



Benjamin McPherson, P.E.
Assistant Engineer (Environmental), Division of Environmental Remediation
New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, NY 14203
November 15, 2018

Re: Letter Report – Soil Vapor Investigation
Call Out # 134781 - 664 - 690 Northland Avenue – NYSDEC Site #915329
New York State Department of Conservation (NYSDEC)
Standby Investigation and Remediation Services Contract (C100061)

Dear Mr. McPherson,

LiRo Engineers, Inc. (LiRo) has prepared this letter report to document the results of soil vapor and ambient air sampling performed at the 664 - 690 Northland Avenue Site (Site No. 915329) (Figure 1).

LiRo collected six (6) soil vapor samples and one (1) outdoor air/ambient sample on October 11, 2018. The samples were collected using SUMA canisters with 4 hour regulators. After sample collection was completed the canisters were transported under chain-of-custody control to the NYSDEC contract laboratory located at 10 Hazelwood Drive Suite #106, Amherst, NY 14228. Samples were submitted for analysis of volatile organic compounds (VOCs) in air using EPA Method TO-15.

Sampling Points Drilling Summary

On October 1, 2018, LiRo drilled six (6) 1-inch diameter sample holes through the surface asphalt, subbase, overburden and into the bedrock. All 6 sampling locations were drilled through recently completed asphalt parking lot within the 664, 688 and 690 Northland Avenue parcels (see Figure 2). Three (3) locations (SSVP-01 through SSVP-03) were drilled within the 664 Northland Avenue parcel, two (2) locations were drilled within the 688 Northland parcel (SSVP-04 and SSVP-05) and one (1) sample location (SSVP-06) was drilled within the 690 Northland Avenue Parcel. The parking lot at 688 and 690 Northland Avenue are contiguous. Tubing was placed in each hole and sealed with beeswax and clay. A summary of drilling field notes is provided in the table below:

Summary of Soil Vapor Sampling Point Construction

Sample ID	Total Depth Below Grade (Inches)	Approximate Depth into Bedrock (Inches)	Depth Below Grade to Bottom of Tubing (Inches)
SSVP-01	31"	BNE	30"
SSVP-02	23"	1 to 2"	22"
SSVP-03	31"	BNE	20"
SSVP-04	20"	2"	14"
SSVP-05	32"	BNE	24"
SSVP-06	28"	2"	24"

BNE = Bedrock Not Encountered.

After installation of tubing (0.25-inch outer diameter polyethylene) to depth, all sampling points were filled with clean quartz sand to approximately 3-inches below grade, packed with 1-inch of natural modeling clay (Craft Smart™) and sealed with bee's wax (granular Country Lane Natural Beeswax™) to ground surface.



Approximately 2 feet of tubing was exposed at ground surface. Sample tubing was secured and covered by a traffic cone after completion of each installation.

Map coordinates for each sample, referenced to Latitude and Longitude and New York State Plane (West), are provided in Table 1.

Soil Vapor Collection Procedure

The sampling schedule was adjusted on multiple occasions due to asphalt repaving of the adjacent Northland Avenue (October 8, 2018) and due heavy precipitation events (from October 2 to 9, 2018) and a subsequently raised groundwater table. Sampling was conducted on October 11, 2018, after the local groundwater table had receded below the bottom of each soil vapor sampling point.

Prior to sampling, each sampling point was vacuum-purged of any ambient/stagnant air/vapor by drawing air into a 150-milliliter syringe attached to the sampling tubing above ground surface. After purging, sampling canisters and regulators were deployed and connected to the sampling tubing and left-in place for 4-hours. Sample containers were under the direction supervision of a LiRo Geologist during the entire duration of their deployment.

Concurrent with subsurface vapor sampling, one outdoor ambient-air sample (AA-01) was collected up gradient from the sub-slab soil vapor samples. (see Figure 2). The ambient sample was also left in-place and supervised for 4-hours.

Upon completion of the 4-hour interval, each canister was labeled with a sample identification code, date and time of sampling and delivered by LiRo under chain-of-custody control to Test America of Amherst, New York.

Soil Vapor Results

A summary of laboratory analytical results for AA-01 and SSVP-01 through SSVP-05 is provided in Table 2. The regulator valve for the canister for SSVP-06 was found to be defective upon inspection by the laboratory and consequently no sample results are reported for that location.

None of the sample results reported any VOC in exceedance of its New York State Department of Health's Air Guidance Value for any of the samples. Reported soil gas Total VOC concentrations ranged between 694 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) in the SSVP-05 sample and 4,717 $\mu\text{g}/\text{m}^3$ in the SSVP-04 sample. Total VOCs for the Ambient Air sample was 17 $\mu\text{g}/\text{m}^3$.

Should you have any questions regarding this matter please contact me anytime at 716-882-5476 ext. 417.

Sincerely,

LiRo Engineers, Inc.

A handwritten signature in blue ink, appearing to read 'Craig Taylor', is written over a faint, light blue circular background.

Craig Taylor
Project Manager

TABLE 1
SOIL VAPOR AND AMBIENT AIR SAMPLE MAP COORDINATES
664 - 690 NORTHLAND AVENUE
NYSDEC SITE ID No. 915329, CALL OUT No. 134781

Location ID	Longitude	Latitude	NYS State Plane (West)	
	East/West	Noth/South	Easting	Northing
AMBIENT	-78° 50' 7.123"	42° 55' 8.787"	1080797.614	1063695.020
SSVP-01	-78° 50' 6.716"	42° 55' 9.507"	1080828.100	1063767.819
SSVP-02	-78° 50' 5.877"	42° 55' 8.952"	1080890.342	1063711.507
SSVP-03	-78° 50' 5.182"	42° 55' 9.460"	1080942.192	1063762.740
SSVP-04	-78° 50' 3.613"	42° 55' 8.880"	1081058.802	1063703.714
SSVP-05	-78° 50' 2.742"	42° 55' 9.449"	1081123.795	1063761.104
SSVP-06	-78° 50' 1.536"	42° 55' 8.782"	1081213.299	1063693.272

Notes:

1) NYS State Plan (West) = New York State Plane Coordinate System of 1983, West Zone (US Survey Feet).

TABLE 2
VOLATILE ORGANIC COMPOUNDS (VOCs) IN SOIL VAPOR AND AMBIENT AIR
664 - 690 NORTHLAND AVENUE
NYSDEC SITE ID No. 915329, CALL OUT No. 134781

Parameters	Units	Matrix Sub-slab Vapor Concentration Range	Location, Sample ID, Sample Date and Type					
			SSVP-01		SSVP-02		SSVP-03	
			SSVP-01		SSVP-02		SSVP-03	
			10/11/2018		10/11/2018		10/11/2018	
			Sub-Slab		Sub-Slab		Sub-Slab	
1,1,1-TRICHLOROETHANE	ug/m ³	100 to 1000	2.6		2.4		6	
1,1,2,2-TETRACHLOROETHANE	ug/m ³	NC	<0.55		<0.55		<0.55	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ug/m ³	NC	<0.61		<0.61		<0.61	
1,1,2-TRICHLOROETHANE	ug/m ³	NC	<0.44		<0.44		<0.44	
1,1-DICHLOROETHANE	ug/m ³	NC	<0.32		<0.32		<0.32	
1,1-DICHLOROETHENE	ug/m ³	NC	<0.16		<0.16		<0.16	
1,2,4-TRICHLOROBENZENE	ug/m ³	NC	<0.59		<0.59		<0.59	
1,2,4-TRIMETHYLBENZENE	ug/m ³	NC	12		7.6		7.4	
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	ug/m ³	NC	<0.61		<0.61		<0.61	
1,2-DICHLOROBENZENE	ug/m ³	NC	<0.48		<0.48		<0.48	
1,2-DICHLOROETHANE	ug/m ³	NC	<0.32		<0.32		<0.32	
1,2-DICHLOROPROPANE	ug/m ³	NC	<0.37		<0.37		<0.37	
1,2-DICHLOROTETRAFLUOROETHANE	ug/m ³	NC	<0.56		<0.56		<0.56	
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	ug/m ³	NC	6.7		2.4		3.4	
1,3-DICHLOROBENZENE	ug/m ³	NC	<0.48		<0.48		<0.48	
1,4-DICHLOROBENZENE	ug/m ³	NC	110	E	95		140	E
1,4-DIOXANE (P-DIOXANE)	ug/m ³	NC	<0.72		<0.72		<0.72	
2,2,4-TRIMETHYLPENTANE	ug/m ³	NC	<0.93		<0.93		<0.93	
BENZENE	ug/m ³	NC	9.8		1		6.4	
BENZYL CHLORIDE	ug/m ³	NC	<0.83		<0.83		<0.83	
BROMODICHLOROMETHANE	ug/m ³	NC	<0.54		<0.54		<0.54	
BROMOFORM	ug/m ³	NC	<0.83		<0.83		<0.83	
BROMOMETHANE	ug/m ³	NC	<0.31		<0.31		<0.31	
CARBON TETRACHLORIDE	ug/m ³	6 to 60	<0.2		<0.2		0.24	
CHLOROBENZENE	ug/m ³	NC	<0.37		<0.37		<0.37	
CHLOROETHANE	ug/m ³	NC	<0.21		<0.21		<0.21	
CHLOROFORM	ug/m ³	NC	5		<0.39		0.48	
CHLOROMETHANE	ug/m ³	NC	1		1.7		0.74	
CIS-1,2-DICHLOROETHYLENE	ug/m ³	6 to 60	<0.16		<0.16		<0.16	
CIS-1,3-DICHLOROPROPENE	ug/m ³	NC	<0.36		<0.36		<0.36	
CYCLOHEXANE	ug/m ³	NC	25		3.8		25	
DIBROMOCHLOROMETHANE	ug/m ³	NC	<0.68		<0.68		<0.68	
DICHLORODIFLUOROMETHANE	ug/m ³	NC	2.2		2.2		1.8	
ETHANOL	ug/m ³	NC	28		57		26	
ETHYLBENZENE	ug/m ³	NC	4.1		0.95		4	
HEXACHLOROBUTADIENE	ug/m ³	NC	<0.85		<0.85		<0.85	
M,P-XYLENES	ug/m ³	NC	24		5.9		29	
METHYL ETHYL KETONE (2-BUTANONE)	ug/m ³	NC	420	E	1800	E	790	E
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ug/m ³	NC	3.2		2.3		2.1	
METHYLENE CHLORIDE	ug/m ³	100 to 1000	1.4		1.9		1.7	
N-HEXANE	ug/m ³	NC	29		12		16	
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/m ³	NC	8		2.9		10	
STYRENE	ug/m ³	NC	1.6		0.47		2.2	
TERT-BUTYL ALCOHOL	ug/m ³	NC	5		9.5		1.1	
TERT-BUTYL METHYL ETHER	ug/m ³	NC	<0.58		<0.58		<0.58	
TETRACHLOROETHYLENE(PCE)	ug/m ³	100 to 1000	0.64		0.58		0.76	
TOLUENE	ug/m ³	NC	24		2.5		18	
TRANS-1,2-DICHLOROETHENE	ug/m ³	NC	<0.32		<0.32		<0.32	
TRANS-1,3-DICHLOROPROPENE	ug/m ³	NC	<0.36		<0.36		<0.36	
TRICHLOROETHYLENE (TCE)	ug/m ³	6 to 60	<0.19		<0.19		0.27	
TRICHLOROFLUOROMETHANE	ug/m ³	NC	1.6		1.9		1.5	
VINYL CHLORIDE	ug/m ³	NC	<0.1		<0.1		<0.1	
TOTAL VOCs	ug/m ³	NC	725		2014		1094	

Notes:

ug/m³ - Micrograms per cubic meter

NC - No Criteria

< = Not Detected and less than the Laboratory Reporting Limit

E = Result exceeded calibration range

Bold = Value indicates "mitigation" based on Decision Matrix

TABLE 2
VOLATILE ORGANIC COMPOUNDS (VOCs) IN SOIL VAPOR AND AMBIENT AIR
664 - 690 NORTHLAND AVENUE
NYSDEC SITE ID No. 915329, CALL OUT No. 134781

Parameters	Units	Matrix Sub-slab Vapor Concentration Range	Location, Sample ID, Sample Date and Type		
			SSVP-04	SSVP-05	AMBIENT
			SSVP-04	SSVP-05	AMBIENT
			10/11/2018	10/11/2018	10/11/2018
			Sub-Slab	Sub-Slab	Ambient
1,1,1-TRICHLOROETHANE	ug/m ³	100 to 1000	<28	<20	<0.44
1,1,2,2-TETRACHLOROETHANE	ug/m ³	NC	<35	<25	<0.55
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ug/m ³	NC	<39	<28	<0.61
1,1,2-TRICHLOROETHANE	ug/m ³	NC	<28	<20	<0.44
1,1-DICHLOROETHANE	ug/m ³	NC	<20	<15	<0.32
1,1-DICHLOROETHENE	ug/m ³	NC	<10	<7.2	<0.16
1,2,4-TRICHLOROBENZENE	ug/m ³	NC	<37	<27	<0.59
1,2,4-TRIMETHYLBENZENE	ug/m ³	NC	<25	<18	<0.39
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	ug/m ³	NC	<39	<28	<0.61
1,2-DICHLOROBENZENE	ug/m ³	NC	<30	<22	<0.48
1,2-DICHLOROETHANE	ug/m ³	NC	<20	<15	<0.32
1,2-DICHLOROPROPANE	ug/m ³	NC	<23	<17	<0.37
1,2-DICHLOROTETRAFLUOROETHANE	ug/m ³	NC	<35	<25	<0.56
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	ug/m ³	NC	<25	<18	<0.39
1,3-DICHLOROBENZENE	ug/m ³	NC	<30	<22	<0.48
1,4-DICHLOROBENZENE	ug/m ³	NC	75	44	<0.48
1,4-DIOXANE (P-DIOXANE)	ug/m ³	NC	<45	<33	<0.72
2,2,4-TRIMETHYLPENTANE	ug/m ³	NC	<59	<42	<0.93
BENZENE	ug/m ³	NC	<16	<12	<0.26
BENZYL CHLORIDE	ug/m ³	NC	<52	<38	<0.83
BROMODICHLOROMETHANE	ug/m ³	NC	<34	<24	<0.54
BROMOFORM	ug/m ³	NC	<52	<38	<0.83
BROMOMETHANE	ug/m ³	NC	<20	<14	<0.31
CARBON TETRACHLORIDE	ug/m ³	6 to 60	<13	<9.2	0.43
CHLOROBENZENE	ug/m ³	NC	<23	<17	<0.37
CHLOROETHANE	ug/m ³	NC	<13	<9.6	<0.21
CHLOROFORM	ug/m ³	NC	<25	<18	<0.39
CHLOROMETHANE	ug/m ³	NC	<26	<19	1.2
CIS-1,2-DICHLOROETHYLENE	ug/m ³	6 to 60	<10	<7.2	<0.16
CIS-1,3-DICHLOROPROPENE	ug/m ³	NC	<23	<17	<0.36
CYCLOHEXANE	ug/m ³	NC	<43	<31	<0.69
DIBROMOCHLOROMETHANE	ug/m ³	NC	<43	<31	<0.68
DICHLORODIFLUOROMETHANE	ug/m ³	NC	<25	<18	2.4
ETHANOL	ug/m ³	NC	<240	<170	4.2
ETHYLBENZENE	ug/m ³	NC	<22	<16	<0.35
HEXACHLOROBUTADIENE	ug/m ³	NC	<54	<39	<0.85
M,P-XYLENES	ug/m ³	NC	<22	<16	<0.35
METHYL ETHYL KETONE (2-BUTANONE)	ug/m ³	NC	4500	E 650	1.1
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ug/m ³	NC	<52	<37	1.4
METHYLENE CHLORIDE	ug/m ³	100 to 1000	<44	<32	2.4
N-HEXANE	ug/m ³	NC	75	<32	0.73
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/m ³	NC	<22	<16	<0.35
STYRENE	ug/m ³	NC	<22	<15	<0.34
TERT-BUTYL ALCOHOL	ug/m ³	NC	67	<44	<0.97
TERT-BUTYL METHYL ETHER	ug/m ³	NC	<36	<26	<0.58
TETRACHLOROETHYLENE(PCE)	ug/m ³	100 to 1000	<34	<25	0.72
TOLUENE	ug/m ³	NC	<29	<21	0.73
TRANS-1,2-DICHLOROETHENE	ug/m ³	NC	<20	<14	<0.32
TRANS-1,3-DICHLOROPROPENE	ug/m ³	NC	<23	<17	<0.36
TRICHLOROETHYLENE (TCE)	ug/m ³	6 to 60	<12	<8.8	<0.19
TRICHLOROFLUOROMETHANE	ug/m ³	NC	<28	<20	1.4
VINYL CHLORIDE	ug/m ³	NC	<6.5	<4.6	<0.1
TOTAL VOCs	ug/m ³	NC	4717	694	17

Notes:

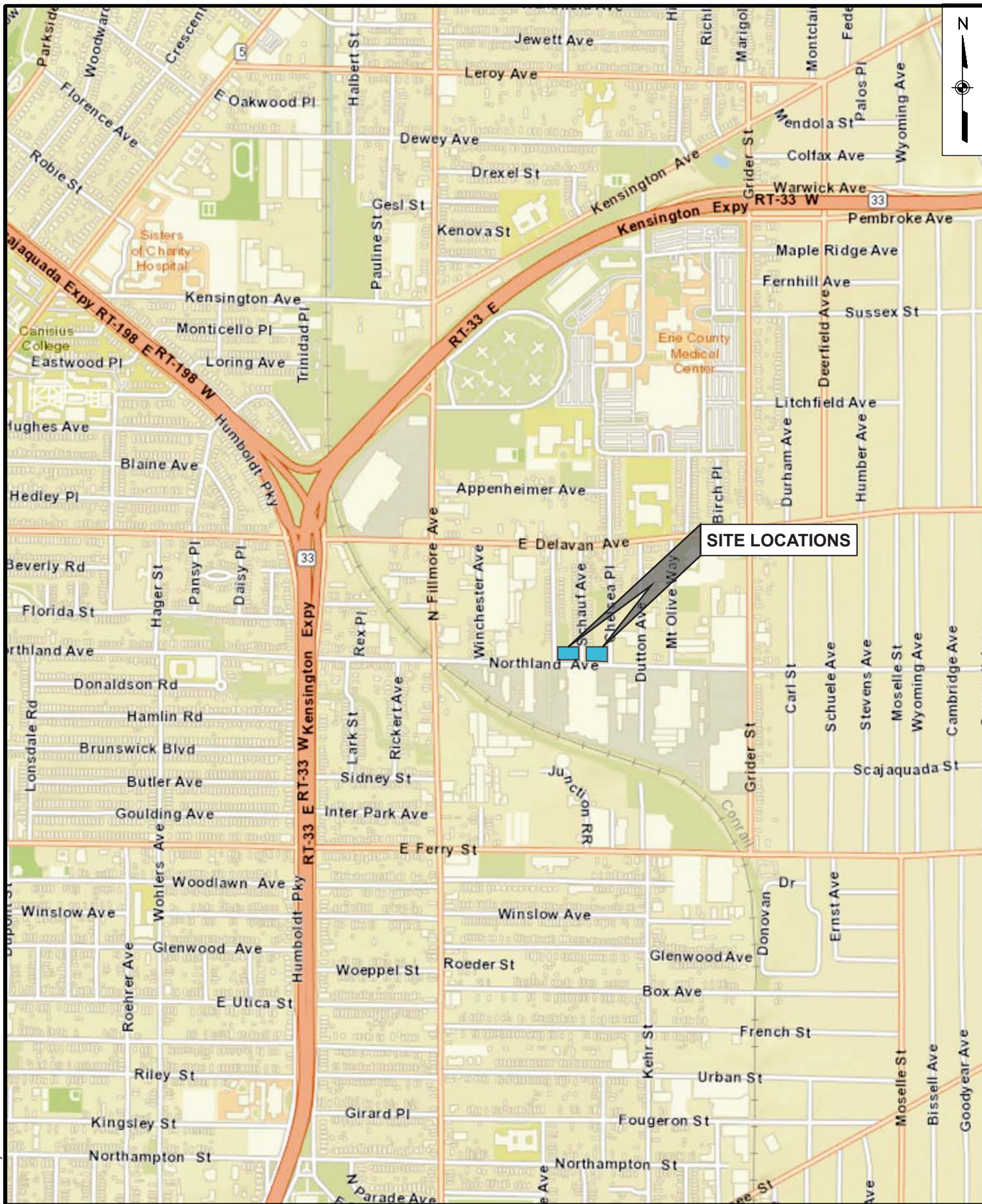
ug/m³ - Micrograms per cubic meter

NC - No Criteria

< = Not Detected and less than the Laboratory Reporting Limit

E = Result exceeded calibration range

Bold = Value indicates "mitigation" based on Decision Matrix

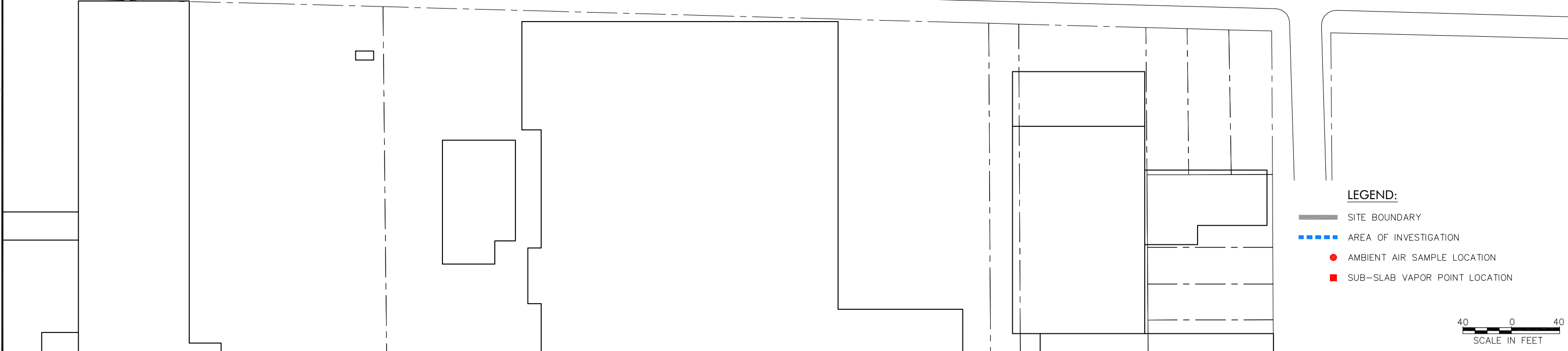


LiRo-Engineers, Inc.
690 Delaware Ave.
Buffalo, New York

664-690 NORTHLAND AVENUE SITE LOCATION MAP

FIGURE NO.

1



WARNING

IT IS A VIOLATION OF SECTION 7209, SUBDIVISION 2, OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, OTHER THAN THOSE WHOSE SEAL APPEARS ON THIS DRAWING, TO ALTER IN ANY WAY AN ITEM ON THIS DRAWING. IF AN ITEM IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

NO.	DATE	DESCRIPTION
REVISIONS		



LiRo Engineers, Inc.

690 Delaware Avenue

Buffalo, New York

PROJ. ENG.: M.J.W.	CLIENT:  NEW YORK STATE OF OPPORTUNITY	Department of Environmental Conservation
DESIGNED BY: M.P.B.		
CHECKED BY: M.J.W.		
DRAWN BY: A.M.K.	DATE: NOVEMBER 2018	SCALE: AS SHOWN

JOB TITLE AND LOCATION:
664-690 NORTHLAND AVENUE
BUFFALO, NEW YORK
NYSDEC SITE NUMBER 915329

DRAWING TITLE:

SAMPLE LOCATION PLAN

LIRO JOB NO.:
17-013-0289

SHEET
2 OF
2

FIGURE NO:

2

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