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The City of Vadnais Heights
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Vadnais Heights, MN 55127

Memorandum:

TO: Honorable Mayor and City Council

FROM: Carie Fuhrman, Planning/Community Development Director *CF KW*

DATE: May 12, 2015 (May 20th Council Workshop)

SUBJECT: Garceau Site Phase II Environmental Assessment Results

Five (5) test pits were completed, and all five pits revealed demolition material containing building materials, such as wood, glass, roofing materials, and some insulation.

Six soil borings were done on the site. SB-1 (closest to the former gas station) showed elevated petroleum compounds to the point that the odor could be detected. SB-2 revealed some PAHs, which are sometimes indicative of asphalt shingles or other oil-containing materials. SB-2 and SB-4 showed levels of arsenic, which is consistent with the presence of the building materials/treated wood.

Mike Hultgren of AET explained that the MPCA's viewpoint on sites such as this has changed over the years: they used to try and clean sites such as this up, but they now taken the standpoint instead of evaluating the risks. The demolition materials will obviously add to the redevelopment costs, but it is manageable.

There may be some debris that will have to be removed and hauled away to a lined landfill, but the MPCA would not require all of the debris to be removed. If a building were to be located on this area of the site, it would have to be located on pilings (similar to the McCullough and Convery sites). In order to mitigate potential issues with the soil gas vapors from the former gas station, a drain tile system can be designed to vent vapors into a pipe through the building to provide a preferential path for the vapors. The major concerns would be in protecting the workers on the site during the redevelopment and making sure they were not exposed to contaminants, and then protecting the inhabitants after the site is redeveloped.

The next steps include:

1. Submit the Phase I, Phase II, and file a No Association Letter with the MPCA.
2. Once we receive word on the DEED grant, AET will begin the Phase I and II on the adjacent Vadnais Market and house site.
3. AET will then put together a Response Action Plan (RAP) for the entire corner.

A full copy of the Phase II ESA will be available at the workshop, or please contact Carie prior to the meeting and she can provide you with a copy.

Encl: Executive Summary, Sample Location Map, Tables 1-4

EXECUTIVE SUMMARY

American Engineering Testing, Inc. (AET) was authorized by the City of Vadnais Heights to conduct a Phase II Environmental Site Assessment (ESA) for the Garceau Hardware property located at 3429 Centerville Road in Vadnais Heights, Minnesota (the Site).

Findings and Opinions

This Phase II Environmental Site Assessment has revealed the following information regarding the potential environmental conditions assessed in connection with the Site:

- The Site is underlain by fill and debris. The debris extends to depths of up to 16 feet beneath the Site. The fill is underlain by organic swamp deposits that appear to be related to former wetland and alluvium associated with Vadnais Lake.
- The soils beneath the Site have been impacted by diesel range organics (DRO), gasoline range organics (GRO), volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), and metals. In addition to DRO, GRO and VOC impacts, petroleum odors were noted in the soils in SB-1. The source of the petroleum is likely the former Vadnais Heights Muffler Shop closed leak site located northeast of the boring location. The source of DRO and elevated metals in SB-3 may be surficial impacts from the former presence of a waste-oil aboveground storage tank in this area. Concentrations of PAHs detected in SB-2, SB-3 and SB-5 are likely associated with debris in the fill soils beneath the Site.
- Groundwater impacts at the Site included DRO, GRO, VOCs, PAHs and arsenic. Arsenic impacts to groundwater exceeding the Environmental Protection Agency Maximum Contaminant Levels indicates the potential that either treated wood or other sources of arsenic contamination were buried with debris at the Site. DRO, GRO and VOC impacts in boring SB-1 are likely associated with the former Vadnais Heights Muffler Shop closed leak site. The remaining groundwater impacts are likely associated with debris associated with the fill buried on the Site.
- Soil gas vapor detections exceeding ten-times the Residential Intrusion Screening Value included 1,2,4-trimethylbenzene, benzene, cyclohexane, n-hexane, and xylenes in sample SV-1. The source of these VOCs in soil gas is likely groundwater contamination from the petroleum release at the former Vadnais Heights Muffler Shop adjacent to the site.

Recommendations

Based on the observations, findings, and discussion above, AET recommends the following actions be conducted during the planned Site development:

1. The presence of soil and groundwater impacts above regulatory levels warrants a Response Action Plan (RAP) to manage associated risks;
2. DRO and GRO impacts above regulated fill criteria warrants specialized management or disposal of soils during Site development;
3. Asbestos containing materials within the fill debris are considered Regulated Asbestos Containing Material and will need to be managed in accordance with federal and state regulations during Site development.
4. Vapor mitigation controls may need to be incorporated during future construction activities depending upon planned use of the Site and location of future buildings.

Please contact AET if assistance is needed to implement the recommendations above.



Legend

- Sample Location
- SB - Soil Boring
- SV - Vapor Sample
- Test Pit Location
- Site Boundary



Map Reference: 2012 Twin Cities
 USGS High Resolution Orthoimagery,
 Minneapolis-St. Paul, Minnesota, Spring
 2012 U.S. Geological Survey and Digital
 Aerial Solutions, LLC, 2012

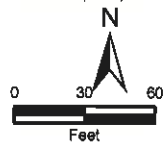


Figure 2
 Sample Location Map
 Phase II Environmental Site Assessment

Garceau Hardware
 3429 Centerville Road
 Vadnais Heights, Minnesota

Date: 04/10/2015

AET Project No. 03-05497

Table 1
Results of Soil Headspace Screening
Garceau Hardware, Vadnais Heights, Minnesota
AET Project No. 03-05497

Date Depth (feet)	Sample ID										
	3/12/15					3/6/15					
	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	TP-1*	TP-2*	TP-3*	TP-4*	TP-5*
0	16.5	0.2	0.4	0.1	0.3	0.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1						0.1					
2	12.0	0.2	0.3	0.1	0.3	0.1					
3						0.2					
4	63.8	0.2	0.5	0.2	0.3	0.1	< 1.0	EOTP	EOTP	EOTP	EOTP
5											
6		0.2		0.1	0.3	0.1					
7											
8	139.7				0.3	EOB					
9		0.2	0.4	0.2						EOTP	
10	869.7				0.5						
11											
12					0.3						
13	NS	0.3	0.3	NS			EOTP				
14											
15											
16	199.0				EOB	EOB					
17		EOB									
18	21.1										
19											
20											
21	15.8										
22											
22.5											
23	13.3										
24											
25	EOB										

Notes:
1. Results in ppm
2. NS = No Sample
3. EOB = End of Boring
4. EOTP = End of Test Pit
* Multiple composite samples taken

Table 2
Summary of Soil Sample Analytical Results
Garceau Hardware, Vadnais Heights, Minnesota
AET Project No. 03-05497

Sample ID	SB-1	SB-2	SB-3	SB-3	SB-4	SB-5	SB-6	MPCA Regulatory Goals			
	Date Sample Collected	3/12/15	3/12/15	3/12/15	3/12/15	3/12/15	3/12/15	3/13/15	Tier 2 Res SRV	Tier 1 Res SRV	Tier 1 SLV
Sample Depth (ft)	10'-12'	0'-2'	0'-2'	0'-12'	2'-4'	0'-2'	6'-7' 5"				
Petroleum											
Diesel Range Organics (DRO)	163	17.8	277	NA	6.56	39.2	ND	Unregulated Fill Criteria <100			
Gasoline Range Organics (GRO)	1340	ND	ND	NA	ND	ND	ND	Unregulated Fill Criteria <100			
Volatile Organic Compounds (VOCs)											
1,2,4-Trimethylbenzene	162	ND	ND	NA	ND	ND	ND	25	8	NE	
1,3,5-Trimethylbenzene	40.3	ND	ND	NA	ND	ND	ND	10	3	NE	
Benzene	2.36	ND	ND	NA	ND	ND	ND	10	6	0.034	
Ethylbenzene	37.6	ND	ND	NA	ND	ND	ND	200	200	4.7	
Isopropylbenzene (Cumene)	4.79	ND	ND	NA	ND	ND	ND	87	30	18	
Naphthalene	16.7	ND	ND	NA	ND	ND	ND	28	10	7.5	
n-Propylbenzene	20.2	ND	ND	NA	ND	ND	ND	93	30	NE	
p-Isopropyltoluene	1.39	ND	ND	NA	ND	ND	ND	NE	NE	NE	
sec-Butylbenzene	2.49	ND	ND	NA	ND	ND	ND	70	25	NE	
Xylene (Total)	195	ND	ND	NA	ND	ND	ND	130	45	45	
Polycyclic Aromatic Hydrocarbons (PAHs)											
Acenaphthene	NA	0.202	NA	7.50	NA	ND	ND	5,260	1,200	50	
Acenaphthylene	NA	ND	NA	0.264	NA	ND	ND	NE	NE	NE	
Anthracene	NA	0.687	NA	19.0	NA	ND	ND	45,400	7,880	942	
Benzo(a)anthracene	NA	2.81	NA	40.7	NA	ND	ND	BaP Eq	BaP Eq	BaP Eq	
Benzo(a)pyrene	NA	3.51	NA	49.3	NA	0.162	ND	BaP Eq	BaP Eq	BaP Eq	
Benzo(b)fluoranthene	NA	1.26	NA	15.3	NA	ND	ND	BaP Eq	BaP Eq	BaP Eq	
Benzo(g,h,i)perylene	NA	2.66	NA	35.9	NA	0.117	ND	NE	NE	NE	
Benzo(k)fluoranthene	NA	1.71	NA	22.7	NA	ND	ND	BaP Eq	BaP Eq	BaP Eq	
Chrysene	NA	2.77	NA	40.5	NA	0.126	ND	BaP Eq	BaP Eq	BaP Eq	
Dibenz(a,h)anthracene	NA	0.492	NA	6.75	NA	ND	ND	BaP Eq	BaP Eq	BaP Eq	
Fluoranthene	NA	4.78	NA	92.2	NA	0.210	ND	6800	1080	295	
Fluorene	NA	0.192	NA	6.77	NA	ND	ND	4,120	850	47	
Indeno(1,2,3-cd)pyrene	NA	1.46	NA	19.7	NA	ND	ND	BaP Eq	BaP Eq	BaP Eq	
2-Methylnaphthalene	NA	ND	NA	1.51	NA	ND	ND	369	100	NE	
Naphthalene	NA	ND	NA	2.73	NA	ND	ND	28	10	7.5	
Phenanthrene	NA	2.28	NA	65.6	NA	ND	ND	NE	NE	NE	
Pyrene	NA	4.24	NA	77.6	NA	0.191	ND	5800	890	272	
BaP Equivalent	NA	4.538	NA	11.334	NA	0.163	ND	3	2	10.2	
Polychlorinated Biphenyls (PCBs)											
PCB 1242	NA	NA	NA	0.337	NA	NA	NA	NE	NE	NE	
PCB 1254	NA	NA	NA	0.389	NA	NA	NA	NE	NE	NE	
Total reported PCBs	NA	NA	NA	0.726	NA	NA	NA	8	1.2	2.1	
Metals											
Arsenic, Total	NA	ND	NA	ND	NA	5.67	ND	20	9	15.1	
Barium, Total	NA	50.1	NA	501	NA	80.3	110	18,000	1,100	842	
Chromium, Total d	NA	10.4	NA	20.7	NA	15.3	33.2	650	87	18	
Lead, Total	NA	4.98	NA	134	NA	55.4	3.58	700	300	525	
Mercury, Total	NA	ND	NA	0.0782	NA	ND	0.0310	1.5	0.5	1.6	

Notes:

Only Compounds Detected are Listed, refer to analytical report for complete results.
 All samples were analyzed at TestAmerica in Cedar Falls, IA
 All results reported in milligrams per kilogram mg/kg dry weight
 NA - Not Analyzed
 ND - Not Detected
 NE - Not Established
 Ind - Industrial
 Res - Residential
 SRV - Soil Reference Value
 SLV - Soil Leaching Value

Red Highlight - Above Ind SRV
Orange Highlight - Above SRV
Green Highlight - Above SLV
Yellow Highlight - Above MPCA Unregulated Fill Criteria
Bold type indicates detected laboratory result

Table 3
Summary of Groundwater Sample Analytical Results
Garceau Hardware, Vadnais Heights, Minnesota
AET Project No. 03-05497

Sample ID	SB-1	SB-2	SB-4	MDH Health Risk Limits
Date Sample Collected	3/12/15	3/12/15	3/12/15	
Screened Interval (ft)	13'-18'	12'-17'	11'-16'	
Petroleum				
Diesel Range Organics (DRO)	1350	295	330	200*
Gasoline Range Organics (GRO)	9680	ND	ND	200*
Volatile Organic Compounds (VOCs)				
1,2,4-Trimethylbenzene	478	ND	ND	100
1,3,5-Trimethylbenzene	161	ND	ND	100
Acetone	ND	10.2	ND	4,000
Benzene	2942	ND	ND	2
Chloroform	1.45	ND	ND	30
Ethylbenzene	594	ND	ND	50
Isopropylbenzene	22.0	ND	ND	300
Naphthalene	73.5	ND	ND	300
n-Butylbenzene	10.0	ND	ND	NE
n-Propylbenzene	67.8	ND	ND	NE
p-Isopropyltoluene	2.15	ND	ND	NE
Toluene	581	ND	ND	200
Total Xylenes	1690	ND	ND	300
Polycyclic Aromatic Hydrocarbons (PAHs)				
2-Methylnaphthalene	NA	ND	0.169	NE
Acenaphthene	NA	ND	0.597	400
Anthracene	NA	ND	0.495	2,000
Benzo(a)anthracene	NA	0.199	0.912	NE
Benzo(a)pyrene	NA	0.273	0.644	0.06*
Benzo(b)fluoranthene	NA	0.279	1.21	NE
Benzo(g,h,i)perylene	NA	0.162	0.553	NE
Benzo(k)fluoranthene	NA	0.104	0.467	NE
Chrysene	NA	0.244	1.05	NE
Dibenz(a,h)anthracene	NA	ND	0.173	NE
Fluoranthene	NA	0.350	2.13	300
Fluorene	NA	<0.101	0.437	300
Indeno(1,2,3-cd)pyrene	NA	0.123	0.462	NE
Naphthalene	NA	ND	0.469	70
Phenanthrene	NA	0.162	1.37	NE
Pyrene	NA	0.427	1.86	200
BaP Equivalent	NA	0.205	1.26	0.06*
Metals				
Arsenic, Dissolved	NA	14.7	12.0	10 **
Barium, Dissolved	NA	125	184	2000
Lead, Dissolved	NA	8.62	0.821	15

Notes:

Only Compounds Detected are Listed, refer to analytical report for complete results.

All samples were analyzed at TestAmerica in Cedar Falls, IA

All results in micrograms per liter (ug/L)

* - Value represents MDH Health Based Value

** - Value represents EPA Maximum Contaminant Levels

MDH - Minnesota Department of Health

ND - Not Detected

NA - Not Analyzed

NE - Not Established

Red Highlight - Above MDH Health Risk Limits

Orange Highlight - Above MDH Health Based Values

Bold type indicates detected laboratory result

Table 4
Summary of Soil Gas Vapor Sample Analytical Results
Garceau Hardware, Vadnais Heights, Minnesota
AET Project No. 03-05497

Sample ID	SV-1	SV-2	SV-3	Reporting Limit µg/m3	Res ISV	Res ISV 10X
Date Sample Collected	3/12/15	3/12/15	3/12/15			
Screened Interval (ft)	4'-6'	4'-6'	4'-6'			
PID (ppm)	270	3.2	0.5			
Volatile Organic Compounds (VOCs)						
1,2,4-Trimethylbenzene	1800	ND	ND	0.98	7	70
2-Butanone (MEK)	ND	1.5	1.6	1.5	5,000	50,000
Acetone	ND	13	ND	12	31,000	310,000
Benzene	8100	ND	ND	0.64	4.5	45
Carbon disulfide	ND	ND	3.3	1.6	700	7,000
Chloroform	ND	1.3	ND	0.98	100	1,000
Cyclohexane	66000	ND	ND	0.69	6,000	60,000
Dichlorofluoromethane	ND	27	4.4	2.5	200	2,000
m&p-Xylene	8100	ND	ND	2.2	100.00	1,000
Methylene chloride	ND	2.8	ND	1.7	20	200
n-Heptane	41000	1.2	1.2	0.82	NE	NE
n-Hexane	100000	2.2	2.9	0.70	2,000	20,000
Tetrachloroethene	ND	14	17	1.4	20	200
Toluene	ND	3.2	0.98	0.75	5,000	50,000
Trichlorofluoromethane	ND	1.2	1.8	1.1	700	7,000
Xylene, o-	3000	ND	ND	0.87	100	1,000

Notes:

Only Compounds Detected are Listed, refer to analytical report for complete results.

All samples were analyzed at TestAmerica in Cedar Falls, IA

All results in micrograms per cubic meter (ug/m3)

Res ISV - Residential Intrusion Screening Value

PID - Photoionization Detector

ppm - Parts Per Million

ND - Not Detected

NA - Not Analyzed

NE - Not Established

Red Highlight - Above Residential ISV 10X

Bold type indicates detected laboratory result