Wittman GeoSciences
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716-574-1513

March 20, 2018

Anthony Lopes, Project Manager
New York State Department of Environmental Conservation
Division of Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203

Re: **RI Work Plan Addendum – Vapor Intrusion Sampling**
MOD-PAC CORP
1801 Elmwood Avenue, Buffalo, New York 14207
BCP Site No. C915314

Dear Mr. Lopes:

Wittman GeoSciences (WGS) is completing a Remedial Investigation (RI) at the above referenced site for MOD-PAC CORP, the property owner, in accordance with the approved Remedial Investigation (RI) Work Plan. Vapor intrusion samples completed as part of the RI are shown on Figure 1. Soil Vapor Intrusion (SVI) testing results and Decision Matrices are included on the attached Tables 1 and 2.

SVI results were evaluated using the New York State Department of Health (NYSDOH) Decision Matrices. Based on results from the Decision Matrices, sub-slab and vapor sample results from SS-1/IA-1 indicate that mitigation is required. Sample results from SS-4/IA-4 indicate that monitoring is recommended. Additional remedial investigation efforts are recommended to further delineate and define the nature and extent of the sub-slap VOC impacts in the indoor and sub-slab at SS-1/IA-1 location.

Additional Soil Vapor Intrusion Investigation

Based on TCE decision matrices, additionally delineation will be completed in the area of SS-1/IA-1 to assess the potential extent of vapor intrusion impacts which required mitigation. Three (3) sample locations will be completed to the north, west and east of SS-1/IA-1 location. Additionally, sample locations SS-1/IA-1 and SS-4/IA-4 will be re-sampled in order to assess current concentrations. Proposed locations are shown on Figure 1.

The SVI sampling will be in done in accordance with scope of work within the approved Remedial Investigation Work Plan.

Building Survey

An inspection of the existing on-site facility and product inventory will be conducted to assess the current conditions in proposed sampling areas and determine the likelihood of existing chemicals of concern that may be present that would influence the vapor test results. A PID will be used to monitor indoor air and scan vapors of individual containers that may be present. Any potential sources identified inside the facility will be removed prior to conducting the vapor test.

Site Preparation
In accordance with NYSDOH recommendations, the HVAC system should be activated.

Vapor Sampling
Three types of air samples will be collected, including sub-slab, ambient indoor air and ambient outdoor air samples, as follows:

- **Sub-Slab:** WGS will install five (5) temporary sub-slab sampling points at locations as shown on Figure 1. Samples will be obtained through core-drilled holes into a competent portion of the concrete floor, away from cracks or drains. Clean, dedicated ¼-inch inside diameter polyethylene tubing will be placed into the hole and will not extend further than 2-inches into the sub-slab material. The corehole annulus will be sealed at the floor surface with modeling clay. Once it is determined that the sampling system is sealed, the sample probe and tube will be purged of one to three volumes, and sampling will be initiated.

  The sub-slab soil gas sample will be collected using a 2.7-liter capacity Summa canister fitted with a laboratory calibrated flow regulation devise to allow the collection of the soil gas sample over an 8-hour sample collection time.

- **Ambient Indoor Air:** An ambient indoor air sample will be collected concurrent with every sub-slab sample locations from approximately 3 to 4 feet above the slab floor. A total of 5 samples will be obtained. Samples will be collected over an 8-hour collection period.

- **Ambient Outdoor Air:** One ambient outdoor sample will be collected at an upwind location from approximately 4 to 5 feet above the ground surface. A sample will be collected over an 8-hour collection period.

All sampling and purging flow rates will not exceed 0.2 liters per minute. Since the ambient outdoor air sample is dependent on wind flow direction, that sample location will be determined the day of the test.

Soil Vapor Sampling Leak Testing Procedures
Leak testing will be completed prior to collection of the sub-slab sample locations using a tracer gas. The tracer gas (i.e., helium) will be released at the ground surface immediately around the sub-slab sampling location prior to sample collection. The following procedure will be used:

- A helium meter will be used to monitor the presence of helium during purging and soil gas sample collection.
- A containment unit will be constructed to cover the sub-slab sampling system. In general, the containment will include a shroud set into bentonite to create a seal. The shroud will have a hole to allow for introduction of helium and a second to allow trapped air to escape.

- Prior to soil gas purging, helium will be introduced into the shroud and helium confirmed to be present.
- The helium meter will be connected in-line with the sub-slab sampling assembly to assess for presence of helium. Should the helium meter detect the presence of helium greater than 10 percent of the source concentration (measured under the shroud), then the sample location will not be utilized or sub-slab collection.

Please approve the addendum for additional remedial investigation efforts, as outlined above, to further delineate and define the nature and extent of contamination of the areas of concerns identified in the initial RI. Should you have any questions relative to this request, please contact me at 716-574-1513.

Very truly yours,
WITTMAN GEOSCIENCES

Michele M. Wittman
Principal

TABLES

Table 1
DRAFT Soil Vapor Intrusion Analytical Testing Results
1801 Elmwood Avenue, Buffalo, NY
December 2017

	Guidance Values- Indoor Air											
Parameter	Table C2 Commercial Indoor Air Background (90%)	NYSDOH Air Guideline Value	SS-1 Sub-Slab	IA-1 Indoor Air	IA-1 Indoor Air (Duplicate)	SS-2 Sub-Slab	IA-2 Indoor Air	SS-3 Sub-Slab	IA-3 Indoor Air	SS-4 Sub-Slab	IA-4 Indoor Air	OA-1 Outdoor Air	Table C2 Outdoor Air Guidance Values
1,1,1-Trichloroethane	20.6		ND	ND	ND	ND	ND	1.34	ND	ND	ND	ND	2.6
1,2,4-Trimethylbenzene	9.5		2.84	34.2	36.8	8.31	16.0	4.92	2.15	ND	1.22	ND	5.8
1,3,5-Trimethylbenzene	3.7		ND	9.34	10.0	5.56	4.28	1.23	ND	ND	ND	ND	2.7
1,3-Butadiene	<3.0		1.39	ND	ND	ND	ND	2.39	ND	2.02	0.569	ND	<3.4
2,2,4-trimethylpentane	NV		ND	1.50	1.60	ND	ND	ND	ND	ND	ND	ND	NV
2-Butanone	12		7.31	ND	ND	9.41	ND	31.6	ND	4.75	ND	ND	11.3
2-Hexanone	NV		ND	ND	ND	3.00	ND	10.7	ND	ND	ND	ND	NV
4-ethyltoluene	3.6		ND	8.06	8.31	3.91	3.34	1.47	ND	ND	ND	ND	3.0
4-Methyl-2-pentanone	6.0		ND	ND	ND	2.13	ND	3.62	ND	ND	ND	ND	1.9
Acetone	98.9		67.5	98.6	101	216	79.3	622	15.1	41.6	3.90	4.23	43.7
Benzene	9.4		15.7	ND	ND	4.28	ND	8.95	ND	24.2	2.03	ND	6.6
Carbon disulfide	4.2		4.76	ND	ND	ND	ND	0.850	ND	4.95	ND	ND	3.7
Carbon tetrachloride	<1.3		ND	0.403	0.415	ND	0.409	2.82	0.415	ND	0.403	0.403	0.7
Chloromethane	3.7		0.589	0.968	0.940	ND	0.940	ND	0.962	ND	0.948	0.973	3.7
cis-1,2-Dichloroethene	<1.9		ND	0.087	0.103	ND	ND	ND	ND	ND	ND	ND	<1.8
Cyclohexane	NV		65.7	ND	ND	4.30	ND	6.82	ND	90.5	ND	ND	NV
Dichlorodifluoromethane	16.5		2.72	2.41	2.29	2.09	2.30	2.21	2.42	1.71	2.42	2.37	8.1
Ethanol	210		12.6	ND	ND	11.1	12.9	81.8	ND	ND	ND	ND	57.0
Ethyl acetate	5.4		5.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5
Ethylbenzene	5.7		4.18	13.4	14.2	59.5	7.47	5.82	ND	1.33	ND	ND	3.5
Heptane	NV		68.8	13.9	14.5	7.09	8.57	11.9	ND	173	ND	ND	NV
n-Hexane	NV		113	0.818	0.733	8.25	0.705	12.4	ND	185	1.05	ND	6.4
Isopropanol	NV		6.07	82.3	85.0	19.9	256	32.7	23.0	1.87	2.32	ND	NV
m&p-Xylene	22.2		14.9	57.8	60.4	180	30.2	22.2	3.28	3.74	3.36	ND	12.8
Methylene chloride	10	60	5.49	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.1
o-Xylene	7.9		3.85	18.3	19.2	59.5	8.25	5.39	1.06	0.925	1.15	ND	4.6
Styrene	1.9		ND	1.22	1.35	ND	ND	ND	ND	ND	ND	ND	1.3
Tertiary butyl Alcohol	NV		ND	ND	ND	1.93	ND	8.09	ND	ND	ND	ND	NV
Tetrachloroethene	15.9	30	ND	0.292	0.319	1.69	0.420	ND	ND	ND	ND	ND	6.5
Tetrahydrofuran	NV		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NV
Toluene	43		31.4	9.46	9.65	17.3	26.7	36.6	2.34	30.0	4.90	ND	33.7
Trichloroethene	4.2	2	14.4	1.68	1.91	ND	2.20	ND	0.188	32.2	0.301	ND	1.3
Trichlorofluoromethane	18.1		ND	1.37	1.37	ND	1.71	3.30	1.34	2.08	1.33	1.30	4.3

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Notes:

1. Compounds detected in one or more samples included in this table. For a list of all compounds, refer to analytical report in Attachment C.
2. Analytical testing for VOCs via TO-15 completed by Alpha Analytical.
3. Results present in ug/m^3 or microgram per cubic meter.
4. Samples were collected during an 8-hour sample duration.
5. 90th percentile values as presented in C2 (EPA 2001: Building assessment and survey evaluation (BASE) database) Appendix C, in the NYSDOH Guidance Manual, as indicated for Indoor and Outdoor air only.
6. Air Guidance Values from "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" dated October 2006, prepared by New York State Department of Health.
7. NYSDOH does not currently have standards, criteria or guidance values for concentrations in sub-slab vapor. The detection of VOCs in sub-slab vapor samples does not necessarily indicate soil vapor intrusion is occurring or action should be taken to address exposures.
8. Grey shaded values represent exceedance of table C2 guidance values; yellow shaded values represent exceedance of NYSDOH Air Guidance Values
9. ND = Non Detect; NV = No Value

Table 2
DRAFT Soil Vapor Intrusion Decision Matrices
1801 Elmwood Avenue, Buffalo, NY

Sample ID	Parameter	Sub-slab Vapor Concentrations (ug/m^3)	Indoor Air Concentration (ug/m^3)	Recommended Action
Matrix A Trichloroethene (TCE); cis-1,2-dichloroethene (cis-DCE); 1,1-dichloroethene (1,1-DCE); Carbon Tetrachloride				
SS-1/IA-1	TCE	14.4	1.68	Mitigate
	cis-DCE	ND	0.087	No further action
	1,1-DCE	ND	ND	No further action
	Carbon Tetrachloride	ND	0.403	No further action
SS-2/IA-2	TCE	ND	2.20	Identify source(s) and Resample or Mitigate
	cis-DCE	ND	ND	No further action
	1,1-DCE	ND	ND	No further action
	Carbon Tetrachloride	ND	0.409	No further action
SS-3/IA-3	TCE	ND	0.188	No further action
	cis-DCE	ND	ND	No further action
	1,1-DCE	ND	ND	No further action
	Carbon Tetrachloride	2.82	0.415	No further action
SS-4/IA-4	TCE	32.2	0.301	Monitor
	cis-DCE	ND	ND	No further action
	1,1-DCE	ND	ND	No further action
	Carbon Tetrachloride	ND	0.403	No further action
Matrix B Methylene Chloride (MC); 1,1,1- Trichloroethane (1,1,1-TCA); Tetrachloroethylene (PCE)				
SS-1/IA-1	MC	5.49	ND	No further action
	1,1,1-TCA	ND	ND	No further action
	PCE	ND	0.292	No further action
SS-2/IA-2	MC	ND	ND	No further action
	1,1,1-TCA	ND	ND	No further action
	PCE	1.69	0.42	No further action
SS-3/IA-3	MC	ND	ND	No further action
	1,1,1-TCA	1.34	ND	No further action
	PCE	ND	ND	No further action
SS-4/IA-4	MC	ND	ND	No further action
	1,1,1-TCA	ND	ND	No further action
	PCE	ND	ND	No further action
Matrix C Vinyl Chloride (VC)				
SS-1/IA-1	VC	ND	ND	No further action
SS-2/IA-2	VC	ND	ND	No further action
SS-3/IA-3	VC	ND	ND	No further action
SS-4/IA-4	VC	ND	ND	No further action

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FIGURES

SS-2/IA-2

SS-1/IA-1

SS-3/IA-3

SS-4/IA-4

SOIL BORING NO. 114 ELEV. 599.56

SOIL BORING NO. 115 ELEV. 599.67

MON. WELL NO. 2 COVER 599.84 GROUND 599.73 SOIL BORING NO. 113

SOIL BORING NO. 112 ELEV. 600.22

SOIL BORING NO. 111 ELEV. 600.83

MON. WELL NO. 3 COVER 601.36 GROUND 601.39 SOIL BOPING NO. 111

SOIL BORING NO. 110 ELEV. 600.98

SOIL BORING NO. 107 ELEV. 602.20

SOIL BORING NO. 108 ELEV. 602.30

SOIL BORING NO. 109 ELEV. 601.29

MON. WELL NO. 1 COVER 605.29 GROUND 601.33

TEST PIT 110 ELEV. 610.50

BENCHMARK: SOUTHEAST BOLT ON LIGHT POLE ELEV. 601.50

BENCHMARK: SOUTHEAST BOLT ON LIGHTPOLE ELEV. 602.73

BRICK BLDG.

MODPAC SHIPPING & RECEIVING DOCK 8

STORM M.H. RIM 602.21 N.W. 10" PVC 599.2± N.E. 18" C.P.P. 597.09 W. 24" C.P.P. 597.13

C.B. RIM 601.37 N. 18" C.P.P. 595.4± N.E. 4" PVC 596.4± E. 24" C.P.P. 594.57 W. 24" C.P.P. 594.67

SAN. M.H. RIM 602.21 N. 12" OPENING 592.83 E. INV. 593.15 W. 18" OPENING 592.78

C.B. RIM 599.17 S.W. 4" PVC 596.39

ASPHALT

CONC.

GRAVEL

GRASS

EDGE OF PAVEMENT

EDGE OF GRAVEL

CONC. WALK

CONC. CURB W/ CONC. PAD & GUARD POSTS

STONE

GAS METER W/AGP

TRENCH DRAIN RIM 602.50 (PLUGGED)

1" PVC RISER

CONDUITS

5" RISERS

4" VENT

4 R.R. TRACK POSTS W/ ELEC. OUTLET & W.V.

CONC. WALL W/ HANDRAIL

ASPHALT RAMP

GUARD POST

5" C.O.

ENT. ELEV. 602.56

ENT. ELEV. 601.40

ENT. ELEV. 602.40

L.P.

OE

ST

R.D.

C.V.

KEY

- = Proposed Soil Vapor Sub-slab/Indoor air location
- = Soil Boring Location (10/2017)
- = Monitoring Well Location (10/2017)
- = Test Pit Location (11/2017)
- = Soil Vapor Sub-slab/Indoor air location (12/2017)

N

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PROPOSED VAPOR INTRUSION SAMPLING LOCATIONS
1801 ELMWOOD AVENUE
BUFFALO, NEW YORK

MOD-PAC CORP.
BUFFALO, NEW YORK

DRAWN BY: SS	SCALE: 1" = 40'	PROJECT: e1605
CHECKED BY: MMW	DATE: 03/2018	FIGURE NO: 1