified site represent an environmental concern to the Subject Property.

State and Tribal Voluntary Cleanup Sites

The Subject Property was not identified on state or tribal Voluntary Cleanup Site databases. However, two sites located within 0.5 mile of the Subject Property were identified on state or tribal Voluntary Cleanup Site databases. Information regarding the listed sites is presented in the following table:

STATE AND TRIBAL VOLUNTARY CLEANUP SITES			
Site	Distance / Direction / Gradient*	ID No.	Regulatory Status
CE-Ossining MGP 39 Central Ave and 30 Water St Ossining, New York	0.150 mile / North-northwest / Crossgradient to Downgradient	57904	Site Type: Former manufactured gas plant Responsible Party: Con Edison Notification Date: Not reported Contaminants: Coal tar, VOCs, SVOCs, BTEX Media Impacted: Soil & GW Status: Active Date of Closure: NA
Hudson Intl Conductors 62 Water St Ossining, New York	0.202 mile / North-northwest / Crossgradient to Downgradient	57382	Site Type: Former wire manufacturing Responsible Party: The Wire Mill, LLC Notification Date: Not reported Contaminants: Cadmium, chromium, zinc, cyanide, chlorinated solvents Media Impacted: Soil & GW Status: Closed, with ongoing monitoring Date of Closure: 12/2010

* Presumed hydrogeologic gradient based upon regional topography

Based upon the current regulatory status and/or presumed hydrogeologic gradient relative to the Subject Property, it is considered unlikely that conditions associated with the identified Voluntary Cleanup Sites represent an environmental concern to the Subject Property.

State and Tribal Brownfield Sites

The Subject Property was not identified on state or tribal Brownfield Sites databases. However, one site located within 0.5 mile of the Subject Property was identified on state or tribal Brownfield Sites databases. Information regarding the listed site is presented in the following table:

STATE AND TRIBAL BROWNFIELD SITES			
Site	Distance / Direction / Gradient*	ID No.	Regulatory Status
Hudson Intl Conductors 62 Water St Ossining, New York	0.202 mile / North-northwest / Crossgradient to Downgradient	57382	Notification Date: Not reported Contaminants: Cadmium, chromium, zinc, cyanide, chlorinated solvents Media Impacted: Soil & GW Status: Closed, with ongoing monitoring Date of Closure: 12/2010

* Presumed hydrogeologic gradient based upon regional topography

Based upon the current regulatory status and presumed hydrogeologic gradient relative to the Subject Property, it is considered unlikely that conditions associated with the identified Brownfield Site represent an environmental concern to the Subject Property.

4.1.3 Local Regulatory Agency Records

Local municipal offices consulted during the completion of this assessment included the following:

Village/Town of Ossining Building Department

EBI submitted a written request to Village of Ossining Building Department for information regarding the generation, transportation, storage, treatment, disposal, and/or spills or releases of hazardous substances or petroleum products at the Subject Property, in accordance with the Freedom of Information Act (FOIA). As of the date of this report, EBI had not received a response to this inquiry. Upon receipt of the agency response, if the provided information has a material effect on the findings of this report, EBI will forward this information as an addendum to this report. If no response is received, or no material information is identified, our report will not be modified.

Westchester County Department of Health

EBI submitted a written request to the Westchester County Department of Health for information regarding the generation, transportation, storage, treatment, disposal, and/or spills or releases of hazardous substances or petroleum products at the Subject Property, in accordance with the Freedom of Information Act (FOIA). As of the date of this report, EBI had not received a response to this inquiry. Upon receipt of the agency response, if the provided information has a material effect on the findings of this report, EBI will forward this information as an addendum to this report. If no response is received, or no material information is identified, our report will not be modified.

Village/Town of Ossining Fire Department

EBI submitted a written request to the Village/Town of Ossining Fire Department for information regarding the generation, transportation, storage, treatment, disposal, and/or spills or releases of hazardous substances or petroleum products at the Subject Property, in accordance with the Freedom of Information Act (FOIA). As of the date of this report, EBI had not received a response to this inquiry. Upon receipt of the agency response, if the provided information has a material effect on the findings of this report, EBI will forward this information as an addendum to this report. If no response is received, or no material information is identified, our report will not be modified.

4.1.4 Vapor Migration

EBI conducted a vapor migration screening survey of the Subject Property. EBI's site observations and review of the environmental database report (cited in Section 4.1) did not identify any conditions on the

Subject Property or on adjoining properties that would indicate a REC relative to vapor migration at the Subject Property.

This vapor migration screening was conducted in accordance with ASTM E1527-13 and is not intended to satisfy the requirements of ASTM E2600-15. The scope of this screening was limited to visual observations and review of the environmental database report and did not include the collection and laboratory analysis of air samples to confirm or refute the presence of airborne contaminants by vapor intrusion.

4.2 PHYSICAL SETTING

4.2.1 Topography

The Subject Property elevation varies from a high of approximately 180 feet above mean sea level (msl) on the northeast part of the site to a low of approximately 80 feet at the western end of the site. The Subject Property is located on a ridge that overlooks the Hudson River to west. The eastern developed part of the site slopes generally gently downward to the south and east. The western undeveloped part of the site slopes moderately to steeply downward to the west. The Subject Property is located east of the Hudson River, and the general slope of the surrounding region is to the west towards the river (see Figure 2 - Locus Map, which depicts the location of the Subject Property on the Ossining, New York USGS 7.5 Minute Topographic Quadrangle).

4.2.2 Geology and Soils

No bedrock outcroppings were observed at the Subject Property. Information concerning the geology of the Subject Property was obtained from the USGS Ground Water Atlas of the United States, New York region (1995). The Subject Property is located within the New England Upland Section physiographic province, which consists of Precambrian metamorphic and igneous rocks, primarily gneiss, mica schist, and granite. Cambrian and Ordovician sedimentary rocks, primarily carbonate rocks, sandstone, and shale, underlie parts of western New England.

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) website (<http://websoilsurvey.nrcs.usda.gov/app/>), the dominant soil composition in the vicinity of the Subject Property is classified as Urban land-Charlton-Chatfield complex, rolling, very rocky, 2 to 15 percent slopes (UIC). This soil consists of well-drained soils consisting of loam, sandy loam and flaggy silt loam overlying unweathered bedrock. The soil extends to a depth of 24 to 60 inches. Permeability is low to high, and the available water capacity is moderate to low. The depth to bedrock ranges from 20 to over 60 inches.

4.2.3 Hydrogeology and Hydrology

No natural surface water bodies were identified on or adjacent to the Subject Property. The nearest downgradient surface water body is the Hudson River, located approximately 700 feet east of the Subject Property.

Local groundwater gradient is expected to follow surface topography; therefore, groundwater flow near the Subject Property is expected to flow overall to the west. Groundwater depths and flow gradients are best evaluated by a subsurface investigation involving the installation of at least three groundwater monitoring wells and precise measurements of hydrostatic pressure. Monitoring wells were not observed on the Subject Property.

4.3 HISTORICAL USE OF THE SUBJECT PROPERTY AND ADJOINING PROPERTIES

EBI attempted to determine the history of the Subject Property dating back to the earlier of 1940 or first developed use. It should be noted that data failure occurred per Section 8.3.2.3 of ASTM Standard E 1527-13. Specifically, EBI could only identify records back to 1886, at which time the Subject Property was developed as a single-family residential property. The prior use of the property is unknown. However, it is anticipated that the Subject Property would have been undeveloped prior to this use, or that any prior uses would not have been involved in any activities that at this point would be considered an environmental concern. Therefore, this data failure is not considered to be significant. The following table summarizes the historical use of the Subject Property and surrounding area.

HISTORICAL USE SUMMARY			
Period	Historical Uses		Source(s)
	Subject Property	Surrounding Area	
At least 1830s-1910	Single-family home (mansion) on the northeastern part of the site, with a few outbuildings to southwest. A few single-family homes at the west end of the site from the 1890s.	Limited single-family residential development. A school (Mount Pleasant Military Academy) is present to northeast from the 1880s.	Fire Insurance Maps Topographic Maps Other Historical Records
1920s-1940s	The home has been expanded with an addition on the north side and is now a Knights of Columbus Club. A few single-family homes are present on the southern end of the site.	Single-family residential development. A school (Mount Pleasant Military Academy) is present through the 1920s and is then gone.	Fire Insurance Maps Topographic Maps Other Historical Records
Late 1940s – 1990s	Existing buildings now occupied by Printex Corporation, a silk screening company, and are expanded in the 1960s and 1970s. A few single-family homes are present on the southern end of the site.	Single-family residential and limited retail development.	Aerial Photographs Fire Insurance Maps Topographic Maps City Directories
1990s – 2013s	Existing buildings occupied by offices and by Hudson Inlay, a woodworking company.	Single-family residential and limited retail development.	Aerial Photographs Fire Insurance Maps Topographic Maps City Directories Personal Interviews
2014 to Present	Vacant	Single-family residential and limited retail development.	Aerial Photographs Fire Insurance Maps Topographic Maps City Directories Personal Interviews

According to our review of historical records Printex Corp was a tenant at the Subject Property from the 1940s through the 1990s and was a silk screening operation. Another tenant of the Subject Property, Creative Design, is listed as having had three USTS. These tanks were discussed previously in Section 4.1.2 and are considered a recognized environmental condition (REC).

4.3.1 Aerial Photographs

Historical aerial photographs may be used to evaluate changes in land use and to identify visible areas of potential environmental concern. A search for historical aerial photographs depicting the Subject Property and vicinity was conducted by Environmental Data Resources, Inc. (EDR). It should be noted that the scale of the available aerial photographs precludes the distinct identification of structures and/or land uses on or in the vicinity of the Subject Property. Aerial photographs depicting the Subject Property were reviewed and are summarized in the following table. Copies of selected aerial photographs are presented in Appendix F.

AERIAL PHOTOGRAPH SUMMARY		
Year	Issues Noted	Observations
1941	No	Subject Property: The resolution of the photograph is poor, no details about the occupancy of the site can be discerned.
		Surrounding Area: The resolution of the photograph is poor, no details about the occupancy of the surrounding properties can be discerned.
1953	No	Subject Property: The Subject Property is occupied by an L-shaped building (the existing structure) located in the northeastern corner of the site. Three single-family homes are located on the southern part of the site.
		Surrounding Area: The surrounding properties are primarily single-family residential, with apparent retail/commercial buildings located to northeast.
1957 1961 1964	No	Subject Property: Conditions on the Subject Property appear to be similar to those depicted on the 1953 photograph, with the exception that the building to south of the northern building is present.
		Surrounding Area: Conditions on the surrounding properties appear to be similar to those depicted on the 1953 photograph.
1974 1985 1989 1994	No	Subject Property: Conditions on the Subject Property appear to be similar to those depicted on the 1964 photograph, except additional small buildings are located west of the building on the northern part of the site.
		Surrounding Area: Conditions on the surrounding properties appear to be similar to those depicted on the 1964 photograph, except the existing apartment buildings that adjoin the western part of the site to south are present.
2006 2009 2011	No	Subject Property: Conditions on the Subject Property appear to be similar to those depicted on the 1994 photograph, except the single-family residences on the southern part of the site are no longer present.
		Surrounding Area: Conditions on the surrounding properties appear to be similar to those depicted on the 1994 photograph.

4.3.2 Fire Insurance Maps

A search for historical fire insurance maps depicting the Subject Property and vicinity was conducted by Environmental Data Resources, Inc. (EDR). Historical fire insurance maps depicting the Subject Property were reviewed and are summarized in the following table. Copies of selected fire insurance maps are presented in Appendix F.

FIRE INSURANCE MAP SUMMARY		
Year	Issues Noted	Observations
1886	No	Subject Property: The Subject Property is occupied by a single residential building located on the northeastern part of the site.
		Surrounding Properties: Features depicted on surrounding properties included single

FIRE INSURANCE MAP SUMMARY		
Year	Issues Noted	Observations
		family homes to east and south and a school (military academy) to northeast.
1891 1897 1903	No	<p>Subject Property: The Subject Property is occupied by a single residential building located on the northeastern part of the site. Two barns/outbuildings are located southwest of the residence.</p> <p>Surrounding Properties: Features depicted on surrounding properties included single family homes to northeast, east, south and southwest and a school (military academy) to northeast.</p>
1911	No	<p>Subject Property: Conditions on the Subject Property are similar to those as depicted on the 1903 map, with the addition of an additional outbuilding (a hen house) southwest of the outbuildings and a single-family residence on the southern part of the site.</p> <p>Surrounding Properties: Features depicted on surrounding properties included single family homes to northeast, east, south and southwest and a school (military academy) to northeast.</p>
1924 1931 1942	No	<p>Subject Property: The residential building has been expanded, is now L-shaped, and is shown to be a Knights of Columbus hall. Three single-family homes are now on the southern part of the site.</p> <p>Surrounding Properties: Features depicted on surrounding properties included single family homes to northeast, east, south and southwest. The school (military academy) to northeast is gone in the 1931 map.</p>
1949	No	<p>Subject Property: The building on the Subject Property is shown to be occupied by Printex Corp of America, cloth printing. The three residences on the southern part remain.</p> <p>Surrounding Properties: Features depicted on surrounding properties included single family homes to northeast, east, south and southwest.</p>
1971	No	<p>Subject Property: The Subject Property is developed with the existing two large buildings and outbuildings, and is shown to be Printex Corp of America, screen cloth printing.</p> <p>Surrounding Properties: Features depicted on surrounding properties included single family homes to northeast, east, south and southwest. The existing apartment buildings to south are present.</p>

4.3.3 Topographic Maps

Historical topographic maps provide information related to physical land configuration such as elevation, ground slope, surface water and other features. While most buildings in densely developed urban centers are not depicted, topographic maps typically show structures equal to or larger than the size of a single-family residence in rural areas. Other notable features such as woods, pipelines, municipal boundaries, and areas of filled land are often marked on topographic maps.

A search for historical topographic maps depicting the Subject Property and vicinity was conducted by Environmental Data Resources, Inc. (EDR). Historical topographic maps depicting the Subject Property were reviewed and are summarized in the following table. Copies of selected topographic maps are presented in Appendix F.

TOPOGRAPHIC MAP SUMMARY		
Year	Issues Noted	Observations
1892 1893	No	<p>Subject Property: One structure is shown on the northeastern part of the site.</p> <p>Surrounding Properties: The surrounding street grid is shown, with small buildings</p>

TOPOGRAPHIC MAP SUMMARY		
Year	Issues Noted	Observations
1902		(apparently residences) located along the streets.
1936	No	Subject Property: One structure which appears to be L-shaped is shown on the northeastern part of the site. Surrounding Properties: The surrounding street grid is shown, with small buildings (apparently residences) located along the streets.
1955	No	Subject Property: One structure which appears to be L-shaped is shown on the northeastern part of the site. Surrounding Properties: The surrounding properties are shaded to represent urban development; no distinct structures or other notable features are depicted.
1967 1979	No	Subject Property: The Subject Property is shaded to represent urban development; no distinct structures or other notable features are depicted. Surrounding Properties: The surrounding properties are shaded to represent urban development; no distinct structures or other notable features are depicted.
2013	No	Subject Property: No structures or other notable features are shown on the site. Surrounding Properties: No structures or other notable features are shown on the surrounding properties.

4.3.4 Street Directories

Street directories are commercial publications containing names and addresses, and in many cases, occupations of the occupants of a particular community. The directories may also contain information pertaining to business processes conducted within a community. A search for historical street directories was conducted by Environmental Data Resources, Inc. (EDR). Historical street directories were reviewed and are summarized in the following table. Copies of the street directories are presented in Appendix F.

STREET DIRECTORY SUMMARY		
Year	Issues Noted	Occupants
1972 1977 1982	No	Subject Property is occupied by Printex Corp and Vera Neumann.
1987	No	Subject Property is occupied by Printex Corp, Levine Graphics, The Cortlandt Group, Vera Neumann and Seville Associates.
1992	No	Subject Property is occupied by Printex Corp, Art Business Consulting, The Cortlandt Group and Creative Designs.
1995	No	Subject Property is occupied by Cortlandt Group, Creative Designs Han Corp and Hudson River Inlay.
1999	No	Subject Property is occupied by PG Arbor & Co, Hudson River Inlay, and United Vision Sales.
2003	No	Subject Property is occupied by D Rotindo, Gregory Tavano, and Hudson River Valley Inlay.
2008	No	Subject Property is occupied by PG Arbor & Co, River Hudson, and United Vision Sales.
2013	No	Subject Property is occupied by Hudson River Inlay, River Hudson, and United Vision Sales.

4.3.5 Recorded Land Title Records

Land title records provide information on previous ownership of a property. Typically, deeds signifying transfer of a land parcel are recorded in county files and can be researched to determine the identity of past owners. A “chain of title” is a continuous record of ownership for a specific parcel. A 50-year chain of title search was not included in the scope of work for this assessment.

4.3.6 Property Tax Records

Property tax records for the Subject Property were obtained from the Westchester County Assessor’s Office. The property records identify the current owners as Ossining Land LLC and Hunter James Associates LLC. A listing of the former Subject Property owners was not available for review.

4.3.7 Environmental Liens and Activity and Use Limitations

A search for Environmental Liens and Activity and Use Limitations was not included in the scope of this assessment.

4.3.8 Previous Environmental Reports

EBI was provided with the following previous environmental document regarding the Subject Property:

New York Department of Labor, Division of Safety and Health, Letter dated September 30, 2015

- The letter is addressed to Adelaide Environmental Health Associates (Adelaide) and indicates the agency granted a variance for interior friable debris cleanup and various ACM removal at the Vacant 3-Story building located at 34 State Street in Ossining New York. The variance refers to a proposed interior cleanup of friable debris in the attic and boiler room and the removal of ACM joint compound in the attic. Attachments to the letter indicate the abatement will address the following materials: 14,600 square feet (sf) of roofing materials, 2,500 sf of joint compound, 600 sf of pin mastic, 600 sf of duct cover, 1,200 sf of floor tile, 25 sf of debris, 26 mudded fittings, 16,000 sf of transite, and approximately 1,700 linear feet of caulk.
- One of the attachments to the letter is a portion of an asbestos and lead-based paint survey report by Adelaide that indicates a survey was conducted on August 12, 13 and 27th and September 2, 2015. The survey included 273 asbestos samples, 385 XRF readings and 3 PCB samples. Nineteen samples/homogeneous areas tested positive for asbestos, 53 XRF readings tested positive for lead, and zero PCB samples tested positive. Note that EBI was not provided with a copy of the inspection report.

Relevant information from the document is discussed in the appropriate sections of this report, and the provided document is presented in Appendix G.

4.3.9 Other Historical Records and Interviews

Mr. Chris Dos Anjos, Day Porter, was interviewed to obtain information regarding the history of the Subject Property. According to Mr. Dos Anjos, he has been familiar with the Subject Property for approximately 10 years and the original part of the northern building constructed in the 1830s. Mr. Dos

Anjos stated that asbestos and lead-based paint abatement was performed at the site in 2016 and is complete. However, he did not provide any related documentation to EBI to verify this statement.

5.0 SUBJECT PROPERTY RECONNAISSANCE

The Subject Property reconnaissance was conducted by Mr. Herb Spitz, EBI Senior Scientist, on January 13, 2017. Mr. Spitz was accompanied by and interviewed Mr. Chris Dos Anjos, the Subject Property Day Porter.

5.1 METHODOLOGY AND LIMITING CONDITIONS

The Subject Property reconnaissance consisted of visual and/or physical observations of the Subject Property and improvements, adjoining properties as viewed from the Subject Property boundaries, and the surrounding area based on visual observations made from adjacent public thoroughfares. Unimproved portions of the Subject Property were observed along the perimeter and in a general grid pattern in safely accessible areas. Building exteriors were observed along the perimeter from the ground, unless described otherwise. Building interiors were observed as they were made safely accessible, unless described otherwise.

At the time of the survey, the weather was sunny and approximately 45° Fahrenheit. During the survey, representative tenant spaces, mechanical spaces, and/or equipment components were observed. There were no significant portions of the Subject Property that were inaccessible or excluded from this survey.

5.2 HAZARDOUS SUBSTANCES AND PETROLEUM PRODUCTS

5.2.1 Hazardous Substances and Petroleum Products (Identified Uses)

No notable hazardous substances or petroleum products were observed at the Subject Property.

EBI did not identify evidence of significant leaks, spills, or the improper handling of petroleum or hazardous substances that might impact the environmental condition of the Subject Property.

5.2.2 Hazardous Substances and Petroleum Products (Unidentified Uses)

EBI did not observe evidence of hazardous substance or petroleum products containers at the Subject Property that were not in connection with identified uses.

5.2.3 Unidentified Substances Containers

EBI did not observe evidence of unidentified substances containers at the Subject Property.

5.3 WASTE GENERATION, STORAGE, AND DISPOSAL

EBI identified the following waste streams generated at the Subject Property:

WASTE GENERATION, STORAGE, AND DISPOSAL			
Classification	Type of Waste / Generation Process	Type of Storage / Location	Disposal Method / Contractor
Non-regulated Solid Waste	Municipal Solid Waste / Routine Site Operations	None observed	NA
Non-regulated Liquid Waste	Sanitary Sewage / Routine Site Operations	NA (Municipal Sanitary Sewer)	Town/Village of Ossining
Regulated Solid or Liquid Waste	None identified	NA	NA
Biomedical Waste	None identified	NA	NA

No evidence of improper solid waste management or the improper disposal of hazardous substances or petroleum products was observed at the time of reconnaissance.

5.4 UNDERGROUND STORAGE TANKS (USTs) & ABOVEGROUND STORAGE TANKS (ASTs)

5.4.1 Existing Storage Tanks

Based upon site reconnaissance, interviews, and a review of state and local records, EBI identified no evidence of existing USTs or ASTs located at the Subject Property.

5.4.2 Former Storage Tanks

According to the regulatory database, a former tenant of the Subject Property (Creative Designs) is listed as having three USTs. According to the database, a 10,000-gallon UST was closed in place at the Subject Property on September 1, 1986. Two more USTs, a 1,000-gallon capacity tank and a 3,000-gallon tank, were removed on December 1, 2003. No releases (LUSTs) were reported. EBI was not provided with any prior reports or closure documents regarding the UST removals/abandonment, or any plans or other documents indicating the location of the former USTs. Because it isn't known if they adversely impacted the Subject Property, these former USTs are considered a *recognized environmental condition (REC)*.

5.5 OIL-CONTAINING EQUIPMENT AND POLYCHLORINATED BIPHENYLS (PCBs)

Polychlorinated biphenyls (PCBs) are a chemical component of many dielectric fluids, heat transfer fluids, hydraulic fluids, lubricating oils, paints, or coatings manufactured prior to July 2, 1979. Equipment that may potentially contain PCBs includes electrical equipment such as transformers or capacitors or hydraulically operated equipment, such as elevators, compaction equipment, or manufacturing equipment. The manufacture and distribution in commerce of PCBs was banned for use in 1979 by the United States Congress, which enacted the Toxic Substance and Control Act (TSCA). In accordance with *US Code of Federal Regulations Title 40 - Protection of Environment, Chapter I - Environmental Protection Agency, Subchapter R - Toxic Substance Control Act (TSCA), Part 761 - Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*, the owner of a transformer or other PCB-containing equipment is responsible for equipment maintenance and remediation in the event of a leak or release.

No potential PCB-containing equipment was identified at the Subject Property.

One overhead traction freight elevator services the southern building. The elevator is electrically powered and cable operated and does not contain hydraulic equipment.

5.6 ADDITIONAL SITE CONDITIONS

The following is a summary of visual and/or physical observations of the Subject Property on the day of the site visit. Photographs of pertinent Subject Property features are presented in Appendix A.

ADDITIONAL SITE CONDITIONS	
Condition	Identified
Interior Drains, Trenches, or Sumps	No
Interior Stains or Corrosion	No
Unusual Odors	No
Interior Pools of Liquid	Yes

ADDITIONAL SITE CONDITIONS	
Condition	Identified
Stained Soil or Pavement	No
Stressed Vegetation	No
Indications of Solid Waste Disposal	Yes
Exterior Pits, Ponds, or Lagoons	No
Wastewater or Stormwater Discharge/Disposal	No
Oil-Water Separators or Clarifiers	No
Septic Systems or Cesspools	No
Wells (Drinking Water Wells, Monitoring Wells, Agricultural/Irrigation Wells, or Process Water Wells)	No
Petroleum or Natural Gas Pipelines/Easements	No

At the time of our site visit part of the basement of the northern building was flooded, apparently from a leaking water line.

Piles of fill soils and construction debris (asphalt, concrete, wood, etc.) were observed at the western edge of the developed part of the site. No evidence of hazardous materials or contamination was observed in these materials, therefore they are not considered a recognized environmental condition.

6.0 INTERVIEWS

The site contact or Key Site Manager was contacted to be interviewed to obtain information regarding recognized environmental conditions in connection with the property. Additionally, a Pre-Survey Questionnaire was forwarded to the designated Subject Property contact. The Pre-Survey Questionnaire has not been completed and returned to our offices. The information requested in the Pre-Survey Questionnaire is intended to assist in gathering information that may be material to identifying recognized environmental conditions in connection with the Subject Property.

KEY SITE MANAGER INTERVIEW			
Contact / Affiliation	Date of Communication	Years Associated with Subject Property	Telephone No.
Mr. Chris Dos Anjos Day Porter	01/13/2017	10	(914) 906-1011

The following additional persons were interviewed to obtain information regarding recognized environmental conditions in connection with the property.

ADDITIONAL INTERVIEWS			
Contact / Affiliation	Date of Communication	Years Associated with Subject Property	Telephone No.
Counter Staff Clerk's Office Town/Village of Ossining	01/13/2017	NA	(914) 762-8428

Pertinent information from the interviews is presented in applicable sections of this report.

7.0 CONSIDERATIONS OUTSIDE THE SCOPE OF ASTM PRACTICE E 1527-13

The following sections address environmental issues or considerations at the Subject Property that parties may wish to assess in connection with commercial real estate that are outside the scope of ASTM Practice E 1527-13 (non-scope considerations).

7.1 ASBESTOS-CONTAINING MATERIAL (ACM)

Asbestos is a term used to describe a group of six naturally occurring crystalline fiber minerals. Asbestos has excellent thermal stability, a high degree of tensile strength, and has been used extensively in the textile, insulation, and building industries, particularly as a component in fireproofing, decorative coatings, insulation materials, and as reinforcement for plaster binders in building products. Asbestos-containing building materials are generally classified as friable or non-friable. Friable materials are those that can be crumbled, pulverized, or reduced to powder by hand pressure, or by normal use or maintenance can be expected to emit asbestos fibers into the air. Non-friable ACM is a potential concern if it is damaged by maintenance work, demolition, or other activities, at which time it may be considered friable.

A previous letter from the New York Department of Labor, dated September 30, 2015 and referenced in Section 4.3.8 of this report, included an attachment which was a portion of an asbestos and lead-based paint survey report by Adelaide Environmental Health Associates (Adelaide) that indicates a survey was conducted on August 12, 13 and 27th and September 2, 2015. The survey included 273 asbestos samples. Nineteen samples/homogeneous areas tested positive for asbestos. Attachments to the letter indicate the abatement will address the following materials: 14,600 square feet (sf) of roofing materials, 2,500 sf of joint compound, 600 sf of pin mastic, 600 sf of duct cover, 1,200 sf of floor tile, 25 sf of debris, 26 mudded fittings, 16,000 sf of transite, and approximately 1,700 linear feet of caulk. Mr. Dos Anjos stated that asbestos abatement was performed at the site in 2016 and is complete. However, he did not provide any related documentation to EBI to verify this statement. EBI was not provided with a copy of the inspection report.

EBI conducted a limited visual screening survey for the presence of ACM at the Subject Property. EBI identified friable suspect ACM in the form of textured ceiling and wall surfacing materials, sheetrock/joint compound composite material, lath and plaster systems, and 2'x4' white perforated acoustical ceiling tile and non-friable suspect ACM in the form of vinyl floor tile and associated mastic, various construction mastics and caulking, and roofing materials. Because EBI wasn't provided with a copy of the previous inspection report, it is not known if these materials were sampled as part of the previously-discussed asbestos inspection and abatement activity.

Please note that this survey was limited to visual observations of accessible areas and that the scope of work for this assessment did not include the collection and laboratory analysis of bulk samples of suspect ACM. Additional suspect ACM may be present in inaccessible areas, including, but not limited to, roofs, pipe chases behind solid walls and ceilings, concealed floor coverings, the interior of machinery or equipment, or water and sewer systems.

It should be noted that the limited visual screening survey conducted under the scope of work for this assessment does not constitute a full asbestos inspection, in which all areas of the buildings would have been thoroughly surveyed and sampled. The possibility exists for ACM to be present in areas of the buildings not accessed or sampled by EBI personnel. Based on the limited scope of this assessment, additional suspect ACM may also present in areas of the buildings that were accessed as part of this assessment. EBI's limited visual screening should not be considered a pre-demolition survey.

Due to the continued distribution of a wide variety of asbestos-containing building materials, asbestos may be present in some of the roofing, flooring, wall and ceiling materials, caulking/putties, adhesives, spackling compounds, and insulation materials, as well as other building materials that may be used at the Subject Property. Sampling many of these materials requires techniques that may be destructive to subject facilities, and in the case of roofing material, may void warranties. It is recommended that an asbestos inspection be performed in accordance with all applicable federal, state, and local regulatory requirements prior to renovation, demolition, or other activities that could cause a material disturbance. Any removal or disturbance of ACM or suspect ACM should be performed by properly trained personnel and in compliance with federal, state, and local regulations.

7.2 RADON

Radon is a naturally-occurring, colorless and odorless radioactive gas that is generated primarily in granitic rocks. The United States Surgeon General has published information that radon is a cause of lung cancer. Radon usually enters a building through openings in the foundation, and therefore is a potential health concern to residents of the lowest level of a building with inadequate ventilation.

The EPA Map of Radon Zones indicates that Westchester County is located within a Zone 3 radon area. Zone 3 is defined as an area that has a low potential for radon gas, with a predicted average indoor radon screening level less than 2.0 picoCuries per liter (pCi/L). The EPA recommended Action Level for radon is 4.0 pCi/L.

Based upon the location in a Zone 3 area and in accordance with the scope of work for this assessment, EBI did not conduct a limited short-term radon screening at the Subject Property.

7.3 LEAD-BASED PAINT (LBP)

Use of lead in household paint was banned by the U.S. Environmental Protection Agency (EPA) effective January 1, 1978. The EPA and the U.S. Department of Housing and Urban Development (HUD) consider lead-based paint as containing a lead concentration equal to or greater than 1.0 milligram per square centimeter (mg/cm²) or 0.5% lead by weight, as defined by Title X of the 1992 Housing and Community Development Act.

Based on the non-residential use of the existing buildings and in accordance with the scope of work of this assessment, a lead-based paint (LBP) survey was not conducted at the Subject Property.

7.4 LEAD IN DRINKING WATER

Lead has historically been used in pipes, solder, and brass fixtures used in water distribution systems and building plumbing systems. In 1986, EPA banned the use of lead at concentrations exceeding 0.2% lead in solder and 8% lead in other plumbing materials. Lead in drinking water results primarily from corrosion of lead containing materials in service lines or from corrosion of lead containing materials in building plumbing systems such as lead solder, brass, bronze, and other lead containing alloys. The EPA Action Level for lead in public drinking water supplies is 0.015 parts per million (ppm) or 0.015 milligrams per liter (mg/L).

Municipal water service is provided to the Subject Property by the Village of Ossining. Potable water is reportedly obtained from the Croton reservoir. Based upon review of the Annual Drinking Water Quality Report for 2015, the municipal water supply meets all current criteria established by the Safe Drinking Water Act (SDWA) and local municipal drinking water standards, including those for lead.

Based upon the existing municipal water service and in accordance with the scope of work for this assessment, EBI did not conduct lead-in-drinking water sampling at the Subject Property.

8.0 FINDINGS AND OPINIONS

EBI has performed this Phase I Environmental Site Assessment of the Subject Property in conformance with the scope and limitations of ASTM Standard E 1527-13. Any exceptions to, or deletions from, this practice are described in Section 1.0 of this report. This assessment has identified no evidence of *recognized environmental conditions (RECs)* in connection with the Subject Property, except for the following:

- Creative Design is a former tenant of the Subject Property and is listed as having three USTs. According to the database, a 10,000-gallon UST was closed in place at the Subject Property on September 1, 1986. Two more USTs, a 1,000-gallon capacity tank and a 3,000-gallon tank, were removed on December 1, 2003. No releases (LUSTs) were reported. EBI was not provided with any prior reports or closure documents regarding the UST removals/abandonment, or any plans or other documents indicating the location of the former USTs. Because it isn't known if they adversely impacted the Subject Property, these former USTs are considered a *recognized environmental condition (REC)*.

In addition, the following *consideration outside the scope of ASTM Practice E 1527-13* was identified in connection with the Subject Property:

- EBI conducted a limited visual screening survey for the presence of ACM at the Subject Property. EBI's limited visual screening should not be considered a pre-demolition survey. EBI identified friable suspect ACM in the form of textured ceiling and wall surfacing materials, sheetrock/joint compound composite material, lath and plaster systems, and 2'x4' white perforated acoustical ceiling tile and non-friable suspect ACM in the form of vinyl floor tile and associated mastic, various construction mastics and caulking, and roofing materials. Because EBI wasn't provided with a copy of the previous inspection report, it is not known if these materials were sampled as part of the previously-discussed asbestos inspection and abatement activity. Please note that this survey was limited to visual observations of accessible areas and that the scope of work for this assessment did not include the collection and laboratory analysis of bulk samples of suspect ACM. Additional suspect ACM may be present in inaccessible areas, including, but not limited to, roofs, pipe chases behind solid walls and ceilings, concealed floor coverings, the interior of machinery or equipment, or water and sewer systems. Asbestos is a condition outside the scope of ASTM E 1527-13 and is not considered a *recognized environmental condition (REC)*.

9.0 RECOMMENDATIONS

Based upon the findings of this investigation, EBI offers the following recommendations:

- EBI recommends that all available documentation regarding the USTs removed from the Property or closed in-place at the Property be provided to EBI for review to further determine if environmental concerns remain. If this additional information is inconclusive or if no additional information is available, then a review of the State files for these tanks is recommended to gather additional information. Cost to review any additional information provided and to review any regulatory files will be \$100 per hour, not to exceed \$1,000 without prior client approval. If information from the State is inconclusive or if no additional pertinent information is available, then a Phase II subsurface investigation is recommended to determine if these tanks have adversely impacted the environmental integrity of the Property. The scope of work for a subsurface investigation could be influenced by the findings of the document review, therefore a cost for subsurface investigation activities is not available at this time.
- It is recommended that an asbestos inspection be performed in accordance with all applicable federal, state, and local regulatory requirements prior to renovation, demolition, or other activities that could cause a material disturbance. Any removal or disturbance of ACM or suspect ACM should be performed by properly trained personnel and in compliance with federal, state, and local regulations.

10.0 REFERENCES

PHASE I ENVIRONMENTAL SITE ASSESSMENT REFERENCES

ASTM Designation E 1527-13 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

Environmental Data Resources, Inc., EDR Aerial Photo Decade Package; Inquiry Number 4825098.5, dated January 11, 2017.

Environmental Data Resources, Inc., Certified Sanborn Map Report, Inquiry Number 4825098.3, dated January 11, 2017.

Environmental Data Resources, Inc., EDR Historical Topographic Map report; Inquiry Number 4825098.4, dated January 11, 2017.

Environmental Data Resources, Inc., The EDR Radius Report with GeoCheck®; Inquiry Number 04825098.2r, dated January 11, 2017.

Environmental Data Resources, Inc., The EDR-City Directory Abstract; Inquiry Number 4825098.6, dated January 12, 2017.

New York Department of Labor, Division of Safety and Health, Letter dated September 30, 2015.

USGS Topographic Map, Ossining, New York Quadrangle, 7.5-Minute Series, dated 2013.

Web Soil Survey, NRCS, U.S. Department of Agriculture, January 17, 2017, On-line:
<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

APPENDIX A

PHOTOGRAPHS



1. Looking southwest across State Street at Subject Property.



2. Looking northwest across State Street at Subject Property.



3. Looking southwest at northern end of Subject Property.



4. Looking north at south end of Subject Property from James Street.



5. Looking east at west end of Subject Property from Hunter Street.



6. Looking east at west end of Subject Property from Hunter Street.



7. Historical portion of northern building, looking west.



8. Addition at north end of northern building.



9. Looking south toward southern building.



10. Looking north at south end of southern building.



11. Crawl space beneath southern building.



12. West façade of southern building.



13. Looking east at historical part of northern building.



14. Looking north into lined concrete area (former lagoon?) next to northern building.



15. Outbuildings west of northern building.



16. Interior of southern building.



17. Vinyl floor tile in southern building.



18. Ceiling tiles in former office area of southern building.



19. Interior of historical part of northern building.



22. Basement of northern building.



20. Basement of historical portion of northern building.



23. Flooded portion of basement of northern building.



21. Lath and plaster system in basement ceiling.



24. Debris piles along western part of developed portion of site.



25.

Debris piles along western part of developed portion of site.



28.

Looking east across State Street at retail properties to northeast of Subject Property.



26.

Looking southwest across the intersection of State and James Streets at single-family homes south of Subject Property.



29.

Looking northwest across State Street at funeral home north of Subject Property.



27.

Looking east across State Street at single-family homes east of Subject Property.



30.

Apartment building south of Subject Property.



31. House on east side of Hunter Street at west end of Subject Property (not a part of site).

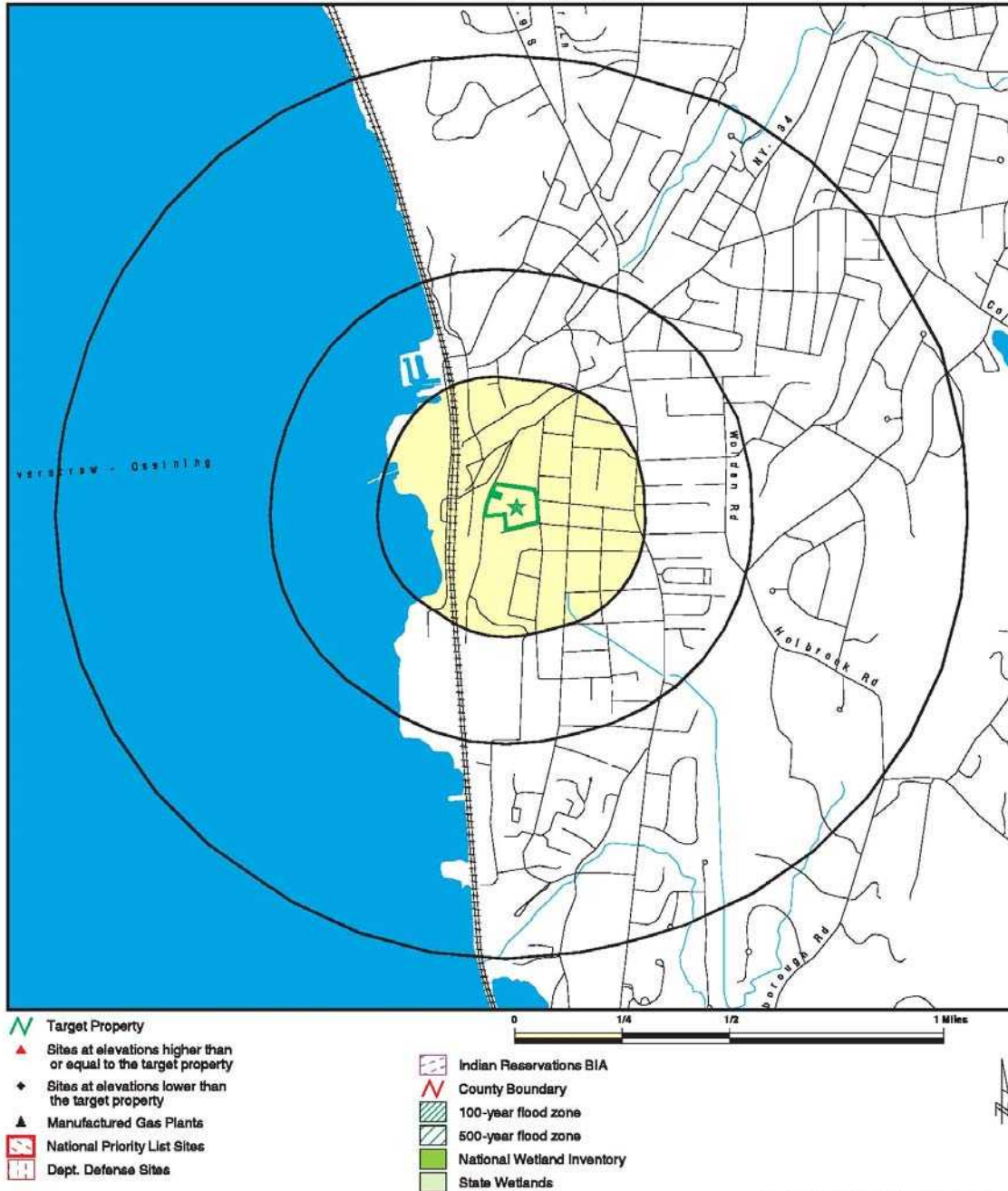


32. Looking west across Hunter Street at single-family homes beyond.

APPENDIX B

FIGURES

OVERVIEW MAP - 04825098.2R



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

<p>SITE NAME: 34 State Street, 17-25 James Street, & 27 Hunter S</p> <p>ADDRESS: 34 State Street, 17-25 James Street, & 27 Hunter S</p> <p>Ossining NY 10562</p> <p>LAT/LONG: 41.157068 / 73.866321</p>	<p>CLIENT: EnviroBusiness, Inc.</p> <p>CONTACT: Production Manager</p> <p>INQUIRY #: 04825098.2r</p> <p>DATE: January 11, 2017 9:29 am</p>
---	--

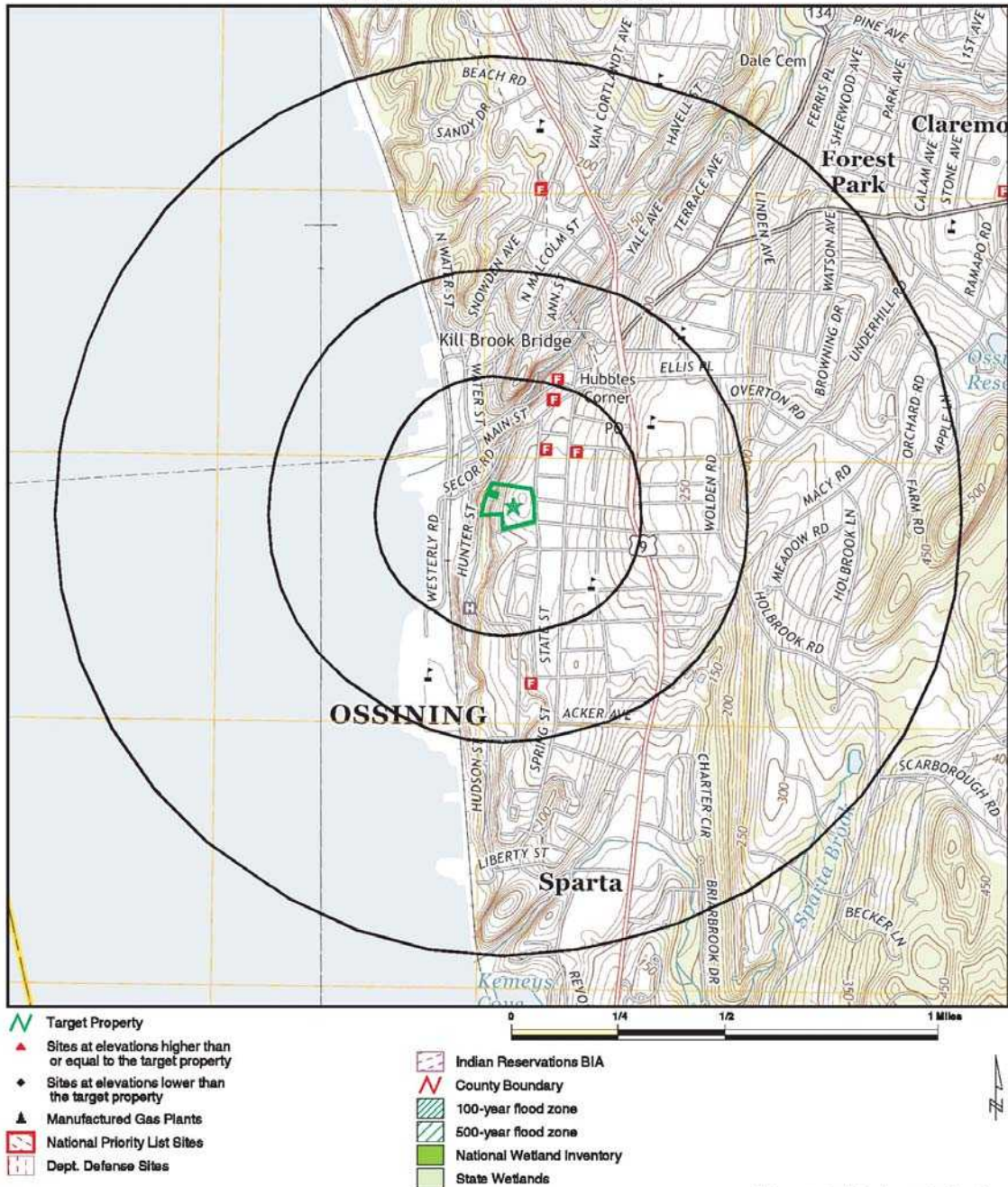
Copyright © 2017 EDR, Inc. © 2015 TomTom Rel. 2015.

Figure 1 –Location Map

PN: 1117000093



OVERVIEW MAP - 04825098.2R



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 34 State Street, 17-25 James Street, & 27 Hunter S
ADDRESS: 34 State Street, 17-25 James Street, & 27 Hunter S
 Ossining NY 10562
LAT/LONG: 41.157068 / 73.866321

CLIENT: EnviroBusiness, Inc.
CONTACT: Production Manager
INQUIRY #: 04825098.2r
DATE: January 11, 2017 9:29 am

Copyright © 2017 EDR, Inc. © 2015 TomTom Rel. 2015.

Figure 2 – USGS Quad Location Map

PN: 1117000093



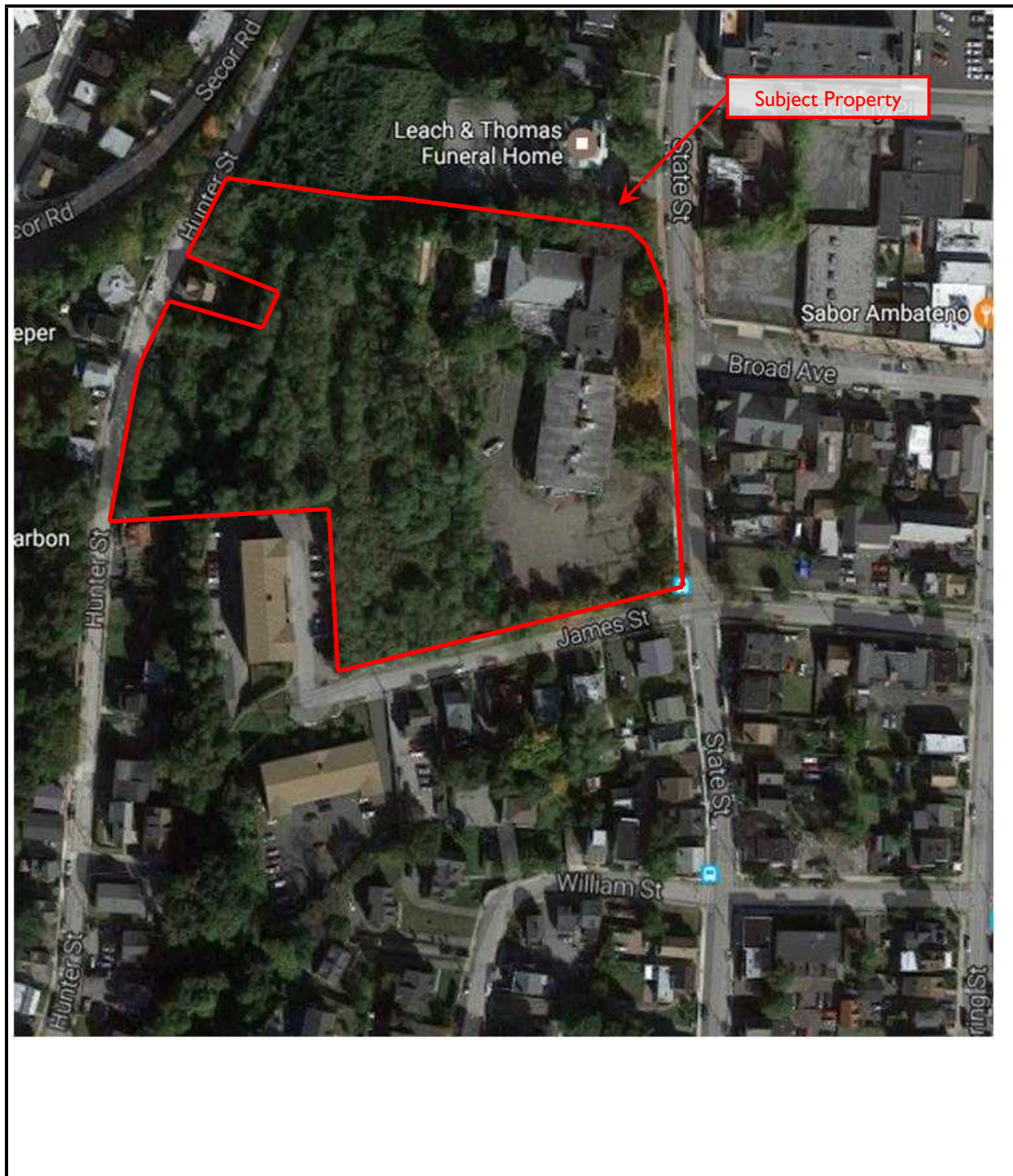


FIGURE 3 – SITE PLAN



Not to scale

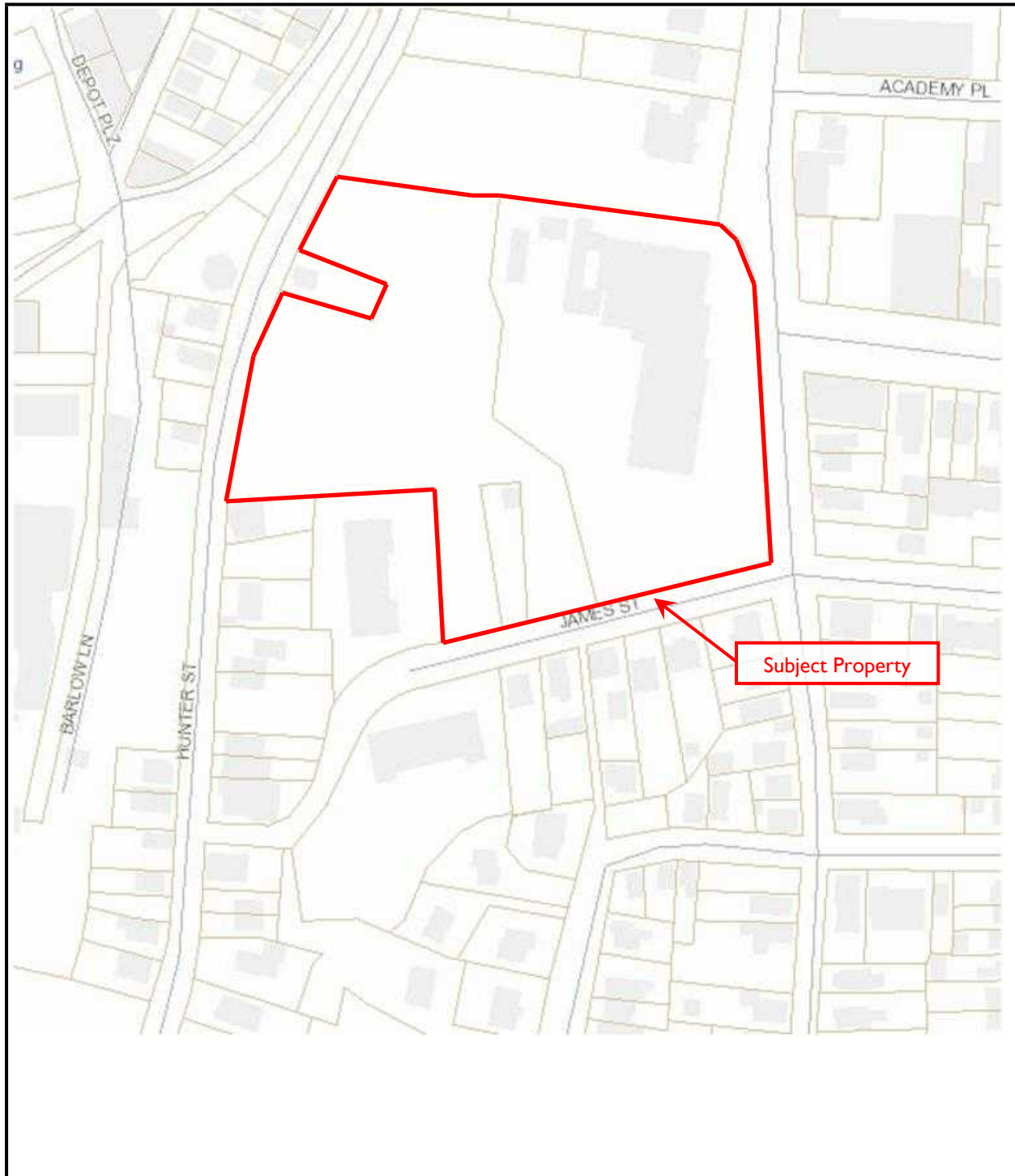


FIGURE 4 – TAX MAP



Not to scale

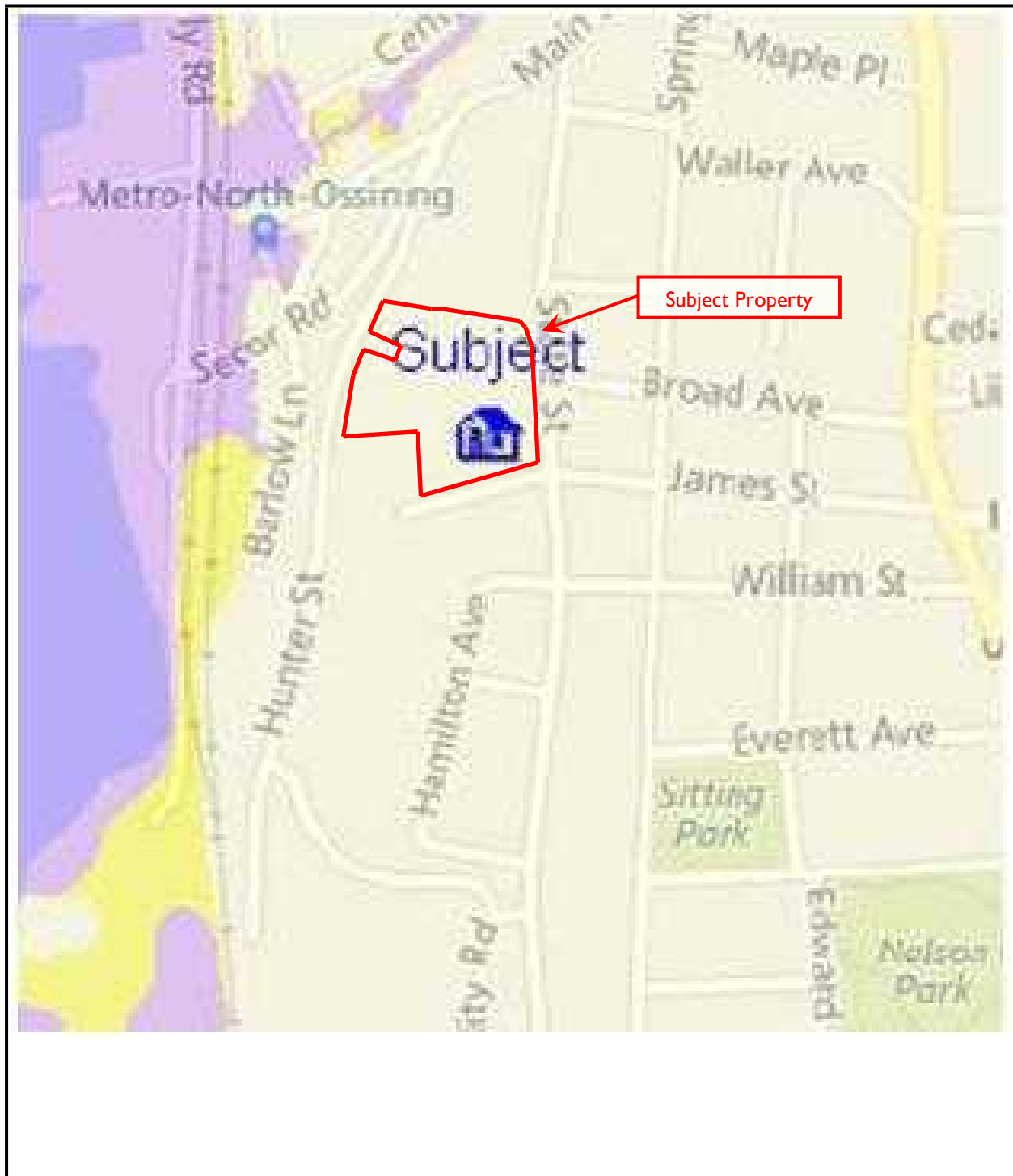


FIGURE 5 – FLOOD MAP



Not to scale

APPENDIX C

PRE-SURVEY QUESTIONNAIRE AND OTHER RELEVANT DOCUMENTATION



CORPORATE

REGIONAL OFFICE

TEL. 717-428-0401 FAX 781-425-3623
REResearchGroup@ebiconsulting.com

FACSIMILE TRANSMITTAL SHEET

To:
Jeremy Nussbaum

From:
Kim Holland
Project Coordinator

Date:
March 20, 2014

Fax number or email address:
jnussbaum@deerwoodcap.com

Total number of pages including cover:
4

☒ **Please complete and return**

☒ **Please Reply**

Email to **REResearchGroup@ebiconsulting.com**
Or Fax to 781-425-3623

☒ **Urgent**

Re: Environmental Site Assessment Questionnaire for property known as or located at

34 STATE STREET, 17-25 JAMES STREET, & 27 HUNTER STREET

We have been requested by:
Paradigm Capital Group, LLC

Subject:
**To complete an Environmental survey of
the above mentioned property.**

EBI Project #:
1117000093

1. Please read these instructions and those on the following page carefully.
2. Please assemble this original questionnaire and one copy of pertinent property documents, and forward all information to the site or the site contact for the Engineer and/or Scientist to use during the site visit. This documentation will be included in our report.
3. Please fill out this questionnaire to the best of your knowledge and email or fax it back to us within three business days.
4. The Scientist will contact you directly to schedule the site visit.
5. This information is extremely time sensitive and necessary to provide your lender with accurate and timely report.



Please fill out and sign this questionnaire to the best of your knowledge for the Scientist's site visit. Email to Kim Holland at REResearchGroup@ebiconsulting.com or fax to 781-425-3623, for our report files, and keep the original to provide to the Scientist.

6.

Subject Property Name: 34 State Street, 17-25 James Street, & 27 Hunter Street
EBI Project #: 1117000093

Address: 34 State Street, 17-25 James Street, & 27 Hunter Street - (Sec. 97.07; Lots 17, 18, 68) Ossining NY

Subject Property Owner: _____ **Purchase Date:** _____

On-Site Property Contact: _____ **Telephone:** _____

Fax: _____ **Email:** _____

Your Name and title	Signature	Date
----------------------------	------------------	-------------

Additional plans and documentation (see page 4) must be forwarded to the site for the Scientist during the survey. For questions not applicable please respond "N/A." Attach additional pages if necessary. This questionnaire and your responses will be included as an exhibit in the Environmental report. Accurate and full completion is critical to a timely completion of our reports, and timely loan closing.

LOCAL JURISDICTIONAL INFORMATION

1. What is the property ID #, Lot and Block, or Township/Range ID #? _____
2. What is the legal Municipality or County that has jurisdiction over the property? _____
3. What is the assessors file ID number and tax file ID number if available? _____

PROPERTY INFORMATION

4. What is the size of the subject property lot or lots, in acres? _____
 5. How many buildings comprise the subject property? _____
 - a. If the property is a mall or large retail center, please confirm and list ownership of each building. _____
 6. What is the gross and net rentable square footage of the building(s)? _____
 7. What is the date of construction of the building(s)? When was the building(s) first occupied? _____
 8. How many tenant spaces or apartments are at the Subject Property? _____
 9. Please list, to the best of your knowledge, any structural, water infiltration, mold, roof, plumbing, HVAC, Fire Alarm or electrical deficiencies or problems. _____
 10. Please list any deficiencies noted during any Building, Fire or Health Department inspections in the last three years. _____
-
- | | |
|--|-----------------------------------|
| 11. Please list the following utility providers: | Electricity: _____ |
| Water: _____ | Storm Drainage: _____ |
| Sanitary Sewer: _____ | Natural Gas or Oil: _____ |
| Trash Hauler: _____ | and, Frequency of Pick-ups: _____ |

12. Please attach a brief history of the property.

ENVIRONMENTAL SITE ASSESSMENT PRE- SURVEY QUESTIONNAIRE

1. Describe the current uses of the property noting tenant names and oil/chemical usage. _____

2. Describe the past uses of the property noting tenant names and oil/chemical usage. _____
3. (Y) (N) Has a previous environmental site assessment report been prepared for the property? If yes, for what reason? Can EBI have a copy? _____
4. (Y) (N) Has a subsurface investigation (Phase II) ever been conducted on the property, including soil sampling, groundwater sampling, or installation of groundwater monitoring wells? If yes, for what reason? What were the results? Can EBI have a copy of the report? Are there any groundwater monitoring wells currently located on the property? _____
5. (Y) (N) Has contamination been identified at the Subject Property? Describe the nature of the contamination (i.e., source, media impacted, location, sampling, cleanup activities, regulatory status, etc.). Can EBI have copies of related documentation? _____
6. (Y) (N) Has a spill or surficial release occurred at the Subject Property? Describe the nature of the spill/surficial release (i.e., source, location, response/cleanup actions, regulatory status, etc.). Can EBI have copies of related documentation? _____
7. (Y) (N) Is the Subject Property listed with the USEPA and/or the state environmental regulatory agency as a contaminated site? If yes, please describe. Can EBI have copies of related documentation? _____
8. (Y) (N) Has there ever been previous sampling for Asbestos, Lead-Based Paint, Lead in Water, or Radon? If yes, please describe. Can EBI have copies of related documentation? _____
9. (Y) (N) Has there been any Asbestos or Lead-Based Paint abatement or Radon mitigation conducted at the Subject Property? Are there Asbestos and/or Lead-Based Paint Operations and Maintenance Plans for the Subject Property? If yes, please describe. Can EBI have copies of related documentation? _____
10. (Y) (N) Any known environmental liens, deed restrictions, or use limitations for the Property? If yes, please describe. Can EBI have copies of related documentation? _____
11. (Y) (N) Any permitted or regulated activities (Hazardous waste generator, air) on the Property? If yes, please describe. _____
12. (Y) (N) Are there any transformers or other electrical equipment, which may contain PCBs? If yes, please describe. Where are they? Who owns the transformer(s)? Who services them? _____
13. (Y) (N) Has an industrial or manufacturing operation, gas station, motor repair facility, commercial printing facility, dry cleaners, photo-developing laboratory, junk yard, landfill or waste, treatment, storage, disposal processing or recycling facility ever been located at or adjacent to the property? If yes, please describe. _____
14. (Y) (N) Are there any discarded drums, barrels or containers, construction debris, damaged or discarded automobile or industrial batteries, or pesticides, paints or other chemicals in individual containers or drums of greater than five gallons or fifty gallons in aggregate located on the property? If yes, please describe. _____
15. (Y) (N) Have there ever been any waste storage or treatment lagoons, pits, ponds, or surface impoundments on the property? If yes, please describe. _____
16. (Y) (N) Does the property have floor drains not discharging to a sewer? Septic System? If yes, please describe. _____
17. (Y) (N) Are there currently aboveground or underground storage tanks at the property? If yes, complete table.

Type of Tank	Size	Content	Installation Date	Spill/Leak Detection? Y or N
Above or Underground	gal			
Above or Underground	gal			
Above or Underground	gal			
Above or Underground	gal			

18. Are you aware of any information to indicate that the Subject Property was sold for substantially below its fair market value? If so, please provide an explanation: _____

19. Additional comments and/or pertinent information relevant to this Phase I ESA: _____

DOCUMENT AND INFORMATION CHECKLIST

Please provide the following information (as much as possible in electronic format) so the Scientist can proceed with the survey of the property.

A. Plans	B. Municipal Documents	C. Additional Information
<ul style="list-style-type: none">▪ ALTA Survey or Site Plan▪ Reduced scale Site and Building Plans	<ul style="list-style-type: none">▪ Certificate of Occupancy▪ Building Permit▪ Copy of tax cards▪ UST/AST Registrations	<ul style="list-style-type: none">▪ Tenant Rent Roll▪ Historical Uses▪ Previous Due Diligence Reports▪ Copy of most Recent Appraisal

EBI ACCESS REQUIREMENTS

At the time of the site visit the Consultant is required to gain access to all areas of the property. This includes:

- All building interiors, including as applicable, common areas, lobbies, a representative sampling of offices, retail spaces, manufacturing or assembly areas, or apartments, community rooms, exercise rooms, pool areas, storage rooms, attics and basements, garages.
- All building perimeters
- All site amenities
- All building roofs, unless pitched asphalt shingles. This may require you to obtain and provide a ladder.
- All mechanical, electric, sprinkler, HVAC, utility, service, elevator, storage and equipment rooms

October 26, 2016

To Whom It May Concern
Records Access Office
Westchester County Department of Health
145 Huguenot Street
New Rochelle, NY 10801

**Re: Phase I Environmental Site Assessment Public Records Request
34 State Street, 17-25 James Street, & 27 Hunter Street
Ossining, New York 10562
EBI Project No. 1117000093**

To Whom It May Concern:

EBI Consulting (EBI) is conducting a Phase I Environmental Site Assessment (ESA) at the above-referenced Subject Property. As part of the ESA process, we would like to request access to records regarding the following, as applicable:

- Current and historical environmental health code violations
- Current and historical environmental health permits
- Asbestos or lead-based paint abatement

We understand that these records may not be available. Please complete the applicable area below regarding record availability and return to our attention either via email at REResearchGroup@ebiconsulting.com or via fax at (781) 425-3623. If these records are available, EBI field personnel will be stopping by to review these records in the next several days. If there are any questions or concerns, please do not hesitate to contact us.

Sincerely,

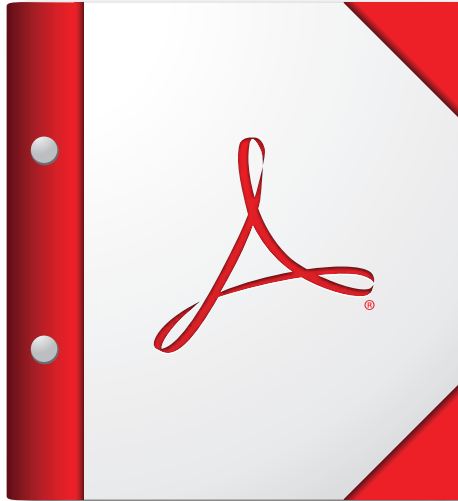
Herb Spitz
21 B Street
Burlington, MA 01803
(602) 909-1112
reresearchgroup@ebiconsulting.com

I hereby certify that requested records ☐ are ☐ are not available in this Department. If records are available, an appointment to review ☐ is not ☐ is required.

Name and Title

Signature

Date



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Acrobat X or Adobe Reader X, or later.**

Get Adobe Reader Now!



MARY ANN ROBERTS
TOWN / VILLAGE CLERK

TOWN OF OSSINING VILLAGE OF OSSINING

MUNICIPAL BUILDING

16 Croton Avenue

Ossining, NY 10562

Phone (914) 762-8428

Fax (914) 941-0627

Mary Ann Roberts

Records Access Officer

Town/Village of Ossining

Telephone 914-762-8428 Fax 914-941-0627



APPLICATION FOR PUBLIC ACCESS TO RECORDS

Name: Herb Spitz

Date: January 10, 2017

Address: 21 B Street Burlington, MA 01803

Telephone: (602) 909-1112

I hereby apply to inspect the following record/s: For the property at 34 State Street, 17-25 James Street, & 27 Hunter Street in Ossining, NY the following as applicable: current and historical building permits and certificates of occupancy, date of construction, dates of public sewer and water connection, installation or removal of storage tanks (above and underground), hazardous materials storage or release, hazardous waste generation or discharge, asbestos or lead based paint abatement.

Rim Holland on behalf of Herb Spitz
SIGNATURE

For Agency Use Only

Approved ()

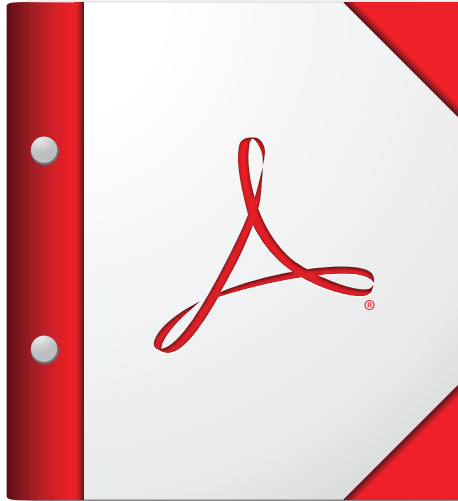
Denied for reason(s)

- () Confidential Disclosure () Part of Investigatory Files
- () Unwarranted Invasion of Person Privacy
- () Record which this Agency as legal custodian cannot be found
- () Record is not maintained by this Agency
- () Exempt by Statute other than Freedom of Information Act
- () Other, please specify _____

SIGNATURE /TITLE

DATE

NOTE: You have a right to appeal a denial of this application to the head of this agency. A full explanation of reason for such denial shall be, in writing, within seven days of receipt of an appeal.



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Acrobat X or Adobe Reader X, or later.**

Get Adobe Reader Now!

ESA AAI USER QUESTIONNAIRE (ASTM E1527)

Subject Property Name: 34 State Street, 17-25 James Street, & 27 Hunter Street - (Sec. 97.07; Lots 17, 18, 68)

EBI Project #: TBD

Address: 34 State Street, 17-25 James Street, & 27 Hunter Street, Ossining, New York

1. Are you aware of any environmental cleanup liens against the Subject Property that are filed or recorded under federal, tribal, state or local law?

No

If yes, please provide a copy.

2. Are you aware of any Activity and Use Limitations (AULs), such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law?

There is an approved site plan for redevelopment of the entire property

If yes, please provide a copy.

3. As the user of this ESA do you have any specialized knowledge or experience related to the Subject Property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the Subject Property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business? Or, do you have documentation (i.e., Phase I ESAs, Phase II subsurface investigations, Tank Removal reports, remedial reports, asbestos sampling and/or abatement reports, lead-based paint sampling and/or abatement reports, etc.) for the Subject Property that may be relevant to the Phase I ESA?

We recently completed an asbestos remediation program on the existing improvements

Comments:

4. Does the purchase price being paid for this Subject Property reasonably reflect the fair market value of the Subject Property?

N/A

If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the Subject Property?

Comments:

5. Are you aware of commonly known or reasonably ascertainable information about the Subject Property that would help the environmental professional to identify conditions indicative of release or threatened releases? For example, as user,

- a. Do you know the past uses of the Subject Property? *Some - silkscreen, woodwork*
- b. Do you know the specific chemicals that are present or once were present at the Subject Property? *No*
- c. Do you know of spills or other chemical releases that have taken place at the Subject Property? *No*
- d. Do you know of any environmental cleanups that have taken place at the Subject Property?

only the asbestos remediation program

Comments:

6. As the user of this ESA, based on your knowledge and experience related to the Subject Property are there any obvious indicators that point to the presence or likely presence of contamination at the Subject Property?

No

Comments:

Michael O'Mara

Title:

APPENDIX D

PROFESSIONAL QUALIFICATIONS

SUMMARY OF EXPERIENCE

Mr. Herb Spitz, PG, is a Senior Scientist with over twenty-five years of project management and supervisory experience in environmental consulting and property condition assessments. He has experience in all phases of Environmental Assessments and Remedial action including soil and groundwater characterization, remedial action plans, remediation oversight, brownfields assessments, and UST investigations and removals. He also has extensive experience in facilities-related services including property condition assessments, asbestos and lead-based paint surveys, radon testing, and indoor air quality/mold assessments.

Mr. Spitz has significant experience throughout the U.S. He has completed projects for commercial, financial, industrial, telecommunications and real estate management firms as well as for local and state governmental clients. Administrative aspects of his experience include technical report review, personnel training, project management, client relations, quality control, regulatory compliance, contract administration and department management.

Relevant Project Experience

Environmental Site Assessments: Mr. Spitz has performed and managed over 1,400 phase I environmental site assessment projects on industrial, commercial, residential, agricultural and undeveloped properties in connection with real estate transactions and telecommunications facilities. Duties included performing site and area reconnaissance, reviewing regulatory searches and researching site history, interviewing site managers/owner and identifying and evaluating potential environmental concerns. Duties also included proposal writing, oversight and training of junior staff, report review and quality control, and client liaison.

Property Condition Assessments: Mr. Spitz has performed over 300 engineering assessments of apartment complexes, healthcare facilities, retail shopping centers and commercial office buildings in accordance with ASTM protocols as well as numerous equity investment scope requirements.

Phase II Environmental Site Assessments: Mr. Spitz has conducted and managed over 350 phase II site assessment projects to evaluate potential soil and groundwater contamination. Duties included proposal and budget development, oversight of drillers, logging soil borings, and collecting and field screening soil and groundwater samples and installation of groundwater monitoring wells. Additional duties have included data evaluation, report writing, client liaison, developing recommendations for further work and/or remedial action, and training of junior staff.

UST Investigations/Remedial Action: Mr. Spitz has developed workplans for UST assessments, designed and implemented subsurface investigations, developed removal specifications, managed contractor bidding and assisted clients with contractor selection, and managed UST removal projects. Conducted site characterizations and coordinated regulatory closures.

Indoor Air Quality Investigations: Mr. Spitz has conducted onsite investigations in response to tenant complaints, conducted air sampling for various constituents (temperature, humidity, carbon monoxide, carbon dioxide, VOCs and microbial contaminants including mold spores). Evaluated data and wrote reports.

Microbial Surveys: Mr. Spitz has conducted building inspections and sample collection on single-family homes as well as multi-tenant residential and commercial facilities with tenant complaints or “sick building” syndrome. Visual investigation and air sample collection was utilized to determine the possible presence of microbial (fungal) contamination in various indoor spaces. Evaluated data, compared indoor microbial levels to background (outdoor) levels, and wrote reports.

Asbestos/Lead Surveys: Mr. Spitz has conducted building inspections and sample collection on approximately 250 industrial, commercial, and residential properties. Sampling included collection of bulk samples/chip samples and XRF usage as well as quantifying and mapping of all materials sampled. Prepared proposals and reports.

Education

Bachelor of Science, Geology, Cum Laude – University of Massachusetts at Amherst
Master of Science, Structural Geology – Oregon State University
Hazardous Materials Management – UCLA and University of California at Santa Barbara

Professional Registrations

Registered Professional Geologist (PG) – State of Arizona
Registered Professional Geologist (PG) – State of California
Certified Engineering Geologist (CEG) – State of California
Certified Environmental Manager (CEM) – State of Nevada
LEED Accredited Professional – U.S. Green Building Council
EPA Accredited Asbestos Inspector

Summary of Experience

Mr. Maglietta is an environmental scientist with over 31 years of experience in performing and managing environmental investigations and site assessments in the U.S., Canada, and Mexico. Mr. Maglietta also has extensive experience conducting regulatory file reviews and performing asbestos, radon, lead paint, lead in water, and indoor air quality surveys.

Mr. Maglietta has performed or managed over 12,000 Phase I and II Environmental Site Assessments, Transaction Screens, Desk Reviews, Database Reviews, and regulatory file reviews for a wide range of properties for the purpose of evaluating site conditions, potential off-site liabilities, and site remediation costs. These services have been performed in order to advise property owners, operators and prospective purchasers of potential and existing environmental concerns. Mr. Maglietta has worked with corporate environmental officers, numerous Wall Street lending institutions, legal counsel, governmental agencies including HUD, SBA, FDIC and state governments, rating agencies, investment companies and real estate brokers to develop strategies for managing properties with environmental concerns.

Relevant Project Experience

Environmental Site Assessments: Mr. Maglietta has conducted ASTM Phase I Environmental Site Assessments, Environmental Site Screenings, and soil and groundwater sampling for various clients and has prepared Phase I and Phase II reports for a variety of properties located in the United States, Canada, and Mexico. These properties have included industrial, commercial, retail, healthcare, raw land, and multi-family residential properties. Mr. Maglietta has provided project management for underground storage tank removals and site characterizations, and has performed sampling for radon, asbestos-containing materials, lead-based paint and lead in water.

Subsurface Investigations: Mr. Maglietta has completed subsurface investigations at retail, commercial and industrial properties. Subsurface investigations have included direct-push sampling methodology, hollow-stem auger methodology, the installation of soil borings and shallow and deep groundwater monitoring wells, and subsequent sampling of soil and groundwater.

Education

B.A., Geology, Augustana College, Rock Island, IL

Professional Registrations

Licensed Professional Geologist, Illinois #196-000719

40-hour OSHA hazardous waste site operations (29 CFR 1910.120)

Airborne asbestos sampling and evaluation techniques, NIOSH 0582

Microscopical identification of asbestos, NIOSH 7400

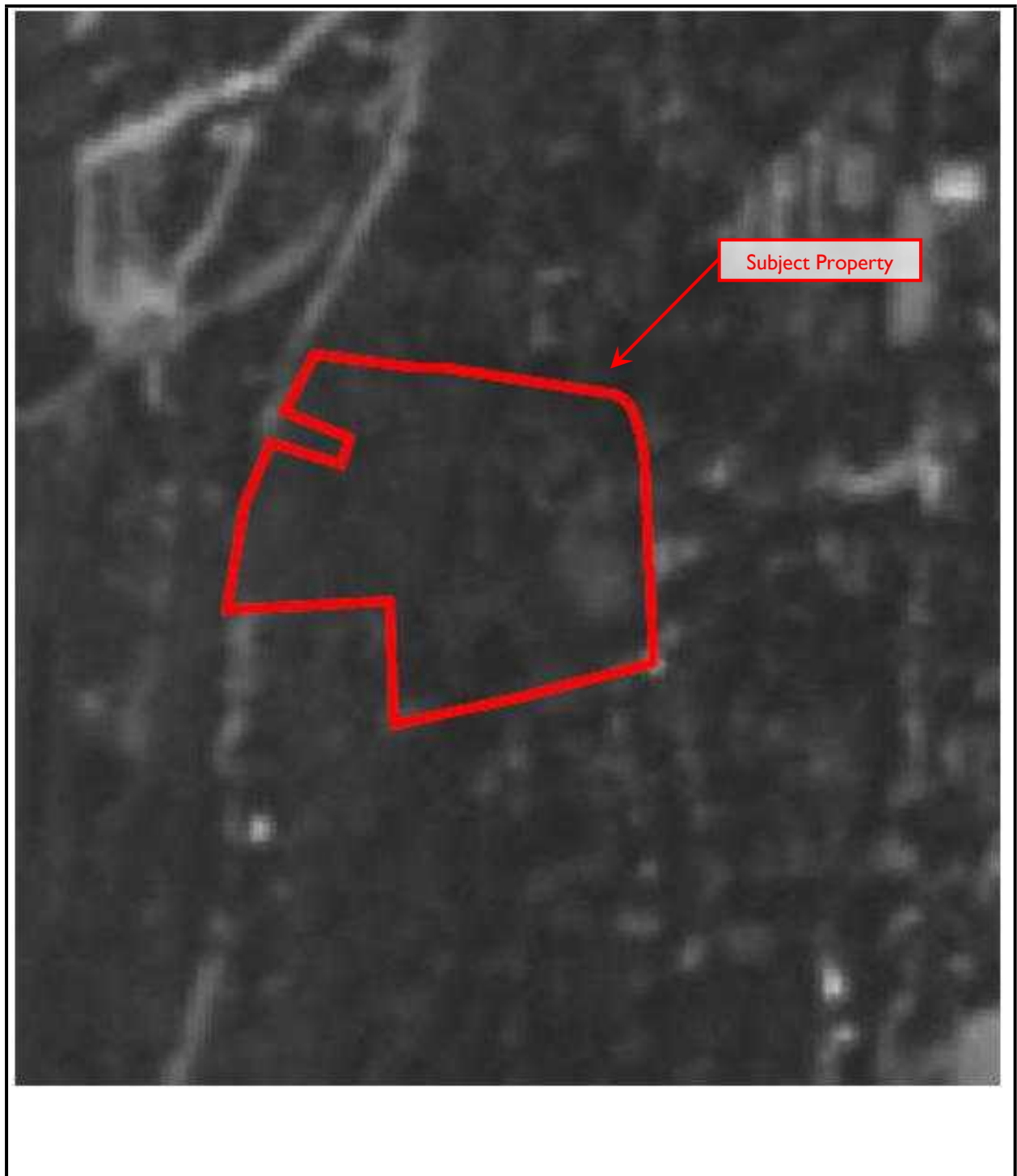
AHERA asbestos inspector

APPENDIX E

REGULATORY DATABASE REPORT

APPENDIX F

HISTORICAL DOCUMENTATION



Aerial Photograph

Year: 1941





Aerial Photograph

Year: 1953





Aerial Photograph

Year: 1957





Aerial Photograph

Year: 1964





Aerial Photograph

Year: 1974





Aerial Photograph

Year: 1985





Aerial Photograph

Year: 1994





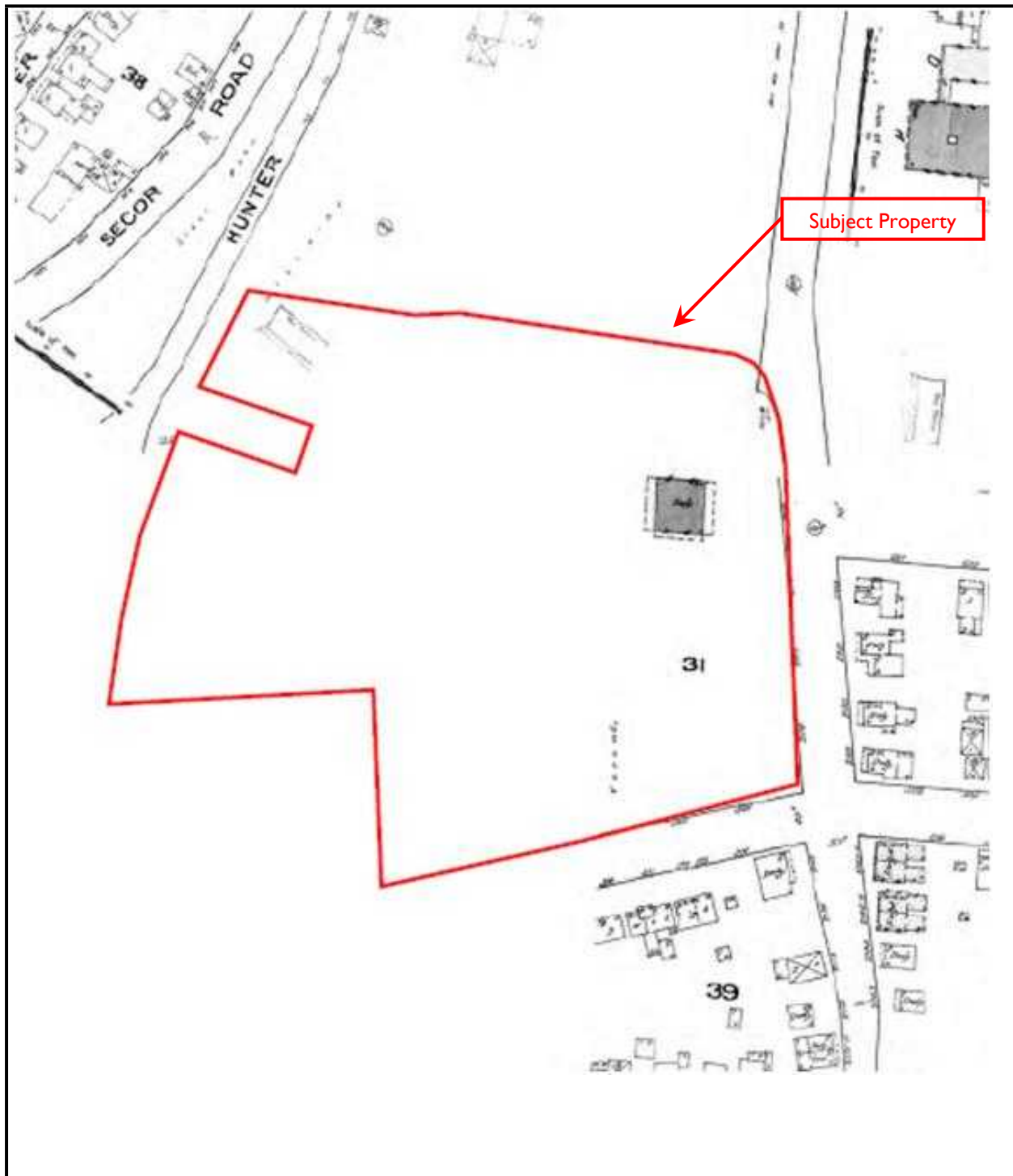
Aerial Photograph
Year: 2006





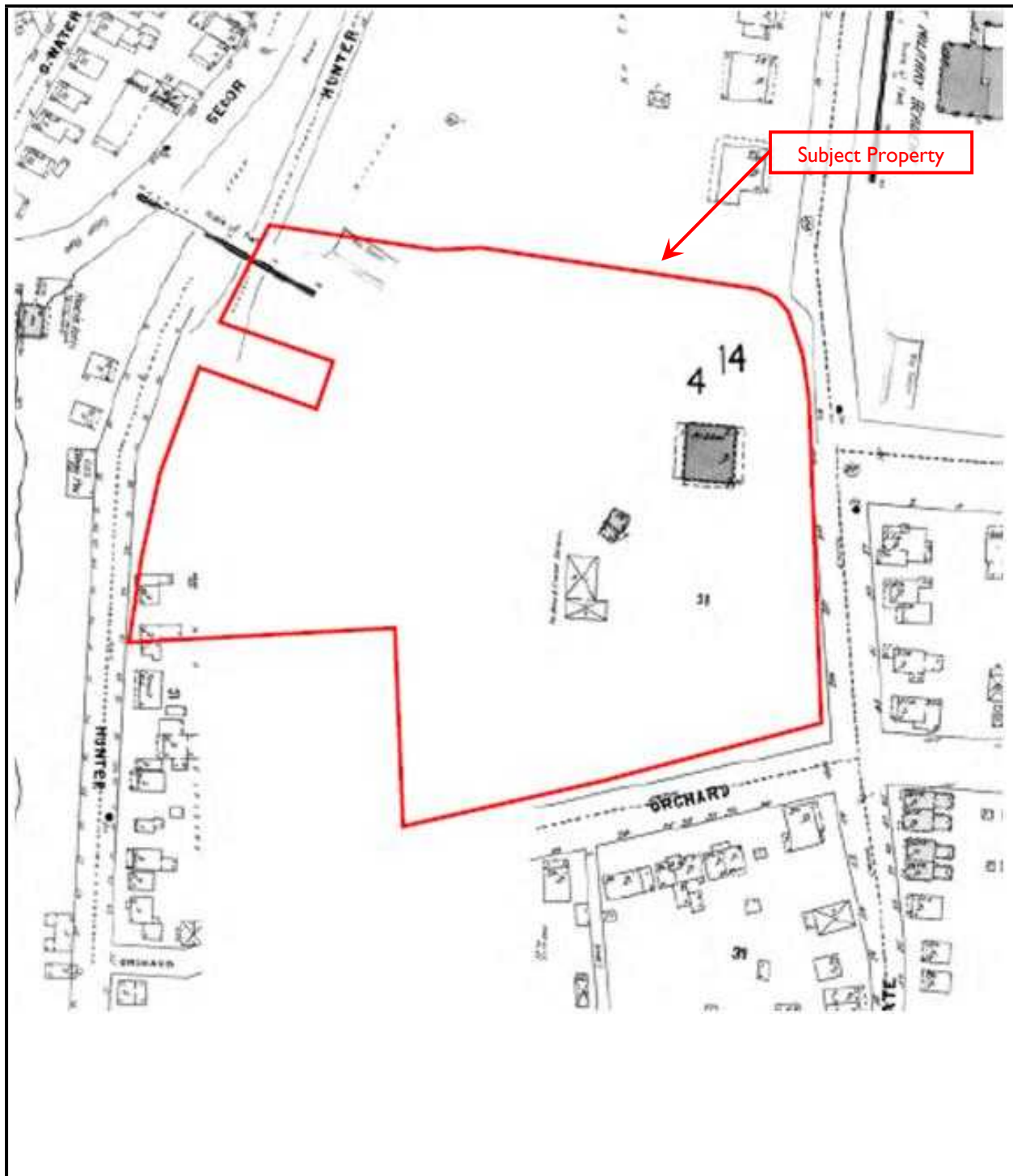
Aerial Photograph
Year: 2011





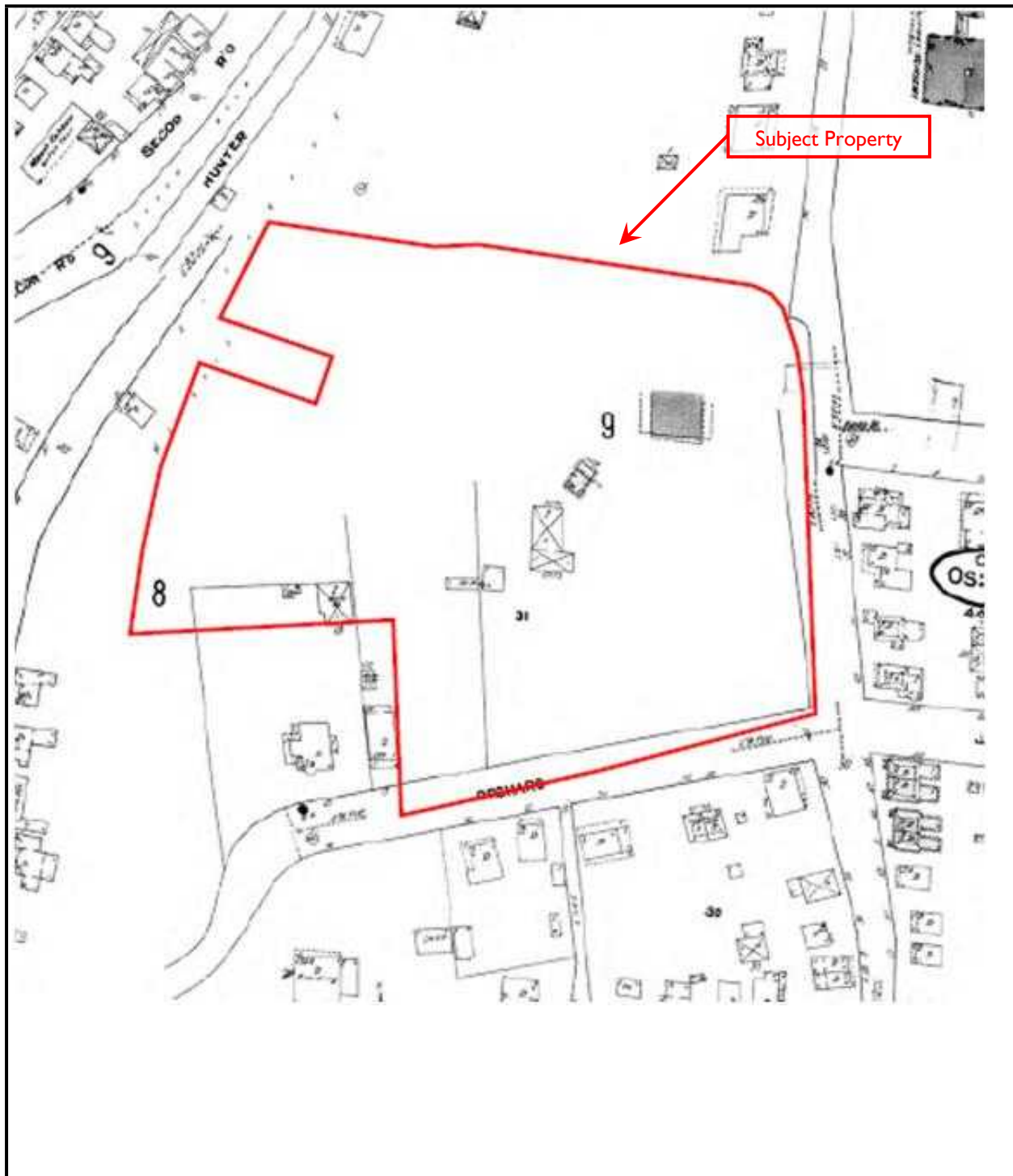
Fire Insurance Map
Year: 1886





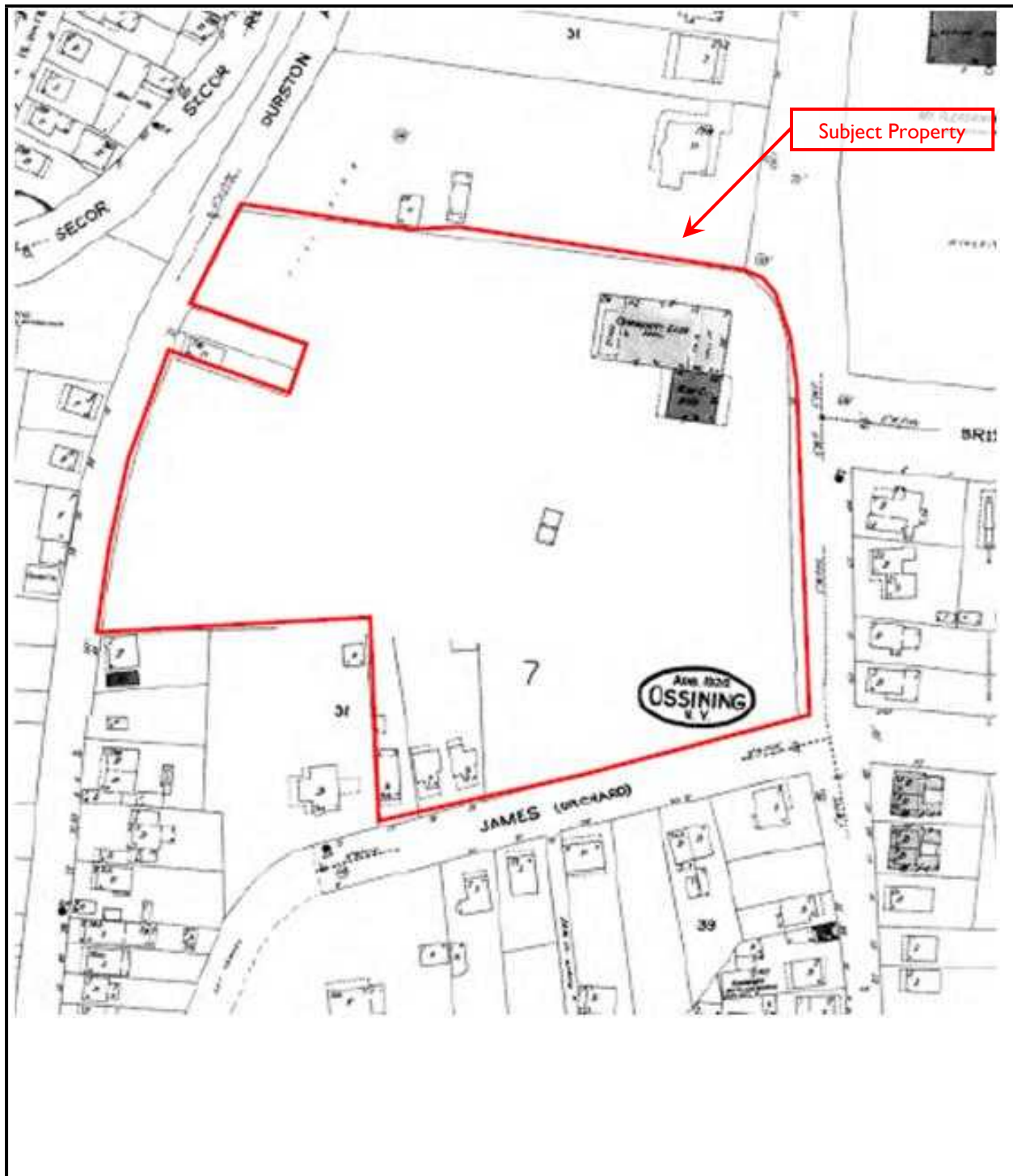
Fire Insurance Map
Year: 1897





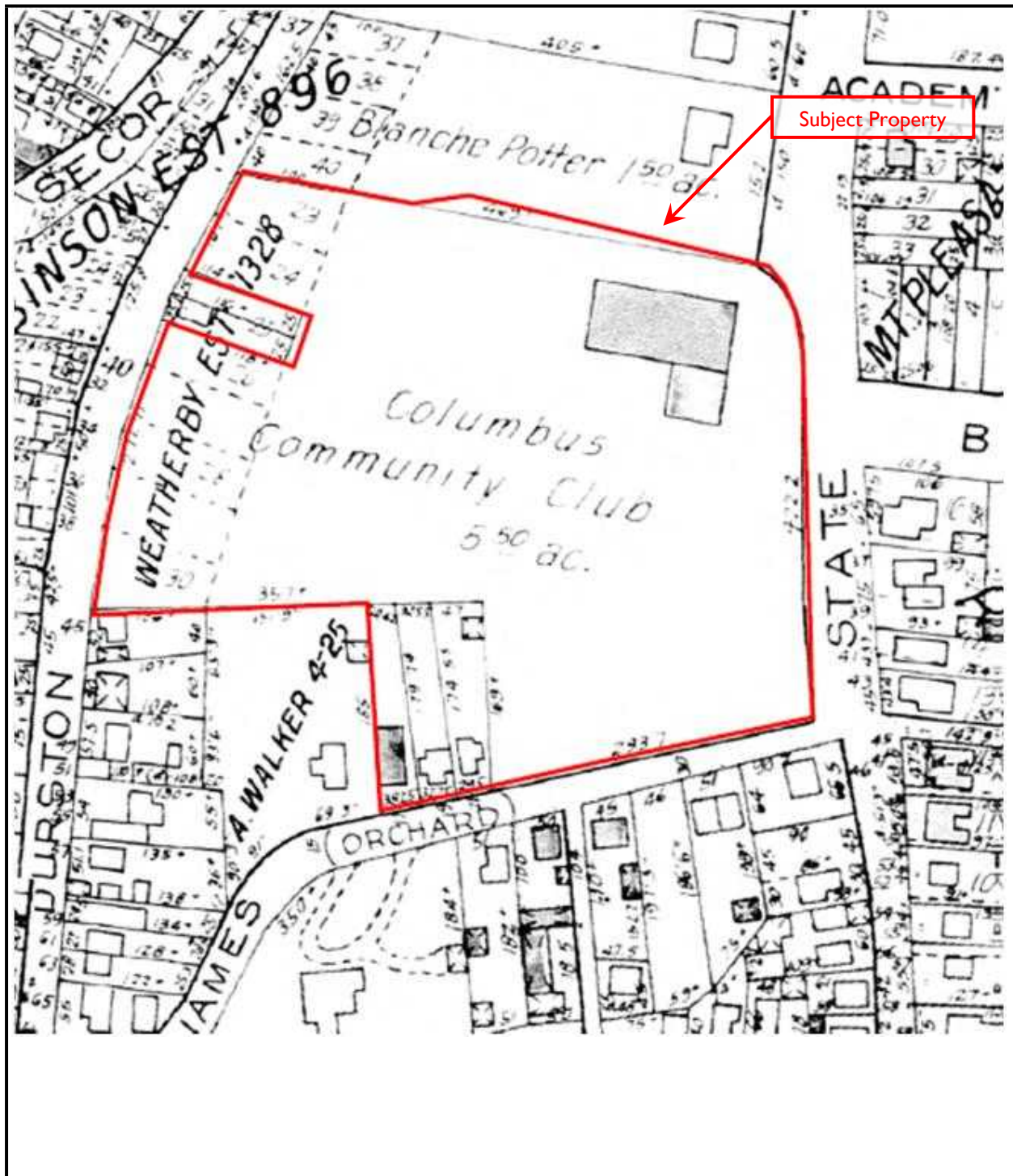
Fire Insurance Map
Year: 1911





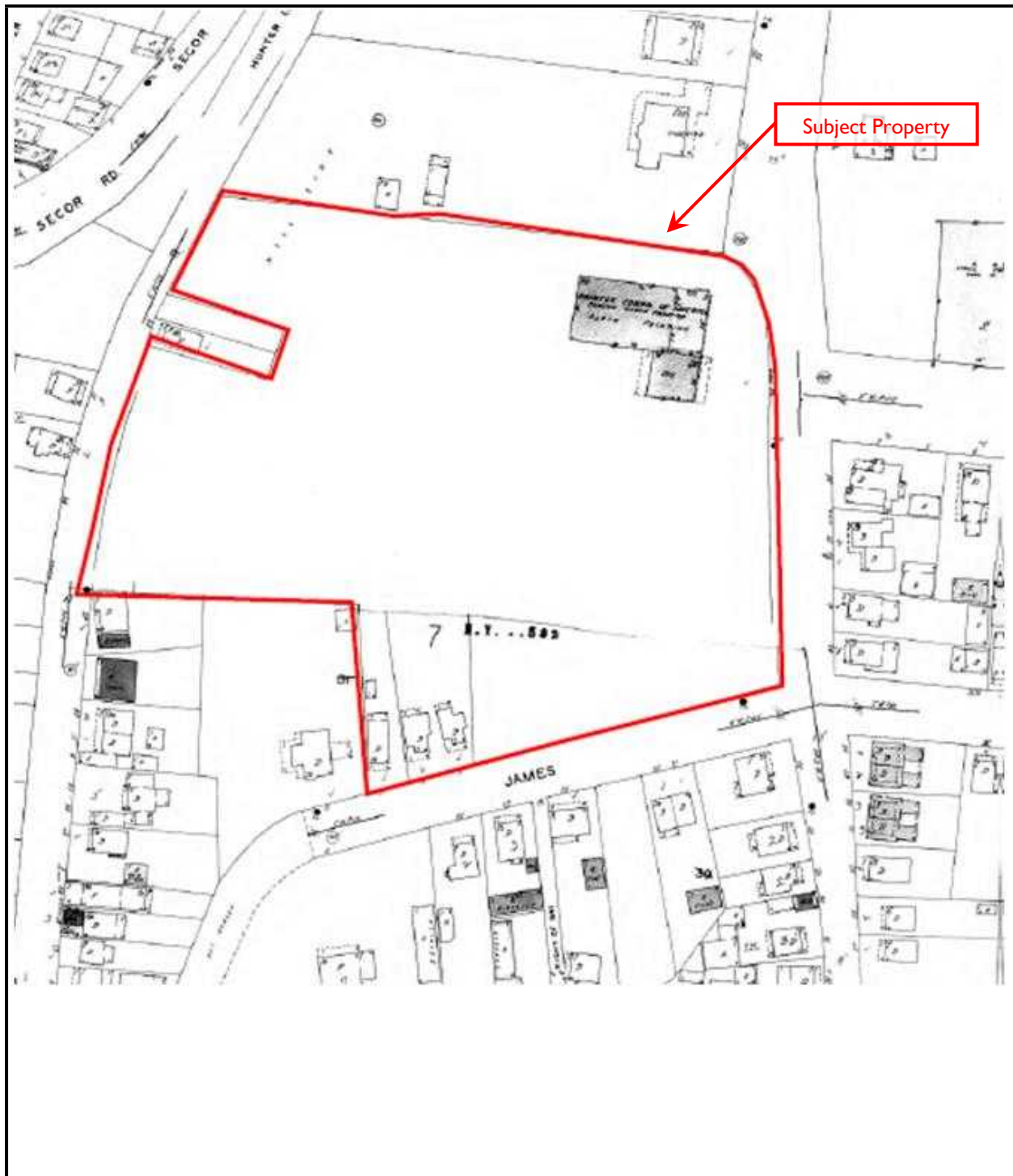
Fire Insurance Map
Year: 1924





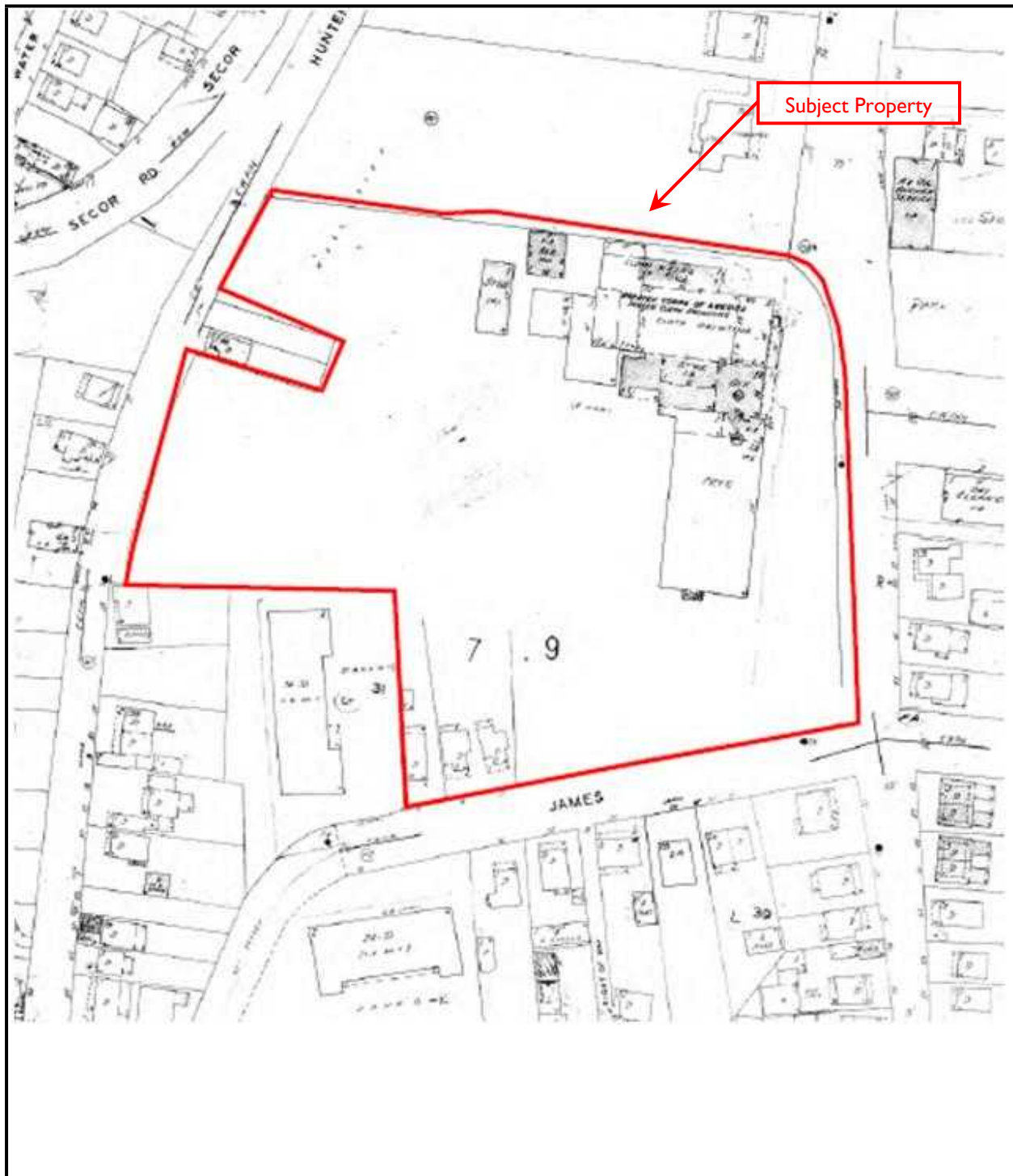
Fire Insurance Map
Year: 1942





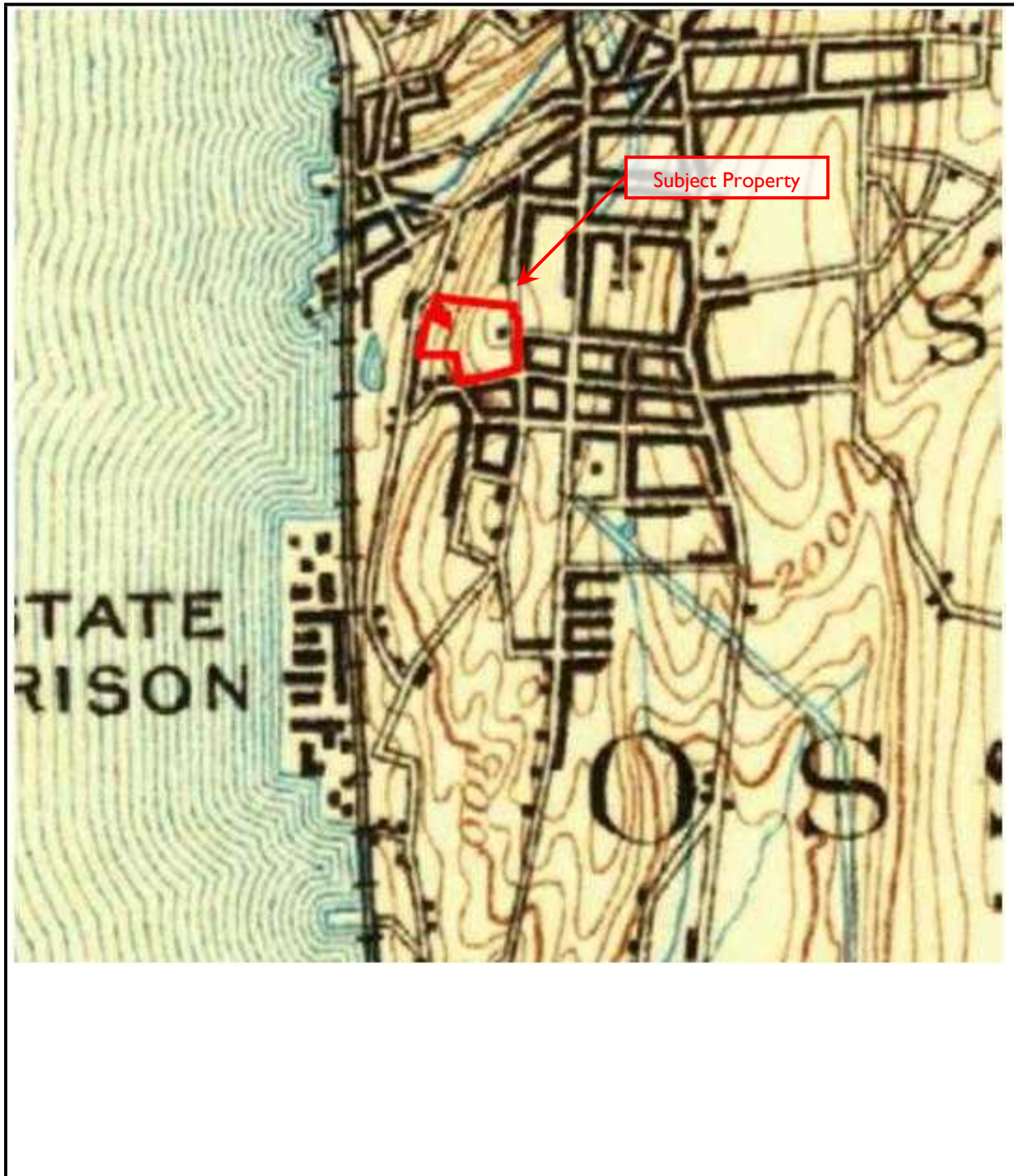
Fire Insurance Map
Year: 1949





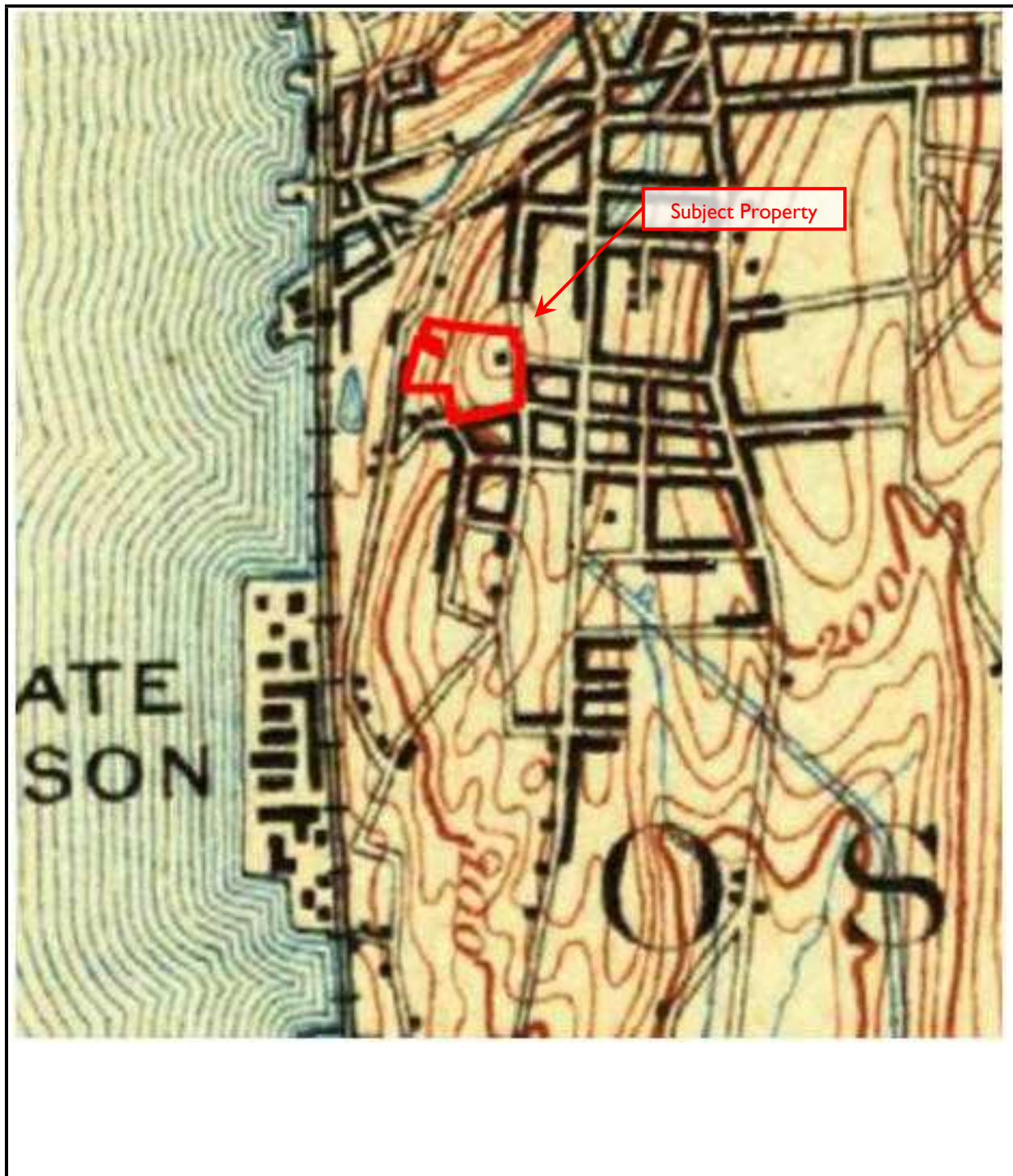
Fire Insurance Map
Year: 1971





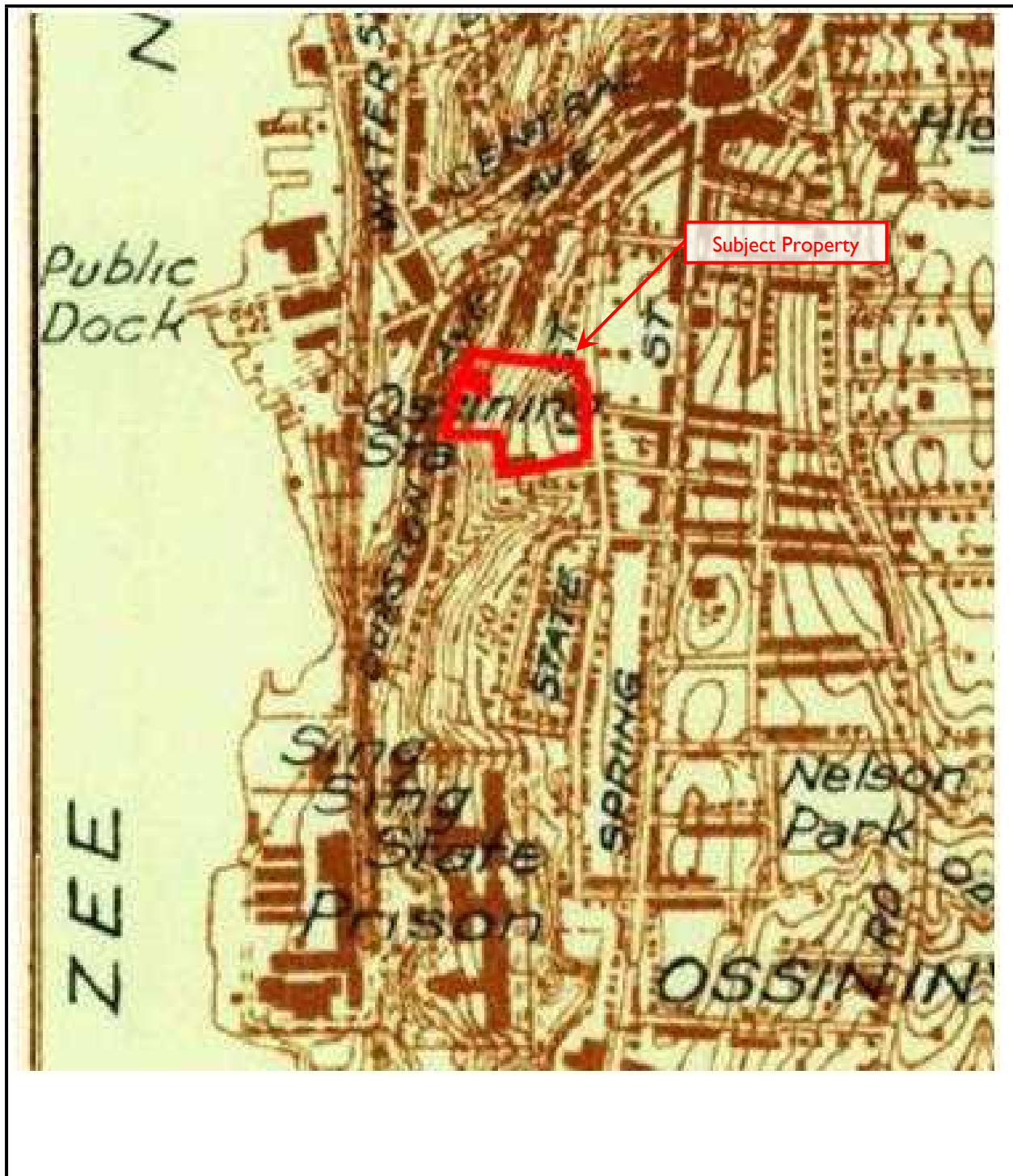
USGS Topographic Map
Year: 1892





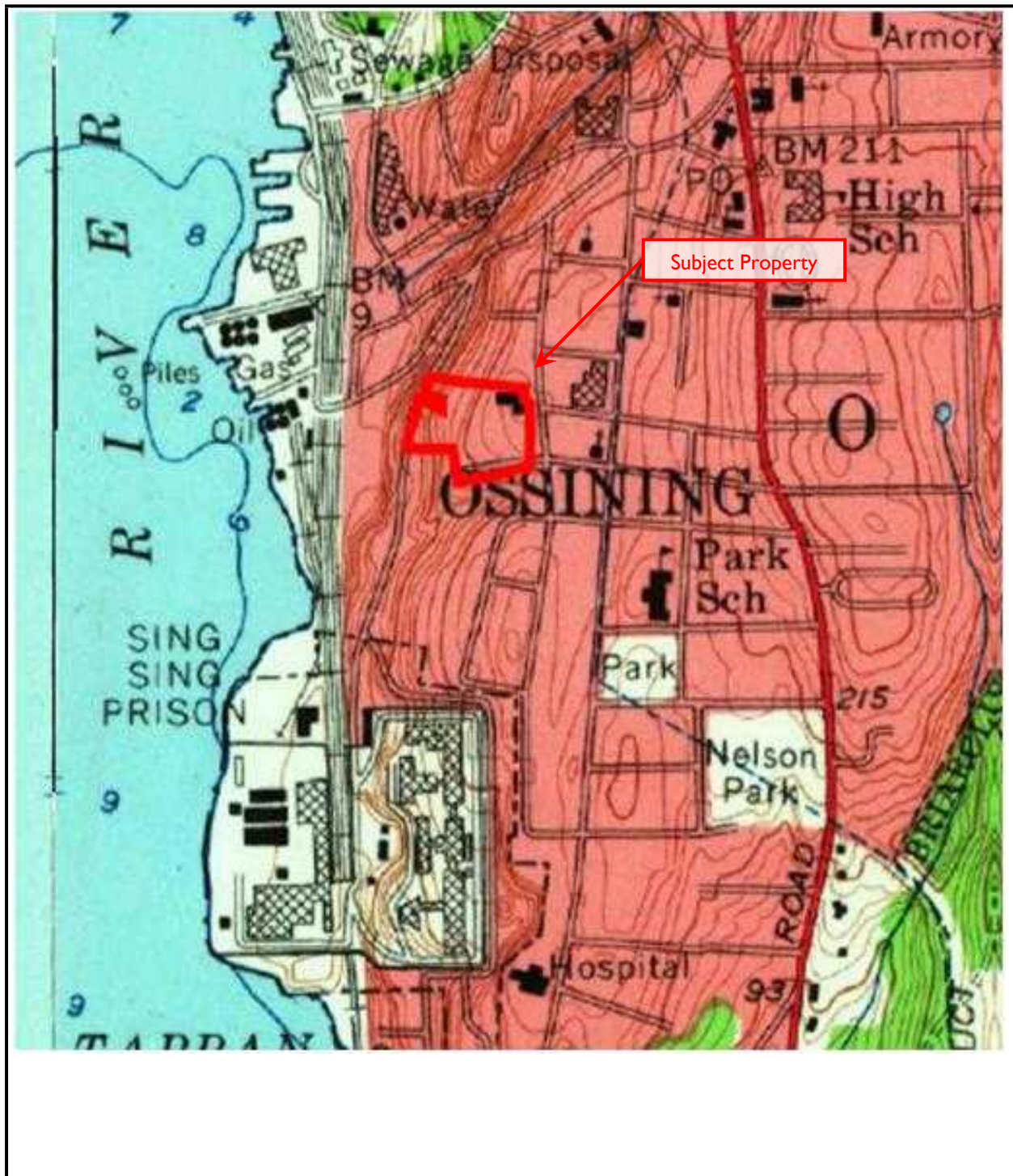
USGS Topographic Map
Year: 1902





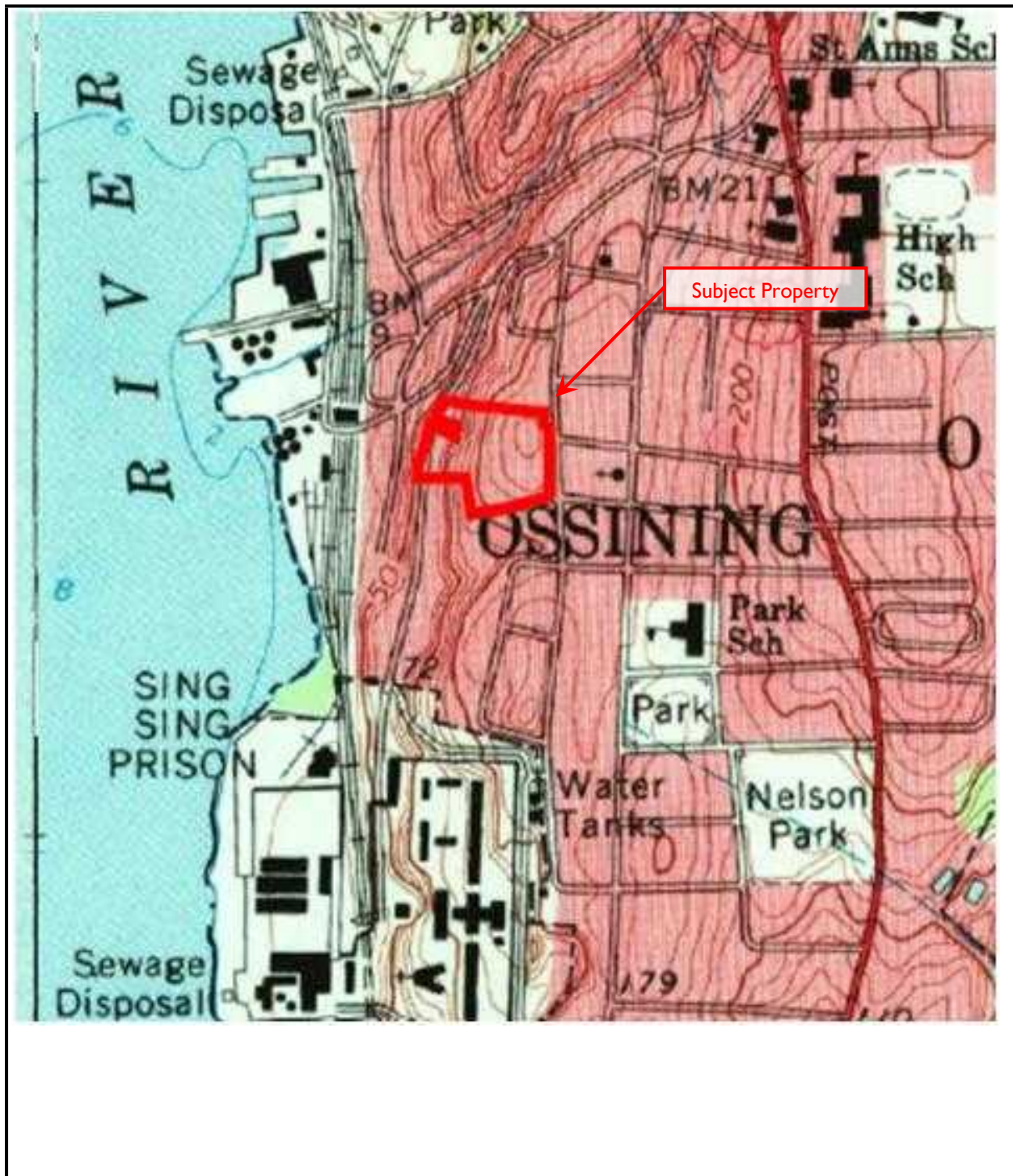
USGS Topographic Map
Year: 1936





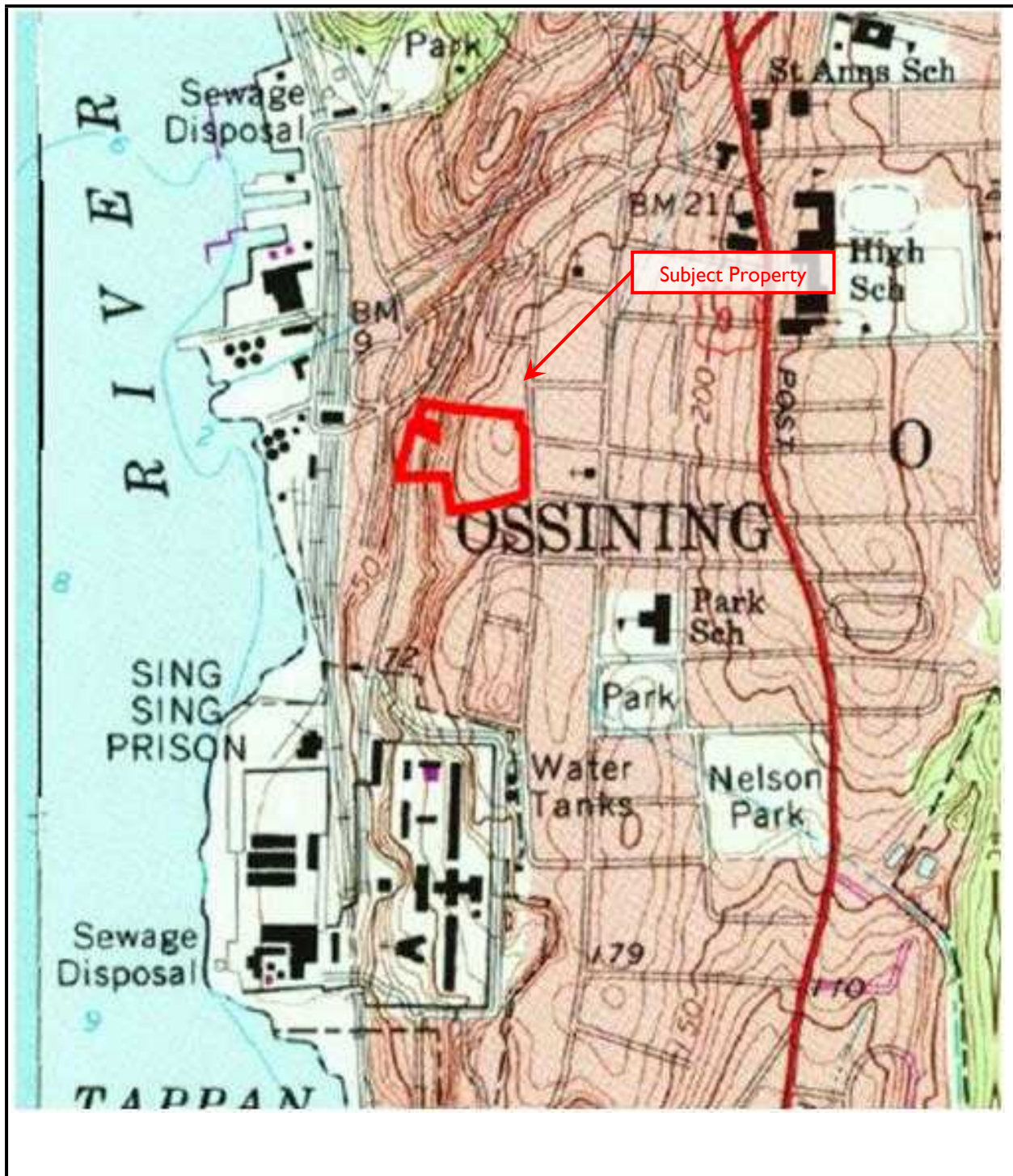
USGS Topographic Map
Year: 1955





USGS Topographic Map
Year: 1967





USGS Topographic Map
Year: 1979





USGS Topographic Map
Year: 2013



APPENDIX G

PORTIONS OF PREVIOUS REPORTS

Division of Safety and Health
Engineering Services Unit

Department of Labor

W. Averell Harriman State Office Campus
Building 12, Room 154, Albany, NY 12240
www.labor.ny.gov
518-457-1536

September 30, 2015

Adelaide Environmental Health Associates
1511 Rte 22 STE C24
Brewster, NY 10509

RE: File No. 15-1247

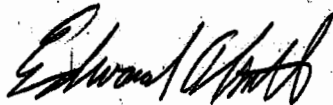
Dear Sir/Madam:

**STATE OF NEW YORK
DEPARTMENT OF LABOR
DIVISION OF SAFETY AND HEALTH**

The attached is a copy of Decision, dated, 9/30/2015, which I have compared with the original filed in this office and which I DO HEREBY CERTIFY to be a correct transcript of the text of the said original.

If you are aggrieved by this decision you may appeal within 60 days from its issuance to the Industrial Board of Appeals as provided by Section 101 of the Labor Law. Your appeal should be addressed to the Industrial Board of Appeals, State Office Building Campus, Building 12, Room 116, Albany, New York, 12240 as prescribed by its Rules and Procedure, a copy of which may be obtained upon request.

WITNESS my hand and the seal of the
NYS Department of Labor, at the City of
Albany, on this day of 9/30/2015.



Edward A. Smith, P.E.
Associate Safety and Health Engineer



**Department
of Labor**

STATE OF NEW YORK
DEPARTMENT OF LABOR
STATE OFFICE BUILDING CAMPUS
ALBANY, NEW YORK 12240-0100

Variance Petition

Of

Adelaide Environmental Health Associates, Inc
Petitioner's Agent on Behalf of

Ossining Land, LLC
Petitioner

in re

Premises: Vacant 3-Story Building
34 State Street
Ossining, NY 10562

**Interior Friable Debris Cleanup & Various
ACM Removal**

File No. 15-1247

DECISION

Case(s) 1 - 3

ICR 56

The Petitioner, pursuant to Section 30 of the Labor Law, having filed Petition No. 15-1247 on September 29, 2015 with the Commissioner of Labor for a variance from the provisions of Industrial Code Rule 56 as hereinafter cited on the grounds that there are practical difficulties or unnecessary hardship in carrying out the provisions of said Rule; and the Commissioner of Labor having reviewed the submission of the petitioner dated September 29, 2015; and

Upon considering the merits of the alleged practical difficulties or unnecessary hardship and upon the record herein, the Commissioner of Labor does hereby take the following actions:

Case No. 1
Case No. 2

ICR 56-7.10(c)
ICR 56-7.11(e)

Case No. 3

ICR 56-9.1(b,c)

VARIANCE GRANTED. The Petitioner's proposal for interior cleanup of friable debris in the attic & boiler room and removal of ACM joint compound in the attic, quantities as stated in the attached proposal, at the subject premises in accordance with the attached 12-page stamped copy of the Petitioner's submittal, is accepted; subject to the Conditions noted below:

THE CONDITIONS

1. Full time project monitor shall be on site and responsible for oversight of the abatement contractor during all abatement activities to ensure compliance with ICR 56 as modified by the variance conditions and that no visible emissions are generated.
2. All contaminated non-porous floors, walls, ceilings, fixtures, and movable and fixed objects contaminated with asbestos debris shall be cleaned as part of this cleanup and abatement project. All porous materials and generated waste shall be disposed of as RACM.
3. One layer of 6-mil fire retardant plastic sheeting shall be used as a dropcloth below ACM removal locations. The dropcloth may be limited to beneath the immediate removal locations and the surrounding ten (10) feet.
4. After removal and cleanings are complete and a minimum drying period has elapsed, an authorized and qualified Project Monitor shall determine if the area is dry, the scope of work complete, and the work area free of visible asbestos debris/residue. If the area is determined to be acceptable and the aggressive clearance air sample results meet 56-4.11 clearance criteria, the final dismantling of the site may begin.
5. Usage of this variance is limited to those asbestos removals identified in this variance or as outlined in the Petitioner's proposal.

In addition to the conditions required by the above specific variances, the Petitioner shall also comply with the following general conditions:

GENERAL CONDITIONS


1. A copy of this DECISION and the Petitioner's proposals shall be conspicuously displayed at the entrance to the personal decontamination enclosure.
2. This DECISION shall apply only to the removal of asbestos-containing materials from the aforementioned areas of the subject premises.

3. The Petitioner shall comply with all other applicable provisions of Industrial Code Rule 56-1 through 56-12.
4. The NYS Department of Labor Engineering Service Unit retains full authority to interpret this variance for compliance herewith and for compliance with Labor Law Article 30. Any deviation to the conditions leading to this variance shall render this variance Null and Void pursuant to 12NYCRR 56-12.2. Any questions regarding the conditions supporting the need for this variance and/or regarding compliance hereto must be directed to the Engineering Services Unit for clarification.
5. This DECISION shall terminate on December 30, 2015.

Date: September 30, 2015

MARIO J. MUSOLINO
ACTING COMMISSIONER OF LABOR

By


Edward A. Smith, P.E.
Associate Safety and Health Engineer

PREPARED BY: Ravi Pilar, P.E.
Senior Safety and Health Engineer

REVIEWED BY: Edward A. Smith, P.E.
Associate Safety and Health Engineer

Pilar, Ravi (LABOR)

From: Jason P. Fullum [jfullum@adelaidellc.com]
Sent: Tuesday, September 29, 2015 4:26 PM
To: Pilar, Ravi (LABOR)
Cc: John Soter; Ssoter@adelaidellc.com
Subject: 34 State Street, Ossining, NY SSV

Importance: High

Ravi

Per our phone conversation:

- The buildings are all sharing one footing and are all connected.
- The only two areas to be decontaminated are the attic with the joint compound and the boiler room with the debris.
- The boiler room will be decontaminated in its entirety instead of using a two layer tent.

Jason Fullum
Director of Technical and Field Operations
Adelaide Environmental Health Associates
1511 Route 22, Suite C24
Brewster, New York 10509
845-278-7710 Phone
845-278-7750 Fax
www.adelaidellc.com

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State of New York - Department of Labor
Division of Safety and Health
Engineering Services Unit
State Office Building Campus
Albany, NY 12240

September 29, 2015

Re: Petition for Variance, 34 State Street, Ossining, New York – Building Demolition

Question 9 - Reason for Request

Nature of Work: The asbestos work is to be performed at 34 State Street in Ossining, New York. All of the buildings are to be demolished except for the main building that will be renovated. There is significantly damaged, friable asbestos on the interior of two of the buildings that will need to be decontaminated prior to demolition. The spaces are currently vacant and locked out to the public.

Based on the above information and reasoning, we are requesting relief from standard full containment requirements during the removal of the referenced materials. We feel the requested relief is justified and the proposed abatement means and methods outlined in Question 11 (attached) are sufficient to contain any asbestos fibers that may be released during abatement activities and will sufficiently protect the Abatement Workers, Facility Employees/Occupants and the General Public. Specific Relief is requested from the following sections:

<u>Section - Title</u>	<u>Reason / Proposed Plan for Protection w/o literal compliance</u>
56-7.10	Based on the fact that all of the surfaces will need to be decontaminated throughout the work areas we are proposing critical/isolation barriers only.
56-7.11(e)	There will not be a full containment as containments shall be critical/isolation barriers only.
56-9.1(b)&(c)	In as much as there will be only isolation/critical barriers constructed we are requesting relief from 1 st and 2 nd cleaning and propose only one final cleaning and visual inspection. Wait times will be per 56-9.1(f).

Proposed means and methods for abatement operations are present in Question 11.

State of New York - Department of Labor
Division of Safety and Health
Engineering Services Unit
State Office Building Campus
Albany, NY 12240

September 29, 2015

Re: Petition for Variance, 34 State Street, Ossining, New York – Building Demolition

Question 10 – Hardship Description

Nature of Work: The asbestos work is to be performed at 34 State Street in Ossining, New York. All of the buildings are to be demolished except for the main building that will be renovated. There is significantly damaged, friable asbestos on the interior of two of the buildings that will need to be decontaminated prior to demolition. The spaces are currently vacant and locked out to the public.

In addition, the facility needs to clean up the debris to prevent further spread of the asbestos.

State of New York - Department of Labor
 Division of Safety and Health
 Engineering Services Unit
 State Office Building Campus
 Albany, NY 12240

September 29, 2015

Re: Petition for Variance, 34 State Street, Ossining, New York – Building Demolition

Question 11 - Proposed Methods

As stated in Question 9, the asbestos containing materials to be affected as a part of the building demolition and renovation project at 34 State Street in Ossining, New York are roofing materials, pin mastic, duct cover, floor tile, debris, joint compound, mudded fittings, transite siding and caulk. We propose the following work methods be utilized during removal operations in the specified areas:

The following materials and associated quantities are to be included in the abatement:

- Roofing Materials: Approximately 14,600 square feet.
 - Joint Compound: Approximately 2,500 square feet
 - Pin Mastic: Approximately 600 square feet
 - Duct Cover: Approximately 600 square feet
 - Floor Tile: Approximately 1,200 square feet
 - Debris: Approximately 25 square feet
 - Mudded Fittings: Approximately 26 fittings
 - Transite: Approximately 16,000 square feet
 - Caulk: Approximately 1,700 linear feet
 - The building is currently vacant and will remain so during all abatement operations.
 - Signage shall be in accordance with 12NYCRR Part 56 utilizing asbestos barrier tape and signs.
 - A personal and waste decontamination unit setup which complies with ICR 56-7 shall be constructed and be attached or remote to the work area depending on the removal taking place and the size of the removal. The unit(s) will be fully sheathed and lockable and shall remain operational until satisfactory final clearance air sample results are achieved.
 - The roofing materials, pin mastic, duct cover, floor tile, mudded fittings, transite and caulk will all be removed using the standard procedures in NYS Code Rule 56. One debris area is less than ten square feet and will be decontaminated as per NYS Code Rule 56.
- Variance/Relief limited to* →
- There are two debris locations with the specifics described below:
- o The asbestos joint compound is located in the attic of one of the buildings to be demolished and has been damaged over the years with debris now on the floor. This area will have an attached large personal and waste decontamination unit. Critical barriers will be installed on all openings with the work area.
 - o The small project debris located in a boiler room will have a ~~tent constructed~~ and an attached small project decontamination unit. ~~A two-layer tent will be constructed around the work area.~~ *critical barriers*
- RP 9/30/15*
- With the containment constructed, negative air will be established within the work area creating at a minimum, eight (8) air changes per hour and -.02" W.C. minimum. Once the containment is constructed and negative air established, a 4-hour pre-abatement settling period will be observed.

- Following the 4-hour pre-abatement settling period and a pre-abatement inspection by the Project Monitor to verify work area integrity, removal operations will commence.
- All debris and contaminated movable objects within the area will be decontaminated and/or removed as asbestos. The asbestos joint compound will be removed using wet methods and a drop cloth underneath. All cleanable surfaces will be wet wiped and/or HEPA vacuumed. Any non cleanable surfaces will be disposed of as asbestos containing material.
- Upon completion of removal and cleaning operations an eight hour waiting/drying period shall be observed. After the waiting/drying period a final visual inspection will be performed by the project monitor. Following this visual clearance, if it passes, the aggressive clearance final air sampling will begin. If the final visual clearance does not pass, another cleaning will commence along with another eight hour waiting/drying period.
- All containments and/or critical/isolation barriers shall remain in place until satisfactory clearance air sample results are achieved.
- All waste will be double-bagged, labeled, and moved from the work area to the waste decontamination unit and finally to a lined dumpster.

We request that this variance expire on ^{12/30/15} ~~9/30/16~~ ~~or upon the projects completion, whichever comes first.~~

Utilizing the proposed methods would in no way compromise the security or safety of the General Public, Facility Employees/Occupants, or any workers involved with the project, and would also allow the timely completion of the abatement operations.

If you have any questions or require any additional information, please feel free to contact Jason Fullum of Adelaide Environmental Health Associates at (845) 278-7710.

1.0 BACKGROUND/PURPOSE

Adelaide Environmental Health Associates, Inc. (Adelaide) was retained by Ossining Land, LLC to perform a demolition asbestos, lead based paint and PCB survey at 34 State Street in Ossining, New York. This survey was based on the scope to renovate the original building and demolish the surrounding buildings in preparation for the upcoming project. The inspection was performed on August 12th, 13th, 27th and September 2nd, 2015 by Adelaide representatives Jason Fullum, David Seddon, Robert See and Jimmie Downes (NYS Asbestos Inspector/ EPA Risk Assessor/Inspectors).

2.0 EXECUTIVE SUMMARY OF INSPECTION RESULTS

Following the scope of work that was given to us, Adelaide inspected all of the buildings on the interior and exterior. Adelaide collected two hundred and seventy three (273) asbestos samples, three hundred eighty five (385) XRF readings and three (3) PCB samples from the above mentioned areas. Nineteen (19) samples/homogenous areas tested positive for asbestos, fifty three (53) XRF readings tested positive for lead based paint and zero (0) PCB samples tested positive. .

All painted surfaces in the main building are considered to be positive for lead based paint.

2.1 SUMMARY OF ASBESTOS CONTAINING MATERIALS

Sample #	Material Sampled	Approximate Quantity	Condition	Areas Affected
7	Vent Pipe Tar	40 SF	Damaged	Roof B, M, N and R Vent Pipes and Exhaust Units
11	Exhaust Unit Pin Mastic	600SF	Damaged	Roof B
13	HVAC Curb Roof Material	300 SF	Damaged	Roof B
15	Flashing Tar	700 SF	Damaged	Roof B
17	Pitch Pocket Tar	6SF	Damaged	Roof B
19	HVAC Duct Cover	600SF	Damaged	Roof B
24	Bottom Layer on Wood	2,000SF	Damaged	Roof G,H,L,K,P,Q and R
26	Flashing Tar	20SF	Damaged	Roof G
28	Tar at Gutter	800SF	Sig. Damaged	Roof A and C Gutters Roof A Chimneys, Raised Roof Sections and Interior of Building C

36	Vapor Barrier on Metal	4,500SF	Sig. Damaged	Roof A and C
44	9x9 Gray Floor Tile	1,200SF	Damaged	Building A – 4 th Floor Building B and C Stairwells
113	Rope Gasket Debris	20 SF	Sig. Damaged	Building A – Basement Boiler Room
131	Bottom Layer of Roofing	6,000SF	Damaged	Roofs E,F,I,M,N and J
178	Joint Compound	2,500SF	Sig. Damaged	Building C Attic (Joint Compound Debris on Floor – Decontamination required for this area see Appendix F)
193	Mudded Fittings	26 Fittings	Damaged	Building B Storage Room and Stairwell Closet
196	Debris on Floor	4SF	Sig. Damaged	Building C – Boiler Room
231	Transite Barrier	16,000 SF	Damaged	Building B
233	Old White Caulk at Transite and Windows	1,700 LF	Sig. Damaged	Building A and B Exterior Windows
239	Tar at Parapet Wall	250SF	Sig. Damaged	Roof M and N

2.2 SUMMARY OF LEAD BASED PAINT

Sample #	Sample Location	Material Sampled	Reading (mg/cm2)
28	Building A 1 st floor right of foyer	Colum – White - Brick	19.50
29	Building A 1 st floor right of foyer	Colum – White - Brick	2.70
45	Building A 1 st floor kitchen side A	Pipe – Gray - Metal	7.70
60	Building A 1 st floor kitchen closet side A	Wall board – Black - Wood	1.90
65	Building A 1 st floor boiler room behind kitchen	Ceiling – White - Plaster	4.00

66	Building A 1st floor boiler room behind kitchen	Ceiling Support beam – White - Metal	1.20
86	Building A 2nd floor hallway	Window case – White - Wood	19.10
89	Building A 2nd floor hallway Side A	Wall – Beige - Plaster	7.00
90	Building A 2nd floor hallway Side B	Wall – Beige – Plaster	12.40
91	Building A 2nd floor hallway Side B	Door Frame – White - Wood	17.40
93	Building A 2nd floor south stairs	Trim – White - Wood	1.40
95	Building A 2nd floor south stairs	Stringer – White - Wood	27.30
97	Building A 2nd floor south stair storage	Ceiling – White - Plaster	10.40
98	Building A 2nd floor south stair storage Wall B	Wall – White - Wood	30.50
99	Building A 2nd floor south stair storage Wall D	Wall – White – Plaster	2.10
100	Building A 2nd floor south stair storage Wall D	Wall – Gray - Plaster	2.00
105	Building A 2nd floor hallway Side B	Door frame – White - Wood	18.10
106	Building A 2nd floor hallway Side C	Door frame – White - Wood	18.80
109	Building A 2nd floor hallway Side D	Trim – White - Wood	2.20
112	Building A 2nd floor hallway	Ceiling – White - Plaster	7.70
113	Building A 2nd floor hallway	Ceiling trim – White - Plaster	13.60
115	Building A 3rd floor hallway side A	Window trim – White - Wood	8.00
117	Building A 3rd floor hallway side B	Door frame – White - Wood	11.10
122	Building A 3rd floor hallway side B	Stringer – White – Wood	19.90
124	Building A 3rd floor hallway side C	Wall – Beige – Plaster	2.00

128	Building A 4 th floor hallway	Floor - Gray - Wood	4.50
153	Building B 2 nd floor hallway side A	Door frame - White - Metal	1.90
154	Building B 2 nd floor hallway side A	Door frame - Sand - Metal	1.30
166	Building B 2 nd floor east hallway side A	Door interior - White - Wood	1.30
186	Building A 2 nd floor NW stairwell west side	Door frame - White - Wood	3.40
188	Building A Basement	Column - Yellow - Wood	6.20
197	Building A Basement	Ceiling - Gray - Wood	1.10
203	Building C East room Side A	Wall - White - Concrete	2.20
204	Building C East room Side D	Wall - White - Concrete	1.70
236	Building C Basement hallway Side C	Column - White - Metal	2.90
238	Building C Basement hallway Side A	Column - White - Metal	1.90
248	Building D main room side B	Column - Gray - Metal	1.80
250	Building D main room side B	Column - White - Metal	1.70
251	Building D main room side B	Support beam - White - Metal	1.50
256	Building D main room side B	Structural steel - White - Metal	3.40
293	Building C 2 nd floor Hallway Center	Support beam - White - Wood	12.70
296	Building C 2 nd floor Hallway Center	Support beam - White - Wood	10.10
310	Building C 3 rd floor room 12 Side C	Window Case - White - Wood	24.50
311	Building C 3 rd floor room 12 Side C	Window Sash - White - Wood	4.30
313	Building C 3 rd floor room 12 Side D	Door frame - Black - Wood	3.80
324	Building B exterior east Side	Column - White - Brick	2.10
333	Building C exterior 2 nd floor east side	Door frame - White Wood	41.60
334	Building C exterior 2 nd floor east side	Door frame - White - Wood	39.80

336	Building C exterior 2nd floor east side	Ceiling – White - Wood	36.40
341	Building C exterior north side	Stair hand rail – Brown - Metal	3.00
342	Building C exterior north side	Stair Stringer – Brown - Metal	5.30
343	Building C exterior north side	Stair tread – Brown - Metal	1.70
360	Building E East room Side A	Door frame – Gray - Metal	1.30

2.3 SUMMARY OF PCB'S

<i>Sample #</i>	<i>Sample Location</i>	<i>Material Sampled</i>	<i>Reading (mg/Kg)</i>
No Positive Samples			

2.4 NEGATIVE MATERIALS LIST:

Building A

- 9x9 Floor Mastic
- Linoleum and Vapor Barrier
- Brown Wall Mastic
- Electrical Wire Insulation
- 12x12 Brown Mottled Floor Tile and Mastic
- 12x12 White Floor Tile and Mastic
- 12x12 Gray Floor Tile and Mastic
- White Insulation Debris
- 4 Inch Covebase and Mastic
- Plaster Wall – Top and Base Coats
- Plaster Ceiling – Textured Coat, Top and Base Coats
- White Firebrick and Mortar
- Red Firebrick
- 4x4 Ceramic Tile Adhesive and Grout
- Millboard Wall
- Epoxy Floor Yellow and Gray Coating
- 2x2 Ceiling Tile
- Popcorn Texture on Drywall Ceiling
- Drywall and Joint Compound

Building B

- Roof Vapor Barrier at Wood
- Exhaust Unit Vibration Cloth
- Red Ceramic Vinyl Tile
- 12x12 Stick On Tile with Flowers

- 12x12 Stick On Tile – Gray
- Yellow Carpet Mastic
- Gray Linoleum Floor and Adhesive
- Window Glazing Compound
- Green Caulk at Transite
- Asphalt Siding
- Fiberglass Pipe Insulation Wrap
- Wallpaper
- Ceramic Tile Grout and Mudset
- 1x1 Spline Ceiling Tile
- 2x2 Ceiling Tile
- 2x4 Ceiling Tile
- Millboard Wall and Adhesive
- Newer Caulk at Transite
- Stone Ballast Roof Layers
- Joint Compound

Building C

- Green Roofing under Metal Roof
- Window Glazing Compound
- Insulation at Door Header
- Exterior Caulk at Louver
- Surface Coat on Brick
- Popcorn Texture on Drywall
- Popcorn Texture on Plaster
- Popcorn Ceiling Coat
- Carpet Mastic
- Blown In Insulation
- Paper From Batt Insulation
- Ceramic Tile Grout and Adhesive
- Drywall Brown
- Drywall White
- Boiler Section Sealant
- Exterior Plaster
- Parge Coat on Exterior
- Tar on Fiberglass
- Joint Compound on the First thru Second Floors and Basement

Building E

- CMU and Mortar
- Stone Mortar
- Concrete

Roof D

- Roof Shingles and Vapor Barrier
- Tar Paper at Exhaust Vents

Roof J

- Top Layer Rolled Roof
- Asphalt Layer Rolled Roof

Roof E

- Top Layer Rolled Roof
- Brown Board Layer
- Asphalt Layer Rolled Roof

Roof N

- Tar at Edge of Roof

Roof M

- Coping Stone Mortar

Roof O

- All Roofing Layers

3.0 ASBESTOS FIELD PROCEDURES AND ANALYSIS METHODOLOGY**3.1 INSPECTION**

Guidelines used for the inspection were established by the U.S. Environmental Protection Agency (EPA) in the Guidance for Controlling Asbestos Containing Materials in Buildings, Office of Pesticides and Toxic Substances, DOC# 560/5-85-024 and 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA). Field information was organized as per the AHERA concept of a homogeneous area (HA); that is, suspect Asbestos Containing Materials (ACM) with similar age, appearance, and texture were grouped together, sampled and assessed for condition.

For the purposes of this inspection, suspect ACM has been placed in three material categories: thermal, surfacing, and miscellaneous.

Surfacing materials are those that are sprayed on, troweled on or otherwise applied to surfaces for fireproofing, acoustical, or decorative purposes (e.g., wall and ceiling plaster).

Thermal materials are those applied to heat pipes or other structural components to prevent heat loss or gain or prevent water condensation (e.g., pipe and fitting insulation, duct insulation, boiler flue).

APPENDIX H

TERMINOLOGY

TERMINOLOGY

The following provides definitions and descriptions of certain terms that may be used in this report. Italics indicate terms that are defined by ASTM Standard Practice E 1527-13. The Standard Practice should be referenced for further detail related definitions or additional explanation regarding the meaning of terms.

Recognized environmental condition (REC): The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: 1) due to any release to the environment, 2) under conditions indicative of a release to the environment; or 3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions.

De minimis conditions: Conditions that generally do not present threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis are not recognized environmental conditions or controlled recognized conditions.

Historical recognized environmental condition(s) (HREC): A past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted residential use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release a historical recognized environmental condition, the environmental professional must determine whether the past release is a recognized environmental condition at the time of the Phase I Environmental Site Assessment is conducted (for example, if there has been a change in the regulatory criteria). If the EP considers the past release to be a recognized environmental condition at the time of the Phase I ESA, the condition shall be included in the conclusions section of the report as a recognized environmental condition,

Controlled recognized environmental condition(s) (CREC): A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by the regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). A condition considered by the environmental professional to be a controlled recognized condition shall be listed in the findings section of the Phase I Environmental Site Assessment report, and as a recognized environmental condition in the conclusions section of the Phase I Environmental Site Assessment report. NOTE: A condition identified as a controlled recognized environmental condition does not imply that the environmental professional has evaluated or confirmed the adequacy, implementation, or continued effectiveness of the required control that has been, or is intended to be, implemented.

Material threat: A physically observable or obvious threat which is reasonably likely to lead to a release that, in the opinion of the environmental professional, is threatening and might result in impact to public health or the environment. An example might include an aboveground storage tank that contains a hazardous substance and which shows evidence of damage such that it may cause or contribute to tank integrity failure with a release of contents to the environment.

Material impact to public health or environment: A substantial risk of harm to public health or the environment resulting from the presence or likely presence of an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. An example might include a release of a hazardous substance in concentrations exceeding applicable governmental agency standards under conditions that could reasonably and foreseeably result in substantial exposure to humans or

substantial damage to natural resources. The risk of that exposure or damage would represent a material impact to public health or environment.

General risk of enforcement action: The likelihood that an environmental condition would be subject to enforcement action if brought to the attention of appropriate governmental agencies. If the circumstances suggest an enforcement action would be more likely than not, then the condition is considered a general risk of enforcement action.

Data failure: A failure to achieve the historical research objectives, even after reviewing the standard historical sources that are reasonably ascertainable and likely to be useful. Data failure is one type of data gap.

Data gap: A lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. Data gaps may result from incompleteness in any of the activities required by this practice, including, but not limited to site reconnaissance (for example, an inability to conduct the site visit), and interviews (for example, an inability to interview the key site manager, regulatory officials, etc.).

September 22, 2017

NH Ossining Lender, LLC
c/o North Hill Capital Management LLC
380 Lexington Avenue, Suite 4005
New York, NY 10168

Re: **Letter of Reliance**
Phase I Environmental Site Assessment dated January 18, 2016
EBI Project 1117000093
34 State Street, 17-25 James Street, & 27 Hunter Street, Ossining, NY 10562

Dear Mr. Kimche:

On behalf of EnviroBusiness, Inc. (dba EBI Consulting, hereinafter "EBI"), I am pleased to provide this Letter of Reliance to NH Ossining Lender, LLC regarding the above referenced Report.

Upon receipt of this letter, signed below by an authorized representative of NH Ossining Lender, LLC, EBI hereby agrees that NH Ossining Lender, LLC is authorized to use and rely upon our prior reports listed above for purposes of underwriting a proposed mortgage loan, subject to the same Standard Terms and Conditions for Engagement and Scope of Work under which the report was completed for Paradigm Capital Corp II ("client"), a copy of which is attached. Please note that the client authorized this request. Additionally reliance is subject to the same Conditions and Limitations listed in the Report and the following additional limitations:

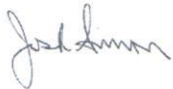
- No additional assessment or due diligence activities were completed in conjunction with this letter. As such, EBI's recommendations and findings for the Subject Property are original to the date of the prior Reports as noted above and have not been updated.
- As of the date of this letter, our Phase I report is dated January 18, 2016 and conditions on the Subject Property may have changed and EBI's opinions may have changed since our original site reconnaissance.
- Please note that the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E 1527- 13 standard has established that the shelf life for a Phase I report is one (1) year. In addition, certain aspects of the original Phase I ESA must be updated after 180 days, including the site visit, regulatory database report review, search for environmental liens and interviews. Based on this stipulation, the report may no longer be valid for ASTM purposes unless it is updated per the ASTM guidelines.
- As part of ASTM Standard E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, we ask that you complete the below User Questionnaire as cited in the Appendix X3 of ASTM Standard E 1527-13. This questionnaire is designed to address one of the requirements to satisfy the intent of the Standard, as noted in Section 1.1 of ASTM E 1527-13. Specifically, in order to qualify for one of the Landowner Liability Protections (LLPs) offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the "Brownfields Amendments"), all appropriate inquiry must be conducted, and a Questionnaire completed by the User of the report is one component of such inquiry. While the Questionnaire is not required, failure to provide this information could result in a determination that "all appropriate inquiry" is not complete. If NH Ossining Lender, LLC does not possess or have knowledge of the information requested in the Questionnaire, it is acceptable to mark such questions accordingly. If you decline to complete and return the Questionnaire, please initial here: ATE.
- The original purpose of the Reports was to assist in the underwriting of a proposed mortgage loan on the Subject Property described in the Reports. Reliance upon the Reports does not extend to property owners, or entities or individuals interested in purchasing the subject property. The Reports were completed in accordance with a refinancing scope, American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E 1527- 13, and are not intended for use in making property purchase or sale decisions.

- This Reliance letter, and any rights or liabilities created under the aforementioned Contract, may not be assigned by Customers Bank without the express written permission of the EBI.

Regardless of whether EBI receives a copy of this letter countersigned by NH Ossining Lender, LLC, by accepting draft and/or final copies of the Report and/or asserting reliance thereon, NH Ossining Lender, LLC agrees to the terms, conditions and limitations set forth in this Reliance Letter.

Please sign below and return this letter to me via facsimile to klafond@ebiconsulting.com. **Please note that all pages of this letter must be initialed and returned with the signed authorization, along with the completed user questionnaire.**

Sincerely,
EBI Consulting,



Josh Simon
Senior Account Executive
Real Estate Services

Authorization and acceptance of terms:
NH Ossining Lender, LLC



Signature

9/22/17

Date

Alfonso Kimche

Name

Authorized Signatory

Title

PHASE II ENVIRONMENTAL SITE ASSESSMENT

34 State Street
Ossining, Westchester County, New York

May 31, 2005

DT CONSULTING SERVICES

1291 Old Post Road
Ulster Park, New York 12487
(845) 658-3484 phone
(845) 658-3320 fax

May 31, 2005

Union State Bank
ATTN: Mr. William MacIntosh
USB Financial Center
100 Dutch Hill Road
Orangeburg, New York 10962

RE: PHASE II ENVIRONMENTAL SITE ASSESSMENT
34 State Street
Ossining, Westchester County, New York

Dear Mr. MacIntosh:

Pursuant to your request for a Phase II Environmental Site Assessment (ESA) to be performed at the above referenced facility, DT Consulting Services (DTCS) is pleased to submit the following report for your review.

If you should have any questions regarding the enclosed, please feel free to contact me at (845) 658-3484. DTCS thanks you for the opportunity to work with you on this project.

Sincerely,
DT CONSULTING SERVICES

Deborah J. Thompson
Senior Geologist / Project Manager

Cc: M. Wodka/Team Environmental Consultants, Inc.

PHASE II ENVIRONMENTAL SITE ASSESSMENT

Pertaining to:

34 State Street
Ossining, Westchester County, New York

Prepared for:

Mr. William MacIntosh
Union State Bank
USB Financial Center
100 Dutch Hill Road
Orangeburg, New York 10962

Prepared by:

Ms. Deborah J. Thompson
Senior Geologist/Project Manager
DT CONSULTING SERVICES
1291 Old Post Road
Ulster Park, New York 12487

Date: May 31, 2005

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1.0 INTRODUCTION/ SITE INFORMATION

DT Consulting Services (DTCS) has been contracted by Union State Bank to perform a Phase II Environmental Site Assessment (ESA) or Subsurface Investigation on the property located at 34 State Street, Ossining, Westchester County, New York. A site location map and a site (base) plan (**Figures 1 and 2**, respectively) are included for your reference. At present, said property is being utilized as a specialty woodworking shop/warehouse and houses associated office facilities. At the time of this report, businesses including Creative Designs, Inc. and Original World Products share the site to perform business activities.

The ± 3 acre property is improved with a $\pm 60,000$ square foot structure historically constructed in three separate phases. The original building was erected in 1840 as a residential unit. In 1929 two additions were built (approximately 7,000 and 22,000 square feet respectively) onto the structure, then utilized as a community center. Afterward, from the mid 1940's until 1981 the property was employed by Printex Corporation of America as a cloth printing and textile design facility. A final addition, which encompasses the site structure as seen today, was constructed in 1968.

At present, potable water and wastewater disposal are provided by the City of Ossining Water and Sewer Districts, respectively. A majority of adjacent land-use includes various residential complexes (both single and multi-family) in each cardinal direction.

The purpose of this Phase II Environmental Site Assessment is to determine if historical – present day operations have impacted subsurface materials on the property located at 34 State Street, Ossining, New York. Phase I ESA (due diligence) activities as performed by Team Environmental Consultants, Inc. (TEAM) and others (Dames & Moore, 1994) have identified historic industrial site use including petroleum bulk storage (PBS) operations on the subject property. In addition, the site had been placed on the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list for potential inclusion on the National Priority List in April of 1980. Upon completion of investigative activities, the site was de-listed in 1983 after potential environmental hazardous were not identified. Thus, based upon knowledge of site activities and the potential future development of the subject property for residential use, a Phase II ESA was deemed appropriate for the site to characterize and quantify any contaminants present within subsurface materials.

2.0 SUBSURFACE INVESTIGATION

Based upon operations throughout the active history of the subject property, DTCS concentrated its investigative efforts surrounding:

1. The known PBS locations located in the northern quadrant of the property.
2. The waste treatment lagoon historically documented in the southeast corner of the property, as utilized by Printex Corporation of America.
3. The general equipment maintenance and storage area along the western portion of the site.

The Phase II ESA was concentrated in these areas due to their potential for environmental liability issues. To provide background conditions of the subsurface, a select up gradient location was also chosen as a sample collection point. Thus, DTCS focused field activities to provide the following data:

- Collect and classify subsurface materials encountered surrounding the aforementioned area(s) in question.
- Provide quantitative data on targeted volatile/semi-volatile organic compounds (VOC/SVOC) and priority pollutant metals (if detected) within subsurface materials on-site.
- Offer recommendations as necessary, to address subsurface contamination if encountered during the course of this investigation.

The location of each borehole (SB-1 – SB-7) may be reviewed in **Figure 2**, attached.

2.1 *Soil Sampling Procedures*

DTCS mobilized to the site on May 10, 2005 to perform the subsurface investigation. Employing a Geoprobe track mounted 4x4 drill rig, soil samples were collected at each borehole location continuously from grade to an approximate depth of eight (8) - twelve (12) feet below grade surface (bgs) or until resistance was encountered. The samples were obtained by advancing a twenty-four (24) inch long, two (2) inch outer diameter, split spoon sampler into undisturbed soils. To prevent cross-contamination, all sampling equipment was

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decontaminated between each soil boring location. A total of seven (7) soil borings were performed during this investigation.

An on-site DTCS Geologist performed screening and classification immediately following collection of subsurface materials. The screening was conducted using a HNu Photoionization Detector or PID. As most petroleum products contain volatile organic compounds, PID screening can indicate the presence of volatile organics in a soil sample.

2.2 *Soil Characterization*

As detected during this investigation, the lithology of overburden materials encountered at the facility can be characterized as light brown sandy loam (fill) with traces of gravel - approximately 0-4 feet bgs, underlain by fine-medium sand with clay and schist fragments. Based upon localized outcrops as observed on-site, resistance on account of detection of the bedrock surface was encountered between eight (8) and nine (9) feet below grade within soil borings SB-1 – SB-3 and SB-5 & SB-6. Overburden materials as encountered adjacent to the site structure were found to thin, when bedrock was detected between three (3) and four (4) feet below grade surface. Groundwater was not encountered during the Phase II ESA performed on site.

Upon removal from the subsurface, headspace screening was subsequently performed on each soil sample interval (i.e. 0-4'/4-8'). This screening was performed by placing the selected soil sample in a Ziploc® style freezer bag, sealing the bag, and after a short pause, yielding stabilized readings with a PID calibrated to 100 parts-per-million (ppm) isobutylene standard. While performing this investigation, headspace screening yielded the non-detect total petroleum hydrocarbons in parts-per-million within each soil profile analyzed. In addition, no visual or olfactory signs of subsurface contamination were encountered while field testing soils from each borehole location.

2.3 *Laboratory Analysis*

During investigative procedures, soil samples were collected from the bottom two (2) feet of each borehole, pending detection of the bedrock surface. Samples submitted for laboratory analysis were composited as follows:

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Sample No. 001 = SB-1 – SB-3

Sample No. 002 = SB-4 & SB-5

Sample No. 003 = SB-6 & SB-7

Soils collected during the investigation were analyzed for volatile and semi-volatile organic compounds and priority pollutant metals via EPA Test Methods 8260w/MTBE, 8270 B/N and 7471 respectively. The complete laboratory package may be found in **Attachment A** for your review.

3.0 FINDINGS/CONCLUSIONS

The property located at 34 State Street, Ossining, Westchester County, New York has historically been utilized to operate commercial/industrial businesses. Upon review of documented environmental issues previously identified in available due diligence reports, a Phase II ESA was deemed necessary for the site prior to its alternate development as residential property.

Based upon field observations and testing, DTCS can conclude that noticeable signs of subsurface contamination were not detected while collecting samples from each borehole location. Although laboratory analysis revealed the presence of some targeted VOC's/SVOC's and priority metals, all were within New York State Department of Environmental Conservation (NYSDEC) Soil Quality Guidance Values (TAGMS #4046, January 1994) as follows:

VOLATILES/SEMI-VOLATILES (8260/8270 B/N)

<i>Parameter</i>	<i>Guidance Value (ug/kg)</i>	<i>Soil Boring #1 - #3</i>	<i>Soil Boring #4 & #5</i>	<i>Soil Boring #6 & #7</i>
<i>Naphthalene</i>	13,000	15	U	U
<i>n-Butyl benzene</i>	10,000	6	U	U
<i>Benzo[a]anthracene</i>	224 or MDL	61	U	U
<i>Fluoranthene</i>	50,000	90	U	U
<i>Pyrene</i>	50,000	78	U	U

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PRIORITY POLLUTANT METALS (7471)

Parameter	Guidance Value (mg/kg)	Eastern USA Soil Background (mg/kg)	Soil Boring #1 - #3	Soil Boring #4 & #5	Soil Boring #6 & #7
Antimony	<i>SB</i>	N/A	5.85	8.55	5.54
Arsenic	<i>7.5 or SB</i>	3 – 12	5.84	4.79	8.44
Beryllium	<i>0.16 or SB</i>	0 – 1.75	U	U	U
Cadmium	<i>1 or SB</i>	0.1 – 1	0.53	0.60	0.51
Chromium	<i>10 or SB</i>	1.5 – 40	15.5	20.8	21.7
Copper	<i>25 or SB</i>	1 – 50	22.3	27.1	18.7
Lead	<i>SB</i>	*	18.6	17.2	32.3
Nickel	<i>13 or SB</i>	0.5 – 25	11.6	16.7	14.5
Selenium	<i>2.0 or SB</i>	0.1 – 3.9	1.83	2.81	2.39
Silver	<i>SB</i>	N/A	U	U	U
Thallium	<i>SB</i>	N/A	U	U	U
Zinc	<i>20 or SB</i>	9 – 50	44.5	52.2	45.1
Mercury	<i>0.1</i>	0.001 – 0.2	U	U	U

NOTES:

- ✚ The presented guidance values were adopted by NYSDEC in Appendix A of TAGM #4046, Soil Cleanup Objectives.
- ✚ Guidance and sample concentrations are reported in ug/kg or parts-per-billion for VOC/SVOC parameters and mg/kg or parts-per-million on the Priority Metals.
- ✚ U = Not detected.
- ✚ SB indicates average Eastern USA background soil levels.
- ✚ *Background levels for lead vary widely. Average levels in undeveloped, rural areas may range from 4-61 ppm. Average background levels in metropolitan or suburban areas or near highways are much higher and typically range from 200-500 ppm.

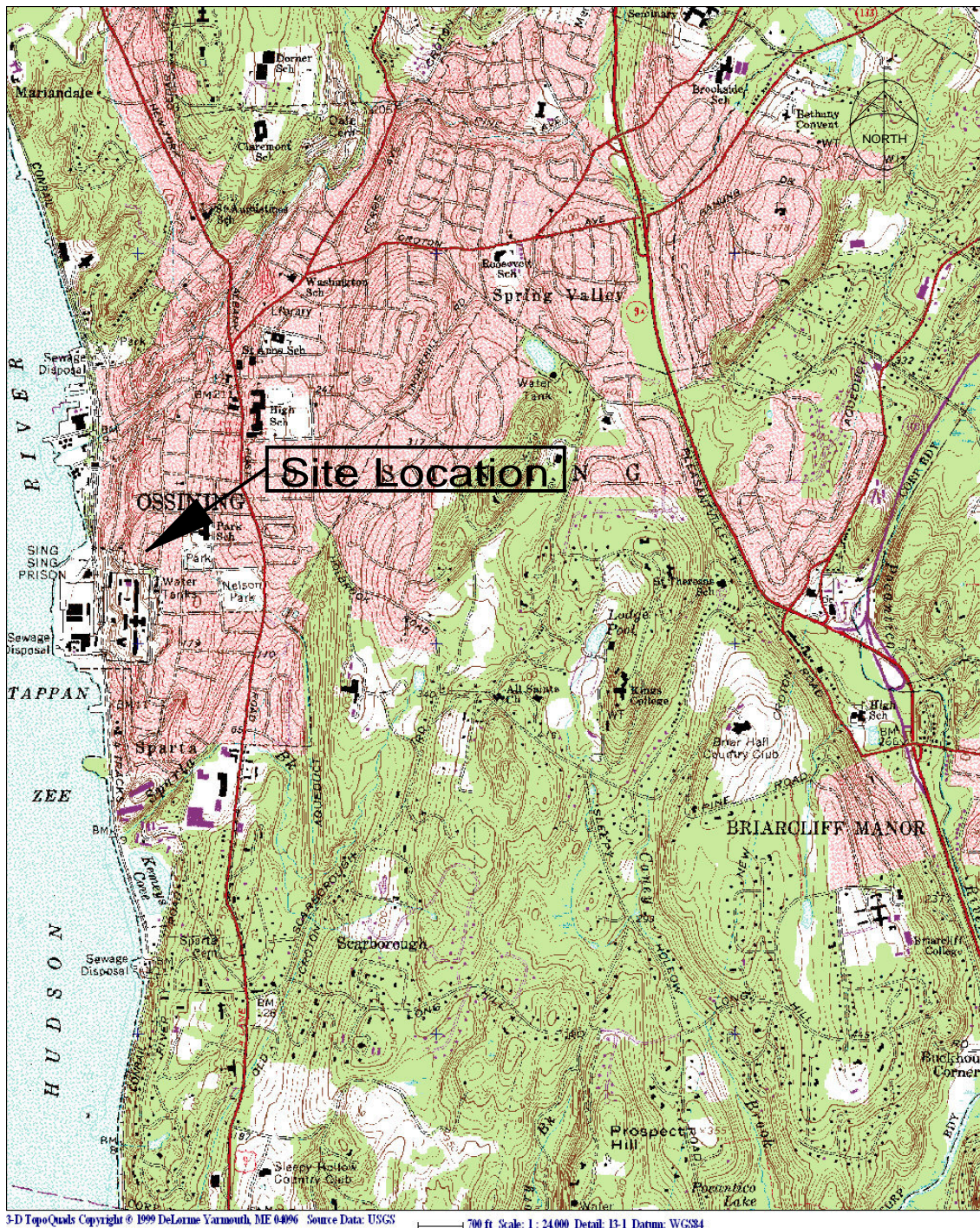
DT CONSULTING SERVICES

Currently, the need to perform additional investigative and/or remedial measures does not appear warranted based upon the findings of this Phase II ESA. Therefore, it is DTCS's opinion that no further action is required at this time within the area of study.

4.0 LIMITATIONS

DTCS has prepared this site assessment using reasonable efforts in each phase of its work to determine the extent of subsurface petroleum contamination (if any) within the locations of potential environmental concern. This report is not definitive, and should not be assumed to be a complete or specific definition of all conditions above or below grade. The conclusions/recommendations set forth herein are applicable only to the facts and conditions described at the time of this report.

FIGURES



Client: Union State Bank

Site: 34 State Street, Ossining, New York

Spill #:
N/A

Drawn by:
DJT

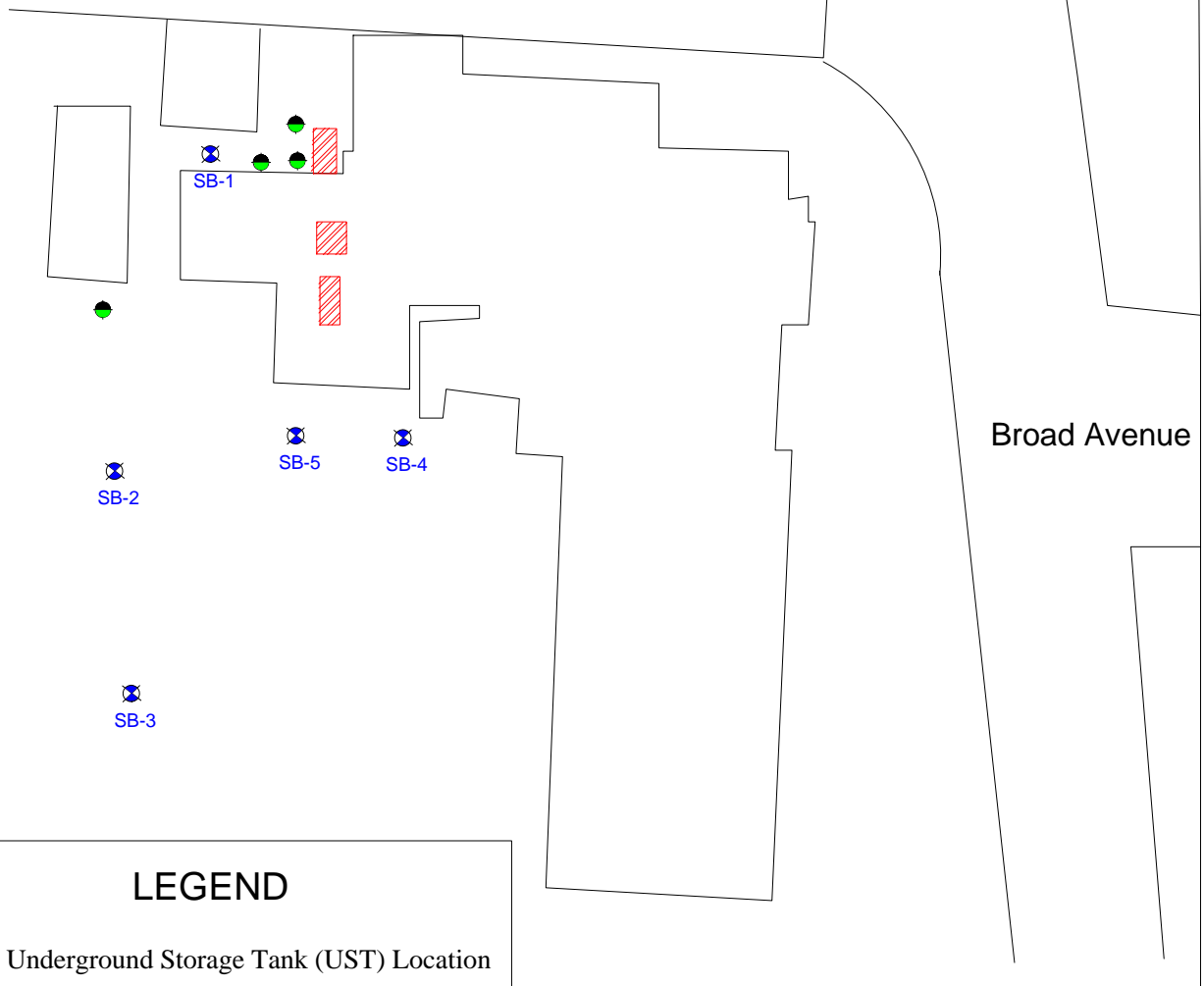
Scale:
1 : 24,000

Site Location Plan

Figure No: 1



Adapted from: Sanborn Map 1971



LEGEND



Underground Storage Tank (UST) Location



Soil Boring Location

SB-1



Previous Borehole Location, 1994



SB-7

SB-6

Client: Union State Bank

Site: 34 State Street, Ossining, New York

Spill #:
N/A

Drawn by:
DJT

Scale:
None

Site (base) Map

Figure No: 2

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ATTACHMENTS

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ATTACHMENT A

Appendix B:

Quality Assurance Project Plan



Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

**QUALITY ASSURANCE PROJECT PLAN
For**

**Proposed Development
34 State Street
New Rochelle, Westchester County, NY**

Prepared for:
WB 34 State LLC

SESI Project No:
13968

Date:
June 2025

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LIST OF ACRONYMS

Acronym	Definition
AAS	Absorption Spectroscopy
ASP	Analytical Service Protocol
BCP	Brownfield Cleanup Program
DUSR	Data Usability Summary Report
ELAP	Environmental Laboratory Accreditation Program
GC/MS	Gas Chromatography/Mass Spectrometry
HAS	Hollow-stem Auger
HDPE	High-Density Polyethylene
LDPE	Low-density Polyethylene
LFPS	Low Flow Purging Sampling
MDL	Method Detection Limit
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCB	Polychlorinated Biphenyls
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PPE	Personal Protective Equipment
PTFE	Polytetrafluoroethylene
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RIWP	Remedial Investigation Work Plan
SESI	SESI Consulting Engineers, Inc.
TIC	Tentatively Identified Compound
TCL	Target Compound List
VOC	Volatile Organic Compound
USEPA	United States Environmental Protection Agency

1.0 PROJECT DESCRIPTION

This document presents the quality assurance project plan (QAPP) for the Remedial Investigation Workplan (RIWP) for the proposed development of the property located at 34 State Street, Ossining, Westchester County, New York (the Site). The Site consists of a 5.858-acre area parcel and is identified as proposed Block 2, Lot 17, 18 and 38 of the Westchester County tax map. The Site is located in a residential and commercial area and is bounded a day care center to the north, residential to the south, residential/commercial uses to the east, and residential to the west.

The Site is improved with a vacant light industrial space at the east and vacant forested area at the west. The Site has historically been occupied by residences and a community center (circa 1929), and a printing company (Printex Corporation of America circa 1940-1981).

2.0 PROJECT ORGANIZATION

The RIWP will be conducted by Soils Engineering Services, Inc. (SESI), on behalf of WB 34 State LLC. The organization of SESI's key project management and field staff, and respective areas of responsibility, is presented below.

2.1 PROJECT PRINCIPAL

Fuad Dahan, PE

Provide technical and administrative oversight and guidance throughout the project, assist in securing company resources, participate in technical review of deliverables, and attend key meetings as needed.

2.2 PRINCIPAL ENGINEER

James Vander Vliet, PE

Provide technical guidance and review of reports, analytical data. Will have key involvement in screening and development of remedial alternatives.

2.3 PROJECT MANAGER

Chris Malvicini

Responsible for maintaining the day-to-day schedule for completing the fieldwork and deliverables according to BCP program requirements and client expectations.

2.4 REMEDIAL INVESTIGATION PROGRAM MANAGER

Chris Malvicini

Responsible for coordinating and directing field efforts of SESI staff and subcontractors, and for maintaining that work is done according to QAPP specifications.

2.5 FIELD TEAM LEADER

Ronnie Reynoso

Responsible for overseeing field work during the RI, including observing subcontractors, maintaining field notes, and collecting samples of various environmental media, in accordance with the NYSDEC-approved Work Plan.

2.6 QUALITY ASSURANCE OFFICER

Chris Malvicini

Responsible for reviewing sampling procedures and certify that the data was collected and analyzed using the appropriate procedures.

3.0 QA/QC OBJECTIVES FOR MEASUREMENT OF DATA

In cases where NYSDOH ELAP Certification exists for a specific group or category of parameters, the laboratories performing analysis in connection with this project will have appropriate NYSDOH ELAP Certification. Analytical Service Protocol (ASP, January 2005) Category B deliverables are required for all samples.

Detection limits set by NYSDEC-ASP (January 2005) will be used for all sample analyses unless otherwise noted. If NYSDEC-ASP-dictated detection limits prove insufficient to assess project goals (i.e., comparison to drinking water standards or attainment of ARARs), then ASP Special Analytical Services (SAS) or other appropriate methods will be utilized.

The quality assurance/quality control objectives for all measurement data include completeness, representativeness, comparability, precision and accuracy.

3.1 COMPLETENESS

The analyses performed must be appropriate and inclusive. The parameters selected for analysis are chosen to meet the objectives of the study.

Completeness of the analyses will be assessed by comparing the number of parameters intended to be analyzed with the number of parameters successfully determined and

validated. Data must meet QC acceptance criteria for 100 percent or more of requested determinations.

3.2 REPRESENTATIVENESS

Samples must be taken of the population and, where appropriate, the population will be characterized statistically to express the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process, or environmental condition.

Non-dedicated sampling devices will be cleaned between sampling points by washing and rinsing with Alconox® detergent, followed by a thorough rinse with distilled water. Specific cleaning techniques are described in the Field Sampling Procedure. Two types of blank samples will accompany each sample set where Target Compound List (TCL) volatiles are to be analyzed (water matrix only). A trip blank, consisting of a 40 ml VOA vial of organic-free water prepared by the laboratory, will accompany each set of sample bottles from the laboratory to the field and back. This bottle will remain sealed throughout the shipment and sampling process. This blank will be analyzed for TCL volatile organic compounds along with the groundwater samples to ensure that contamination with TCL volatile compounds has not occurred during the bottle preparation, shipment and sampling phase of the project. In order to check for contaminant carryover when non-dedicated sampling equipment is used, a rinsate blank will be submitted to the laboratory. This blank will also be analyzed for TCL volatile organic compounds. The TCL compounds are identified in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program dated October 2016.

The analysis results obtained from the determination of identical parameters in field duplicate samples can be used to further assess the representativeness of the sample data.

3.3 COMPARABILITY

Consistency in the acquisition, preparation, handling and analysis of samples is necessary in order for the results to be compared where appropriate. Additionally, the results obtained from analyses of the samples will be compared with the results obtained in previous studies, if available.

To ensure the comparability of analytical results with those obtained in previous or future testing, all samples will be analyzed by NYSDEC-approved methods. The NYSDEC-ASP mandated holding times for various analyses will be strictly adhered to.

3.4 PRECISION AND ACCURACY

The validity of the data produced will be assessed for precision and accuracy. Analytical methods which will be used include gas chromatography/mass spectrometry (GC/MS), gas chromatography (GC), colorimetry, atomic spectroscopy, gravimetric and titrimetric techniques. The following outlines the procedures for evaluating precision and accuracy, routine monitoring procedures, and corrective actions to maintain analytical quality control. All data evaluations will be consistent with NYSDEC-ASP procedures (June 2000). Data will be 100 percent compliant with NYSDEC-ASP requirements.

The number of duplicate, spiked and blank samples analyzed will a minimum of 1 duplicate for every 20 samples per each medium of groundwater and soil. The inclusion and frequency of analysis of field blanks will be on the order of one per every 20 samples (soil) but not more than one per day. For the aqueous matrix field blanks will be collected at a frequency of one per day. Samples to be analyzed for volatile organic compounds will be accompanied by a trip blank for each shipment and field blanks (water matrix) or field blanks (soil).

Quality assurance audit samples will be prepared and submitted by the laboratory QA manager for each analytical procedure used. The degree of accuracy and the recovery of analyte to be expected for the analysis of QA samples and spiked samples depend upon the matrix, method of analysis, and compound or element being determined. The concentration of the analyte relative to the detection limit is also a major factor in determining the accuracy of the measurement. The lower end of the analytical range for most analyses is generally accepted to be five times the detection limit. At or above this level, the determination and spike recoveries for metals in water samples will be expected to range from 75 to 125 percent. The recovery of organic surrogate compounds and matrix spiking compounds determined by GC/MS will be compared to the guidelines for recovery of individual compounds as established by the United States Environmental Protection Agency Contract Laboratory Program dated 7/85 or as periodically updated.

The quality of results obtained for inorganic ion and demand parameters will be assessed by comparison of QC data with laboratory control charts for each test.

4.0 SAMPLING PROCEDURES

4.1 SAMPLING PROGRAM

The sampling program for this project will include soil, groundwater and soil vapor. Soil samples will be collected from split spoon sampling or macrocore devices retrieved from soil borings. Groundwater samples will be collected from groundwater monitoring wells using low flow purging techniques. Soil vapor samples will be collected from vapor points screened in the vadose zone using Summa Canisters.

4.1.1 DRILLING/SAMPLING PROCEDURES

Soil and groundwater samples will be collected by means of a soil boring program. Soil borings shall be completed using the hollow stem auger drilling methods, direct push methods, or rotary drilling methods, whichever methods are determined to be best suited to site conditions by the SESI project manager and SESI field team leader.

Soil samples will be collected from soil borings and analyzed in accordance with the NYSDEC-approved Work Plan. Monitoring wells for groundwater sample collection will be installed in select completed soil borings. Either hollow stem auger (HSA) or direct push drilling methods may be utilized for monitoring well completion.

Samples of the encountered overburden materials shall be collected continuously during drilling so that a complete soil profile is examined and described by the SESI field geologist. The sampling method employed shall be ASTM D-1586/Split Barrel Sampling using a standard 2-foot long, 2-inch outside diameter split- spoon sampler with a 140-pound hammer, in cases where HSA methods are used. Upon retrieval of the sampling barrel, the collected sample shall be placed in glass jars and labeled, stored on site (on ice in a cooler if necessary), and transmitted to the appropriate testing laboratory or storage facility. Chain-of-custody procedures will be practiced following Section 15, EPA-600/4-82-029, Handbook for Sampling and Sample Preservation of Water and Waste Waters.

A geologist or engineer will be on site during the drilling operations to fully describe each soil sample, following the New York State Soil Description Procedure, and to retain representative portions of each sample.

The drilling contractor will be responsible for obtaining accurate and representative samples, informing the geologist of changes in drilling pressure, keeping a separate general log of soils encountered including blow counts [i.e., the number of blows from a

soil sampling drive weight (140 pounds)] required to drive the split-spoon sampler in 6-inch increments and installing monitoring wells to levels directed by the supervising geologist following specifications further outlined in this protocol.

4.1.2 MONITORING WELL COMPLETION

Monitoring wells will be constructed of 0.010-inch slot size PVC well screen and riser casing. Other materials utilized for completion will be washed silica sand (Q-Rock No. 4 or approved equivalent) bentonite grout, Portland cement, and a protective steel locking well casing and cap with locks. The depth of the wells will be determined based on the depth to water, type of contaminant and field conditions encountered.

The monitoring well installation method for wells within unconsolidated sediments shall be to place the screen and riser assembly into the casing once the screen interval has been selected. At that time, a washed silica sand pack will be placed around the well screen if required to prevent screen plugging. If a sand pack is not warranted, the auger string will be pulled back to allow the native aquifer material to collapse 2 to 3 feet above the top of the screen. Bentonite pellets will then be added to the annulus between the casing and the inside auger to ensure proper sealing. Cement/bentonite grout will continue to be added during the extraction of the augers until the entire aquifer thickness has been sufficiently sealed off from horizontal and/or vertical flow above the screened interval. During placement of sand and bentonite pellets, frequent measurements will be made to check the height of the sand pack and thickness of bentonite layers by a weighted drop tape measure.

A bolt-down protective curb box will be installed, flush with the ground, or steel "stick-up" protective casing and secured by a Portland cement seal. The cement seal shall extend laterally at least 1 foot in all directions from the protective casing and shall slope gently away to drain water away from the well.

4.1.3 WELL DEVELOPMENT

All monitoring wells will be developed or cleared of all fine-grained materials and sediments that have settled in or around the well during installation so that the screen is transmitting representative portions of the groundwater. The development will be by one of two methods, pumping or bailing groundwater from the well until it yields relatively sediment-free water.

A decontaminated pump or bailer will be used and subsequently decontaminated after each use following procedures outlined in the Decontamination Protocol. Pumping or bailing will cease when the turbidity falls below 50 NTUs or until specific conductivity, pH, and temperature are stable (i.e., consecutive readings are within 10 percent with no

overall upward or downward trends in measurements). Well development water will be contained in drums and properly disposed off-site.

4.1.4 DECONTAMINATION

All drilling equipment and associated tools including augers, drill rods, sampling equipment, wrenches and any other equipment or tools that have come in contact with contaminated materials will be decontaminated before any drilling on site begins, between each well, and prior to removing any equipment from the site. The preferred decontamination procedure will be to scrape the equipment from any residual soils and then rinse with water and Alconox®. Every effort will be made to minimize the generation of contaminated water, which will be drummed, to extent possible, for disposal.

4.1.5 PFAS SAMPLING CONSIDERATIONS

This section contains the materials limitations for Per- and polyfluoroalkyl substances sampling in accordance with the Draft NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (April 2023).

The groundwater samples will be analyzed for PFAS using USEPA Method 1633. Reporting limits for PFOA and PFOS will not exceed 2 nanograms per liter (ng/L). Category B deliverables and an electronic data deliverable will be completed.

PFAS are very persistent in the environment and in the human body. Due to their presence in a variety of products, persistence in the environment and very low drinking water standards, care must be used when groundwater sampling for PFAS to avoid cross contamination from the sampling equipment and personal protective equipment (PPE).

No fabric softener will be used on clothing to be worn in field. Cosmetics, moisturizers, hand cream, unauthorized sunscreen, insect repellent or other related products will not be used the morning of sampling. The field samplers will wear powder-free nitrile gloves while filling and sealing the sample bottles. The sampling equipment components and sample containers will not come in contact with material that may potentially contain PFAS such as aluminum foil, low density polyethylene (LDPE), glass or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials will be avoided. Food and drink packaging materials will be avoided, as well.

Sampling will be performed using certified PFAS-free sampling materials such as stainless steel, high density polyethylene (HDPE), PVC, silicone, acetate or polypropylene pump and tubing. Rinse water must be laboratory-provided certified PFAS-free distilled or de-ionized water. Standard two step decontamination using Alconox® detergent and clean certified PFAS-free water rinse will be performed for equipment that does come in contact with PFAS materials.

No waterproof field books, plastic clipboards, binders, or spiral hard cover will be used for PFAS containers. No adhesives (i.e. Post-It® Notes), sharpies, or permanent markers will be used for PFAS containers. The PFAS containers will be labeled with ballpoint pens. PFAS samples will be stored in separate cooler filled with regular ice only with no chemical (blue) ice packs.

Pre-cleaned sample bottles with closures, coolers, sample labels and a chain of custody form will be provided by the laboratory.

4.2 GROUNDWATER SAMPLING PROGRAM.

4.2.1 WELL EVACUATION

Prior to sampling a monitoring well, the static water level will be recorded. All well data will be recorded on a field sampling record. The wells will be sampled in accordance with the USEPA guidelines for the Low Flow Purging Sampling (LFPS). The purpose of LFPS is to collect groundwater samples from monitoring wells that are representative of ambient groundwater conditions in the aquifer. The LFPS method reduces turbidity which is needed particularly when sampling for metals.

4.2.2 SAMPLING PROCEDURE

The wells will be sampled using the LFPS technique. A flow rate of 100 ml to 250 ml per minute is used to purge the wells. Drawdown should not exceed 0.3 feet. QED bladder pumps or peristaltic pumps are used for this method. The pump intake is lowered to the mid-point of the water column or as subsurface features such as bedrock fractures or more permeable zones warrant. At the initiation of low flow purging a water level is recorded as well as field parameters. Field parameters are then monitored every five minutes during low flow purging using a flow through cell. When three consecutive measurements of pH differ by 0.1 units or less, with ORP within 10 mv or less, turbidity varies 10 percent or less, conductivity differs by 3 percent or less and dissolved oxygen by 10 percent or less, sampling may begin. Flow through cells are used so continuous real time readings are made. When the parameters stabilize the flow through cell is disconnected and sample bottles are filled directly from the tubing.

4.3 SOIL VAPOR SAMPLING

Soil vapor sampling will be conducted in accordance with NYSDOH Guidance for Evaluating Soil Vapor Intrusion in New York State (October 2006, amended in May 2017 and February 2024). Soil vapor samples will be collected in the vadose zone from shallow (5 feet) well points. Each vapor point will be installed in a shallow boring drilled either by hand-operated equipment (e.g. hand auger or percussion hammer drill), or by a

small truck-mounted drill rig. Drilling equipment used shall be based on soil conditions, and the method that provides the most practical approach.

Each vapor point will consist of an inert sampling tube (polyethylene, stainless steel, or Teflon®) with a 6-inch screened section at the bottom through which soil vapors can be sampled. The screen slot size will be 0.0075 inches. A sampling zone will be created around the screened section by backfilling with 1 to 2 feet of porous coarse sand or glass beads, and at least three feet of bentonite will be placed above the porous sampling zone to form a seal from the surface. Native clean soil will be packed around the remaining annulus to the ground surface.

Each designated soil vapor sampling location will be purged of a minimum of three volumes using a low volume pump, and then attached to a regulator, and secured with a clamp. The regulator will then be attached to a 1-liter summa canister.

The regulator will be set to collect a soil vapor sample at a flow rate of less than 0.2 liters per minute. After the summa canister is filled, the valve will be closed.

Each canister will be listed according to a specific sample I.D. on a chain of custody form. Sample canisters will be delivered to the laboratory within 24 hours and analyzed for VOCs by method TO-15. The detection limit for VOCs will be 1 µg/m³ or less.

The soil vapor sampling effort will include the use of inert helium tracer gas to verify that the soil vapor samples are not diluted by ambient air. The atmosphere around the sampling tube will be enriched with the tracer gas, and the soil vapor sample will be collected in the presence of the enriched tracer atmosphere. This will be accomplished by placing an inverted plastic pail over the sampling point and filling the pail with the tracer gas via a small tube penetrating the site of the pail. Refer to NYSDOH Guidance for Evaluating Soil Vapor Intrusion in New York State (October 2006 amended in May 2017 and February 2024).

Weather conditions in the 48 hours prior to the test, and during the test, will be noted, including average wind speed, precipitation, temperature, and barometric pressure.

4.4 SAMPLE PRESERVATION AND SHIPMENT

Since all bottles will contain the necessary preservatives as shown in Table 4.1, they need only be filled. The 40 ml VOA vials must be filled brim full with no air bubbles. The other bottles should be filled to within about 1 inch from the top.

The bottles will be sent from the laboratory in coolers which will be organized on a per site basis. Following sample collection, the bottles should be placed on ice in the shipping cooler. The samples will be cooled to 4°C, but not frozen.

Final packing and shipment of coolers will be performed in accordance with guidelines outlined in the ASP.

5.0 SAMPLE CUSTODY

The program for sample custody and sample transfer is in compliance with the NYSDEC-ASP, as periodically updated. If samples may be needed for legal purposes, chain-of-custody procedures, as defined by NEIC Policies and Procedures (USEPA-330/9-78-001-R, Revised June 1988) will be used. Sample chain-of-custody is initiated by the laboratory with selection and preparation of the sample containers. To reduce the chance for error, the number of personnel handling the samples should be minimized.

5.1 FIELD SAMPLE CUSTODY

A chain-of-custody record accompanies the samples from initial sample container selection and preparation at the laboratory, shipment to the field for sample containment and preservation, and return to the laboratory. Two copies of this record follow the samples to the laboratory. The laboratory maintains one file copy and the completed original is returned to the site inspection team. Individual sample containers provided by the laboratory are used for shipping samples. The shipping containers are insulated and ice is used to maintain samples at approximately 4°C until samples are returned and in the custody of the laboratory. All sample bottles within each shipping container are individually labeled and controlled. Samples are to be shipped to the laboratory within 24-48 hours of the day of collection depending on parameter holding times.

Each sample shipping container is assigned a unique identification number by the laboratory. This number is recorded on the chain-of-custody record and is marked with indelible ink on the outside of the shipping container. The field sampler will indicate the sample designation/location number in the space provided on the appropriate chain-of-custody form for each sample collected. The shipping container is closed and a seal provided by the laboratory is affixed to the latch. This seal must be broken to open the container, and this indicates possible tampering if the seal is broken before receipt at the laboratory. The laboratory will contact the site investigation team leader and the sample will not be analyzed if tampering is apparent.

5.2 LABORATORY SAMPLE CUSTODY

The site investigation team leader or Project Quality Assurance Officer notifies the laboratory of upcoming field sampling activities and the subsequent transfer of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The laboratory sample program meets the following criteria:

- The laboratory has designated a sample custodian who is responsible for maintaining custody of the samples and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check the original chain-of-custody documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian signs the chain-of-custody record and records the date and time received.
- Care is exercised to annotate any labeling or descriptive errors. In the event of discrepant documentation, the laboratory will immediately contact the site investigation team leader as part of the corrective action process. A qualitative assessment of each sample container is performed to note any anomalies, such as broken or leaking bottles. This assessment is recorded as part of the incoming chain-of-custody procedure.
- The samples are stored in a secured area at a temperature of approximately 4°C until analyses are to commence.
- A laboratory chain-of-custody record accompanies the sample or sample fraction through final analysis for control.
- A copy of the chain-of-custody form will accompany the laboratory report and will become a permanent part of the project records.

5.3 FINAL EVIDENCE FILES

Final evidence files include all originals of laboratory reports and are maintained under documented control in a secure area.

A sample or an evidence file is under custody if:

- It is in your possession; it is in your view, after being in your possession.
- It was in your possession and you placed it in a secure area.
- It is in a designated secure area.

6.0 CALIBRATION PROCEDURES

Instruments and equipment used to gather, generate or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the appropriate manufacturer's specifications or project specific requirements. The procedures for instrument calibration, calibration verification, and the frequency of calibrations are described in the ASP. The calibration of instruments used for the determination of metals will be as described in the appropriate CLP standard operating procedures.

Calibration of other instruments required for measurements associated with these analyses will be in accordance with the manufacturer's recommendations and the standard operating procedures of the laboratory.

7.0 ANALYTICAL PROCEDURES

Analytical procedures shall conform to the most recent revision of the NYSDEC-ASP (June 2005) and are summarized on Table 7.1. In the absence of USEPA or NYSDEC guidelines, appropriate procedures shall be submitted for approval by NYSDEC prior to use.

The procedures for the sample preparation and analysis for organic compounds are as specified in the NYSDEC-ASP. Analytical cleanups are mandatory where matrix interferences are noted. No sample shall be diluted any more than 1 to 5 times. The sample shall be either re-extracted, re-sonicated, re-stream distilled, etc. or be subjected to any one analytical cleanup noted in SW846 or a combination thereof. The analytical laboratory shall expend such effort and discretion to demonstrate good laboratory practice and demonstrate an attempt to best achieve the method detection limit.

7.1 VOLATILE ORGANICS (VOA)

For the analysis of water samples for Target Compound List (TCL), volatile organic compounds (VOCs), no sample preparation is required. The analytical procedure for volatiles is detailed in NYSDEC-ASP (Volume I, Section D-I). A measured portion of the sample is placed in the purge and trap apparatus and the sample analysis is performed by gas chromatography/mass spectrometry for the first round. USEPA Method 8260C will be used, plus tentatively identified compounds (TICs). USEPA Methods 8010 or 8020 (gas chromatography with different detectors) will be used if subsequent rounds with lower limits of detection are warranted.

7.2 SEMI-VOLATILE ORGANIC COMPOUNDS

The extraction and analytical procedures used for preparation of water, soil and sediment samples for the analysis of the TCL semi-volatile organic compounds are described in NYSDEC-ASP Volume I, Section D-III. USEPA Method 8270D will be used, plus tentatively identified compounds (TICs).

Instrument calibration, compound identification, and quantitation are performed as described in Section 6 of this document and in the NYSDEC-ASP.

7.3 PESTICIDE AND PCB COMPOUNDS

The sample preservation procedures for gas chromatography for pesticides and PCB's will be as described in the NYSDEC-ASP methods (Section D-IV). The analysis of standard mixes, blanks and spiked samples will be performed at the prescribed frequency with adherence to the 72-hour requirement described in the method.

7.4 METALS

Water, soil and waste samples will be analyzed for the metals listed in Table 7.1. The detection limits for these metals are as specified in the NYSDEC-ASP, Section D-V. The instrument detection limits will be determined using calibration standards and procedures specified in the NYSDEC-ASP. The detection limits for individual samples may be higher due to the sample matrix. The procedures for these analyses will be as described in the NYSDEC-ASP.

The analyses for metals will be performed by atomic absorption spectroscopy (AAS) or inductively-coupled plasma emission spectroscopy (ICPES), as specified in the ASP with regard to AAS flame analysis.

7.5 PER- AND POLYFLUOROALKYL SUBSTANCES

The NYSDEC has developed a list of 41 PFAS Analytes List on Table 7.1 for remedial programs. These are:

- Perfluorobutanesulfonic acid
- Perfluoropentanesulfonic acid
- Perfluorohexanesulfonic acid
- Perfluoroheptanesulfonic acid
- Perfluorooctanesulfonic acid
- Perfluorononanesulfonic acid
- Perfluorodecanesulfonic acid
- Perfluorododecanesulfonic acid
- Perfluorobutanoic acid
- Perfluoropentanoic acid
- Perfluorohexanoic acid
- Perfluoroheptanoic acid
- Perfluorooctanoic acid
- Perfluorononanoic acid
- Perfluorodecanoic acid
- Perfluoroundecanoic acid
- Perfluorododecanoic acid
- Perfluorotridecanoic acid
- Perfluorotetradecanoic acid
- Perfluorohexadecanoic acid

- Hexafluoropropylene oxide dimer acid
- 4,8-Dioxa-3H-perfluorononanoic acid
- Perfluoro-3-methoxypropanoic acid
- Perfluoro-4-methoxybutanoic acid
- Nonafluoro-3,6-dioxaheptanoic acid
- 4:2 Fluorotelomer sulfonic acid
- 6:2 Fluorotelomer sulfonate
- 8:2 Fluorotelomer sulfonate
- 3:3 Fluorotelomer carboxylic acid
- 5:3 Fluorotelomer carboxylic acid
- 7:3 Fluorotelomer carboxylic acid
- Perflurooctane sulfonamide
- N-methylperfluorooctane sulfonamide
- N-ethylperfluorooctane sulfonamide
- N-methyl perfluorooctanesulfonamidoacetic acid
- N-ethyl perfluorooctanesulfonamidoacetic acid
- N-methylperfluorooctane sulfonamidoethanol
- N-ethylperfluorooctane sulfonamidoethanol
- 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major)
- 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)
- Perfluoro(2-ethoxyethane) sulfonic acid

Currently, ELAP does not offer certification for PFAS compounds in matrices other than finished drinking water. Per the NYSDEC July 2023 guidance on emergent contaminant sampling, the analytical procedure for soil and groundwater sampling of PFAS is Modified EPA Method 1633. The reporting limit for PFAS in soil samples is 0.5 ug/kg. Reporting limits for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) in groundwater should not exceed 2 ng/L.

7.6 SITE SPECIFICITY OF ANALYSES

Work plans prepared for remedial investigation waste sites contain recommendations for the chemical parameters to be determined for each site. Thus, some or all of the referenced methods will apply to the analysis of samples collected at the individual waste sites. Analyses of Target Compound List (TCL) analytes will be performed on all samples.

TABLE 4.1 – SAMPLE CONTAINERIZATION

PARAMETER & ANALYTICAL METHOD	NO.	BOTTLE TYPE	PRESERVATIVE ⁽¹⁾	HOLDING TIME
Aqueous Samples				
SVOCs (BNAs) – USEPA 8270D or E	2	1-liter amber glass bottle	Ice to 4°C	7 days (until extraction) 40 days (extracted)
Pesticides – USEPA 8081B	2	1-liter amber glass bottle	Ice to 4°C	7 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082A	2	1-liter amber glass bottle	Ice to 4°C	7 days (until extraction) 40 days (extracted)
VOCs – USEPA 8260C or D	2	40 mL, glass vial with septum cap	Hydrochloric Acid to pH <2 Ice to 4°C	14 days
Metals ⁽²⁾ – 6010C or D, Mercury 7470A	1	1-liter, plastic bottle	Nitric acid to pH <2 NaOH for cyanide Ice to 4°C	180 days Mercury: 28 days
Cyanide – SM 4500-CN-E	1	1-liter, plastic	Sodium Hydroxide to pH >12 Ice to 4°C	14 days
PFAS Compounds – USEPA Method 1633	2	500 ml HDPE or Polypropylene with non-Teflon lid	Chilled to 0 - 6 °C	14 days
Soil, Sediment, Solid Waste Samples				
VOCs – USEPA 8260C or D	3	15-gram EnCore samplers	Chilled to 0 - 6°C	14 days
SVOCs (BNAs) and 1,4-Dioxane – USEPA 8270D SIM if RL cannot be reached	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	14 days (until extraction, 40 days extracted)
Pesticides – USEPA 8081B	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	14 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082A	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	none
Metals ⁽²⁾ – 6010C or D, Mercury 7471B	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	180 days Cyanide: 14 days Mercury: 28 days
PFAS Compounds – USEPA Method 1633	2	500 ml HDPE or Polypropylene with non-Teflon lid	Chilled to 0 - 6°C	28 days
Soil Vapor / Indoor Air Samples				
VOCs – USEPA TO-15	1	Summa Canister	None	30 days

(1) All samples will be preserved with ice during collection and shipment to 0-6 degrees C.

(2) From verified time of sample receipt by the analytical laboratory (within 24 to 48 hours of collection).

(3) A complete list of compounds is provided on Table 7.1.

TABLE 4.2 – SAMPLING PROCEDURE FOR MONITORING WELLS USING VOLUME AVERAGED PURGING

1. Initial static water level recorded with an electric contact probe accurate to the nearest 0.1 foot.
2. Sampling device and electric contact probe decontaminated.
 - a. Sampling device and probe are rinsed with pesticide-grade methanol and distilled water.
 - b. Methanol is collected into a large funnel which empties into a five- gallon container.
3. Sampling device lowered into well.
 - a. Bailer lowered by dedicated PVC or polypropylene line.
4. Sample taken.
 - a. Sample is poured slowly from the open end of the bailer with the sample bottle tilted so that aeration and turbulence are minimized.
 - b. Duplicate sample is collected when appropriate.
5. Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.
6. All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.
 - a. Dedicated line is disposed of or left at well site.
7. Equipment/wash blanks are collected when non-dedicated sampling equipment is used.
8. Chain-of-custody forms are completed in triplicate.
 - a. The original and one carbon copy are put into a zip-lock bag and placed into the cooler.
9. The original will be returned following sample analysis.
 - a. A second carbon copy is kept on file.
10. Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.

TABLE 4.3 – SAMPLING PROCEDURE FOR MONITORING WELLS USING LOW-STRESS (LOW-FLOW) METHODS

1. Initial static water level recorded with an electric contact probe accurate to the nearest 0.1 foot.
2. Sampling device is lowered into well. Slowly lower the pump, safety cable, tubing and electrical lines into the well to the depth specified for that well. Pump intake must be no less than 2 feet from the bottom of the well to prevent disturbance and resuspension of sediments which may be at the bottom of the well.
3. Measure water level again: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.
4. Purge Well: Start pumping the well at 200 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. As noted above, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.
5. Monitor Indicator Parameters: During purging of the well, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, Eh, and DO) approximately every five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows (Puls and Barcelona, 1996):
 - a. 0.1 for pH
 - b. 3% for specific conductance (conductivity)
 - c. 10 mv for redox potential
 - d. 10% for DO and turbidity
6. Dissolved oxygen and turbidity usually require the longest time to achieve stabilization. The pump must not be removed from the well between purging and sampling.
7. Collect Samples: Collect samples at a flow rate between 100 and 250 ml/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 ft. VOC samples must be collected first and directly into sample containers. All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container.
8. Ground water samples to be analyzed for volatile organic compounds (VOCs) require pH adjustment. The appropriate EPA Program Guidance should be consulted to determine whether pH adjustment is necessary. If pH adjustment is necessary for VOC sample preservation, the amount of acid to be added to each sample vial prior to sampling should be determined, drop by drop, on a separate and

equal volume of water (e.g., 40 ml). Groundwater purged from the well prior to sampling can be used for this purpose.

9. Remove Pump and Tubing: After collection of the samples, the tubing, unless permanently installed, must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.
10. Measure and record well depth.
11. Close and lock the well.
12. Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.
13. All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.
 - a. Dedicated line is disposed of or left at well site.
14. Equipment/wash blanks are collected when non-dedicated sampling equipment is used.
15. Chain-of-custody forms are completed in triplicate.
 - a. The original and one carbon copy are put into a zip-lock bag and placed into the cooler. The original will be returned following sample analysis.
 - b. A second carbon copy is kept on file.
16. Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.

Table 7-1 – PFAS Compound List and Reporting and Method Detection Limits for Soil and Groundwater

	PFAS	Reporting Limit — Groundwater (ng/l)
1	Perfluorobutanesulfonic acid (PFBS)	1.6
2	Perfluoropentanesulfonic acid (PFPeS)	1.6
3	Perfluorohexanesulfonic acid (PFHxS)	1.6
4	Perfluoroheptanesulfonic acid (PFHpS)	1.6
5	Perfluorooctanesulfonic acid (PFOS)	1.6
6	Perfluorononanesulfonic acid (PFNS)	1.6
7	Perfluorodecanesulfonic acid (PFDS)	1.6
8	Perfluorododecanesulfonic acid (PFDoS)	1.6
9	Perfluorobutanoic acid (PFBA)	6.4
10	Perfluoropentanoic acid (PFPeA)	3.2
11	Perfluorohexanoic acid (PFHxA)	1.6
12	Perfluoroheptanoic acid (PFHpA)	1.6
13	Perfluorooctanoic acid (PFOA)	1.6
14	Perfluorononanoic acid (PFNA)	1.6
15	Perfluorodecanoic acid (PFDA)	1.6
16	Perfluoroundecanoic acid (PFUnA)	1.6
17	Perfluorododecanoic acid (PFDoA)	1.6
18	Perfluorotridecanoic acid (PFTTrDA)	1.6
19	Perfluorotetradecanoic acid (PFTeDA)	1.6
20	Hexafluoropropylene oxide dimer acid (HFPO-DA)	6.4
21	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.4
22	Perfluoro-3-methoxypropanoic acid (PFMPA)	3.2
23	Perfluoro-4-methoxybutanoic acid (PFMBA)	3.2
24	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	3.2
25	4:2 Fluorotelomer sulfonic acid (4:2-FTS)	6.4
26	6:2 Fluorotelomer sulfonic acid (6:2-FTS)	6.4
27	8:2 Fluorotelomer sulfonic acid (8:2-FTS)	6.4
28	3:3 Fluorotelomer carboxylic acid (3:3 FTCA)	8.0
29	5:3 Fluorotelomer carboxylic acid (5:3 FTCA)	40
30	7:3 Fluorotelomer carboxylic acid (7:3 FTCA)	40
31	Perfluorooctane sulfonamide (PFOSA)	1.6
32	N-methylperfluorooctane sulfonamide (NMeFOSA)	1.6
33	N-ethylperfluorooctane sulfonamide (NEtFOSA)	1.6
34	N-methylperfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	1.6
35	N-ethylperfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	1.6
36	N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	16
37	N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	16
38	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major) (9CL-PF3ONS)	6.4
39	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor) (11CL-PF3OUDS)	6.4
40	Perfluoro(2-ethoxyethane) sulfonic acid (PFEEESA)	3.2

	PFAS	Reporting Limit — Groundwater (ng/l)
41	Perfluorohexadecanoic acid (PFHxDA) ¹	~
	1,4-dioxane	5

	PFAS	Reporting Limit — Soil (ng/g)
1	Perfluorobutanesulfonic acid (PFBS)	0.2
2	Perfluoropentanesulfonic acid (PFPeS)	0.2
3	Perfluorohexanesulfonic acid (PFHxS)	0.2
4	Perfluoroheptanesulfonic acid (PFHpS)	0.2
5	Perfluorooctanesulfonic acid (PFOS)	0.2
6	Perfluorononanesulfonic acid (PFNS)	0.2
7	Perfluorodecanesulfonic acid (PFDS)	0.2
8	Perfluorododecanesulfonic acid (PFDoS)	0.2
9	Perfluorobutanoic acid (PFBA)	0.8
10	Perfluoropentanoic acid (PFPeA)	0.4
11	Perfluorohexanoic acid (PFHxA)	0.2
12	Perfluoroheptanoic acid (PFHpA)	0.2
13	Perfluorooctanoic acid (PFOA)	0.2
14	Perfluorononanoic acid (PFNA)	0.2
15	Perfluorodecanoic acid (PFDA)	0.2
16	Perfluoroundecanoic acid (PFUnA)	0.2
17	Perfluorododecanoic acid (PFDoA)	0.2
18	Perfluorotridecanoic acid (PFTTrDA)	0.2
19	Perfluorotetradecanoic acid (PFTeDA)	0.2
20	Hexafluoropropylene oxide dimer acid (HFPO-DA)	0.8
21	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.8
22	Perfluoro-3-methoxypropanoic acid (PFMPA)	0.4
23	Perfluoro-4-methoxybutanoic acid (PFMBA)	0.4
24	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.4
25	4:2 Fluorotelomer sulfonic acid (4:2-FTS)	0.8
26	6:2 Fluorotelomer sulfonic acid (6:2-FTS)	0.8
27	8:2 Fluorotelomer sulfonic acid (8:2-FTS)	0.8
28	3:3 Fluorotelomer carboxylic acid (3:3 FTCA)	1.0
29	5:3 Fluorotelomer carboxylic acid (5:3 FTCA)	5.0
30	7:3 Fluorotelomer carboxylic acid (7:3 FTCA)	5.0
31	Perfluorooctane sulfonamide (PFOSA)	0.2
32	N-methylperfluorooctane sulfonamide (NMeFOSA)	0.2
33	N-ethylperfluorooctane sulfonamide (NEtFOSA)	0.2
34	N-methylperfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	0.2
35	N-ethylperfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	0.2
36	N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	2.0

	PFAS	Reporting Limit — Soil (ng/g)
37	N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	2.0
38	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major) (9CL-PF3ONS)	0.8
39	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor) (11CL-PF3OUdS)	0.8
40	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)	0.4
41	Perfluorohexadecanoic acid (PFHxDA) ¹	~

Source: EPA Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS, Second Draft Method 1633, November 2022

Data for this table are derived from the single-laboratory validation study and are only provided as examples for this draft method. The data will be updated to reflect the interlaboratory study results in a subsequent revision. Therefore, these criteria will change after interlaboratory validation.

¹ This compound was not listed in the EPA Method 1633 2nd draft and currently no known values exist

Appendix C:

Emerging Contaminant Sampling Plan



Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

**Soil and Groundwater Sampling Plan for Emerging Contaminants
For**

**Proposed Redevelopment
34 State Street
Ossining, Westchester County, NY**

Prepared for:
WB 30 State LLC
June 2025

SESI Project No:
13968

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TABLE 2.1	PFAS COMPOUNDS LIST
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LIST OF ACRONYMS

Acronym	Definition
DUSR	Data Usability Summary Report
ELAP	Environmental Laboratory Accreditation Program
HDPE	High-Density Polyethylene
LDPE	Low-density Polyethylene
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
ng/L	Nanogram per liter
NYSDEC	New York State Department of Environmental Conservation
PFAS	Per and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PTFE	Polytetrafluoroethylene
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
TAL	Target Analyte List
TCL	Target Compound List
ug/kg	micrograms pers kilogram
USEPA	United States Environmental Protection Agency

1.0 PROJECT DESCRIPTION

This document presents the Soil and Groundwater Plan for Emerging Contaminants for the Remedial Investigation Work Plan for the proposed development at 34 State Street, Ossining, Westchester County, New York (the "Site"). The Site is identified as a parcel to be consolidated as Block 2, Lots 17, 18 and 68 on the Westchester County tax map and totals approximately 5.858-acres in size. The Site is improved with an asphalt lot, former building footprints, demolition debris, one (1) large three (3) story residential historic house building, one (1) shed and wooded areas. These buildings are currently vacant and abandoned.

The Site is located in a residential and commercial area and is bounded by a day care center to the north, residential to the south, residential/commercial uses to the east, and residential to the west. The closest notable surface water body is the Hudson River located approximately 760 feet west of the Subject Property.

2.0 SOIL SAMPLING PLAN

The sampling will be performed in accordance with the New York State Department of Environmental Conservation (NYSDEC) Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Remedial Programs, dated April 2023. The soil samples will be sent via chain of custody to an ELAP-certified laboratory and analyzed for TCL/TAL+30, 1,4-dioxane and the per and polyfluoroalkyl substances (PFAS) compounds listed in Table 2.1. The soil samples will be analyzed for PFAS using Draft Method 1633. Reporting limits for each PFAS compound will not exceed 0.5 micrograms per kilogram (ug/kg). NYSDEC will be informed if detection limits on certain PFAS compounds cannot be met by the laboratory. Category B deliverables and an electronic data deliverable will be completed. A data usability summary report (DUSR) will be prepared by a data validator for all the analyses including PFAS and 1,4-dioxane. The method detection limit (MDL) for 1,4-dioxane will be no higher than 0.1 mg/kg (ppm).

Because PFAS compounds must be analyzed at concentrations in the ng/kg range, precautions must be taken to prevent cross-contamination during sampling events. Field sampling equipment that is used at multiple sites or sampling locations could become highly contaminated with PFAS. Soil sampling at this Site will involve the use of non-dedicated equipment, such as a Geoprobe direct push drill rig, which could be a source of cross-contamination. Decontamination procedures outlined in this document will be followed to avoid cross contamination and equipment will be verified as PFAS-free. Special care and consideration will be given to the field sampling equipment when stored and handled outside the Site boundaries or between different sample locations.

Items that may be directly in contact with the soil, including spoons, bowls, and direct push equipment, including any split spoon or sampling barrels, have a high likelihood of cross-contamination occurring if the proper decontamination procedures are not followed. These items should be known to be PFAS free. Items that will not directly contact the soil, including field books, Post-It® Notes, aluminum foil, recycled paper towels, binders, or spiral hard cover notebook, can be a source of PFAS contamination. Every effort will be made to ensure these items are PFAS-free.

For the sampling equipment, the following items, materials, and procedures will be used for decontamination:

- Municipal drinking water may be used for decontamination if it is known to be PFAS-free. Commercially available deionized water in a high-density polyethylene (HDPE) container may also be used for decontamination.
- Standard two step decontamination using Alconox® detergent and PFAS-free triple water rinse will be performed for the sampling equipment.
- Sampling equipment may be scrubbed with polyethylene or a polyvinyl chloride (PVC) brush to remove particulates.
- The sampling equipment components will not come in contact with material that may potentially contain PFAS such as aluminum foil, low density polyethylene (LDPE), polytetrafluoroethylene (PTFE, Teflon®) or other fluoropolymers.
- Soil sampling equipment will be decontaminated between each sampling point and at the conclusion of the workday. This is to ensure sampling equipment is decontaminated ahead of time for the next sampling event.

Equipment rinsate blanks will be collected daily for the equipment that comes in contact with the soil samples and is decontaminated and reused. If all the sampling materials are disposable, no field blanks will be collected. Field duplicates will be collected on a frequency of one (1) per 20 samples. One matrix spike and matrix spike duplicate (MS/MSD) will also be collected on a frequency of one (1) per 20 samples. A trip blank will accompany each laboratory shipment which includes analysis for volatile organic compounds.

3.0 GROUNDWATER SAMPLING PLAN

The sampling will be performed in accordance with the NYSDEC Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Remedial Programs, dated April 2023, the NYSDEC July 2018 letter on Groundwater Sampling for Emerging Contaminants, and the PFAS Groundwater Samples from Monitoring Well Sample Protocols Revision 1.2 August 9, 2019. The groundwater samples will be sent via chain of custody in a cooler at 4 degrees C to an ELAP-certified laboratory and analyzed for TCL/TAL+30, 1,4-dioxane and the PFAS compounds listed in Table 2.1. The groundwater samples will be analyzed for PFAS using Modified USEPA Draft Method 1633. Reporting limits for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) will not exceed 2 nanogram per liter (ng/L). Category B deliverables and an electronic data deliverable will be completed. A DUSR will be prepared by a data validator for all the analyses including PFAS and 1,4-dioxane. The MDL for 1,4-dioxane will be no higher than 0.35 µg/l (ppb). In order to get the appropriate detection limit, the lab will run EPA Method 8270 in "selective ion monitoring" (SIM) mode for 1,4-dioxane.

PFAS are very persistent in the environment and in the human body. There is evidence that exposure to PFAS can lead to adverse human health effects. EPA established the health advisory levels for PFAS in drinking water at 4 parts per trillion. Due to their presence in a variety of products, persistence in the environment and very low drinking water standards, care must be used when groundwater sampling for PFAS to avoid cross contamination from the sampling equipment and personal protective equipment (PPE).

4.0 SOIL SAMPLE COLLECTION AND HANDLING

The following considerations will be observed:

- No fabric softener will be used on clothing to be worn by the sampling personnel in the field. Clothing that contains PTFE material (including GORE-TEX®) or that has been waterproofed with PFAS-containing materials will be avoided.
- Cosmetics, moisturizers, hand cream, unauthorized sunscreen, insect repellent or other related products will not be used by the sampling staff on sampling days.
- Food and drink packaging materials such as pre-wrapped food or snacks (i.e. candy bars, microwave popcorn, etc.) will not be used in the sampling and staging areas.
- Sampling will be conducted with powderless nitrile gloves. The gloves will be changed frequently any time there is an opportunity for cross-contamination during sampling, including, but not limited to:
 - a. Immediately prior to sample collection
 - b. Each time sampling equipment is placed in and then removed from soil at a new location
 - c. Handling of any sample, including quality assurance/quality control (QA/QC) samples
 - d. After the handling of any non-dedicated sampling equipment
 - e. After contact with non-decontaminated surfaces
 - f. After decontamination of sampling equipment
 - g. When judged necessary by field personnel
- HDPE or polypropylene sample bottles with Teflon®-free caps, provided by the laboratory will be used. Sample containers will not come in contact with material that may potentially contain PFAS.
- Bottles will only be opened immediately prior to sampling.

- Dust and fibers will be kept out of sample bottles.
- The sample caps will never be placed directly on the ground during sampling. If the sampling staff must set the sample bottle cap down during sample collection and a second member of the sampling crew (wearing a fresh pair of powderless nitrile gloves) is not available, the cap will be set on a clean surface (cotton sheeting, HDPE sheeting, triple rinsed cooler lid, etc.).
- Regular size Sharpie® and thicker markers will be avoided. Fine and Ultra-Fine point Sharpie® markers may be used. Ballpoint pens may be used when labeling sample containers. If ballpoint pens do not write on the sample container labels, preprinted labels from the laboratory may be used.
- Sample bottles, coolers, sample labels and a chain of custody form will be provided by the analytical laboratory.

PFAS samples will be collected prior to collecting non-PFAS samples.

5.0 SAMPLE SHIPMENT

In the absence of a formal USEPA guidance for PFAS sample storage, the documentation in USEPA Draft Method 1633 will be used as a guide for thermal preservation and holding times for soil or other samples. Samples will be chilled during storage and shipment and will not exceed 50°F (10° C) during the first 48 hours after collection.

The following procedures will be used by SESI for sample shipment:

- Regular ice will be used to cool and maintain the samples at or below 42.8°F (6°C). Chemical or blue ice may be used if it is known to be PFAS-free and the samples can be cooled and maintained at or below 42.8°F (6°C) during collection and through transit to the laboratory.
- The coolers will be periodically checked to ensure samples are well iced and at the proper temperature. Refresh with regular ice if needed. The ice may be double bagged in LDPE resealable storage bags. LDPE may be used if an equipment blank demonstrates the LDPE is PFAS-free.
- Chain of Custody and other forms will be single bagged in LDPE (e.g. Ziploc®) storage bags and taped to the inside of the cooler lid. LDPE may be used if an equipment blank demonstrates the LDPE is PFAS-free.

- The cooler(s) will be taped closed with a custody seal and picked up by the laboratory within 24 hrs.



NEW YORK
STATE OF
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**Department of
Environmental
Conservation**

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Under NYSDEC's Part 375 Remedial Programs

April 2023



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ERRATA SHEET for

**SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES
(PFAS) Under NYSDEC's Part 375 Remedial Programs Issued January 17, 2020**

Citation and Page Number	Current Text	Corrected Text	Date
Title of Appendix I, page 32	Appendix H	Appendix I	2/25/2020
Document Cover, page 1	Guidelines for Sampling and Analysis of PFAS	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs	9/15/2020
Data Assessment and Application to Site Cleanup Page 3	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published	Until such time as Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published	3/28/2023
Water Sample Results Page 3	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt) and is determined to be attributable to the site, either by a comparison of upgradient and downgradient levels, or the presence of soil source areas, as defined below.	NYSDEC has adopted ambient water quality guidance values for PFOA and PFOS. Groundwater samples should be compared to the human health criteria of 6.7 ng/l (ppt) for PFOA and 2.7 ng/l (ppt) for PFOS. These guidance values also include criteria for surface water for PFOS applicable for aquatic life, which may be applicable at some sites. Drinking water sample results should be compared to the NYS maximum contaminant level (MCL) of 10 ng/l (ppt). Analysis to determine if PFOA and PFOS concentrations are attributable to the site should include a comparison between upgradient and downgradient levels, and the presence of soil source areas, as defined below.	3/28/2023
Soil Sample Results Page 3	Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values:	NYSDEC will delay adding soil cleanup objectives for PFOA and PFOS to 6 NYCRR Part 375-6 until the PFAS rural soil background study has been completed. Until SCOs are in effect, the following are to be used as guidance values:	3/28/2023
Protection of Groundwater Page 3	PFOA (ppb) 1.1 PFOS (ppb) 3.7	PFOA (ppb) 0.8 PFOS (ppb) 1.0	3/28/2023

Citation and Page Number	Current Text	Corrected Text	Date
Footnote 2 Page 3	The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	The Protection of Groundwater values are based on the above referenced ambient groundwater guidance values. Details on that calculation are available in the following document, prepared for the February 2022 proposed changes to Part 375 (https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375techsupport.pdf). The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	3/28/2023
Testing for Imported Soil Page 4	If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.	If the concentrations of PFOA and PFOS in leachate are at or above the ambient water quality guidance values for groundwater, then the soil is not acceptable.	3/28/2023
Routine Analysis, page 9	“However, laboratories analyzing environmental samples...PFOA and PFOS in drinking water by EPA Method 537, 537.1 or ISO 25101.”	“However, laboratories analyzing environmental samples...PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533.”	9/15/2020
Additional Analysis, page 9, new paragraph regarding soil parameters	None	“In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.”	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Data Assessment and Application to Site Cleanup Page 10	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Target levels for cleanup of PFAS in other media, including biota and sediment, have not yet been established by the DEC.	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.	9/15/2020
Water Sample Results Page 10	<p>PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water (...)</p> <p>If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.</p>	<p>PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water (...)</p> <p>If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.</p>	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Soil Sample Results, page 10	<p>“The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase.”</p>	<p>“Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values. “</p> <p>[Interim SCO Table]</p> <p>“PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.</p> <p>As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference:</p> <p>https://www.nj.gov/dep/srp/guidance/rs/daf.pdf. ”</p>	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Testing for Imported Soil Page 11	<p>Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the PFAS Analyte List (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs.</p> <p>If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.</p>	<p>Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.</p> <p>PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.</p>	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Footnotes	None	¹ TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances. ² The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the soil cleanup objective for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	9/15/2020
Additional Analysis, page 9	In cases... soil parameters, such as Total Organic Carbon (EPA Method 9060), soil...	In cases... soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil...	1/8/2021
Appendix A, General Guidelines, fourth bullet	List the ELAP-approved lab(s) to be used for analysis of samples	List the ELAP- certified lab(s) to be used for analysis of samples	1/8/2021
Appendix E, Laboratory Analysis and Containers	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101.	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101	1/8/2021
Water Sample Results Page 9	<p>“In addition, further assessment of water may be warranted if either of the following screening levels are met:</p> <p>a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or</p> <p>b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L”</p>	Deleted	6/15/2021

Citation and Page Number	Current Text	Corrected Text	Date
Routine Analysis, Page XX	Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP)... criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids).	Deleted	5/31/2022
Analysis and Reporting, Page XX	As of October 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.	Deleted	5/31/2022
Routine Analysis, Page XX	LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media.	EPA Method 1633 is the procedure to use for environmental samples.	
Soil Sample Results, Page XX	Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6	Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6	
Appendix A	"Include in the text... LC-MS/MS for PFAS using methodologies based on EPA Method 537.1"	"Include in the textEPA Method 1633"	
Appendix A	"Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101"	Deleted	
Appendix B	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	

Citation and Page Number	Current Text	Corrected Text	Date
Appendix C	“Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1”	“Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633”	
Appendix D	“Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1”	“Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633”	
Appendix G		Updated to include all forty PFAS analytes in EPA Method 533	
Appendix H		Deleted	
Appendix I	Appendix I	Appendix H	
Appendix H	“These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report.”	“These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER).”	
Appendix H	“The holding time is 14 days...”	“The holding time is 28 days...”	
Appendix H, Initial Calibration	“The initial calibration should contain a minimum of five standards for linear fit...”	“The initial calibration should contain a minimum of six standards for linear fit...”	
Appendix H, Initial Calibration	Linear fit calibration curves should have an R ² value greater than 0.990.	Deleted	
Appendix H, Initial Calibration Verification	Initial Calibration Verification Section	Deleted	
Appendix H	secondary Ion Monitoring Section	Deleted	
Appendix H	Branched and Linear Isomers Section	Deleted	

Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis, reporting, and assessment of PFAS, DER has developed this document which summarizes currently accepted procedures and updates previous DER technical guidance pertaining to PFAS.

Applicability

All work plans submitted to DEC pursuant to one of the remedial programs under Part 375 shall include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments, or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day per site or one per twenty samples, whichever is more frequent.

Analysis and Reporting

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third-party data validator. Electronic data submissions should meet the requirements provided at: <https://www.dec.ny.gov/chemical/62440.html>.

DER has developed a *PFAS Analyte List* (Appendix G) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

EPA Method 1633 is the procedure to use for environmental samples. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist. Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay).

In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.¹

¹ TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

Data Assessment and Application to Site Cleanup

Until such time as Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.

Water Sample Results

NYSDEC has adopted ambient water quality guidance values for PFOA and PFOS. Groundwater samples should be compared to the human health criteria of 6.7 ng/l (ppt) for PFOA and 2.7 ng/l (ppt) for PFOS. These human health criteria should also be applied to surface water that is used as a water supply. This guidance also includes criteria for surface water for PFOS applicable for aquatic life, which may be applicable at some sites. Drinking water sample results should be compared to the NYS maximum contaminant level (MCL) of 10 ng/l (ppt). Analysis to determine if PFOA and PFOS concentrations are attributable to the site should include a comparison between upgradient and downgradient levels, and the presence of soil source areas, as defined below.

If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

NYSDEC will delay adding soil cleanup objectives for PFOA and PFOS to 6 NYCRR Part 375-6 until the PFAS rural soil background study has been completed. Until SCOs are in effect, the following are to be used as guidance values:

Guidance Values for Anticipated Site Use	PFOA (ppb)	PFOS (ppb)
Unrestricted	0.66	0.88
Residential	6.6	8.8
Restricted Residential	33	44
Commercial	500	440
Industrial	600	440
Protection of Groundwater ²	0.8	1.0

PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These

² The Protection of Groundwater values are based on the above referenced ambient groundwater guidance values. Details on that calculation are available in the following document, prepared for the February 2022 proposed changes to Part 375 (https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375techsupport.pdf). The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).

additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.

As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference:

<https://www.nj.gov/dep/srp/guidance/rs/daf.pdf>.

Testing for Imported Soil

Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above the ambient water quality guidance values for groundwater, then the soil is not acceptable.

PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
 - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP certified lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an “Analytical Methods/Quality Assurance Summary Table” specifying:
 - Matrix type
 - Number or frequency of samples to be collected per matrix
 - Number of field and trip blanks per matrix
 - Analytical parameters to be measured per matrix
 - Analytical methods to be used per matrix with minimum reporting limits
 - Number and type of matrix spike and matrix spike duplicate samples to be collected
 - Number and type of duplicate samples to be collected
 - Sample preservation to be used per analytical method and sample matrix
 - Sample container volume and type to be used per analytical method and sample matrix
 - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by EPA Method 1633
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
 - Reporting Limits should be less than or equal to:
 - Aqueous – 2 ng/L (ppt)
 - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- Include detailed sampling procedures
 - Precautions to be taken
 - Pump and equipment types
 - Decontamination procedures
 - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per site for each matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^{\circ}$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., washroom sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank per day per site and a minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers.
- A field reagent blank (FRB) should be collected at a rate of one per 20 samples. The lab will provide a FRB bottle containing PFAS free water and one empty FRB bottle. In the field, pour the water from the one bottle into the empty FRB bottle and label appropriately.
- Request appropriate data deliverable (Category B) and an electronic data deliverable
- For sampling events where multiple private wells (homes or sites) are to be sampled per day, it is acceptable to collect QC samples at a rate of one per 20 across multiple sites or days.

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the current SOP developed by the Division of Fish and Wildlife (DFW) entitled “General Fish Handling Procedures for Contaminant Analysis” (Ver. 8). This SOP should be followed when collecting fish for contaminant analysis. Note, however, that the Bureau of Ecosystem Health will not be supplying bags or tags. All supplies are the responsibility of the collector

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

**NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

- A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:
1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).
 2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.
 3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.
- B. The following data are required on each **Fish Collection Record** form:
1. Project and Site Name.
 2. DEC Region.
 3. All personnel (and affiliation) involved in the collection.
 4. Method of collection (gill net, hook and line, etc.)
 5. Preservation Method.
- C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:
1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.
 2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.
 3. Date collected.
 4. Sample location (waterway and nearest prominent identifiable landmark).
 5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.
 2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.
 3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.
 4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate "Age" column.
 5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.
 6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.
 7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.
- E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish's tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with

the same information.

- F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.
- G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.
- H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:
 - No materials containing Teflon.
 - No Post-it notes.
 - No ice packs; only water ice or dry ice.
 - Any gloves worn must be powder free nitrile.
 - No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
 - No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
 - Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
 - Wash hands after handling any food containers or packages as these may contain PFCs.
 - Keep pre-wrapped food containers and wrappers isolated from fish handling.
 - Wear clothing washed at least six times since purchase.
 - Wear clothing washed without fabric softener.
 - Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with “fluor” in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.
- I. All fish must be kept at a temperature $<45^{\circ}\text{F}$ ($<8^{\circ}\text{C}$) immediately following data processing. As soon as possible, freeze at $-20^{\circ}\text{C} \pm 5^{\circ}\text{C}$. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.
- J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.
- K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

page _____ of _____

Project and Site Name _____ DEC Region _____

Collections made by (include all crew) _____

Sampling Method: ☐Electrofishing ☐Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other _____

Preservation Method: ☐Freezing ☐Other _____ Notes (SWFDB survey number): _____

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ()	WEIGHT ()	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION CHAIN OF CUSTODY

I, _____, of _____ collected the
(Print Name) (Print Business Address)
 following on _____, 20____ from _____
(Date) (Water Body)
 in the vicinity of _____
(Landmark, Village, Road, etc.)
 Town of _____, in _____ County.
 Item(s) _____

 Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on _____, 20____.

Signature Date

I, _____, received the above mentioned sample(s) on the date specified and assigned identification number(s) _____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelopes, approximately 2" x 3.5", if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonic acids	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluoropentanesulfonic acid	PFPeS	2706-91-4
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorononanesulfonic acid	PFNS	68259-12-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
	Perfluorododecanesulfonic acid	PFDoS	79780-39-5
Perfluoroalkyl carboxylic acids	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUnA	2058-94-8
	Perfluorododecanoic acid	PFDaA	307-55-1
	Perfluorotridecanoic acid	PFTTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTeDA	376-06-7
Per- and Polyfluoroether carboxylic acids	Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
	4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
	Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
	Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
	Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6
Fluorotelomer sulfonic acids	4:2 Fluorotelomer sulfonic acid	4:2-FTS	757124-72-4
	6:2 Fluorotelomer sulfonic acid	6:2-FTS	27619-97-2
	8:2 Fluorotelomer sulfonic acid	8:2-FTS	39108-34-4
Fluorotelomer carboxylic acids	3:3 Fluorotelomer carboxylic acid	3:3 FTCA	356-02-5
	5:3 Fluorotelomer carboxylic acid	5:3 FTCA	914637-49-3
	7:3 Fluorotelomer carboxylic acid	7:3 FTCA	812-70-4
Perfluorooctane sulfonamides	Perfluorooctane sulfonamide	PFOSA	754-91-6
	N-methylperfluorooctane sulfonamide	NMeFOSA	31506-32-8
	N-ethylperfluorooctane sulfonamide	NEtFOSA	4151-50-2
Perfluorooctane sulfonamidoacetic acids	N-methylperfluorooctane sulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethylperfluorooctane sulfonamidoacetic acid	N-EtFOSAA	2991-50-6
Perfluorooctane sulfonamide ethanol	N-methylperfluorooctane sulfonamidoethanol	MeFOSE	24448-09-7
	N-ethylperfluorooctane sulfonamidoethanol	EtFOSE	1691-99-2

Group	Chemical Name	Abbreviation	CAS Number
Ether sulfonic acids	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major)	9Cl-PF3ONS	756426-58-1
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	11Cl-PF3OUdS	763051-92-9
	Perfluoro(2-ethoxyethane) sulfonic acid	PFEESA	113507-82-7

Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER). Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 28 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6°C upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of six standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects
-----------	-----------------------------------

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results
---------------------------	----------------

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample
----------	------------------------------------

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects
---	---

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).


Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

Appendix D:

Typical Boring/Well Construction Log

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted. Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

					PROJECT NAME:				GEOPROBE NO.	
					LOCATION:				JOB NO.	
					METHOD:				GROUND ELEVATION:	
GEOPROBE BY:					DATE STARTED:				GROUNDWATER TABLE DEPTH:	
INSPECTOR:					DATE COMPLETED:		0 Hr.		24 Hr.	
									Date	
DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM TO (ft) (ft)		ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION				PID
0										
5										
10										
15										
20										
25										
30										
35										
40										

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1 1/2 in.

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

Appendix E:

Health and Safety Plan



Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

**HEALTH AND SAFETY PLAN
For**

**Proposed Mixed-Use Development
34 State Street
Ossining, Westchester County, NY**

Prepared for:
**WB 34 State LLC
June 2025**

SESI Project No:
13968

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Disclaimer: This Health and Safety Plan (HASP) is based upon information provided [and, if applicable, conditions discovered during a site visit], and is limited by the project scope.

The HASP should be periodically reviewed and updated based on a number of factors, including but not limited to: (1) changes in applicable governmental requirements; (2) changes in procedures at the site; and (3) site conditions which were unknown to SESI Consulting Engineers (SESI) as of the time the HASP was prepared.

This HASP has been prepared for the sole and exclusive use of Client listed above, and may not be relied upon by any other person without the express written consent and authorization of SESI.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

For

**WB 30 State LLC
SESI Project NO.: 13968**

Prepared by:

Chris Malvicini
SESI - Asst Project Manager

Approved by:

Fuad Dahan, PE
SESI – Principal Engineer

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LIST OF ACRONYMS

Acronym	Definition
ACGIH	American Conference of Governmental Industrial Hygienists
COC	Contaminants(s) of Concern
CRZ	Contamination Reduction Zone
EMS	Emergency Medical Services
EZ	Exclusion Zone
FS	Field Supervisor
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSM	Health and Safety Manager
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
NRR	Noise Reduction Rating
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PFD	Personal Flotation Device
PID	Photoionization Detector
PM	Project Manager
PO	Project Officer
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
SESI	SESI Consulting Engineers
SSO	Site Safety Officer
SVOC	Semi-Volatile Organic Compound
SZ	Support Zone
TLV	Threshold Limit Value
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

HEALTH AND SAFETY PLAN SUMMARY

The chemical hazards associated with site operations are related to inhalation, ingestion, and skin exposure to site Chemicals of Concern (COCs). COCs at the site include Metals and Pesticides. Concentrations of airborne COCs during site tasks may be measurable and will require air monitoring during certain operations.

The potential for inhalation of site COCs is low. The potential for dermal contact with soils containing site COCs during remedial operations is moderate.

The following table summarizes airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the site.

Parameter	Reading	Action
Dust	0 to .5 mg/m ³	Normal operations
	0.5 to 1 mg/m ³	Begin soil wetting procedure (Level C protection would be needed beyond this point)
	> 1 mg/m ³	Stop work, fully implement dust control plan
Oxygen	≤ 19.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	≥ 23.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Carbon Monoxide	0 ppm to ≤ 20 ppm	Normal operations
	> 20 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the Field Supervisor and Site Safety Officer. The following table presents a selection matrix to determine appropriate Personal Protective Equipment.

Task	Anticipated Level of Protection
Mobilization	Level D
Subsurface Intrusive Activities (Mass Excavation, Drilling, Soil Grouting)	Modified Level D/Level C
Earthwork/Grading	Level D
Additional Chemical Sampling / Delineation	Modified Level D/Level C
Decontamination	Modified Level D
Demobilization	Level D

1.0 INTRODUCTION

1.1 OBJECTIVE

The objective of this Health and Safety Plan (HASP) is to provide a mechanism for establishing safe working conditions during remedial action activities. The safety organization, procedures, and protective equipment have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of injury, illness, or other hazardous incident.

The HASP was written to meet the requirements of all applicable Federal, State, and local health and safety regulations, including 29 CFR 1910.120. The HASP is based on current knowledge regarding the specific chemical and physical hazards that are known or anticipated at the Site. This HASP is a dynamic document, for which changes and/or revisions may be realized as changes in scope and/or site conditions are encountered. Should revised documents be produced, said revised documents will refer to the specific changes and why they were made.

1.2 SITE AND FACILITY DESCRIPTION

This document presents the health and safety plan (HASP) for the Remedial Investigation Work Plan (RIWP) for the proposed development of the property located at 34 State Street, Ossining, Westchester County, New York (the Site). The Site consists of a 5.858-acre area parcel and is identified as Block 2, Lots 17, 18 and 68 on the Westchester County tax map. The Site is located in a residential and commercial area and is bounded by a day care center to the north, residential to the south, residential/commercial uses to the east, and residential to the west.

The Site is improved with an asphalt lot, former building footprints, demolition debris, one (1) large three (3) story residential historic house building, one (1) shed and wooded areas. These buildings are currently vacant and abandoned. The Site has been developed since prior to 1892 and historically has been residences, a community center (circa 1929), and a printing company (Printex Corporation of America circa 1940-1981).

1.3 POLICY STATEMENT

The policy of SESI Consulting Engineers (SESI) is to provide a safe and healthful work environment. No aspect of operations is of greater importance than injury and illness prevention. A fundamental principle of safety management is that all injuries, illnesses, and incidents are preventable. SESI will take every reasonable step to eliminate or control hazards in order to minimize the possibility of injury, illness, or incident.

This HASP prescribes the procedures that must be followed by SESI personnel during activities at the site. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Health and Safety Manager (HSM). This document will be reviewed periodically by the HSM to ensure that it is current and technically correct. Any changes in site conditions and/or the scope of work will require a review and modification to this HASP. Such changes will be completed in the form of an addendum or a revision to the plan.

The provisions of this plan are mandatory for all SESI personnel and are advisory for all contractors, and subcontractors assigned to the project. ***Subcontractors will be responsible for preparing their own site-specific HASPs that meet the basic requirements outlined in this HASP.*** All visitors to SESI work areas at the site must abide by the requirements of this plan.

1.4 REFERENCES

This HASP complies with applicable Occupational Safety and Health Administration (OSHA) regulations, United States Environmental Protection Agency (USEPA) regulations, and SESI health and safety policies and procedures. This plan follows the guidelines established in the following:

- *Standard Operating Safety Guides*, USEPA (Publication 9285.1-03, June 1992).
- *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, NIOSH, OSHA, USCG, USEPA (86116, October 1985).
- *Title 29 of the Code of Federal Regulations (CFR)*, Part 1910.
- *Title 29 of the Code of Federal Regulations (CFR)*, Part 1926.
- *Pocket Guide to Chemical Hazards*, DHHS, PHS, CDC, NIOSH (2004).
- *Threshold Limit Values*, ACGIH (2005).
- *Guide to Occupational Exposure Values*, ACGIH (2005).
- *Quick Selection Guide to Chemical Protective Clothing*, Forsberg, K. and S.Z. Mansdorf, 2nd Ed. (1993).

1.5 DEFINITIONS

The following definitions (listed alphabetically) are applicable to this HASP:

- *Contamination Reduction Zone (CRZ)* - Area between the exclusion zone and support zone that provides a transition between contaminated and clean areas. Decontamination stations are located in this zone.
- *Exclusion Zone (EZ)* - Any portions of the site where hazardous substances are, or are reasonably suspected to be present, and pose an exposure hazard to on-site personnel.
- *Incident* - All losses, including first aid cases, injuries, illnesses, spills/leaks, equipment and property damage, motor vehicle accidents, regulatory violations, fires, and business interruptions.
- *On-Site Personnel* - All SESI and subcontractors involved with the project.
- *Project* - All on-site work performed under the scope of work.
- *Site* - The area described in Section 1.2, Site and Facility Description, where the work is to be performed by SESI personnel and subcontractors.
- *Support Zone (SZ)* - All areas of the site except the EZ and CRZ. The SZ surrounds the CRZ and EZ. Support equipment and break areas are located in this zone.
- *Subcontractor* - Includes contractor personnel hired by SESI.
- *Visitor* - All other personnel, except the on-site personnel.
- *Work Area* - The portion of the site where work activities are actively being performed. This area may change daily as work progresses and includes the SZ, CRZ, and EZ. If the work area is located in an area on the site that is not contaminated, or suspected of being contaminated, the entire work area may be a SZ.

2.0 PROJECT SCOPE OF WORK

This HASP contains information for the following tasks that SESI is anticipated to conduct at the Site. Should additional and/or different tasks be identified, amendments to this HASP will be required to address these changed items.

- Mobilization/Sample location stakeout;
- Soil Borings and Monitoring Well Installation;
- Excavation of contaminated soil “hot spots”;
- Earthwork and grading;
- Chemical sampling of soil and groundwater; and
- Decontamination and demobilization/site restoration.

3.0 ROLES AND RESPONSIBILITIES

3.1 ALL PERSONNEL

All SESI project personnel must adhere to the procedures outlined in this HASP during the performance of their work. Each person is responsible for completing tasks safely and reporting any unsafe acts or conditions to their supervisor. No person may work in a manner that conflicts with these procedures. After due warnings, the PM will dismiss from the site any SESI employee or subcontractor who violates safety procedures.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. In addition, all SESI personnel will attend an initial hazard briefing prior to beginning work at the site.

The roles of key safety personnel and subcontractors are outlined in the following sections. Key project personnel and contacts are summarized in **Table 1** on page 7.

3.2 KEY SAFETY PERSONNEL

3.2.1 PROJECT OFFICER (PO)

The PO is responsible for providing resources to assure project activities are completed in accordance with this HASP, and for meeting all regulatory and contractual requirements.

3.2.2 PROJECT MANAGER (PM)

The PM is responsible for verifying that project activities are completed in accordance with the requirements of this HASP. The PM is responsible for confirming that the Field Supervisor (FS) has the equipment, materials, and qualified personnel to fully implement the safety requirements of this HASP, and/or that subcontractors assigned to this project meet the requirements established by SESI. It is also the responsibility of the PM to:

- Consult with the HSM on site health and safety issues;
- Verify that subcontractors meet health and safety requirements prior to commencing work;
- Verify that all incidents are thoroughly investigated;
- Approve, in writing, addenda or modifications of this HASP; and

- Suspend work or modify work practices, as necessary, for personal safety, protection of property, and regulatory compliance.

3.2.3 HEALTH AND SAFETY MANAGER (HSM)

The HSM or his designee, the health and safety manager (HSM), has overall responsibility for the technical health and safety aspects of the project, including review and approval of this HASP. Inquiries regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The HSM or his designee must approve changes or addenda to this HASP.

3.2.4 SITE SAFETY OFFICER (SSO)

The SSO is responsible for field health and safety issues, including the execution of this HASP. Questions in the field regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The SSO will advise the PM on health and safety issues and will establish and coordinate the project air-monitoring program if one is deemed necessary (see Section 5.1, Air Monitoring). The SSO is the primary site contact on health and safety matters. It is the responsibility of the SSO to:

- Provide on-site technical assistance, if necessary;
- Participate in all accident/incident reports and ensure that they are reported to the HSM, client, and PM within 24 hours;
- Coordinate site and personal air monitoring as required, including equipment maintenance and calibration;
- Conduct site safety orientation training and safety meetings;
- Verify that project personnel have received the required physical examinations and medical certifications;
- Review site activities with respect to compliance with this HASP;
- Maintain required health and safety documents and records; and
- Assist the FS in instructing field personnel on project hazards and protective procedures.

3.2.5 FIELD SUPERVISOR (FS)

The FS is responsible for implementing this HASP, including communicating requirements to on-site personnel and subcontractors. The FS will be responsible for informing the PM of changes in the work plan, procedures, or site conditions so that those changes may be addressed in this HASP. Other responsibilities are to:

- Consult with the SSO on site health and safety issues;
- Stop work, as necessary, for personal safety, protection of property, and regulatory compliance;
- Obtain a site map and determine and post routes to medical facilities and emergency telephone numbers;
- Notify local public emergency representatives (as appropriate) of the nature of the site operations, and post their telephone numbers (i.e., local fire department personnel who would respond for a confined space rescue);
- Observe on-site project personnel for signs of ill health effects;
- Investigate and report any incidents to the SSO;
- Verify that all on-site personnel have had applicable training;

- Verify that on-site personnel are informed of the physical, chemical, and biological hazards associated with the site activities, and the procedures and protective equipment necessary to control the hazards; and
- Issue/obtain any required work permits (hot work, confined space, etc.).

3.2.6 FIELD PERSONNEL (FP)

All SESI field personnel are responsible for following the Health and Safety procedures specified in this HASP and work practices specified in applicable operation procedures. Some specific responsibilities include, but are not limited to:

- Reading and understanding the HASP;
- Reporting all accidents, incidents, injuries, or illnesses to the FS;
- Complying with the requests of the SSO;
- Immediately communicating newly identified hazards or noncompliance issues to the FS or SSO; and
- Stopping work in cases of immediate danger.

3.3 SUBCONTRACTORS

Subcontractors and their personnel must understand and comply with applicable regulations and site requirements established in this HASP. Subcontractors will prepare their own site-specific HASP that must be consistent with the requirements of this HASP.

All subcontractor personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. All subcontractor personnel will attend an initial hazard briefing prior to beginning work at the site. Additionally, on-site subcontractor personnel must conduct daily site safety meetings.

Subcontractors must designate individuals to function as the PM, HSM, SSO, and FS. In some firms the HSM to be carried out by the PM. This is acceptable provided the PM has the required knowledge, training, and experience to properly address all hazards associated with the work, and to prepare, approve, and oversee the execution of the site-specific HASP. A subcontractor may designate the same person to perform the duties of both the SSO and the FS. However, depending on the level of complexity of a contractor's scope of work, it may be infeasible for one person to perform both functions satisfactorily.

3.4 STOP WORK AUTHORITY

Every SESI employee and subcontractor is empowered, expected, and has the responsibility to stop the work of another co-worker if the working conditions or behaviors are considered unsafe.

3.5 ALL ON-SITE PERSONNEL

All on-site SESI personnel (including SESI subcontractors) must read and acknowledge their understanding of their respective HASPs before commencing work and abide by the requirements of the plans. All on-site SESI personnel shall sign their HASP Acknowledgement Form following their review of their HASP.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. In addition, all on-site personnel will attend an initial hazard briefing provided by the SSO prior to beginning work at the site and conduct daily safety meetings thereafter.

On-site personnel will immediately report the following to the FS or SSO:

- Personal injuries and illnesses no matter how minor;
- Unexpected or uncontrolled release of chemical substances;
- Symptoms of chemical exposure;
- Unsafe or hazardous situations;
- Unsafe or malfunctioning equipment;
- Changes in site conditions that may affect the health and safety of project personnel;
- Damage to equipment or property; and
- Situations or activities for which they are not properly trained.

3.6 VISITORS

All SESI personnel and subcontractors visiting the Site must check in with the FS. Visitors will be cautioned to avoid skin contact with surfaces, soils, groundwater, or other materials that may impacted or be suspected to be impacted by constituents of concern (COCs).

Visitors requesting to observe work at the site must don appropriate personal protective equipment (PPE) prior to entry to the work area and must have the appropriate training and medical clearances to do so. If respiratory protective devices are necessary, visitors who wish to enter the work area must have been respirator-trained and fit tested for a respirator within the past 12 months.

Table 1 – Key Safety Personnel

SESI Personnel		
Role	Name	Address/Telephone No.
Project Officer (PO)	James Vander Vliet	Parsippany, NJ/973-808-9050
Project Manager (PM)	James Vander Vliet	Parsippany, NJ/973-808-9050
Senior Project Engineer (SPE)	James Vander Vliet	Parsippany, NJ/973-808-9050
Health and Safety Manager (HSM)	Justin Protasiewicz	Parsippany, NJ/973-808-9050
Site Safety Officer (SSO)	Chris Malvicini	Parsippany, NJ/973-808-9050
Field Supervisor (FS)	Chris Malvicini	Parsippany, NJ/973-808-9050
Field Personnel	TBD	
Subcontractors		
Company/Role	Name	Address/Telephone No.
Drilling Subcontractor - TBD	TBD	TBD
Analytical Lab - TBD	TBD	TBD

4.0 PERSONAL PROTECTIVE EQUIPMENT

4.1 LEVELS OF PROTECTION

PPE is required to safeguard site personnel from various hazards. Varying levels of protection may be required depending on the levels of COCs and the degree of physical hazard. This section presents the various levels of protection and defines the conditions of use for each level. A summary of the levels is presented in **Table 2** on page 11.

4.1.1 LEVEL D PROTECTION

The minimum level of protection that will be required of project personnel at the site will be Level D, which will be worn when site conditions or air monitoring indicates no inhalation hazard exists. The following equipment will be used:

- Work clothing as prescribed by weather;
- Steel toe work boots, meeting American National Standards Institute (ANSI) Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Leather work gloves and/or nitrile surgical gloves;
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and
- PFD if working on or near the water.

4.1.2 MODIFIED LEVEL D PROTECTION

Modified Level D will be used when airborne contaminants are not present at levels of concern, but site activities present an increased potential for skin contact with contaminated materials. Modified Level D consists of:

- Nitrile gloves worn over nitrile surgical gloves;
- Latex/polyvinyl chloride (PVC) overboots when contact with COC-impacted media is anticipated;
- Steel toe work boots, meeting ANSI Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Face shield in addition to safety glasses or goggles when projectiles or splash hazards exist (e.g. during Power Washing activities);
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used);
- Tyvek® suit (polyethylene coated Tyvek® suits for handling liquids) when body contact with COC-impacted media is anticipated; and
- PFD if working on or near the water.

4.1.3 LEVEL C PROTECTION

Level C protection will be required when the airborne concentration of COC reaches one-half of the OSHA Permissible Exposure Limit or ACGIH TLV. The following equipment will be used for Level C protection:

- Full-face, air-purifying respirator with combination organic vapor/HEPA cartridges;
- Polyethylene-coated Tyvek® suit, with ankles and cuffs taped to boots and gloves;

- Nitrile gloves worn over nitrile surgical gloves;
- Steel toe work boots, meeting ANSI Z41;
- Chemical-resistant boots with steel toes or latex/PVC overboots over steel toe boots;
- Hard hat, meeting ANSI Z89;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and
- PFD if working on or near the water.

4.2 SELECTION OF PPE

Equipment for personal protection will be selected based on the potential for contact, site conditions, ambient air quality, and the judgment of supervising site personnel and health and safety professionals. The PPE used will be chosen to be effective against the COCs present on the site.

4.3 SITE RESPIRATORY PROTECTION PROGRAM

Respiratory protection is an integral part of employee health and safety at the site due to potentially hazardous concentrations of airborne COCs. The site respiratory protection program will consist of the following (as a minimum):

- All on-site personnel who may use respiratory protection will have an assigned respirator.
- All on-site personnel who may use respiratory protection will have been fit tested and trained in the use of a full-face air-purifying respirator within the past 12 months. Documentation of the fit test must be provided to the SSO prior to commencement of work.
- All on-site personnel who may use respiratory protection must within the past year have been medically certified as being capable of wearing a respirator. Documentation of the medical certification must be provided to the SSO, prior to commencement of site work.
- Only cleaned, maintained, NIOSH-approved respirators will be used.
- If respirators are used, the respirator cartridge is to be properly disposed of at the end of each work shift, or when load-up or breakthrough occurs.
- Contact lenses are not to be worn when a respirator is worn.
- All on-site personnel who may use respiratory protection must be clean-shaven. Mustaches and sideburns are permitted, but they must not touch the sealing surface of the respirator.
- Respirators will be inspected, and a negative pressure test performed prior to each use.
- After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag, away from direct sunlight in a clean, dry location, in a manner that will not distort the face piece.

4.4 USING PPE

Depending upon the level of protection selected, specific donning and doffing procedures may be required. The procedures presented in this section are mandatory if Modified Level D or Level C PPE is used. All personnel entering the EZ must put on the required PPE in

accordance with the requirements of this HASP. When leaving the EZ, PPE will be removed in accordance with the procedures listed, to minimize the spread of COCs.

4.4.1 DONNING PROCEDURES

These procedures are mandatory only if Modified Level D or Level C PPE is used on the site:

- Remove bulky outerwear. Remove street clothes and store in clean location;
- Put on work clothes or coveralls;
- Put on the required chemical protective coveralls;
- Put on the required chemical protective boots or boot covers;
- Tape the legs of the coveralls to the boots with duct tape;
- Put on the required chemical protective gloves;
- Tape the wrists of the protective coveralls to the gloves;
- Don the required respirator and perform appropriate fit check (Level C);
- Put hood or head covering over-head and respirator straps and tape hood to facepiece (Level C); and
- Don remaining PPE, such as safety glasses or goggles and hard hat.

When these procedures are instituted, one person must remain outside the work area to ensure that each person entering has the proper protective equipment.

4.4.2 DOFFING PROCEDURES

The following procedures are only mandatory if Modified Level D or Level C PPE is required for the site. Whenever a person leaves the work area, the following decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated materials from the boots or remove contaminated boot covers;
- Clean reusable protective equipment;
- Remove protective garments, equipment, and respirator (Level C). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels;
- Wash hands, face, and neck (or shower if necessary);
- Proceed to clean area and dress in clean clothing; and
- Clean and disinfect respirator for next use.

All disposable equipment, garments, and PPE must be bagged in plastic bags, labeled for disposal. See Section 7, Decontamination, for detailed information on decontamination stations.

4.5 SELECTION MATRIX

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the FS and SSO of the potential for skin contact with COCs. The PPE selection matrix is presented in **Table 2** below. This matrix is based on information available at the time this plan was written. The Airborne Contaminant Action Levels in **Table 3** on page 12, Airborne Contaminant Action Levels, should be used to verify that the PPE prescribed in these matrices is appropriate.

Table 2 – PPE Selection Matrix

Task	Anticipated Level of Protection
Mobilization	Level D
Subsurface Intrusive Activities (Excavation, Drilling)	Modified Level D/Level C
Earthwork/Grading	Level D
Chemical Sampling / Delineation	Modified Level D/Level C
Decontamination	Modified Level D
Demobilization	Level D

5.0 AIR AND NOISE MONITORING

5.1 AIR MONITORING

Air monitoring, sampling, and testing will be conducted to determine employee exposure to airborne constituents. The monitoring results will dictate work procedures and the selection of PPE. The SESI SSO will be responsible for defining appropriate air monitoring procedures and for utilizing the air monitoring results to determine appropriate procedures and PPE for project personnel. Air monitoring results should be recorded in field notebooks or on an air monitoring log (see Attachment 1 for a copy of the Air Monitoring Log). Any deviations from the procedures listed here should be documented and explained in the Air Monitoring Log.

The monitoring devices to be used are a PDR1000 particulate monitor (or equivalent) and a Rae Systems MultiRAE detector (PID with a 11.7 eV lamp/oxygen/LEL/hydrogen sulfide sensors). Colorimetric detector tubes may be utilized to estimate airborne concentrations of benzene and should be onsite during any activities that may result in elevated PID readings including drilling, excavating, and groundwater sampling.

Air monitoring will be conducted continuously with the LEL/Oxygen meter during drilling in areas where flammable vapors or gases are suspect. All work activity must stop where tests indicate the concentration of flammable vapors exceeds 10% of the LEL at a location with a potential ignition source. Such an area must be ventilated to reduce the concentration to an acceptable level.

5.2 NOISE MONITORING

Noise monitoring may be conducted as required. Hearing protection is mandatory for all employees in noise hazardous areas, such as around heavy equipment. As a general rule, sound levels that cause speech interference at normal conversation distance should require the use of hearing protection.

5.3 MONITORING EQUIPMENT MAINTENANCE AND CALIBRATION

All direct-reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments that are necessary. All air monitoring equipment calibrations, including the standard used for calibration, must be documented on a calibration log or in the field notebook. All completed health and safety documentation/forms must be reviewed by the SSO and maintained by the FS.

All air monitoring equipment will be maintained and calibrated in accordance with the specific manufacturer's procedures. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturer's procedures. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the SSO must be responsible for immediately removing the instrument from service and obtaining a replacement unit. If the instrument is essential for safe operation during a specific activity, that activity must cease until an appropriate replacement unit is obtained. The SSO will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

5.4 ACTION LEVELS

Table 3 below presents airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the site.

Table 3 – Airborne Contaminant Action Levels

Parameter	Reading	Action
Total Hydrocarbons	0 ppm to ≤ 1 ppm	Normal operations; continue hourly breathing zone monitoring
	> 1 ppm to 5 ppm	Increase monitoring frequency to every 15 minutes and use benzene detector tube to screen for the presence of benzene
	≥ 5 ppm to ≤ 50 ppm	Upgrade to Level C PPE; continue screening for benzene
	> 50 ppm	Stop work; investigate cause of reading
	At any reading > 5 ppm	Monitor perimeter per CAMP
Benzene	≥ 1 ppm to 5 ppm	Upgrade to Level C PPE
	> 5 ppm	Stop work; investigate cause of reading
Dust	0 to .05 mg/m ³	Normal operations
	0.05 to 0.1 mg/m ³	Begin soil wetting procedure (Level C protection would be needed beyond this point)
	> 0.15 mg/m ³	Stop work, fully implement dust control plan
Oxygen	≤ 19.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	≥ 23.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Carbon Monoxide	0 ppm to ≤ 20 ppm	Normal operations
	> 20 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Hydrogen Sulfide	0 ppm to ≤ 5 ppm	Normal operations
	> 5 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area

Parameter	Reading	Action
Flammable Vapors (LEL)	< 10% LEL	Normal operations
	≥ 10% LEL	Stop work, ventilate area, investigate source of vapors

6.0 WORK ZONES AND DECONTAMINATION

6.1 WORK ZONES

6.1.1 AUTHORIZATION TO ENTER

Only personnel with the appropriate training and medical certifications (if respirators are required) will be allowed to work at the project site. The FS will maintain a list of authorized persons; only personnel on the authorized persons list will be allowed to enter the site work areas.

6.1.2 SITE ORIENTATION AND HAZARD BRIEFING

No person will be allowed in the work area during site operations without first being given a site orientation and hazard briefing. This orientation will be presented by the FS or SSO and will consist of a review of this HASP. This review must cover the chemical, physical, and biological hazards, protective equipment, safe work procedures, and emergency procedures for the project. Following this initial meeting, daily safety meetings will be held each day before work begins.

All people entering the site work areas, including visitors, must document their attendance at this briefing, as well as the daily safety meetings on the forms included with this plan.

6.1.3 CERTIFICATION DOCUMENTS

A training and medical file may be established for the project and kept on site during all site operations. Specialty training, such as first aid/cardiopulmonary resuscitation (CPR) certificates, as well as current medical clearances for all project field personnel required to wear respirators, will be maintained within that file. All project personnel must provide their training and medical documentation to the SSO prior to starting work.

6.1.4 ENTRY LOG

A log-in/log-out sheet will be maintained at the site by the FS. Personnel must sign in and out on a log sheet as they enter and leave the work area, and the FS may document entry and exit in the field notebook.

6.1.5 ENTRY REQUIREMENTS

In addition to the authorization, hazard briefing, and certification requirements listed above, no person will be allowed in any SESI work area unless they are wearing the minimum PPE as described in Section 4.0.

6.1.6 EMERGENCY ENTRY AND EXIT

People who must enter the work area on an emergency basis will be briefed of the hazards by the FS or SSO. All activities will cease in the event of an emergency. People exiting the work area because of an emergency will gather in a designated safe area for a head count. The FS is responsible for ensuring that all people who entered the work area have exited in the event of an emergency.

6.1.7 CONTAMINATION CONTROL ZONES

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas.

6.1.8 EXCLUSION ZONE (EZ)

An EZ may consist of a specific work area or may be the entire area of potential contamination. All employees entering an EZ must use the required PPE and must have the appropriate training and medical clearance for hazardous waste work. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. Cones, caution tape, or a posted site diagram will identify the location of each EZ.

6.1.9 CONTAMINATION REDUCTION ZONE

The CRZ or transition area will be established, if necessary, to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal. This zone is the only appropriate corridor between the EZ and the support zone (SZ) discussed below.

6.1.10 SUPPORT ZONE (SZ)

The SZ is a clean area outside the CRZ located to prevent employee exposure to hazardous substances. Eating and drinking will be permitted in the support area only after proper decontamination. Smoking may be permitted in the SZ, subject to site requirements.

6.1.11 POSTING

Work areas will be prominently marked and delineated using cones, caution tape, or a posted site diagram.

6.1.12 SITE INSPECTIONS

The FS will conduct a daily inspection of site activities, equipment, and procedures to verify that the required elements are in place.

6.2 DECONTAMINATION

6.2.1 PERSONNEL DECONTAMINATION

All personnel wearing Modified Level D or Level C protective equipment in the EZ must undergo personal decontamination prior to entering the SZ. The personnel decontamination area will consist of the following stations at a minimum:

- *Station 1:* Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots.
- *Station 2:* Personnel will remove their outer garment and gloves and dispose of it in properly labeled containers. Personnel will then decontaminate their hard hats, and boots with an aqueous solution of detergent or other appropriate cleaning solution. These items are then hand carried to the next station.
- *Station 3:* Personnel will thoroughly wash their hands and face before leaving the CRZ. Respirators will be sanitized and then placed in a clean plastic bag.

6.2.2 EQUIPMENT DECONTAMINATION

All vehicles that have entered the EZ will be decontaminated at the decontamination pad prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

6.2.3 PERSONAL PROTECTIVE EQUIPMENT DECONTAMINATION

Where and whenever possible, single-use, external protective clothing must be used for work within the EZ or CRZ. This protective clothing must be disposed of in properly labeled containers. Reusable protective clothing will be rinsed at the site with detergent and water. The rinsate will be collected for disposal.

When removed from the CRZ, the respirator will be thoroughly cleaned with soap and water. The respirator face piece, straps, valves, and covers must be thoroughly cleaned at the end of each work shift, and ready for use prior to the next shift. Respirator parts may be disinfected with a solution of bleach and water (mixed at 2% bleach by volume), or by using a spray disinfectant.

7.0 TRAINING AND MEDICAL SURVEILLANCE

7.1 TRAINING

7.1.1 GENERAL

All on-site project personnel who work in areas where they may be exposed to site contaminants must be trained as required by OSHA Regulation 29 CFR 1910.120 (HAZWOPER). Field employees also must receive a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Personnel who completed their initial training more than 12 months prior to the start of the project must have completed an eight-hour refresher course within the past 12 months. The FS must have completed an additional eight hours of supervisory training and must have a current first-aid/CPR certificate (See Attachment 2).

7.1.2 BASIC 40-HOUR COURSE

The following is a list of the topics typically covered in a 40-hour HAZWOPER training course:

- General safety procedures;
- Physical hazards (fall protection, noise, heat stress, cold stress);
- Names and job descriptions of key personnel responsible for site health and safety;
- Safety, health, and other hazards typically present at hazardous waste sites;
- Use, application, and limitations of PPE;
- Work practices by which employees can minimize risks from hazards;
- Safe use of engineering controls and equipment on site;
- Medical surveillance requirements;
- Recognition of symptoms and signs which might indicate overexposure to hazards;
- Worker right-to-know (Hazard Communication OSHA 1910.1200);
- Routes of exposure to contaminants;
- Engineering controls and safe work practices;

- Components of a health and safety program and a site-specific HASP;
- Decontamination practices for personnel and equipment;
- Confined-space entry procedures; and
- General emergency response procedures.

7.1.3 SUPERVISOR COURSE

Management and supervisors must receive an additional eight hours of training, which typically includes:

- General site safety and health procedures;
- PPE programs; and
- Air monitoring techniques.

7.1.4 SITE-SPECIFIC TRAINING

Site-specific training will be accomplished by on-site personnel reading this HASP, and through a thorough site briefing by the PM, FS, or SSO on the contents of this HASP before work begins. The review must include a discussion of the chemical, physical, and biological hazards; the protective equipment and safety procedures; and emergency procedures.

7.1.5 DAILY SAFETY MEETINGS

Daily safety meetings will be held to cover the work to be accomplished, the hazards anticipated, the PPE and procedures required to minimize site hazards, and emergency procedures. The FS or SSO should present these meetings prior to beginning the day's fieldwork. No work will be performed in an EZ before a daily safety meeting has been held. An additional safety meeting must also be held prior to new tasks, or if new hazards are encountered. The daily safety meetings will be logged in the field notebook.

7.1.6 FIRST AID AND CPR

At least one employee current in first aid/CPR will be assigned to the work crew and will be on the site during operations. Site records will document the presence of this individual. Refresher training in first aid (triennially) and CPR (annually) is required to keep the certificate current. These individuals must also receive training regarding the precautions and protective equipment necessary to protect against exposure to blood-borne pathogens.

7.2 MEDICAL SURVEILLANCE

7.2.1 MEDICAL EXAMINATION

All personnel who are potentially exposed to site contaminants must participate in a medical surveillance program as defined by OSHA at 29 CFR 1910.120 (f).

7.2.2 PRE-PLACEMENT MEDICAL EXAMINATION

All potentially exposed personnel must have completed a comprehensive medical examination prior to assignment, and periodically thereafter as defined by applicable regulations. The pre-placement and periodic medical examinations typically include the following elements:

- Medical and occupational history questionnaire;
- Physical examination;

- Complete blood count, with differential;
- Liver enzyme profile;
- Chest X-ray, at a frequency determined by the physician;
- Pulmonary function test;
- Audiogram;
- Electrocardiogram for persons older than 45 years of age, or if indicated during the physical examination;
- Drug and alcohol screening, as required by job assignment;
- Visual acuity; and
- Follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The examining physician provides the employee with a letter summarizing his findings and recommendations, confirming the worker's fitness for work and ability to wear a respirator. Documentation of medical clearance will be available for each employee during all project site work.

Subcontractors will certify that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations must meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134. Subcontractors will supply copies of the medical examination certificate for each on-site employee.

7.2.3 OTHER MEDICAL EXAMINATIONS

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- At employee request after known or suspected exposure to toxic or hazardous materials; and
- At the discretion of the SSO, HSM, or occupational physician in anticipation of, or after known or suspected exposure to toxic or hazardous materials.

7.2.4 PERIODIC EXAM

Following the placement examination, all employees must undergo a periodic examination, similar in scope to the placement examination. For employees potentially exposed over 30 days per year, the frequency of periodic examinations will be annual. For employees potentially exposed less than 30 days per year, the frequency for periodic examinations will be 24 months.

7.2.5 MEDICAL RESTRICTION

When the examining physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee and the SSO. The terms of the restriction will be discussed with the employee and the supervisor.

8.0 GENERAL SAFETY PRACTICES

8.1 GENERAL SAFETY RULES

General safety rules for site activities include, but are not limited to, the following:

- At least one copy of this HASP must be in a location at the site that is readily available to personnel, and all project personnel shall review the plan prior to starting work.
- Consume or use food, beverages, chewing gum, and tobacco products only in the SZ or other designated area outside the EZ and CRZ. Cosmetics shall not be applied in the EZ or CRZ.
- Wash hands before eating, drinking, smoking, or using toilet facilities.
- Wear all PPE as required and stop work and replace damaged PPE immediately.
- Secure disposable coveralls, boots, and gloves at the wrists and legs and ensure closure of the suit around the neck.
- Upon skin contact with materials that may be impacted by COCs, remove contaminated clothing and wash the affected area immediately. Contaminated clothing must be changed. Any skin contact with materials potentially impacted by COCs must be reported to the FS or SSO immediately. If needed, medical attention should be sought.
- Practice contamination avoidance. Avoid contact with surfaces either suspected or known to be impacted by COCs, such as standing water, mud, or discolored soil. Equipment must be stored on elevated or protected surfaces to reduce the potential for incidental contamination.
- Remove PPE as required in the CRZ to limit the spread of COC-containing materials.
- At the end of each shift or as required, dispose of all single-use coveralls, soiled gloves, and respirator cartridges in designated receptacles designated for this purpose.
- Removing soil containing site COCs from protective clothing or equipment with compressed air, shaking, or any other means that disperses contaminants into the air is prohibited.
- Inspect all non-disposable PPE for contamination in the CRZ. Any PPE found to be contaminated must be decontaminated or disposed of appropriately.
- Recognize emergency signals used for evacuation, injury, fire, etc.
- Report all injuries, illnesses, and unsafe conditions or work practices to the FS or SSO.
- Use the “buddy system” during all operations requiring Level C PPE, and when appropriate, during Modified Level D operations.
- Obey all warning signs, tags, and barriers. Do not remove any warnings unless authorized to do so.
- Use, adjust, alter, and repair equipment only if trained and authorized to do so, and in accordance with the manufacturer’s directions.
- Personnel are to perform only tasks for which they have been properly trained and will advise their supervisor if they have been assigned a task for which they are not trained.
- The presence or consumption of alcoholic beverages or illicit drugs during the workday, including breaks, is strictly prohibited. Notify your supervisor if you must take prescription or over-the-counter drugs that indicate they may cause drowsiness or, that you should not operate heavy equipment.
- Remain upwind during site activities whenever possible.

8.2 BUDDY SYSTEM

On-site personnel must use the buddy system as required by operations. Use of the “buddy system” is required during all operations requiring Level C to Level A PPE, and when appropriate, during Level D operations. Crewmembers must observe each other for signs of chemical exposure, and heat or cold stress. Indications of adverse effects include, but are not limited to:

- Changes in complexion and skin coloration;
- Changes in coordination;
- Changes in demeanor;
- Excessive salivation and pupillary response; and
- Changes in speech pattern.

Crewmembers must also be aware of the potential exposure to possible safety hazards, unsafe acts, or non-compliance with safety procedures.

Field personnel must inform their partners or fellow crewmembers of non-visible effects of exposure to toxic materials that they may be experiencing. The symptoms of such exposure may include, but are not limited to:

- Headaches;
- Dizziness;
- Nausea;
- Blurred vision;
- Cramps; and
- Irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

8.3 HEAT STRESS

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

Heat rashes are one of the most common problems in hot work environments. Commonly known as prickly heat, a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat cramps are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much or too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3% NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

Heat exhaustion occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness; nausea; headache, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

Heat stroke is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

8.4 HEAT STRESS SAFETY PRECAUTIONS

Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described in **Table 4** below.

Table 4 – Work/Rest Schedule

Adjusted Temperature ^b	Work/Rest Regimen Normal Work Ensemble ^c	Work/Rest Regimen Impermeable Ensemble
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5° - 90°F (30.8°-32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5° - 87.5°F (28.1° - 30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5° - 82.5°F (25.3° - 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5° - 77.5°F (30.8° - 32.2°C)	After each 150 minutes of work	After each 120 minutes of work

- For work levels of 250 kilocalories/hour (Light-Moderate Type of Work)
- Calculate the adjusted air temperature (ta adj) by using this equation: $ta\ adj\ ^\circ F = ta\ ^\circ F + (13 \times \% \text{ sunshine})$. Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)
- A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.
- The information presented above was generated using the information provided in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) Handbook.

In order to determine if the work rest cycles are adequate for the personnel and specific site conditions, additional monitoring of individual heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period.

Additionally, one or more of the following control measures can be used to help control heat stress and are mandatory if any site worker has a heart rate (measure immediately prior to rest period) exceeding 115 beats per minute:

- Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.
- On-site drinking water will be kept cool (50 to 60°F).
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices, such as vortex tubes or cooling vests, should be used when personnel must wear impermeable clothing in conditions of extreme heat.
- Employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.

- Employees must not be assigned to other tasks during breaks.
- Employees must remove impermeable garments during rest periods. This includes white Tyvek-type garments.

All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

8.5 COLD STRESS

Cold stress normally occurs in temperatures at or below freezing, or under certain circumstances, in temperatures of 40°F. Extreme cold for a short time may cause severe injury to exposed body surfaces or result in profound generalized cooling, causing death. Areas of the body that have high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. Two factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. For instance, 10°F with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at 18°F. An equivalent chill temperature chart relating the actual dry bulb temperature and wind velocity is presented in **Table 5** below.

Table 5 – Wind Chill Temperature Chart

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within one minute.			GREAT DANGER Flesh may freeze within 30 seconds.				
	Trench foot and immersion foot may occur at any point on this chart.											

[This chart was developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA (Source: ACGIH Threshold Limit Values for Chemical Substances and Physical Agents)].

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of tissue damage associated with frostbite. Frostbite of the extremities can be categorized into:

- *Frost Nip or Incipient Frostbite* - characterized by sudden blanching or whitening of skin.
- *Superficial Frostbite* - skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- *Deep Frostbite* - tissues are cold, pale, and solid; extremely serious injury.

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. It can be fatal. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy,

listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the extremities; and 5) death. Trauma sustained in freezing or sub-zero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment. To avoid cold stress, site personnel must wear protective clothing appropriate for the level of cold and physical activity. In addition to protective clothing, preventive safe work practices, additional training, and warming regimens may be utilized to prevent cold stress.

8.6 SAFETY PRECAUTIONS FOR COLD STRESS PREVENTION

For air temperature of 0°F or less, mittens should be used to protect the hands. For exposed skin, continuous exposure should not be permitted when air speed and temperature results in a wind chill temperature of -25°F.

At air temperatures of 36°F or less, field personnel who become immersed in water or whose clothing becomes wet must be immediately provided with a change of clothing and be treated for hypothermia.

If work is done at normal temperature or in a hot environment before entering the cold, the field personnel must ensure that their clothing is not wet as a consequence of sweating. Wet field personnel must change into dry clothes prior to entering the cold area.

If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work must be modified or suspended until adequate clothing is made available or until weather conditions improve.

Field personnel handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F must take special precaution to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling.

8.7 SAFE WORK PRACTICES

Direct contact between bare skin and cold surfaces (< 20°F) should be avoided. Metal tool handles and/or equipment controls should be covered by thermal insulating material.

For work performed in a wind chill temperature at or below 10°F, workers should be under constant protective observation (buddy system). The work rate should be established to prevent heavy sweating that will result in wet clothing. For heavy work, rest periods must be taken in heated shelters and workers should be provided with an opportunity to change into dry clothing if needed.

Field personnel should be provided the opportunity to become accustomed to cold-weather working conditions and required protective clothing. Work should be arranged in such a way that sitting or standing still for long periods is minimized.

During the warming regimen (rest period), field personnel should be encouraged to remove outer clothing to permit sweat evaporation or to change into dry work clothing. Dehydration, or loss of body fluids, occurs insidiously in the cold environment and may increase susceptibility to cold injury due to a significant change in blood flow to the extremities. Fluid

replacement with warm, sweet drinks and soups is recommended. The intake of coffee should be limited because of diuretic and circulatory effects.

8.8 BIOLOGICAL HAZARDS

Biological hazards may include poison ivy, snakes, thorny bushes and trees, ticks, mosquitoes, spiders, and other pests.

8.8.1 TICK BORNE DISEASES

Lyme Disease - The disease commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

Erlchiosis - The disease also commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, and swelling and pain in the joints, and eventually, arthritis. Symptoms of erlichiosis include muscle and joint aches, flu-like symptoms, but there is typically no skin rash.

Rocky Mountain Spotted Fever (RMSF) - This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death, if untreated, but if identified and treated promptly, death is uncommon.

Control - Tick repellent containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pant legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

8.8.2 POISONOUS PLANTS

Poisonous plants may be present in the work area. Personnel should be alerted to its presence and instructed on methods to prevent exposure.

Control - The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding

skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with soap and water and observed for signs of reddening.

8.8.3 SNAKES

The possibility of encountering snakes exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snakebites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

Control - To minimize the threat of snakebites, all personnel walking through vegetated areas must be aware of the potential for encountering snakes, and the need to avoid actions potentiating encounters, such as turning over logs, etc. If a snakebite occurs, an attempt should be made to safely identify the snake via size and markings. The victim must be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

8.8.4 SPIDERS

Personnel may encounter spiders during work activities.

Two spiders are of concern, the black widow and the brown recluse. Both prefer dark sheltered areas such as basements, equipment sheds and enclosures, and around woodpiles or other scattered debris. The black widow is shiny black, approximately one inch long, and found throughout the United States. There is a distinctive red hourglass marking on the underside of the black widows body. The bite of a black widow is seldom fatal to healthy adults, but effects include respiratory distress, nausea, vomiting, and muscle spasms. The brown recluse is smaller than the black widow and gets its name from its brown coloring and behavior. The brown recluse is more prevalent in the southern United States. The brown recluse has a distinctive violin shape on the top of its body. The bite of the brown recluse is painful and the bite site ulcerates and takes many weeks to heal completely.

Control - To minimize the threat of spider bites, all personnel walking through vegetated areas must be aware of the potential for encountering these arachnids. Personnel need to avoid actions that may result in encounters, such as turning over logs, and placing hands in dark places such as behind equipment or in corners of equipment sheds or enclosures. If a spider bite occurs, the victim must be transported to the nearest hospital as soon as possible; first aid consists of applying ice packs and washing the area around the wound to remove any unabsorbed venom.

8.9 NOISE

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In

addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

Control - All personnel must wear hearing protection, with a Noise Reduction Rating (NRR) of at least 20, when noise levels exceed 85 dBA. When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss. Noise monitoring is discussed in Section 5.2, Noise Monitoring.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

8.10 SPILL CONTROL

All personnel must take every precaution to minimize the potential for spills during site operations. All on-site personnel shall immediately report any discharge, no matter how small, to the FS.

Spill control equipment and materials will be located on the site at locations that present the potential for discharge. All sorbent materials used for the cleanup of spills will be containerized and labeled appropriately. In the event of a spill, the FS will follow the provisions in Section 10.0, Emergency Procedures, to contain and control released materials and to prevent their spread to off-site areas.

8.11 SANITATION

Site sanitation will be maintained according to OSHA requirements.

8.11.1 BREAK AREA

Breaks must be taken in the SZ, away from the active work area after site personnel go through decontamination procedures. There will be no smoking, eating, drinking, or chewing gum or tobacco in any area other than the SZ.

8.11.2 POTABLE WATER

The following rules apply to all field operations:

- An adequate supply of potable water will be provided at each project site. Potable water must be kept away from hazardous materials or media, and contaminated clothing or equipment.
- Portable containers used to dispense drinking water must be capable of being tightly closed and must be equipped with a tap dispenser. Water must not be consumed directly from the container (drinking from the tap is prohibited) nor may it be removed from the container by dipping.
- Containers used for drinking water must be clearly marked and shall not be used for any other purpose.
- Disposable drinking cups must be provided. A sanitary container for dispensing cups and a receptacle for disposing of used cups is required.

8.11.3 SANITARY FACILITIES

Access to facilities for washing before eating, drinking, or smoking, or alternate methods such as waterless hand-cleaner and paper towels will be provided.

8.11.4 LAVATORY

If permanent toilet facilities are not available, an appropriate number of portable chemical toilets will be provided. This requirement does not apply to mobile crews or to normally unattended site locations so long as employees at these locations have transportation immediately available to nearby toilet facilities.

8.12 EMERGENCY EQUIPMENT

Adequate emergency equipment for the activities being conducted on site and as required by applicable sections of 29 CFR 1910 and 29 CFR 1926 will be on site prior to the commencement of project activities. Personnel will be provided with access to emergency equipment, including, but not limited to, the following:

- Fire extinguishers of adequate size, class, number, and location as required by applicable sections of 29 CFR 1910 and 1926;
- Industrial first aid kits of adequate size for the number of personnel on site; and
- Emergency eyewash and/or shower if required by operations being conducted on site.

8.13 LOCKOUT/TAGOUT PROCEDURES

Only fully qualified and trained personnel will perform maintenance procedures. Before maintenance begins, lockout/tagout procedures per OSHA 29 CFR 1910.147 will be followed.

Lockout is the placement of a device that uses a positive means, such as lock, to hold an energy or material-isolating device such that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system shall be used. Tagout is the placement of a warning tag on an energy or material isolating device indicating that the equipment controls may not be operated until the personnel who attached the tag remove the tag.

8.14 ELECTRICAL SAFETY

Electricity may pose a particular hazard to site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, a qualified electrician must perform it.

General electrical safety requirements include:

- All electrical wiring and equipment must be a type listed by Underwriters Laboratories (UL), Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency.
- All installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or USCG regulations.
- Portable and semi-portable tools and equipment must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.

- Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.
- Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.
- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.
- All circuits must be protected from overload.
- Temporary power lines, switchboxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.
- Plugs and receptacles must be kept out of water unless of an approved submersible construction.
- All extension cord outlets must be equipped with ground fault circuit interrupters (GFCI).
- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.
- Extension cords or cables must be inspected prior to each use and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire.
- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

8.15 LIFTING SAFETY

Using proper lifting techniques may prevent back strain or injury. The fundamentals of proper lifting include:

- Consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone.
- The hands and the object should be free of dirt or grease that could prevent a firm grip.
- Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces.
- Fingers must be kept away from points that could crush or pinch them, especially when putting an object down.
- Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.
- The load should be kept as low as possible, close to the body with the knees bent.
- To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.
- A worker should not carry a load that he or she cannot see around or over.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

8.16 LADDER SAFETY

When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (9 m) above the upper landing surface to which the ladder is

used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

- Ladders shall be maintained free of oil, grease, and other slipping hazards.
- Ladders shall not be loaded beyond the maximum intended load for which they were built, or beyond their manufacturer's rated capacity.
- Ladders shall be used only for the purpose for which they were designed.
- Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).
- Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.
- Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.
- Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.
- Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces, including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.
- Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
- The area around the top and bottom of ladders shall be kept clear.
- The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.
- Ladders shall not be moved, shifted, or extended while occupied.
- Ladders shall have non-conductive side rails if they are used where the employee or the ladder could contact exposed energized electrical equipment.
- The top, top step, or the step labeled that it or any step above it should not be used as a step.
- Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- Ladders shall be inspected by the HSM for visible defects on a daily basis and after any occurrence that could affect their safe use.
- Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; corroded components; or other faulty or defective components shall either be immediately marked in a manner that readily identifies them as defective or be tagged with "Do Not Use" or similar language and shall be withdrawn from service.

- Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; or corroded components; shall be withdrawn from service.
- Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.
- Single-rail ladders shall not be used.
- When ascending or descending a ladder, the user shall face the ladder.
- Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- An employee shall not carry any object or load that could cause the employee to lose balance and fall.

8.17 TRAFFIC SAFETY

The project site may be located adjacent to a public roadway where exposure to vehicular traffic is likely. Traffic may also be encountered as vehicles enter and exit the area. To minimize the likelihood of project personnel and activities being affected by traffic, the following procedures will be implemented.

Cones must be placed along the shoulder of the roadway starting 100 feet from the work area to alert passing motorists to the presence of personnel and equipment. A “Slow” or “Men Working” sign must be placed at the first cone. Barricades with flashing lights should be placed between the roadway and the work area.

During activities along a roadway, equipment will be aligned parallel to the roadway to the extent feasible, facing into the oncoming traffic so as to place a barrier between the work crew and the oncoming traffic. All crewmembers must remain behind the equipment and the traffic barrier.

All site personnel who are potentially exposed to vehicular traffic must wear an outer layer of orange warning garments, such as vests, jackets, or shirts. If work is performed in hours of dusk or darkness, workers will be outfitted with reflective garments either orange, white (including silver-coated reflective coatings or elements that reflect white light), yellow, fluorescent red-orange, or fluorescent yellow-orange.

The flow of traffic into and out of the adjacent business must be assessed, and precautions taken to warn motorists of the presence of workers and equipment. Where possible, vehicles should be aligned to provide physical protection of people and equipment.

9.0 SITE-SPECIFIC HAZARDS AND CONTROL MEASURES

9.1 EVALUATION OF HAZARDS

The evaluation of hazards is provided as a quick reference as to the known conditions for the Site, wherein the level of detail for each of the subsections is identified.

9.1.1 HAZARD CHARACTERISTICS

Existing information for Site:

☒ Detailed ☐ Preliminary ☐ None

Hazardous/Contaminated Material Form(s):

☒ Solid ☒ Liquid ☐ Sludge ☐ Gas ☒ Vapor

Containment Type(s):

☐ Drum ☒ Tank ☐ Pit ☐ Debris
☐ Pond ☐ Lagoon Other: _____

Hazardous Material Characteristics:

☒ Volatile ☐ Corrosive ☐ Reactive ☐ Radioactive
☐ Ignitable ☒ Toxic ☐ Unknown

Routes of Exposure:

☒ Oral ☒ Dermal ☒ Eye ☒ Respiratory

9.1.2 POTENTIAL HEALTH AND SAFETY HAZARDS

<input checked="" type="checkbox"/> Heat	<input type="checkbox"/> Congested areas
<input checked="" type="checkbox"/> Cold	<input checked="" type="checkbox"/> General Construction
<input type="checkbox"/> Confined space entry	<input checked="" type="checkbox"/> Physical injury
<input type="checkbox"/> Oxygen depletion	<input checked="" type="checkbox"/> Electrical hazards
<input type="checkbox"/> Asphyxiation	<input checked="" type="checkbox"/> Handling and product transfer
<input checked="" type="checkbox"/> Excavation	<input checked="" type="checkbox"/> Fire
<input checked="" type="checkbox"/> Cave-ins	<input checked="" type="checkbox"/> Explosion
<input checked="" type="checkbox"/> Falls, slippage	<input checked="" type="checkbox"/> Biological Hazards
	<input checked="" type="checkbox"/> Plants – Poison Ivy, Poison Oak
	<input checked="" type="checkbox"/> Insects – Ticks
	<input checked="" type="checkbox"/> Insects – Mosquitoes
	<input checked="" type="checkbox"/> Insects – Bees and Wasps
	<input checked="" type="checkbox"/> Rats and Mice
<input checked="" type="checkbox"/> Heavy equipment	<input type="checkbox"/> Non-ionizing Radiation (i.e. UV, IR, etc.)
<input type="checkbox"/> Other: Potential Ignition Hazard.	

9.2 FIELD ACTIVITIES, HAZARDS, AND CONTROL PROCEDURES

The following task-specific safety analyses identify potential health, safety, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the site to identify hazards that may affect on-site personnel, the community, or the environment. The FS must be aware of these changing conditions and discuss them with the PM whenever these changes impact employee health, safety, the environment, or performance of the project. The FS will keep on-site personnel informed of the changing conditions, and the PM will write and/or approve addenda or revisions to this HASP as necessary.

9.2.1 MOBILIZATION/CONSTRUCTION STAKEOUT

Description of Tasks

Site mobilization will include establishing excavation locations, determining the location of utilities and other installations, and establishing work areas. Mobilization will also include setting up equipment and establishing a temporary site office. A break area will be set up outside of regulated work areas. Mobilization may involve clearing areas for the SZ and CRZ. During this initial phase, project personnel will walk the site to confirm the existence

of anticipated hazards and identify safety and health issues that may have arisen since the writing of this plan.

Hazard Identification

The hazards of this phase of activity are associated with heavy equipment operation, manual materials handling, installation of temporary on-site facilities, and manual site preparation.

Manual materials handling and manual site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Installation of temporary field office and support facilities may expose personnel to electrical hazards, underground and overhead utilities, and physical injury due to the manual lifting and moving of materials. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat- or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Controls

Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.2.2 DEMOLITION/SITE CLEARING

Description of Tasks

Site clearance will involve manual or mechanical removal of objects impeding access to the construction footprint. These obstructions are both natural and man-made items and will include, but not be limited to, fabricated metal and concrete structures, trees, vegetation, rubble, and miscellaneous trash/debris.

Hazard Identification

Hazards associated with demolition and site clearance include personnel working in and around potentially unstable structures, or locations of potential contact with hazardous chemicals, utilities, and/or falling objects. This task will involve manual, as well as mechanical demolition/clearance efforts so exertion and equipment hazards exist.

Controls

PPE – Personnel shall be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.

Preparatory Operations – Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a licensed Professional Engineer, of the structure to determine the stability of the structure. Any adjacent structure shall where personnel may be exposed shall also be similarly checked. The PO shall have in writing evidence that such a survey has been performed. All structural instabilities shall be shored or braced, under the supervision of a licensed Professional Engineer, prior to access by an FP.

Utilities – All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company that is involved shall be notified in advance. If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary.

Hazardous Substances – It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging shall be performed and the hazard eliminated before demolition is started.

Falling Debris/Objects – No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected. Access to the area where falling objects/debris may be encountered must be gated and controlled.

Structural Collapse – Structural or load supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. Walls, which are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load. Mechanical equipment shall not be used on floors or working surfaces unless such floors or surfaces are not of sufficient strength to support the imposed load.

Rollover Guards – All equipment used in site clearing operations shall be equipped with rollover guards meeting the applicable requirements. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the applicable requirements.

Inspections – During demolition, continuing inspections by a licensed Professional Engineer shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, walls, or loosened material. No FP shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

9.2.3 EXCAVATION AND CUT/FILL OPERATIONS

9.2.3.1 EXCAVATION/TRENCHING

Description of Tasks

This task includes the excavation of contaminated soils and superficial debris. Excavation depths vary across the site.

Hazard Identification

The hazards of this activity are associated with heavy equipment operation, subsurface intrusion, manual materials handling, stockpiling, and disposal. Subsurface intrusion presents hazards associated with negotiating buried utilities, cave-ins of the excavated areas, and regress methods for personnel working inside the excavated areas. Disruption of contaminated soil also presents a health hazard.

Controls

Underground Utilities – The estimated locations of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably

may be expected to be encountered during the excavation work, shall be determined prior to opening an excavation. Utility companies or owners shall be contacted (“Call Before You Dig”) within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.

When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means. While the excavation is open, underground installations shall be protected, supported, or removed, as necessary, to safeguard site personnel.

Cave-Ins – Project personnel in an excavation shall be protected from cave-ins by an adequate protective system, except when:

- Excavations are made entirely in stable rock or excavations are less than five feet in depth and examination of the ground by the SSO provides no indication of a potential cave-in.
- Protective systems shall have the capacity to resist, without failure, all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

Project personnel shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least two feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by the SSO for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the SSO prior to the start of work and as needed throughout operations. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are only required when project personnel exposure can be reasonably anticipated.

Where the SSO finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed personnel shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

Excavation Egress – A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are four feet or more in depth so as to require no more than 25 feet or lateral travel for project personnel.

9.2.3.2 HEAVY EQUIPMENT OPERATION

Description of Tasks

Heavy equipment to be used for this task include, but are not limited to, excavators, dozers, dump trucks, and water sprayers (if required).

Hazard Identification

The most common type of accident that occurs in material handling operations is the “caught between” situation when a load is being handled and an object gets caught between two moving parts of the equipment. Operation of the heavy construction equipment may produce harmful noise.

Controls

Equipment Inspection – All vehicles in use shall be checked prior to operation to ensure that all parts, equipment, and accessories that affect safe operations are in proper operating condition and free from defects. All defects shall be corrected before the vehicle is placed in service.

Ground Guides – No personnel shall use any motor vehicle, earthmoving, or compacting equipment having an obstructed view to the rear, unless:

- The vehicle has a reverse signal alarm distinguishable from the surrounding noise level; or
- The vehicle is backed up only when an observer signals that it is safe to do so.

Blocking – Heavy machinery, equipment, or parts thereof that are suspended or held aloft shall be substantially blocked to prevent falling or shifting before employees are permitted to work under or between them.

Noise – Control measures for noise are addressed in Section 4.9.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.3.3 DISTURBANCE/HANDLING OF CONTAMINATED MATERIAL

Description of Tasks

After the contaminated soil is excavated from below the Site’s surface, the material will be stockpiled, dried, and either transported offsite or relocated and backfilled on site.

Hazard Identification

The hazards associated with materials handling include contact of the contaminated material with project personnel, or cross contamination with other site soil.

Controls

Cross Contamination – Following excavation, contaminated soil stockpiles will be placed on a structure constructed to separate the material from the site soil and collect any groundwater leachate. The material shall be covered to prevent storm water erosion or migration of contaminants through storm water.

Air Monitoring – Air and particulate monitoring will be conducted during soil excavation activities to assess the potential for exposure to airborne COCs. If the results of air monitoring indicate the presence of organic vapors or particulates in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.4 DRILLING/SUBSURFACE INTRUSION ACTIVITIES

Description of Tasks

Site mobilization will include establishing excavation locations, determining the location of utilities and other installations, and establishing work areas. Mobilization will also include setting up equipment and establishing a temporary site office. A break area will be set up outside of regulated work areas. Mobilization may involve clearing areas for the SZ and CRZ. During this initial phase, project personnel will walk the site to confirm the existence of anticipated hazards and identify safety and health issues that may have arisen since the writing of this plan.

Hazard Identification

The primary physical hazards for this activity are associated with the use of soil boring and grouting equipment. The equipment is hydraulically powered and uses static force and dynamic percussion force to advance sampling and penetrating tubes.

Accidents can occur as a result of improperly placing the equipment on uneven or unstable terrain or failing to adequately secure the equipment prior to the start of operations. Overhead utility lines can create hazardous conditions if contacted by the equipment. Underground installations such as electrical lines, conduit, and product lines pose a significant hazard if contacted.

Controls

Geoprobe and Drill Rig Safety Procedures - The operator of the equipment must possess required state or local licenses to perform such work. All members of the crew shall receive site-specific training prior to beginning work.

The operator is responsible for the safe operation of the rig, as well as the crew's adherence to the requirements of this HASP. The operator must ensure that all safety equipment is in proper condition and is properly used. The members of the crew must follow all instructions of the operator, wear all personal protective equipment, and be aware of all hazards and control procedures. The operator and crew must participate in the Daily Safety Meetings and be aware of all emergency procedures.

Equipment Inspection - Each day, prior to the start of work, the rig and associated equipment must be inspected by the operator. The following items must be inspected:

- Vehicle condition;
- Proper storage of equipment;
- Condition of all hydraulic lines;
- Fire extinguisher; and
- First aid kit.

Equipment Set Up - The drill rig must be properly blocked and leveled prior to raising the derrick. The wheels which remain on the ground must be chocked. The leveling jacks shall not be raised until the derrick is lowered. The rig shall be moved only after the derrick has been lowered.

All well sites will be inspected by the driller prior to the location of the rig to verify a stable surface exists. This is especially important in areas where soft, unstable terrain is common.

The drill rig must be properly blocked and leveled prior to raising the derrick. Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking ensures that differential settling of the rig does not occur.

When the ground surface is soft or otherwise unstable, wooden blocks, at least 24" by 24" and 4" to 8" thick shall be placed between the jack swivels and the ground. The emergency brake shall be engaged, and the wheels that are on the ground shall be chocked.

Rules for Intrusive Activity - Before beginning any intrusive activity, the existence and location of underground pipe, conduit, electrical equipment, and other installations will be determined. This will be done, if possible, by contacting the appropriate client representative to mark the location of the lines. "Call Before You Dig" will verify the potential for encountering subsurface utilities. If the client's knowledge of the area is incomplete, an appropriate device, such as a magnetometer, will be used to locate the line.

Combustible gas readings of the general work area will be made regularly in areas where and/or during operations when the presence of flammable vapors or gases is suspected, such as during intrusive activities (see Section 5.1). Operations must be suspended and corrective action taken if the airborne flammable concentration reaches 10% of the LEL in the immediate area (a one-foot radius) of the point of drilling, or near any other ignition sources.

Overhead Electrical Clearances - If equipment is operated in the vicinity of overhead power lines, the power to the lines must be shut off or the equipment must be positioned and blocked such that no part, including cables, can come within the minimum clearances as follows:

Nominal Voltage	System	Minimum Clearance	Required
0-50kV		10 feet	
51-100kV		12 feet	
101-200kV		15 feet	
201-300kV		20 feet	
301-500kV		25 feet	
501-750kV		35 feet	
751-1,000kV		45 feet	

When the drill rig is in transit, with the boom lowered and no load, the equipment clearance must be at least 4 feet for voltages less than 50kV, 10 feet for voltages of 50 kV to 345 kV, and 16 feet for voltages above 345 kV.

Hoisting Operations - Drillers should never engage the rotary clutch without watching the rotary table, and ensuring it is clear of personnel and equipment.

Unless the drawworks is equipped with an automatic feed control, the brake should not be left unattended without first being tied down.

Drill pipe, auger strings or casing should be picked up slowly. Drill pipe should not be hoisted until the driller is sure that the pipe is latched in the elevator, or the derrickman has signaled that he may safely hoist the pipe.

During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller should be on the rig floor; no one else should be on the rig or derrick.

The brakes on the drawworks of the drill rig should be tested by the driller each day. The brakes should be thoroughly inspected by a competent individual each week.

A hoisting line with a load imposed should not be permitted to be in direct contact with any derrick member or stationary equipment, unless it has been specifically designed for line contact.

Workers should never stand near the borehole whenever any wire line device is being run.

Hoisting control stations should be kept clean and controls labeled as to their functions.

Catline Operations - Only experienced workers will be allowed to operate the cathead controls. The kill switch must be clearly labeled and operational prior to operation of the catline. The cathead area must be kept free of obstructions and entanglements.

The operator should not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.

Personnel should not stand near, step over, or go under a cable or catline which is under tension.

Employees rigging loads on catlines shall:

- Keep out from under the load;
- Keep fingers and feet where they will not be crushed;
- Be sure to signal clearly when the load is being picked;
- Use standard visual signals only and not depend on shouting to coworkers; and
- Make sure the load is properly rigged, since a sudden jerk in the catline will shift or drop the load.

Wire Rope - When two wires are broken or rust or corrosion is found adjacent to a socket or end fitting, the wire rope shall be removed from service or re-socketed. Special attention shall be given to the inspection of end fittings on boom support, pendants, and guy ropes.

Wire rope removed from service due to defects shall be cut up or plainly marked as being unfit for further use as rigging.

Wire rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope; the clip nuts shall be re-tightened immediately after initial load carrying use and at frequent intervals thereafter.

When a wedge socket fastening is used, the dead or short end of the wire rope shall have a clip attached to it or looped back and secured to itself by a clip; the clip shall not be attached directly to the live end.

Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

Except for eye splices in the ends of wires and for endless wire rope slings, wire rope used in hoisting, lowering, or pulling loads, shall consist of one continuous piece without knot or splice.

An eye splice made in any wire rope shall have not less than five full tucks.

Wire rope shall not be secured by knots. Wire rope clips shall not be used to splice rope.

Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire clips or knots.

Pipe/Auger Handling - Pipe and auger sections shall be transported by cart or carried by two persons. Individuals should not carry auger or pipe sections without assistance.

Workers should not be permitted on top of the load during loading, unloading, or transferring of pipe or rolling stock.

Employees should be instructed never to try to stop rolling pipe or casing; they should be instructed to stand clear of rolling pipe.

Slip handles should be used to lift and move slips. Employees are not permitted to kick slips into position.

When pipe is being hoisted, personnel should not stand where the bottom end of the pipe could whip and strike them.

Pipe and augers stored in racks, catwalks or on flatbed trucks should be secured to prevent rolling.

9.2.5 SUBSURFACE CHEMICAL SAMPLE COLLECTION/ANALYSIS

Description of Tasks

This sub-task consists of the collection of soil samples for subsequent field and laboratory analysis. The physical hazards of soil sampling are primarily associated with the sample collection methods, procedures utilized, and the environment itself.

Hazard Identification

Incidental contact with COCs is the primary hazard associated with sampling the stabilized material. This contact may occur through the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. The primary hazards associated with these sampling procedures are not potentially serious; however, other operations in the area, or the conditions under which

samples must be collected, may present chemical and physical hazards. The hazards directly associated with sampling procedures are generally limited to strains/sprains and potential eye hazards. Potential chemical hazards may include contact with media containing site COCs and potential contact with chemicals used for equipment decontamination.

Controls

PPE – To control dermal exposure during sampling activities, a minimum of Level D protection will be worn. If necessary, based on field observations and site conditions, air monitoring may be conducted during sediment sampling activities. If the results of air monitoring indicate the presence of airborne contaminants in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

9.2.6 UST CLOSURE

9.2.6.1 WORKING IN CONFINED SPACES

Description of Tasks

Working in confined spaces is not anticipated for this project.

Hazard Identification

Hazard identification such as the entrance into confined spaces will be evaluated if necessary.

Controls

All personnel required to enter into confined or enclosed spaces must be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of required protective and emergency equipment. The PO shall comply with all specific regulations that apply to work in dangerous or potentially dangerous areas.

9.2.6.2 WORKING WITH COMPRESSED AIR

Description of Tasks

The proposed method of purging the USTs includes the injection of compressed gas into the tank and attached piping network.

Hazard Identification

Uncontrolled release of the highly pressured air can cause injury to FP during this task. Cylinders must also be properly managed to ensure they are not compromised during storage and/or use.

Controls

Pressure Regulation – Compressed air used for cleaning purposes shall be reduced to less than 30 pounds per square inch and then only with effective chip guarding and personal protective equipment.

Cylinder Storage – Valve protection caps shall be in place and secured when compressed gas cylinders are transported, moved, or stored. Cylinder valves shall be closed when work is finished and when cylinders are empty or are moved. Compressed gas cylinders shall be secured in an upright position at all times, except if necessary for short periods of time

when cylinders are actually being hoisted or carried. Cylinders shall be placed in a location where they cannot become part of an electrical circuit.

9.2.7 DECONTAMINATION

All equipment will be decontaminated before leaving the site. Personnel involved in decontamination activities may be inadvertently exposed to skin contact with contaminated materials and chemicals brought from the EZ. Personnel involved in decontamination activities must wear PPE that is, at a minimum, one level below the level worn by personnel working in the EZ.

9.2.8 DEMOBILIZATION

Demobilization involves the removal of all tools, equipment, supplies, and vehicles brought to the site. The hazards of this phase of activity are associated with heavy equipment operation and manual materials handling.

Manual materials handling may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Heavy equipment operation presents noise and vibration hazards, and hot surfaces, to operators. Personnel in the vicinity of heavy equipment operation may be exposed to physical hazards resulting in fractures, contusions, and lacerations and may be exposed to high noise levels. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat-or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.3 CHEMICAL HAZARDS

The chemical hazards associated with site operations are related to inhalation, ingestion, and skin exposure to site COCs. Concentrations of airborne COCs during site tasks may be measurable and will require air monitoring during certain operations. Air monitoring requirements for site tasks are outlined in Section 5.1. COCs at the site include PAHs, Metals and PCBs..

The potential for inhalation of site COCs is low. The potential for dermal contact with soils containing site COCs during remedial operations is moderate. Table 6 lists the primary contaminants that have been identified at the Site and the media in which they are present.

Table 6 – List of Primary Contaminants

Media: Soil		
	Maximum	Applicable

PAHs	Concentration (mg/kg)	Monitoring Instrument
benzo(a)anthracene	6.0	Not Applicable
benzo(a)pyrene	6.2	Not Applicable
benzo(b)fluoranthene	8.2	Not Applicable
chrysene	5.8	Not Applicable
dibenzo(a,h)anthracene	0.94	Not Applicable
indeno(1,2,3-cd)pyrene	4.2	Not Applicable
PCBs	Maximum Concentration (mg/kg)	Applicable Monitoring Instrument
Aroclor 1260	2.48	Not Applicable
Total PCBs	2.48	Not Applicable
PAHs	Maximum Concentration (mg/kg)	Applicable Monitoring Instrument
Barium	1,160	Not Applicable
Cadmium	4.99	Not Applicable
Copper	3,840	Not Applicable
Lead	2,180	Not Applicable
Manganese	19,400	Not Applicable
Mercury	1.5	Not Applicable

10.0 EMERGENCY PROCEDURES

10.1 GENERAL

Prior to the start of operations, the work area will be evaluated for the potential for fire, contaminant release, or other catastrophic event. Unusual conditions or events, activities, chemicals, and conditions will be reported to the FS/SSO immediately.

The FS/SSO will establish evacuation routes and assembly areas for the site. All personnel entering the site will be informed of this route and the assembly area.

10.2 EMERGENCY RESPONSE

If an incident occurs, the following steps will be taken:

- The FS/SSO will evaluate the incident and assess the need for assistance and/or evacuation;
- The FS/SSO will call for outside assistance as needed;
- The FS/SSO will ensure the PM is notified promptly of the incident; and
- The FS/SSO will take appropriate measures to stabilize the incident scene.

10.2.1 FIRE

In the case of a fire at the site, the FS/SSO will assess the situation and direct fire-fighting activities. The FS/SSO will ensure that the PM is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that site personnel are unable to safely extinguish with one fire extinguisher, the local fire department will be summoned.

10.2.2 CONTAMINANT RELEASE

In the event of a contaminant release, the following steps will be taken:

- Notify FS/SSO immediately;
- Evacuate immediate area of release;
- Conduct air monitoring to determine needed level of PPE; and
- Don required level of PPE and prepare to implement control procedures.

The FS/SSO has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-site areas.

10.3 MEDICAL EMERGENCY

All employee injuries must be promptly reported to the SSO/FS, who will:

- Ensure that the injured employee receives prompt first aid and medical attention;
- In emergency situations, the worker is to be transported by appropriate means to the nearest urgent care facility (normally a hospital emergency room); and
- If the injured person is a SESI employee, notify SESI at 973-808-9050.

10.3.1 EMERGENCY CARE STEPS

Survey the scene. Determine if it is safe to proceed. Try to determine if the conditions that caused the incident are still a threat. Protect yourself from exposure before attempting to rescue the victim.

- Do a primary survey of the victim. Check for airway obstruction, breathing, and pulse. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.
- Phone Emergency Medical Services (EMS). Give the location, telephone number used, caller's name, what happened, number of victims, victim's condition, and help being given.
- Maintain airway and perform rescue breathing as necessary.
- Perform CPR as necessary.
- Do a secondary survey of the victim. Check vital signs and do a head-to-toe exam.

Treat other conditions as necessary. If the victim can be moved, take him/her to a location away from the work area where EMS can gain access.

10.4 FIRST AID - GENERAL

All persons must report any injury or illness to their immediate supervisor or the FS. Trained personnel will provide first aid. Injuries and illnesses requiring medical treatment must be documented. The FS and SSO must fill out an accident/incident report as soon as emergency conditions no longer exist and first aid and/or medical treatment has been ensured. The report must be completed and submitted to the PM within 24 hours after the incident.

If first-aid treatment is required, first aid kits are kept at the CRZ. If treatment beyond first aid is required, the injured person(s) should be transported to the medical facility. If the injured person is not ambulatory or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is

any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

10.4.1 FIRST AID - INHALATION

Any employee complaining of symptoms of chemical overexposure as described in Section 4, General Site Safety Procedures, will be removed from the work area and transported to the designated medical facility for examination and treatment.

10.4.2 FIRST AID - INGESTION

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for treatment information. If the victim is unconscious, keep them on their side and clear the airway if vomiting occurs.

10.4.3 FIRST AID - SKIN CONTACT

Project personnel who have had skin contact with contaminants will, unless the contact is severe, proceed through the CRZ, to the wash area. Personnel will remove any contaminated clothing, and then flush the affected area with water for at least 15 minutes. The worker should be transported to the medical facility if he/she shows any sign of skin reddening, irritation, or if he/she requests a medical examination.

10.4.4 FIRST AID - EYE CONTACT

Project personnel who have had contaminants splashed in their eyes or who have experienced eye irritation while in the EZ, must immediately proceed to the eyewash station in the CRZ. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

10.5 REPORTING INJURIES, ILLNESSES, AND SAFETY INCIDENTS

Injuries and illnesses, however minor, will be reported to the FS immediately. The FS will complete an injury report and submit it to the HSM, and the PM by end of shift.

10.6 EMERGENCY INFORMATION

The means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the daily safety meeting. These agencies are identified in **Table 7** below.

Table 7 – Emergency Contacts

Local Emergency Contacts	Telephone No.
EMERGENCY	911
Montefiore Nayak Hospital	(845) 348-2000
Police Emergency	911
Fire Emergency	911
Rescue Squad	911
Ambulance	911
Miscellaneous Contacts	Telephone No.
N.Y. Poison Control Center	(800) 222-1222
National Response Center and Terrorist Hotline	(800) 424-8802
Center for Disease Control	(800) 311-3435

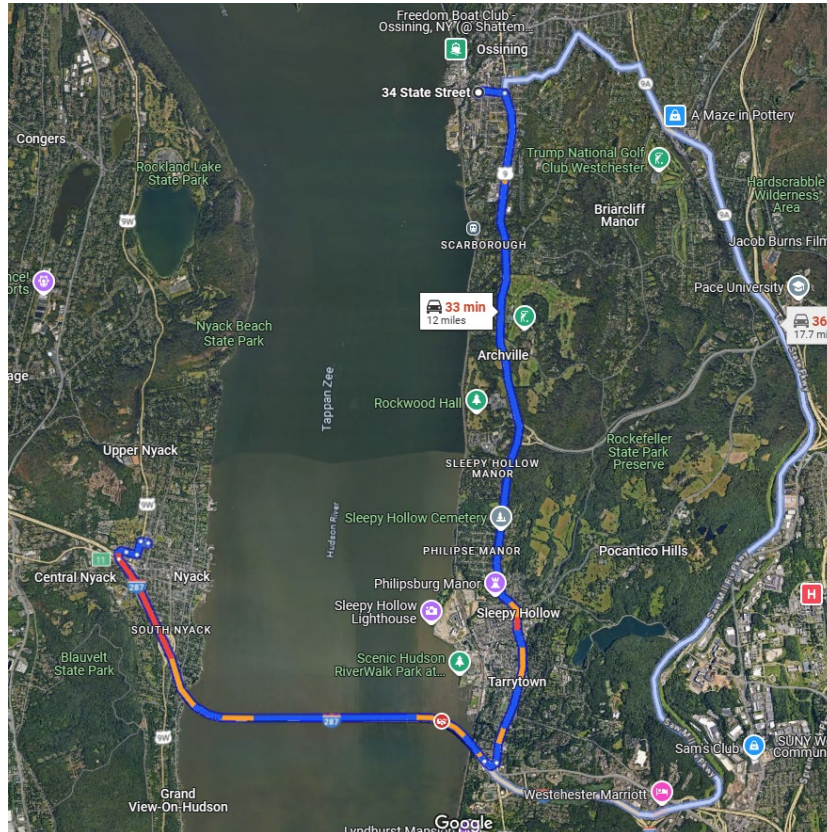
Utility Mark-Out

(800) 962-7962

10.6.1 Directions to Hospital

Montefiore Nayak Hospital
160 N Midland Ave, Nyack, NY 10960
(845) 348-2000

Fig-1: Direction to Hospital



34 State St
Ossining, NY 10562

Take Broad Ave to US-9 S/Albany Post Rd/S Highland Ave

- 2 min (0.3 mi)
- ↑ 1. Head south toward State St
 - 295 ft
 - ↩ 2. Turn left onto State St
 - 135 ft
 - ↪ 3. Turn right onto Broad Ave
 - 0.2 mi

Follow US-9 S and I-287 W/I-87 N to Nyack

- 21 min (11.6 mi)
- ↪ 4. Turn right onto US-9 S/Albany Post Rd/S Highland Ave
 - Continue to follow US-9 S
 - Pass by KeyBank (on the right in 5.6 mi)
 - 6.6 mi
 - ↗ 5. Slight right onto the I-287 N ramp
 - 0.2 mi
 - ↗ 6. Merge onto I-287 W/I-87 N
 - 4.5 mi
 - ↪ 7. Take exit 11 toward US-9W/Nyack
 - 0.1 mi
 - ↑ 8. Continue onto High Ave
 - 0.1 mi
 - ↩ 9. Turn left onto N Highland Ave
 - 0.1 mi

Drive to your destination

- 59 sec (0.1 mi)
- ↪ 10. Turn right
 - 289 ft
 - ↪ 11. Turn right
 - 62 ft
 - ↩ 12. Turn left
 - 82 ft
 - ↩ 13. Turn left
 - 62 ft
 - ↩ 14. Turn left
 - Destination will be on the right
 - 39 ft

Montefiore Nyack Hospital
160 N Midland Ave, Nyack, NY 10960

11.0 LOGS, REPORTS, AND RECORD KEEPING

The following is a summary of required health and safety logs, reports, and record keeping for the operations at the subject site.

11.1 HASP FIELD CHANGE REQUEST

To be completed for initiating a change to the HASP. PM approval is required. The original will be kept in the project file (See Attachment 3).

11.2 MEDICAL AND TRAINING RECORDS

The HSM must obtain and keep a log of personnel meeting appropriate training and medical qualifications for the site work. The log will be kept in the project file. Each company's Human Resources Department will maintain medical records, in accordance with 29 CFR 1910.1020.

11.3 EXPOSURE RECORDS

Any personnel monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept in accordance with 29 CFR 1910.1020. For SESI employees, the originals will be sent to the Human Resources Manager. For subcontractor employees, the original file will be sent to the subcontractor employer with a copy maintained in the SESI project file.

11.4 ACCIDENT/INCIDENT REPORT

Any accident/incident reports must be completed following procedures given in Section 10.5 of this HASP. The originals will be sent to the HSM for maintenance. A copy of the forms will be kept in the project file. (See Attachment 4)

11.5 OSHA FORM 200

An OSHA Form 200 (Log of Occupational Injuries and Illnesses) will be kept at the project site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the Human Resources Manager for maintenance. Subcontractor employees must also meet the requirements of maintaining an OSHA 200 Form. The accident/incident report meets the requirements of the OSHA Form 101 (Supplemental Record), which must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

11.6 ON-SITE HEALTH AND SAFETY FIELD LOGBOOKS

The HSM or designee will maintain an on-site health and safety log book in which daily Site conditions, activities, personnel, and significant events will be recorded. Calibration records and personnel monitoring results, if available, will also be recorded in the field logbook. The original logbook will be kept in the project file.

Whenever any personnel monitoring is conducted onsite, the monitoring results will be noted in the filed logbook. These will become part of the exposure records file and will be maintained by the HSM.

A signatory page is included (See Attachment 5) and is to be signed by those working on and/or visiting the site.

11.7 SAFETY DATA SHEETS

Safety Data Sheets (SDS) will be obtained and kept on file at the project site for each hazardous chemical brought to, use, or stored at the Site (See Attachment 6).

12.0 COVID-19 RESPONSE ACTION PLAN

SESI is concerned with the safety and well-being of its employees, vendors, subcontractors, and others with access to its offices and job sites, with particular emphasis on the unique challenges posed by COVID-19.

SESI has established the following protocols in keeping with the recommendations of the CDC and other sources including State Governor Executive Orders for work taking place on construction sites.

We request that all SESI employees, vendors, and subcontractors help with our prevention efforts while at work.

In order to minimize the spread of COVID-19, we must all cooperate in doing the following:

- Frequently wash your hands with soap and water for at least 20 seconds. When soap and running water are unavailable, use an alcohol-based hand rub with at least 60% alcohol. Always wash hands that are visibly soiled.
- Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow.
- Discourage handshaking, avoid touching your eyes, nose, or mouth with unwashed hands.
- Limit the sharing of tools, machinery, equipment, phones, desks, and computers.
- Wear cloth face coverings on all construction sites.
- Avoid close contact with people who are sick.
- Employees who have symptoms (i.e., fever, cough, or shortness of breath) should notify their supervisor and stay home—DO NOT GO TO WORK.
- Sick employees should follow CDC-recommended steps. Employees should not return to work until the criteria to discontinue home isolation are met, in consultation with healthcare providers and state and local health departments.

The following are the specific jobsite protocols and response actions to be taken in the event someone on site has been in contact with, or has themselves, the COVID-19 virus:

OFFICE/JOBSITE PROTOCOL

- If an employee/worker exhibits COVID-19 symptoms, the employee/worker must remain at home until he or she is symptom free for 72 hours (3 full days) without the use of fever-reducing or other symptom-altering medicines (e.g. acetaminophen, cough suppressants). SESI will similarly require an employee or worker that reports to work with symptoms to return home until they are symptom free for 72 hours (3 full days).
- Limit person to person contact, and when unavoidable, maintain CDC distancing guidelines.
- Avoid eating lunch in groups.

- Avoid in-person meetings if possible. If an in-person meeting is necessary, conduct it in a well-ventilated area with enough space for attendees to distance themselves from one another. Field jobsite meetings should be conducted in smaller group meetings (no more than 5 persons when possible) versus one large meeting.
- Only workers necessary to the execution of the work should be at the jobsites. No non-essential visitors should be permitted at the worksite.

RESPONSE ACTION TRIGGER EVENTS:

- an employee/worker at work has tested positive for COVID-19
- an employee/worker at work has suspected, but unconfirmed, case of COVID-19
- an employee/worker self-reported that they came in contact with someone who had a presumptive positive case of COVID-19
- an employee/worker has been exposed to the virus but only found out after they have interacted with others

RESPONSE ACTIONS:

- Upon occurrence of any of the Trigger Events above, employees/subcontractors shall notify SESI Management about the suspected employee/worker infected with, or exposed to, COVID-19.
- SESI Management will investigate the incident to confirm the report is valid.
- Employees/Subcontractors shall investigate their respective infected employee(s) and report the following to SESI Management and HR:
 - Identify all individuals who worked in proximity (six feet) of the infected employee/worker,
 - Employee(s)/Worker(s) infected with the COVID-19 virus, and employee(s)/worker(s) that came in contact with the infected employee/worker shall be sent home for a period of 14 days,
 - Do not identify the infected employee/worker by name to avoid violation of privacy/confidentiality laws, and,
 - Keep SESI Management informed of progress and updates.
- If an infected person was in the office, SESI will clean and disinfect common areas and surfaces, in accordance with CDC recommendations.
- SESI Management will notify affected employees/workers of the Trigger Event and instruct them to take the response actions above.
- SESI Management policy requires written documentation from a health care professional, that confirmed infected employees can return to work.

Except for circumstances in which SESI is legally required to report workplace occurrences of communicable disease, the confidentiality of all medical conditions will be maintained in accordance with applicable law and to the extent practical under the circumstances. When required, the number of persons who will be informed of an employee's/worker's condition will be kept at the minimum needed to appropriately notify other potentially affected employees/workers of Trigger Events and to attempt to minimize the potential for transmission of the virus.

Attachment 1:
Air Monitor Log

Air Monitoring: Sample Collection and Analysis

Date & Time of Monitoring	Task / Operation Being	Substance(s)/ Hazard(s) Being	Monitoring Location	Type/Method of Monitoring	Monitoring Results	Exposure Limits	Required Action

Attachment 2:

OSHA Poster

Job Safety and Health

It's the law!



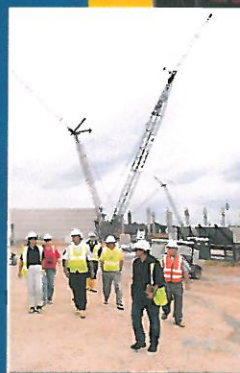
EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health



Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA (6742)
www.osha.gov

OSHA 3165-02 2012R



Attachment 3:
Field Change Request Form

HEALTH & SAFETY PLAN CHANGE NOTICE

Pages ____ of ____

Project: _____ H&S-CN

1) HASP VERSION: _____ SECTION: _____ PAGE (s): _____

RE: --- Change to existing HASP Anticipated Revision Date: _____
--- Addition to existing HASP
--- Other: _____
_____ CONT. _____

2) PROPOSED CHANGE: _____

3) REASON FOR PROPOSED CHANGE(s):
--- Required by SPEC or Change Order --- Other: _____
--- Disposition of Deficiency _____ CONT. _____
--- Change in Regulatory or Other Requirements
--- Operational Experience

4) EXHIBITS ATTACHED ____ NO ____ YES (If YES, describe) _____
_____ CONT. _____

5) PMK APPROVALS PROJECT MANAGER: _____ Date: _____
SITE MANAGER: _____ Date: _____
H&S MANAGER: _____ Date: _____

Client Approval Required: ____ NO ____ YES (If YES, date submitted) _____

6) CLIENT APPROVAL ____ APPROVED ____ REMANDED ____ REJECTED

Comments: _____

_____ CONT. _____

Client Representative: _____ Date: _____

7) DISTRIBUTION AFTER APPROVAL

☒ HASP UPDATE LIST --- OTHER: _____
☒ CLIENT _____
☒ PROJECT FILES _____

8) PREPARED BY: _____ Date: _____
Title: _____

Attachment A:
Injury Report Form

OSHA's Form 301

Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Information about the employee

- 1) Full name _____
- 2) Street _____
City _____ State _____ ZIP _____
- 3) Date of birth ____/____/____
- 4) Date hired ____/____/____
- 5) ☐ Male
☐ Female

Information about the physician or other health care professional

- 6) Name of physician or other health care professional _____

- 7) If treatment was given away from the worksite, where was it given?
Facility _____
Street _____
City _____ State _____ ZIP _____

- 8) Was employee treated in an emergency room?
☐ Yes
☐ No

- 9) Was employee hospitalized overnight as an inpatient?
☐ Yes
☐ No

Information about the case

- 10) Case number from the *Log* _____ (Transfer the case number from the *Log* after you record the case.)
- 11) Date of injury or illness ____/____/____
- 12) Time employee began work ____ AM / PM
- 13) Time of event ____ AM / PM ☐ Check if time cannot be determined

- 14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

- 15) **What happened?** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

- 16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or "sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

- 17) **What object or substance directly harmed the employee?** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." If this question does not apply to the incident, leave it blank.

- 18) **If the employee died, when did death occur?** Date of death ____/____/____

Completed by _____
Title _____
Phone (____) _____ Date ____/____/____

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Form approved OMB no. 1218-0176


City _____ State _____

Describe the case

(F)
Describe injury or illness, parts of body affected,
and object/substance that directly injured
or made person ill (e.g., *Second degree burns on
right forearm from acetylene torch*)

CHECK ONLY ONE box for each case based on the most serious outcome for that case:

Check the "Injury" column or choose one type of illness:

Luxury 

Skin disorders

Respiratory condition

Poisoning

Hearing loss

All other illnesses

Page of

Summary of Work-Related Injuries and Illnesses

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entire from every page of the Log. If you had no cases, write "0."

Employers, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
(g) _____	(h) _____	(i) _____	(j) _____

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
(k) _____	(l) _____

Injury and Illness Types

Total number of ... (m) _____	
(1) Injuries _____	(4) Poisonings _____
(2) Skin disorders _____	(5) Hearing loss _____
(3) Respiratory conditions _____	(6) All other illnesses _____

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspect of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (e.g., *Manufacture of motor truck trailers*) _____

Standard Industrial Classification (SIC), if known (e.g., 3715) _____

OR

North American Industrial Classification (NAICS), if known (e.g., 336212) _____

Employment information (If you don't have these figures, see the Worksheet on the back of this page to estimate.)

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Company executive _____ Title _____
() _____ / /
Phone _____ Date _____

Attachment 5: Signatory Page

Attachment 5 – Site-Specific Health and Safety Orientation Signatory Page
HEALTH AND SAFETY PLAN

Title	Name	Signature
Project Manager:	TBD	
Health and Safety Manager:	TBD	

I have read the attached Health and Safety Plan (HASP) and have received site-specific information and orientation regarding the identified physical, chemical, and biological hazards anticipated at this site. My signature certifies that I understand the procedures, equipment, and restrictions applicable to this project site and agree to abide by them.

Signature	Printed Name	Company	Date

Attachment 5– Health and Safety Orientation Signatory Page (continued)

[illegible]

Attachment 6:
Material Safety Data Sheets

SAFETY DATA SHEET

Version 6.0
Revision Date 06/17/2019
Print Date 07/17/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : AROCLOR 1260

Product Number : CRM48736

Brand : Supelco

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765

Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Carcinogenicity (Category 1B), H350

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word : Danger

Hazard statement(s)
H350 : May cause cancer.

Precautionary statement(s)

P201 : Obtain special instructions before use.

P202 : Do not handle until all safety precautions have been read and understood.

P280 : Wear protective gloves/ protective clothing/ eye protection/ face protection.

P308 + P313 : IF exposed or concerned: Get medical advice/ attention.

P405
P501

Store locked up.
Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Component		Classification	Concentration
Distillates (petroleum), hydrotreated middle			
CAS-No.	64742-46-7	Carc. 1B; H350	>= 90 - <= 100 %
EC-No.	265-148-2		
Index-No.	649-221-00-X		
Baseoil - unspecified			
CAS-No.	64742-53-6	Carc. 1B; H350	>= 30 - < 50 %
EC-No.	265-156-6		
Index-No.	649-466-00-2		
2,6-di-tert-Butyl-p-cresol			
CAS-No.	128-37-0	Aquatic Chronic 1; H410 M-Factor - Aquatic Acute: 1 M-Factor - Aquatic Chronic: 1	>= 0.1 - < 1 %
EC-No.	204-881-4		
Registration number	01-2119565113-46-XXXX		

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Nature of decomposition products not known.

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store at room temperature.

Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Distillates (petroleum), hydrotreated middle	64742-46-7	TWA	500.000000 ppm 2,000.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	Remarks	The value in mg/m3 is approximate.		
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	10.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	10 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		As sampled by method that does not collect vapor.		
Baseoil - unspecified	64742-53-6	TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Not classifiable as a human carcinogen		

		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	10 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		As sampled by method that does not collect vapor.		
2,6-di-tert-Butyl-p-cresol	128-37-0	TWA	2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Not classifiable as a human carcinogen		
		TWA	10 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	10 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance	Form: liquid
b) Odour	No data available
c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	No data available
f) Initial boiling point and boiling range	No data available
g) Flash point	()No data available
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	No data available
l) Vapour density	No data available
m) Relative density	No data available
n) Water solubility	No data available
o) Partition coefficient: n-octanol/water	No data available
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Nature of decomposition products not known.

Other decomposition products - No data available

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

SECTION 15: Regulatory information

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Chronic Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Distillates (petroleum), hydrotreated middle	CAS-No. 64742-46-7	Revision Date 1989-08-11
Baseoil - unspecified	64742-53-6	2016-09-09

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.0

Revision Date: 06/17/2019

Print Date: 07/17/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 05/28/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Barium

Product Number : 474711

Brand : Aldrich

CAS-No. : 7440-39-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765

Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Substances and mixtures, which in contact with water, emit flammable gases (Category 2), H261

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H261

In contact with water releases flammable gases.

Precautionary statement(s)

P223

Do not allow contact with water.

P231 + P232

Handle under inert gas. Protect from moisture.

P280

Wear protective gloves/ eye protection/ face protection.

P335 + P334

Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.

P370 + P378

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

P402 + P404
P501

Store in a dry place. Store in a closed container.
Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : Ba
Molecular weight : 137.33 g/mol
CAS-No. : 7440-39-3
EC-No. : 231-149-1

Hazardous components

Component	Classification	Concentration
Barium		
	Water-react. 2; H261	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Dry powder

5.2 Special hazards arising from the substance or mixture

Barium oxide

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Further processing of solid materials may result in the formation of combu formation should be taken into consideration before additional processing

Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Never allow product to get in contact with water during storage.

Store under inert gas.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Barium	7440-39-3	TWA	0.500000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Eye, skin, & Gastrointestinal irritation Muscular stimulation Not classifiable as a human carcinogen		
		TWA	0.500000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.500000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Eye irritation Muscular stimulation Skin irritation Gastrointestinal irritation Not classifiable as a human carcinogen		
		TWA	0.500000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Eye irritation Muscular stimulation Skin irritation Gastrointestinal irritation Not classifiable as a human carcinogen		

		TWA	0.5 mg/m ³	USA. NIOSH Recommended Exposure Limits
--	--	-----	-----------------------	--

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|--|--|
| a) Appearance | Form: Pieces
Colour: grey |
| b) Odour | No data available |
| c) Odour Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | Melting point/range: 725 °C (1337 °F) - lit. |
| f) Initial boiling point and boiling range | 1,640 °C (2,984 °F) - lit. |
| g) Flash point | ()Not applicable |
| h) Evaporation rate | No data available |

- | | |
|---|--|
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | 3.6 g/cm ³ at 25 °C (77 °F) |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Auto-ignition temperature | No data available |
| q) Decomposition temperature | No data available |
| r) Viscosity | No data available |
| s) Explosive properties | No data available |
| t) Oxidizing properties | No data available |

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Reacts violently with water.

10.4 Conditions to avoid

Exposure to moisture

10.5 Incompatible materials

Oxidizing agents, Water, acids, Oxygen, Chlorinated solvents, Carbon dioxide (CO₂), Halogens, Halogenated hydrocarbon, Alcohols, Sulphur compounds, Hydrogen sulfide gas

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Barium oxide

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available Barium

Inhalation: No data available (Barium)

Dermal: No data available (Barium)

No data available (Barium)

Skin corrosion/irritation

No data available (Barium)

Serious eye damage/eye irritation

No data available (Barium)

Respiratory or skin sensitisation

No data available(Barium)

Germ cell mutagenicity

No data available(Barium)

Carcinogenicity

This product is or contains a component that is not classifiable as to its classification.(Barium)
(Barium)
(Barium)

Reproductive toxicity

No data available(Barium)

No data available(Barium)

Specific target organ toxicity - single exposure

No data available(Barium)

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available(Barium)

Additional Information

RTECS: CQ8370000

Stomach/intestinal disorders, Nausea, Vomiting, Drowsiness, Dizziness, Gastrointestinal disturbance, Weakness, Tremors, Seizures.(Barium)

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Barium)

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

Toxicity to fish	mortality NOEC - Cyprinodon variegatus (sheepshead minnow) - 500 mg/l - 96 h(Barium)
	LC50 - Cyprinodon variegatus (sheepshead minnow) - > 500 mg/l - 96 h(Barium)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available(Barium)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1400 Class: 4.3 Packing group: II
Proper shipping name: Barium
Reportable Quantity (RQ) : 1000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1400 Class: 4.3 Packing group: II EMS-No: F-G, S-O
Proper shipping name: BARIUM

IATA

UN number: 1400 Class: 4.3 Packing group: II
Proper shipping name: Barium

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

SARA 311/312 Hazards

Reactivity Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H261 In contact with water releases flammable gases.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	3
Physical Hazard	1

NFPA Rating

Health hazard:	0
Fire Hazard:	3
Reactivity Hazard:	1
Special hazard.I:	W

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 6.1

Revision Date: 05/28/2017

Print Date: 06/28/2019

SAFETY DATA SHEET

Version 5.8
Revision Date 02/02/2018
Print Date 10/19/2018

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Benzo[a]pyrene

Product Number : 48564
Brand : Supelco
Index-No. : 601-032-00-3

CAS-No. : 50-32-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Skin sensitisation (Category 1), H317
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1B), H350
Reproductive toxicity (Category 1B), H360
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H317 May cause an allergic skin reaction.
H340 May cause genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

P261	understood.
P272	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P273	Contaminated work clothing should not be allowed out of the workplace.
P280	Avoid release to the environment.
	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 3,4-Benzpyrene
3,4-Benzopyrene
Benzo[def]chrysene
benzo[pqr]tetraphene

Formula : C₂₀H₁₂
Molecular weight : 252.31 g/mol
CAS-No. : 50-32-8
EC-No. : 200-028-5
Index-No. : 601-032-00-3

Hazardous components

Component	Classification	Concentration
Benzo[a]pyrene		
	Skin Sens. 1; Muta. 1B; Carc. 1B; Repr. 1B; Aquatic Acute 1; Aquatic Chronic 1; H317, H340, H350, H360, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low		

		as possible. Suspected human carcinogen		
		Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen		
Benzo[a]pyrene	50-32-8	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		
		TWA	0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.1 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		
		TWA	0.2 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological	Basis
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				specimen	
	-	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|---------------|-------------------|
| a) Appearance | Form: solid |
| b) Odour | No data available |

c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	Melting point/range: 177 - 180 °C (351 - 356 °F)
f) Initial boiling point and boiling range	495 °C (923 °F)
g) Flash point	No data available
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	No data available
l) Vapour density	No data available
m) Relative density	1.35 g/cm ³
n) Water solubility	No data available
o) Partition coefficient: n-octanol/water	log Pow: 5.97
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

LD50 Subcutaneous - Rat - 50 mg/kg

Skin corrosion/irritation

Skin - Mouse

Result: Mild skin irritation

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

Chronic exposure may cause dermatitis.

Germ cell mutagenicity

May alter genetic material.

In vivo tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC: 1 - Group 1: Carcinogenic to humans (Benzo[a]pyrene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benzo[a]pyrene)

OSHA: OSHA specifically regulated carcinogen (Benzo[a]pyrene)

Reproductive toxicity

May cause congenital malformation in the fetus.

Presumed human reproductive toxicant

May cause reproductive disorders.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates EC50 - Daphnia magna (Water flea) - 0.25 mg/l - 48 h

Toxicity to algae EC50 - Pseudokirchneriella subcapitata (green algae) - 0.02 mg/l - 72 h

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation Lepomis macrochirus (Bluegill) - 48 h
- 0.0005 mg/l

Bioconcentration factor (BCF): 3,208

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Benzo[a]pyrene)
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo[a]pyrene)
Marine pollutant: yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[a]pyrene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
--	---------	---------------

Benzo[a]pyrene

50-32-8

2007-03-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

Benzo[a]pyrene

CAS-No.
50-32-8

Revision Date
1990-01-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H317	May cause an allergic skin reaction.
H340	May cause genetic defects.
H350	May cause cancer.
H360	May damage fertility or the unborn child.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Muta.	Germ cell mutagenicity

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8

Revision Date: 02/02/2018

Print Date: 10/19/2018

SAFETY DATA SHEET

Version 6.1
Revision Date 07/17/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[**a**]fluoranthene

Product Number : 48490

Brand : Supelco

Index-No. : 601-034-00-4

CAS-No. : 205-99-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765

Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word : Danger

Hazard statement(s)

H350

May cause cancer.

H410

Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 3,4-Benzofluoranthene

Formula : C₂₀H₁₂
Molecular weight : 252.31 g/mol
CAS-No. : 205-99-2
EC-No. : 205-911-9
Index-No. : 601-034-00-4

Hazardous components

Component	Classification	Concentration
Benz[e]acephenanthrylene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

	Remarks	
		Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benz[e]acephenant hrylene	205-99-2	1- Hydroxypyren e		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|--|---|
| a) Appearance | Form: solid |
| b) Odour | No data available |
| c) Odour Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | Melting point/range: 163 - 165 °C (325 - 329 °F) - lit. |
| f) Initial boiling point and boiling range | No data available |
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |

j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

TDLo Oral - Mouse - 7.57 mg/kg

Remarks: Liver:Changes in liver weight. Endocrine:Changes in thymus weight.

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[e]acephenanthrylene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benz[e]acephenanthrylene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

Toxicity to daphnia and other aquatic invertebrates Immobilization EC50 - Daphnia magna (Water flea) - > 1.024 mg/l - 24 h(Benz[e]acephenanthrylene)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available(Benz[e]acephenanthrylene)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F

Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

(Benz[e]acephenanthrylene)

Marine pollutant : yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[e]acephenanthrylene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

SARA 311/312 Hazards

Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

California Prop. 65 Components

, which is/are known to the State of California to cause cancer.

For more information go to www.P65Warnings.ca.gov.

Benz[e]acephenanthrylene

CAS-No.	Revision Date
205-99-2	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350

May cause cancer.

H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 6.1

Revision Date: 07/17/2018

Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 07/17/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Benz[*a*]anthracene

Product Number : 48563
Brand : Supelco
Index-No. : 601-033-00-9

CAS-No. : 56-55-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word : Danger

Hazard statement(s)

H350

May cause cancer.

H410

Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 1,2-Benzanthracene
Tetraphene

Formula : C₁₈H₁₂
Molecular weight : 228.29 g/mol
CAS-No. : 56-55-3
EC-No. : 200-280-6
Index-No. : 601-033-00-9

Hazardous components

Component	Classification	Concentration
Benz[a]anthracene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|---|--|
| a) Appearance | Form: solid |
| b) Odour | No data available |
| c) Odour Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | Melting point/range: 157 - 159 °C (315 - 318 °F) |
| f) Initial boiling point and boiling range | 437.6 °C (819.7 °F) |
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | No data available |

- | | | |
|----|--|-------------------|
| n) | Water solubility | No data available |
| o) | Partition coefficient: n-octanol/water | No data available |
| p) | Auto-ignition temperature | No data available |
| q) | Decomposition temperature | No data available |
| r) | Viscosity | No data available |
| s) | Explosive properties | No data available |
| t) | Oxidizing properties | No data available |

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

LD50 Intravenous - Rat - > 200 mg/kg

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[a]anthracene)
IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[a]anthracene)
NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benz[a]anthracene)
NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benz[a]anthracene)
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available
No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available(Benz[a]anthracene)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

UN number: 3077

Class: 9

Packing group: III

EMS-No: F-A, S-F

Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benz[a]anthracene)

Marine pollutant : yes

IATA

UN number: 3077

Class: 9

Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[a]anthracene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Chronic Health Hazard

Massachusetts Right To Know Components

Benz[a]anthracene

CAS-No.
56-55-3

Revision Date
1993-04-24

Pennsylvania Right To Know Components

Benz[a]anthracene

CAS-No.
56-55-3

Revision Date
1993-04-24

Benz[a]anthracene

CAS-No.
56-55-3

Revision Date
1993-04-24

New Jersey Right To Know Components

Benz[a]anthracene

CAS-No.
56-55-3

Revision Date
1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

Benz[a]anthracene

CAS-No.
56-55-3

Revision Date
2007-09-28

WARNING! This product contains a chemical known to the State of California to cause cancer.

Benz[a]anthracene

CAS-No.
56-55-3

Revision Date
2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350

May cause cancer.

H400

Very toxic to aquatic life.

H410

Very toxic to aquatic life with long lasting effects.

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1

Revision Date: 07/17/2018

Print Date: 01/21/2019

SAFETY DATA SHEET

Version 4.8

Revision Date 01/11/2018

Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Beryllium

Product Number : 378135

Brand : Aldrich

CAS-No. : 7440-41-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 3), H301

Acute toxicity, Inhalation (Category 2), H330

Skin irritation (Category 2), H315

Eye irritation (Category 2A), H319

Skin sensitisation (Category 1), H317

Carcinogenicity (Category 1B), H350

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

Specific target organ toxicity - repeated exposure (Category 1), H372

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H301

Toxic if swallowed.

H315

Causes skin irritation.

H317

May cause an allergic skin reaction.

H319

Causes serious eye irritation.

H330

Fatal if inhaled.

H335

May cause respiratory irritation.

H350

May cause cancer.

H372

Causes damage to organs through prolonged or repeated exposure.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	: Be
Molecular weight	: 9.01 g/mol
CAS-No.	: 7440-41-7
EC-No.	: 231-150-7

Hazardous components

Component	Classification	Concentration
Beryllium foil		
	Acute Tox. 3; Acute Tox. 2; Skin Irrit. 2; Eye Irrit. 2A; Skin Sens. 1; Carc. 1B; STOT SE 3; STOT RE 1; H301, H315, H317, H319, H330, H335, H350, H372	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES**5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE**7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

Storage class (TRGS 510): 4.1B: Flammable solid hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1 Control parameters**

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Beryllium foil	7440-41-7	TWA	2.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Peak	25.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	2.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
	Remarks	Z27.29-1970		
		CEIL	5.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		Peak	25.000000micro gram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		TWA	0.000050 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Beryllium sensitization Chronic beryllium disease (berylliosis) Confirmed human carcinogen Danger of cutaneous absorption Sensitizer		
		C	0.000500 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		See Table Z-2		
		TWA	2.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		TWA	2.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		CEIL	5.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		CEIL	5.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		Peak	25.000000micro gram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		Peak	25.000000micro gram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		TWA	0.000050 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Beryllium sensitization Chronic beryllium disease (berylliosis)		

		Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Confirmed human carcinogen Danger of cutaneous absorption Sensitizer		
		C	0.000500 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		See Table Z-2		
		TWA	2microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		CEIL	5microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		Peak	25microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		C	0.0005 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		PEL	0.0002 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	0.025 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an

industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|---|---|
| a) Appearance | Form: powder
Colour: grey |
| b) Odour | odourless |
| c) Odour Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | Melting point/range: 1,278 °C (2,332 °F) - lit. |
| f) Initial boiling point and boiling range | 2,970 °C (5,378 °F) - lit. |
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | 1.85 g/cm ³ at 25 °C (77 °F) |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Auto-ignition temperature | No data available |
| q) Decomposition temperature | No data available |
| r) Viscosity | No data available |
| s) Explosive properties | No data available |
| t) Oxidizing properties | No data available |

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Alkali metals

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Beryllium oxides

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

LD50 Intravenous - Rat - 0.496 mg/kg

Remarks: Liver:Hepatitis (hepatocellular necrosis), zonal.

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

Hamster

Lungs

Result: negative

Carcinogenicity

Carcinogenicity - Rat - Intratracheal

Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Lungs, Thorax, or Respiration:Bronchiogenic carcinoma.

Carcinogenicity - Rabbit - Intravenous

Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Musculoskeletal:Tumors.

Possible human carcinogen

IARC: 1 - Group 1: Carcinogenic to humans (Beryllium foil)

NTP: Known - Known to be human carcinogen (Beryllium foil)

Known - Known to be human carcinogenThe reference note has been added by TD based on the background information of the NTP. (Beryllium foil)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: DS1750000

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods****Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION**DOT (US)**

UN number: 1567 Class: 6.1 (4.1) Packing group: II
Proper shipping name: Beryllium, powder
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 1567 Class: 6.1 (4.1) Packing group: II EMS-No: F-G, S-G
Proper shipping name: BERYLLIUM POWDER

IATA

UN number: 1567 Class: 6.1 (4.1) Packing group: II
Proper shipping name: Beryllium powder

15. REGULATORY INFORMATION**SARA 302 Components**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Beryllium foil	7440-41-7	1993-04-24

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Beryllium foil	7440-41-7	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Beryllium foil	7440-41-7	1993-04-24

	CAS-No.	Revision Date
Beryllium foil	7440-41-7	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Beryllium foil	7440-41-7	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

	CAS-No.	Revision Date
Beryllium foil	7440-41-7	2008-10-10

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H301	Toxic if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H350	May cause cancer.
H372	Causes damage to organs through prolonged or repeated exposure.
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation

HMIS Rating

Health hazard:	4
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	4
Fire Hazard:	3
Reactivity Hazard:	3

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.8

Revision Date: 01/11/2018

Print Date: 06/28/2019

SAFETY DATA SHEET

Version 5.10
Revision Date 01/10/2018
Print Date 06/22/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : CHRYSENE, 98%

Product Number : 245186

Brand : Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Germ cell mutagenicity (Category 2), H341

Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H341

Suspected of causing genetic defects.

H350

May cause cancer.

H410

Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201

Obtain special instructions before use.

P202

Do not handle until all safety precautions have been read and understood.

P273

Avoid release to the environment.

P281

Use personal protective equipment as required.

P308 + P313

IF exposed or concerned: Get medical advice/ attention.

P391

Collect spillage.

P405

Store locked up.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS**3.1 Substances**

Formula : C₁₈H₁₂
Molecular weight : 228.29 g/mol

Hazardous components

Component	Classification	Concentration
Chrysene	Muta. 2; Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H341, H350, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES**4.1 Description of first aid measures****General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES**5.1 Extinguishing media****Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Confirmed animal carcinogen with unknown relevance to humans		
Chrysene	218-01-9	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C		

		See Appendix A		
		PEL	0.2 mg/m ³	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- a) Appearance Form: solid

	Colour: white, light yellow
b) Odour	No data available
c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	253.0 °C (487.4 °F)
f) Initial boiling point and boiling range	448.0 °C (838.4 °F)
g) Flash point	No data available
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	No data available
l) Vapour density	No data available
m) Relative density	No data available
n) Water solubility	insoluble
o) Partition coefficient: n-octanol/water	log Pow: 5.73
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

LD50 Intraperitoneal - Mouse - > 320 mg/kg

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

Laboratory experiments have shown mutagenic effects.

In vitro tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Chrysene)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: OSHA specifically regulated carcinogen (Chrysene)

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates EC50 - Daphnia magna (Water flea) - 1.90 mg/l - 2 h

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Chrysene)
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Chrysene)
Marine pollutant: yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Chrysene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

New Jersey Right To Know Components

Chrysene

CAS-No.
218-01-9

Revision Date
1994-04-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

Chrysene

CAS-No.
218-01-9

Revision Date
2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.10

Revision Date: 01/10/2018

Print Date: 06/22/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 03/12/2019
Print Date 06/22/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifiers**

Product name : Copper

Product Number : 31284
Brand : Aldrich
CAS-No. : 7440-50-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture**

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none**SECTION 3: Composition/information on ingredients****3.1 Substances**

Formula : Cu
Molecular weight : 63.55 g/mol
CAS-No. : 7440-50-8
EC-No. : 231-159-6

Component	Classification	Concentration
-----------	----------------	---------------

Copper,		
		<= 100 %

SECTION 4: First aid measures

4.1 Description of first aid measures

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

In case of skin contact

Wash off with soap and plenty of water.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Copper oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapours, mist or gas.
For personal protection see section 8.

6.2 Environmental precautions

No special environmental precautions required.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Store under inert gas. Air sensitive.

Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Copper,	7440-50-8	TWA	1 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Irritation Gastrointestinal metal fume fever		
		TWA	0.2 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
		Irritation Gastrointestinal metal fume fever		

		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	0.1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls

General industrial hygiene practice.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatrill® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatrill® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

No special environmental precautions required.

SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties**

a) Appearance	Form: Wire Colour: light red
b) Odour	No data available
c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	Melting point/range: 1,083.4 °C (1,982.1 °F)
f) Initial boiling point and boiling range	2,567 °C 4,653 °F
g) Flash point	()No data available
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	No data available
l) Vapour density	No data available
m) Relative density	8.940 g/cm ³
n) Water solubility	No data available
o) Partition coefficient: n-octanol/water	No data available
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong acids, Strong oxidizing agents, Acid chlorides, Halogens

10.6 Hazardous decomposition products

Other decomposition products - No data available

Hazardous decomposition products formed under fire conditions. - Copper oxides

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

LD50 Intraperitoneal - Mouse - 3.5 mg/kg

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: GL5325000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information**12.1 Toxicity**

No data available

12.2 Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product**

Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information**DOT (US)**

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

SECTION 15: Regulatory information

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

No SARA Hazards

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16
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Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16
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New Jersey Right To Know Components

Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16
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California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.1

Revision Date: 03/12/2019

Print Date: 06/22/2019

MATERIAL SAFETY DATA SHEET

Date Printed: 20.10.2018

Date Updated: 07.05.2009

Version 1.4

Section 1 - Product and Company Information

Product Name	1,2:5,6-DIBENZANTHRACENE, 97% (NO BULK ORDERS ALLOWED)
Product Number	D31400
Brand	ALDRICH
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
1,2:5,6-DIBENZANTHRACENE	53-70-3	Yes
Formula	C22H14	
Synonyms	1,2:5,6-Benzanthracene * DB(a,h)A * 1,2,5,6-DbA * 1,2,5,6-Dibenzanthracene (Dutch) * 1,2:5,6-Dibenzanthracene * 1,2:5,6-Dibenz(a)anthracene * Dibenzo(a,h)anthracene * 1,2:5,6-Dibenzoanthracene * RCRA waste number U063	
RTECS Number:	HN2625000	

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Toxic. Dangerous for the environment.
May cause cancer. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Target organ(s): Lungs. Liver. Calif. Prop. 65 carcinogen.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 2
FLAMMABILITY: 0
REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT

N/A

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use.

METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	0.004 MG/M3
Poland		NDSch	-
Poland		NDSP	-

Section 9 - Physical/Chemical Properties

Appearance Physical State: Solid

Property	Value	At Temperature or Pressure
Molecular Weight	278,3500 AMU	
pH	N/A	
BP/BP Range	524,000 °C	760,000 mmHg
MP/MP Range	262,000 °C	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	

Solubility N/A

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: May cause eye irritation.

Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Lungs. Liver.

SIGNS AND SYMPTOMS OF EXPOSURE

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Species: Rat

Route of Application: Intratracheal

Dose: 100 MG/KG

Result: Tumorigenic: Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration: Tumors.

Species: Mouse

Route of Application: Oral

Dose: 4160 MG/KG

Exposure Time: 26W

Frequency: I

Result: Lungs, Thorax, or Respiration: Tumors.

Tumorigenic: Carcinogenic by RTECS criteria.

Species: Mouse

Route of Application: Skin

Dose: 1200 MG/KG

Exposure Time: 50W

Frequency: I

Result: Tumorigenic: Tumors at site or application.

Tumorigenic: Carcinogenic by RTECS criteria. Skin and Appendages:

Other: Tumors.

Species: Mouse
Route of Application: Subcutaneous
Dose: 445 UG/KG
Result: Skin and Appendages: Other: Tumors.
Tumorigenic: Carcinogenic by RTECS criteria. Tumorigenic: Tumors at site or application.

Species: Mouse
Route of Application: Intravenous
Dose: 40 MG/KG
Result: Tumorigenic: Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration: Tumors. Liver: Tumors.

Species: Mouse
Route of Application: Implant
Dose: 80 MG/KG
Result: Kidney, Ureter, Bladder: Tumors. Tumorigenic: Carcinogenic by RTECS criteria.

Species: Mouse
Route of Application: Multiple
Dose: 40 MG/KG
Exposure Time: 12D
Frequency: I
Result: Tumorigenic: Tumors at site or application. Lungs, Thorax, or Respiration: Tumors. Tumorigenic: Equivocal tumorigenic agent by RTECS criteria.

Species: Guinea pig
Route of Application: Subcutaneous
Dose: 250 MG/KG
Exposure Time: 24D
Frequency: I
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Tumorigenic: Tumors at site or application. Lungs, Thorax, or Respiration: Tumors.

Species: Guinea pig
Route of Application: Intravenous
Dose: 30 MG/KG
Result: Tumorigenic: Tumors at site or application. Lungs, Thorax, or Respiration: Tumors. Tumorigenic: Equivocal tumorigenic agent by RTECS criteria.

Species: Pigeon
Route of Application: Intramuscular
Dose: 6 MG/KG
Result: Tumorigenic: Carcinogenic by RTECS criteria.
Liver: Tumors. Tumorigenic: Tumors at site or application.

Species: Frog
Route of Application: Intrarenal
Dose: 12 MG/KG
Result: Kidney, Ureter, Bladder: Kidney tumors. Lungs, Thorax, or Respiration: Tumors. Tumorigenic: Neoplastic by RTECS criteria.

Species: Mouse
Route of Application: Implant
Dose: 14 MG/KG

Result: Tumorigenic:Neoplastic by RTECS criteria.
Tumorigenic:Tumors at site or application.

Species: Mouse
Route of Application: Subcutaneous
Dose: 78 UG/KG
Result: Tumorigenic:Neoplastic by RTECS criteria.
Tumorigenic:Tumors at site or application.

Species: Mouse
Route of Application: Oral
Dose: 4520 MG/KG
Exposure Time: 36W
Frequency: C
Result: Tumorigenic:Carcinogenic by RTECS criteria. Lungs,
Thorax, or Respiration:Tumors. Gastrointestinal:Tumors.

Species: Mouse
Route of Application: Implant
Dose: 200 MG/KG
Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax,
or Respiration:Bronchiogenic carcinoma. Tumorigenic:Tumors at
site or application.

Species: Mouse
Route of Application: Skin
Dose: 6 UG/KG
Result: Tumorigenic:Neoplastic by RTECS criteria. Skin and
Appendages: Other: Tumors.

Species: Mouse
Route of Application: Subcutaneous
Dose: 6 MG/KG
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS
criteria. Tumorigenic:Tumors at site or application.

Species: Mouse
Route of Application: Skin
Dose: 400 MG/KG
Exposure Time: 40W
Frequency: I
Result: Tumorigenic:Neoplastic by RTECS criteria. Skin and
Appendages: Other: Tumors.

Species: Mouse
Route of Application: Implant
Dose: 100 MG/KG
Result: Tumorigenic:Carcinogenic by RTECS criteria. Kidney,
Ureter, Bladder:Tumors. Tumorigenic:Tumors at site or
application.

Species: Rat
Route of Application: Subcutaneous
Dose: 135 MG/KG
Exposure Time: 9W
Frequency: I
Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax,
or Respiration:Tumors. Tumorigenic:Tumors at site or application.

Species: Mouse

Route of Application: Subcutaneous
Dose: 400 MG/KG
Exposure Time: 10W
Frequency: I
Result: Tumorigenic:Neoplastic by RTECS criteria.
Tumorigenic:Tumors at site or application.

IARC CARCINOGEN LIST

Rating: Group 2A

NTP CARCINOGEN LIST

Rating: Anticipated to be a carcinogen.

CHRONIC EXPOSURE - MUTAGEN

Result: Laboratory experiments have shown mutagenic effects.

Species: Human
Dose: 360 NMOL/L
Cell Type: Embryo
Mutation test: DNA

Species: Human
Dose: 100 UMOL/L
Cell Type: fibroblast
Mutation test: Unscheduled DNA synthesis

Species: Human
Dose: 10 MG/L
Cell Type: Other cell types
Mutation test: Unscheduled DNA synthesis

Species: Human
Dose: 100 NMOL/L
Cell Type: HeLa cell
Mutation test: Unscheduled DNA synthesis

Species: Human
Dose: 54 UG/L
Cell Type: lymphocyte
Mutation test: Mutation in mammalian somatic cells.

Species: Rat
Route: Intratracheal
Dose: 25500 UG/KG
Exposure Time: 16H
Mutation test: Micronucleus test

Species: Rat
Route: Oral
Dose: 200 MG/KG
Mutation test: Morphological transformation.

Species: Rat
Dose: 100 UG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Rat

Route: Intratracheal
Dose: 25560 UG/KG
Mutation test: DNA

Species: Rat
Route: Intratracheal
Dose: 51150 UG/KG
Mutation test: Sister chromatid exchange

Species: Mouse
Route: Intraperitoneal
Dose: 500 MG/KG
Mutation test: Micronucleus test

Species: Mouse
Dose: 4250 UG/L (+S9)
Cell Type: lymphocyte
Mutation test: Mutation in microorganisms

Species: Mouse
Dose: 500 UG/L
Cell Type: fibroblast
Mutation test: Morphological transformation.

Species: Mouse
Dose: 100 UG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Mouse
Dose: 6 UMOL/L
Cell Type: liver
Mutation test: DNA

Species: Mouse
Route: Skin
Dose: 40 UMOL/KG
Mutation test: DNA

Species: Mouse
Dose: 1 MG/L
Cell Type: Other cell types
Mutation test: DNA

Species: Mouse
Dose: 1 MG/L
Cell Type: Other cell types
Mutation test: Other mutation test systems

Species: Mouse
Dose: 510 NMOL/L
Cell Type: Embryo
Mutation test: DNA

Species: Mouse
Dose: 510 NMOL/L
Cell Type: Embryo
Mutation test: Other mutation test systems

Species: Hamster

Dose: 56400 NMOL/L (+S9)
Cell Type: lung
Mutation test: Mutation in microorganisms

Species: Hamster
Dose: 2500 UG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Hamster
Dose: 25 UG/L
Cell Type: kidney
Mutation test: Morphological transformation.

Species: Hamster
Dose: 5 MG/L
Exposure Time: 24H
Cell Type: fibroblast
Mutation test: DNA damage

Species: Hamster
Dose: 360 NMOL/L
Cell Type: Embryo
Mutation test: DNA

Species: Hamster
Dose: 5 MG/L
Cell Type: kidney
Mutation test: DNA damage

Species: Hamster
Dose: 1 MG/L
Cell Type: lung
Mutation test: DNA

Species: Hamster
Dose: 1 MG/L
Cell Type: lung
Mutation test: Other mutation test systems

Species: Hamster
Dose: 1 MMOL/L
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

Species: Hamster
Route: Intraperitoneal
Dose: 900 MG/KG
Exposure Time: 24H
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 500 UG/L
Cell Type: lung
Mutation test: Mutation in mammalian somatic cells.

Species: Mammal
Dose: 2 NMOL/L
Cell Type: lymphocyte
Mutation test: DNA damage

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations. (DN) Requires special label: "Contains a substance which is regulated by Danish work environmental law due to the risk of carcinogenic properties."

Section 14 - Transport Information

DOT

Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s.
UN#: 3077
Class: 9
Packing Group: Packing Group III
Hazard Label: Class 9
PIH: Not PIH

IATA

Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s.
IATA UN Number: 3077
Hazard Class: 9
Packing Group: III

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: T-N
Indication of Danger: Toxic. Dangerous for the environment.
R: 45-50/53
Risk Statements: May cause cancer. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S: 53-45-60-61
Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic. Dangerous for the environment.
Risk Statements: May cause cancer. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Wear suitable protective clothing, gloves, and eye/face protection. This

material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.
US Statements: Target organ(s): Lungs. Liver. Calif. Prop. 65 carcinogen.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

NOTES: This product is subject to SARA section 313 reporting requirements.

TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s) known to the state of California to cause cancer. This product is or contains chemical(s) known to the state of California to cause cancer.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: No

NDSL: Yes

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.
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SAFETY DATA SHEET

Version 5.6
Revision Date 12/11/2017
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Indeno[1,2,3-*cd*]pyrene

Product Number : 48499

Brand : Supelco

CAS-No. : 193-39-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Carcinogenicity (Category 2), H351

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Warning

Hazard statement(s)

H351

Suspected of causing cancer.

Precautionary statement(s)

P201

Obtain special instructions before use.

P202

Do not handle until all safety precautions have been read and understood.

P281

Use personal protective equipment as required.

P308 + P313

IF exposed or concerned: Get medical advice/ attention.

P405

Store locked up.

P501

Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : C₂₂H₁₂
Molecular weight : 276.33 g/mol
CAS-No. : 193-39-5
EC-No. : 205-893-2

Hazardous components

Component	Classification	Concentration
Indeno[1,2,3-cd]pyrene	Carc. 2; H351	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.

Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Hazardous components without workplace control parameters

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Indeno[1,2,3-cd]pyrene	193-39-5	1-Hydroxypyrene (1-HP)		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the

sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance	Form: solid
b) Odour	No data available
c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	163.6 °C (326.5 °F)
f) Initial boiling point and boiling range	536.0 °C (996.8 °F)
g) Flash point	No data available
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	No data available
l) Vapour density	No data available
m) Relative density	No data available
n) Water solubility	No data available
o) Partition coefficient: n-octanol/water	No data available
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Indeno[1,2,3-cd]pyrene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Indeno[1,2,3-cd]pyrene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Chronic Health Hazard

Massachusetts Right To Know Components

Indeno[1,2,3-cd]pyrene

CAS-No.
193-39-5

Revision Date
1993-04-24

Pennsylvania Right To Know Components

Indeno[1,2,3-cd]pyrene

CAS-No.
193-39-5

Revision Date
1993-04-24

Indeno[1,2,3-cd]pyrene

CAS-No.
193-39-5

Revision Date
1993-04-24

New Jersey Right To Know Components

Indeno[1,2,3-cd]pyrene

CAS-No.
193-39-5

Revision Date
1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the
State of California to cause cancer.
Indeno[1,2,3-cd]pyrene

CAS-No.
193-39-5

Revision Date
2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Carc.	Carcinogenicity
H351	Suspected of causing cancer.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	1
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6

Revision Date: 12/11/2017

Print Date: 11/10/2018

SAFETY DATA SHEET

Version 4.11

Revision Date 10/12/2018

Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Lead

Product Number : 391352

Brand : Aldrich

CAS-No. : 7439-92-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 4), H302

Carcinogenicity (Category 2), H351

Reproductive toxicity (Category 2), H361

Specific target organ toxicity - repeated exposure (Category 2), H373

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Warning

Hazard statement(s)

H302

Harmful if swallowed.

H351

Suspected of causing cancer.

H361

Suspected of damaging fertility or the unborn child.

H373

May cause damage to organs through prolonged or repeated exposure.

H410

Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201

Obtain special instructions before use.

P202

Do not handle until all safety precautions have been read and understood.

P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	: Pb
Molecular weight	: 207.20 g/mol
CAS-No.	: 7439-92-1
EC-No.	: 231-100-4

Hazardous components

Component	Classification	Concentration
Lead		
	Acute Tox. 4; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H302, H351, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	See 1910.1025		
Lead	7439-92-1	TWA	0.05 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
		Confirmed animal carcinogen with unknown relevance to humans		
		TWA	0.05 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Hematologic effects Peripheral Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		

		TWA	0.05 mg/m ³	USA. NIOSH Recommended Exposure Limits
		See Appendix C		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Lead	200 µg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Not critical			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|---------------|-------------------|
| a) Appearance | Form: powder |
| b) Odour | No data available |

c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	Melting point/range: 327.4 °C (621.3 °F) - lit.
f) Initial boiling point and boiling range	1,740 °C (3,164 °F) - lit.
g) Flash point	Not applicable
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	No data available
l) Vapour density	No data available
m) Relative density	No data available
n) Water solubility	No data available
o) Partition coefficient: n-octanol/water	No data available
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong acids

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Lead oxides

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

Rat

Cytogenetic analysis

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Lead)

NTP: RAHC - Reasonably anticipated to be a human carcinogenThe reference note has been added by TD based on the background information of the NTP. (Lead)

OSHA: OSHA specifically regulated carcinogen (Lead)

Reproductive toxicity

Reproductive toxicity - Rat - Inhalation

Effects on Newborn: Biochemical and metabolic.

Reproductive toxicity - Rat - Oral

Effects on Newborn: Behavioral.

Reproductive toxicity - Mouse - Oral

Effects on Fertility: Female fertility index (e.g., # females pregnant per females mated). Effects on Fertility: Pre-implantation mortality (e.g., reduction in numbe corpora lutea).

May damage fertility. May damage the unborn child.

Developmental Toxicity - Rat - Inhalation

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow).

Developmental Toxicity - Rat - Oral

Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow). Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Developmental Toxicity - Rat - Oral

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Developmental Toxicity - Mouse - Oral

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

No data available

Additional Information

RTECS: OF7525000

anemia

Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LOEC - Oncorhynchus mykiss (rainbow trout) - 1.19 mg/l - 96.0 h
	LC50 - Micropterus dolomieu - 2.2 mg/l - 96.0 h
	mortality NOEC - Salvelinus fontinalis - 1.7 mg/l - 10.0 d
Toxicity to daphnia and other aquatic invertebrates	mortality LOEC - Daphnia (water flea) - 0.17 mg/l - 24 h
	mortality NOEC - Daphnia (water flea) - 0.099 mg/l - 24 h
Toxicity to algae	mortality EC50 - Skeletonema costatum - 7.94 mg/l - 10 d

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

Bioaccumulation	Oncorhynchus kisutch - 2 Weeks - 150 µg/l
	Bioconcentration factor (BCF): 12

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Lead)
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead)
Marine pollutant: yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Lead)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

New Jersey Right To Know Components

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

	CAS-No.	Revision Date
Lead	7439-92-1	2009-02-01

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

	CAS-No.	Revision Date
Lead	7439-92-1	2009-02-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H302	Harmful if swallowed.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.11

Revision Date: 10/12/2018

Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 05/28/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Manganese

Product Number : 463728

Brand : Aldrich

CAS-No. : 7439-96-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765

Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Substances and mixtures, which in contact with water, emit flammable gases (Category 1), H260

Acute aquatic toxicity (Category 3), H402

Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H260

In contact with water releases flammable gases which may ignite spontaneously.

H412

Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P223

Keep away from any possible contact with water, because of violent reaction and possible flash fire.

P231 + P232

Handle under inert gas. Protect from moisture.

P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P402 + P404	Store in a dry place. Store in a closed container.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	: Mn
Molecular weight	: 54.94 g/mol
CAS-No.	: 7439-96-5
EC-No.	: 231-105-1

Hazardous components

Component	Classification	Concentration
Manganese		
	Water-react. 1; Aquatic Acute 3; Aquatic Chronic 3; H260, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Dry powder Carbon dioxide (CO₂)

Unsuitable extinguishing media

Water

5.2 Special hazards arising from the substance or mixture

Manganese/manganese oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Never allow product to get in contact with water during storage.

Moisture sensitive. Keep in a dry place.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Manganese	7439-96-5	TWA	0.200000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC)		
		C	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		
		C	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		

		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		C	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		
		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.200000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) varies		
		TWA	0.100000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment 2015 Adoption varies		
		TWA	0.020000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment 2015 Adoption varies		
		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Not classifiable as a human carcinogen varies		
		TWA	0.02 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Not classifiable as a human carcinogen varies		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Impervious clothing, Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES**9.1 Information on basic physical and chemical properties**

- | | |
|---|---|
| a) Appearance | Form: powder
Colour: grey |
| b) Odour | No data available |
| c) Odour Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | Melting point/range: 1,244 °C (2,271 °F) - lit. |
| f) Initial boiling point and boiling range | 1,962 °C (3,564 °F) - lit. |
| g) Flash point | ()Not applicable |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | No data available |
| l) Vapour density | No data available |
| m) Relative density | 7.3 g/mL at 25 °C (77 °F) |
| n) Water solubility | No data available |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Auto-ignition temperature | No data available |
| q) Decomposition temperature | No data available |
| r) Viscosity | No data available |
| s) Explosive properties | No data available |
| t) Oxidizing properties | No data available |

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY**10.1 Reactivity**

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Reacts violently with water.

10.4 Conditions to avoid

Exposure to moisture

10.5 Incompatible materials

acids, Halogens, Bases, Phosphorus, Sulphur oxides, Peroxides

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Manganese/manganese oxides

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 9,000 mg/kg(Manganese)

Inhalation: No data available(Manganese)

Dermal: No data available(Manganese)

No data available(Manganese)

Skin corrosion/irritation

Skin - Rabbit(Manganese)

Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation

Eyes - Rabbit(Manganese)

Result: Mild eye irritation - 24 h

Respiratory or skin sensitisation

No data available(Manganese)

Germ cell mutagenicity

No data available(Manganese)

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available(Manganese)

May cause reproductive disorders.(Manganese)

Specific target organ toxicity - single exposure

No data available(Manganese)

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available(Manganese)

Additional Information

RTECS: OO9275000

Men exposed to manganese dusts showed a decrease in fertility. Chronic man system. Early symptoms include languor, sleepiness and weakness in the le disturbances such as uncontrollable laughter and a spastic gait with tend cases. High incidence of pneumonia has been found in workers exposed to t(Manganese)

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence(Manganese)

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

Toxicity to daphnia and other aquatic invertebrates EC50 - Daphnia magna (Water flea) - 40 mg/l - 48 h(Manganese)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available(Manganese)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life.

No data available

13. DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods****Product**

Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION**DOT (US)**

UN number: 3208

Class: 4.3

Packing group: I

Proper shipping name: Metallic substance, water-reactive, n.o.s. (Manganese)

Poison Inhalation Hazard: No

IMDG

UN number: 3208

Class: 4.3

Packing group: I

EMS-No: F-G, S-N

Proper shipping name: METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S. (Manganese)

IATA

UN number: 3208 Class: 4.3 Packing group: I
Proper shipping name: Metallic substance, water-reactive, n.o.s. (Manganese)
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION**SARA 302 Components**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

SARA 311/312 Hazards

Reactivity Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION**Full text of H-Statements referred to under sections 2 and 3.**

H260	In contact with water releases flammable gases which may ignite spontaneously.
H402	Harmful to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	2

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	2
Special hazard.I:	W

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling

or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1

Revision Date: 05/28/2017

Print Date: 06/28/2019

SAFETY DATA SHEET

Version 3.15

Revision Date 03/05/2018

Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Mercury

Product Number : 215457
Brand : Sigma-Aldrich
Index-No. : 080-001-00-0

CAS-No. : 7439-97-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USATelephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Inhalation (Category 2), H330

Reproductive toxicity (Category 1B), H360

Specific target organ toxicity - repeated exposure (Category 1), H372

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H330

Fatal if inhaled.

H360

May damage fertility or the unborn child.

H372

Causes damage to organs through prolonged or repeated exposure.

H410

Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201

Obtain special instructions before use.

P202

Do not handle until all safety precautions have been read and understood.

P260

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	: Hg
Molecular weight	: 200.59 g/mol
CAS-No.	: 7439-97-6
EC-No.	: 231-106-7
Index-No.	: 080-001-00-0

Hazardous components

Component	Classification	Concentration
Mercury		
	Acute Tox. 2; Repr. 1B; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H330, H360, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. In some instances, a mercury spill kit may be used. Please consult with your site EHS representative to determine the most appropriate clean up method. Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store under inert gas.

Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Mercury	7439-97-6	C	0.1 mg/m ³	USA. NIOSH Recommended Exposure Limits
	Remarks	Potential for dermal absorption		
		CEIL	1.0mg/10m ³	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	0.05 mg/m ³	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		

		TWA	0.025 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Kidney damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen Danger of cutaneous absorption		
		TWA	0.05 mg/m ³	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		

8.2 Exposure controls

Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|---------------|---------------------------------------|
| a) Appearance | Form: liquid
Colour: silver, white |
|---------------|---------------------------------------|

b) Odour	odourless
c) Odour Threshold	No data available
d) pH	No data available
e) Melting point/freezing point	Melting point/range: -38.87 °C (-37.97 °F) - lit.
f) Initial boiling point and boiling range	356.6 °C (673.9 °F) - lit.
g) Flash point	Not applicable
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	< 0.01 hPa (< 0.01 mmHg) at 20 °C (68 °F) 1 hPa (1 mmHg) at 126 °C (259 °F)
l) Vapour density	6.93 - (Air = 1.0)
m) Relative density	13.55 g/cm ³ at 25 °C (77 °F)
n) Water solubility	0.00006 g/l at 25 °C (77 °F)
o) Partition coefficient: n-octanol/water	No data available
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density 6.93 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents, Ammonia, Azides, Nitrates, Chlorates, Copper

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Mercury/mercury oxides.

Other decomposition products - No data available

In the event of fire: see section 5

Bioconcentration factor (BCF): 155,986

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: A. W. Mercury
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

IATA

UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: Mercury

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Mercury

CAS-No.
7439-97-6

Revision Date
2015-11-23

Pennsylvania Right To Know Components

Mercury

CAS-No.
7439-97-6

Revision Date
2015-11-23

Mercury

CAS-No.
7439-97-6

Revision Date
2015-11-23

New Jersey Right To Know Components

Mercury

CAS-No.
7439-97-6

Revision Date
2015-11-23

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
Mercury

CAS-No.
7439-97-6

Revision Date
2013-12-20

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
H330	Fatal if inhaled.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Repr.	Reproductive toxicity

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.15

Revision Date: 03/05/2018

Print Date: 06/28/2019

Chemical Safety Data Sheet MSDS / SDS

Polychlorinated Biphenyls (PCBs)

Revision Date:2025-01-11 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name : Polychlorinated Biphenyls (PCBs)
CBnumber : CB7160460
CAS : 1336-36-3
EINECS Number : 215-648-1
Synonyms : PYRANOL,polychlorinated biphenyls

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.
Uses advised against : none

Company Identification

Company : Chemicalbook
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone : 010-86108875

SECTION 2: Hazards identification

Classification of the substance or mixture

Specific target organ toxicity – repeated exposure, Category 2
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

Label elements

Pictogram(s)

☐

Signal word Warning

Hazard statement(s)

H373 May cause damage to organs through prolonged or repeated exposure
H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P273 Avoid release to the environment.

Response

P319 Get medical help if you feel unwell.

P391 Collect spillage.

Storage

none

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: Polychlorinated Biphenyls (PCBs)
Synonyms	: PYRANOL, polychlorinated biphenyls
CAS	: 1336-36-3
EC number	: 215-648-1
MF	: N/A
MW	: 0

SECTION 4: First aid measures

Description of first aid measures**If inhaled**

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately.

Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

no data available

Indication of any immediate medical attention and special treatment needed

If PCB-containing substances have been ingested recently, gastric decontamination may be reasonable. Activated charcoal has not been proven beneficial, but is not contraindicated.

SECTION 5: Firefighting measures

Extinguishing media

Use dry chemical, carbon dioxide, or alcohol foam extinguishers. Vapors are heavier than air and will collect in low areas. Vapors in confined areas may explode when exposed to fire. Containers may explode in fire. Storage containers and parts of containers may rocket great distances, in many directions. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors, or shows any signs of deforming), withdraw immediately to a secure position ... The only respirators recommended for fire fighting are self-contained breathing apparatuses that have full facepieces and are operated in a pressure-demand or other positive pressure mode.

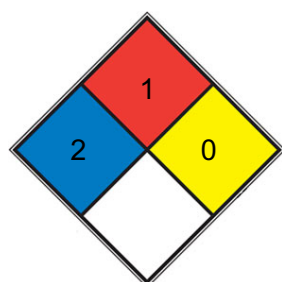
Specific Hazards Arising from the Chemical

no data available

Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

NFPA 704



■ HEALTH 2 Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. [diethyl ether](#), ammonium phosphate, iodine)

■ FIRE 1 Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Includes some finely divided suspended solids that do not require heating before ignition can occur. Flash point at or above 93.3 °C (200 °F). (e.g. [mineral oil](#), ammonia)

■ REACT 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium, [N2](#))

□ SPEC.
□ HAZ.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Dry sand or earth should be spread on the leak, or spill area. ...

SECTION 7: Handling and storage

Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

PCB material should be stored in closed containers, in ventilated areas ... PCB's should be handled in isolated areas of the plant, where efficient ventilation systems remove airborne PCB's. ...

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	1,1'-Biphenyl, chloro derivs.			
CAS No.	1336-36-3			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m ³	ppm	mg/m ³
Canada - Ontario	?	0,05 (1)	?	?
Denmark	?	0,01	?	0,02
Finland	?	0,003 (1)	?	?
Germany (DFG)	?	0,003 (1)(2)(3)(5)	?	0,024 (1)(2)(3)(4)(5)
Hungary	?	POP	?	?
Ireland	?	0,1	?	?
Japan	?	0,01	?	?
Japan - JSOH	?	0,01	?	?
Latvia	?	1	?	?
New Zealand	?	0,1	?	?
Poland	?	1	?	?
Sweden	?	0,01	?	0,03 (1)
Switzerland	0,05	0,5	0,4	4
United Kingdom	?	0,1	?	?
	Remarks			
Canada - Ontario	(1) as sum of components assayed by chromatographic procedure with reference of the bulk sample			
Finland	(1) Total PCB = 5*([PCB 28] + [PCB 52] + [PCB 101] + [PCB 138] + [PCB 153] + [PCB 180])			

Germany (AGS)	(1) 42% Chlorine (CAS-No. 53469-21-9) (2) 54% Chlorine (CAS-No. 11097-69-1)
Germany (DFG)	(1) Only for chlorinated biphenyls with Cl
Hungary	POP Persistent Organic Pollutant
Sweden	(1) Short-term value, 15 minutes average value

Biological limit values

no data available

Exposure controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flamm resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	no data available
Colour	Vary from mobile oily liquids to white crystalline solids and hard noncrystalline resins.
Odour	Practically odorless; mild aromatic odor
Melting point/freezing point	no data available
Boiling point or initial boiling point and boiling range	340~375
Flammability	no data available
Lower and upper explosion limit/flammability limit	no data available
Flash point	195(O.C)
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	Solubility in water is extremely low; soluble in oils and organic solvents.
Partition coefficient n-octanol/water	... literature Kow values will vary. These increase with increasing chlorination. log Kow values at 25 deg C: 3.76 (biphenyl); 5.7 (Cl4-PCB's); 6.0 (Cl5-PCB's); 7.0 (Cl6-PCB's); 8.26 (Cl10-PCB's).

Vapour pressure	2.04E-07mmHg at 25°C
Density and/or relative density	1.44(30°C)
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

NIOSH considers chlorodiphenyl containing 54% chlorine to be a potential occupational carcinogen. Aroclor 1254

NIOSH considers chlorodiphenyl containing 54% chlorine to be a potential occupational carcinogen. Aroclor 1254

Chemical stability

PCB's are chemically very inert and are stable to conditions of hydrolysis and oxidation in industrial use. Photochemical degradation may be one route of their breakdown in the environment. ...

Possibility of hazardous reactions

Flame resistant.

Conditions to avoid

no data available

Incompatible materials

Liquid chlorine reacts exothermically with polychlorinated biphenyl heat transfer liquid. Polychlorinated biphenyl

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of Chloride.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Mouse (C57B1/6J) male oral 19 mg/kg/28 day
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

EPA: Possibly carcinogenic to humans, IARC: Probably carcinogenic to humans, NTP: Known to be a human carcinogen

Reproductive toxicity

An epidemiological study of women occupationally exposed to high levels of PCBs suggested a relationship between PCB exposure and reduced birth weight and shortened gestational age of their babies; however, limitations of the study limit the strength of the conclusion. Two series of human studies that investigated exposure to PCBs through the consumption of contaminated fish suggest that exposure to PCBs may cause developmental effects in humans. Both studies reported an association between consumption of fish with high PCB levels by pregnant women and an increased incidence of neurodevelopmental effects, such as motor deficits at birth, impaired psychomotor index, impaired visual recognition, and deficits in short-term memory in infants. Human studies are not conclusive on the reproductive effects of PCBs. One study of men who were occupationally exposed to PCBs showed no fertility abnormalities, while another study of men with low sperm counts found elevated levels of PCBs in the blood and an association between certain PCB compounds in semen and decreased sperm motility. Animal studies have reported developmental effects, such as learning deficits, impaired immune functions, focal liver necrosis, and cellular alterations of the thyroid, in the offspring of animals exposed orally to PCBs. Reproductive effects, such as decreased fertility, decreased conception, and prolonged menstruation have also been noted in animal studies of dietary PCB exposures.

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: EC50; Species: *Pseudokirchneriella subcapitata* (green algae); Conditions: freshwater, static, 22 deg C; Concentration: 182 nmol/L for 48 hr; Effect: decreased population biomass />98% pure

Toxicity to microorganisms: no data available

Persistence and degradability

AEROBIC: The microbial mineralization of three chlorophenols and a PCB mixture was studied using natural bacterial assemblages in laboratory model systems. The systems consisted of water and surface sediment from two lake types: one with a high content of humic substances and the other with a low content. Final PCB concentration in the model systems was 38 ug/L. Aerobic mineralization of the (14)C-ring-labelled compounds was determined as production of (14)CO₂ in the systems over the course of 60 days. Mineralization of PCBs in the systems was low compared to the aromatics. The breakdown of PCB was 0.047 nM in the humic cultures and 0.052 nM in cultures from the clear water lake. The avg mineralization rates of PCBs over the 60 day test period for the clear-water and humic cultures were 1.1 and 1.2

pM/day. More than 90% of the PCBs adsorbed to the sediment, while <1% was found in the water phase.

Bioaccumulative potential

Polychlorinated biphenyls (PCBs) are highly lipophilic and bioconcentrate in tissue from concentrations in water ...

Mobility in soil

PCB mobility in aqueous soil-sediment systems has reported experimental Koc values ranging from 510 to 13,300,000 for a variety of Aroclors and PCB congeners; reported Koc values were mostly above 5000(1). Reviews of the PCB mobility literature have found that adsorption of PCBs to soil and sediment generally increases with an increase in the degree of chlorination(2,3). Organic solvents, found at hazardous waste sites, will also increase the solubility and mobility of PCBs(3). Using soil TLC, column leaching and five different soils, PCBs were found to be generally immobile when leached with water or aqueous landfill leachate, but highly mobile when leached with organic solvents(4). PCB fluids can penetrate and travel through the cracks and other connected void spaces found in soil formations(5). In the presence of organic material dissolved from soil, the water solubility of PCBs increases which may augment its leachability. Environmental releases of PCBs often accompany releases of carrier materials from utility equipment. The PCBs that are present in the mineral oil-PCB mixture become even less water soluble than before. This is due to the PCB partitioning into the mineral oil and the reduced interaction of the PCBs with precipitation or groundwater caused by the hydrophobic nature of the oil matrix. The volatility of PCBs also affects their migration through the soil profile. Researchers have carried out simulations that indicate that PCBs can volatilize beneath the soil surface and potentially migrate through several meters of soil cover(5).

Toxics Screening Level

The Initial Risk Screening Level (IRSL) for polychlorinated biphenyls is 0.01 µg/m³ based on an annual averaging time.

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Environmental hazards

ADR/RID: Yes

IMDG: Yes

IATA: Yes

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Not Listed.

PICCS

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pagelD=0&request_locale=en

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Disclaimer:

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.

Appendix F:

Community Air Monitoring Plan



Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

**Community Air Monitoring Plan
For
Proposed Redevelopment
34 State Street
Ossining, Westchester County, NY**

Prepared for:
**WB 34 State LLC
June 2025**

SESI Project No:
13968

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LIST OF ACRONYMS

Acronym	Definition
CAMP	Community Air Monitoring Plan
mcg/m ³	micrograms per cubic meter
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	Photoionization Detector
PM-10	Less than 10 micrometers
ppm	Parts Per Million
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This document presents a Community Air Monitoring Plan (CAMP) for the Remedial Investigation Workplan (RIWP) for the proposed development of the property located at 466 Main Street, New Rochelle, Westchester County, New York (the Site). The Site consists of a 5.858-acre area parcel and is identified as proposed Block 2, Lots 17, 18 and 68 on the Westchester County tax map. The Site is located in a residential and commercial area and is bounded by a day care center to the north, residential to the south, residential/commercial uses to the east, and residential to the west.

The Site is improved with an asphalt lot, former building footprints, demolition debris, one (1) large three (3) story residential historic house building, one (1) shed and wooded areas. These buildings are currently vacant and abandoned. The Site has been developed since prior to 1892 and historically has been residences, a community center (circa 1929), and a printing company (Printex Corporation of America circa 1940-1981).

2.0 OBJECTIVES

The objective of the CAMP is to provide a measure of protection for the downwind community from potential airborne contaminant releases that may arise during all ground intrusive activities, and potentially contaminated soil and material handling and staging. In addition, the CAMP is intended to ensure that dust and contaminants are not leaving the work zone.

3.0 METHODS

The CAMP will include continuous monitoring for particulate matter (e.g., airborne “dust”) and volatile organic compounds (VOCs) during the planned demolition and remediation activities. Any CAMP exceedances will be reported to the NYSDEC and NYSDOH on the same business day and as soon as possible. Notification of the exceedance will be sent via email along with the reason for the exceedance, the measure(s) taken to address the exceedance, and if the exceedance was resolved. In addition, the following NYSDEC and NYSDOH personnel will be provided weekly CAMP data summaries for review.

Name	Contact Information
NYSDEC Project Manager	TBD
NYSDOH Project Manager	TBD

3.1 CONTINUOUS MONITORNG

Continuous monitoring for particulates and VOCs will be conducted during all ground intrusive activities including soil borings, monitoring well installations, and soil vapor probe installations.

3.2 PERIODIC MONITORING

Periodic monitoring for VOCs will be conducted during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection consists of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

4.0 VOC MONITORNG, RESPONSE LEVELS, AND ACTIONS

VOC Monitoring, Response Levels, and Actions Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using a photoionization detector (PID) equipped with a 10.6 ev lamp. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment

should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

3.3 PARTICULATE MONITORING, RESPONSE LEVELS, AND ACTIONS

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

4.0 SPECIAL REQUIREMENTS FOR WORK WITHIN 20 FEET OF POTENTIALLY EXPOSED INDIVIDUAL STRUCTURES

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the

occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m^3 , work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m^3 or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Appendix G:

Citizen Participation Plan
