

## MEMORANDUM

**DATE:** April 7, 2015

**TO:** Don Whitehead  
BNBuilders

**FROM:** Angie Goodwin, LHG and Roy Jensen, LHG

**RE:** **Summary of Groundwater Sampling and Analysis Results**  
400 Dexter Avenue  
Seattle, Washington  
19028-00

**CC:** Jeff Graves, Alexandria Real Estate Equities, Inc.

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This memorandum summarizes the groundwater sampling and analysis conducted at the 400 Dexter Avenue project site in Seattle, Washington. BNBuilders is submitting a dewatering plan, which requires water quality analysis; therefore, BNBuilders requested Hart Crowser to sampled the one monitoring well (HC-3) that is located at the project site. A summary of groundwater sampling procedures and results are described below.

Monitoring well HC-3 was installed and developed on March 28 and 29, 2014, respectively. During drilling of HC-3, we observed 2 feet of fill over stiff to hard silt to about 9 feet below ground surface (bgs). Below about 9 feet, very dense, very silty sand and sandy silt with occasional sand and gravel to about 44 feet bgs was observed. Below 44 feet, silt with iron-oxide layers to about 54 feet bgs was observed; this layer was underlain by very dense silty sand and sand to the bottom of the boring at 71.5 feet bgs.

The well was screened in the very silty sand and sandy silt unit, from 35 to 45 feet bgs. During development, the well purged dry after 2 casing volumes and was believed to recharge very slowly. Due to the limited water available, only pH was measured prior to groundwater being sampled on March 31, 2015. Depth to groundwater at well HC-3 was measured at 33.10 feet below top of well casing and pH was measured to be 7.18. Groundwater was sampled from the middle of the well screen at a low-flow rate. Groundwater was collected and analyzed for diesel-, heavy oil-, and gasoline-range petroleum hydrocarbons; volatile organic compounds (VOCs); and total metals (arsenic, cadmium, chromium, lead, and mercury).



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The groundwater sample analytical results reported “not detected” for petroleum hydrocarbons, VOCs, arsenic, cadmium, chromium, and mercury. The groundwater sample reported a low-concentration of lead at 0.003 mg/L, which is below the MTCA Method A cleanup level of 0.015 mg/L. The laboratory report is attached at the end of this memorandum.

**Attachments:**

Advanced Analytical Laboratory Report

L:\Notebooks\1902800\_400 Dexter Geotech\Deliverables In-Basket\GW Result Memo.docx

April 06, 2015

*Angie Goodwin  
Hart Crowser, Inc.  
1700 Westlake Avenue North, Suite 200  
Seattle, WA 98109*

Dear Ms. Goodwin:

Please find enclosed the analytical data report for the *400 Dexter, 19028-00 (B50331-3)* Project.

Samples were received on *April 06, 2015*. The results of the analyses are presented in the attached tables. Applicable reporting limits, QA/QC data and data qualifiers are included. A copy of the chain-of-custody and an invoice for the work is also enclosed.

ADVANCED ANALYTICAL LABORATORY appreciates the opportunity to provide analytical services for this project. Should there be any questions regarding this report, please contact me at (425) 497-0110.

It was a pleasure working with you, and we are looking forward to the next opportunity to work together.

Sincerely,



Val G. Ivanov, Ph.D.  
Laboratory Manager



AAL Job Number: B50331-3  
Client: Hart Crowser, Inc.  
Project Manager: Angie Goodwin  
Client Project Name: 400 Dexter  
Client Project Number: 19028-00  
Date received: 03/31/15

AAL Job Number: B50331-3  
Client: Hart Crowser, Inc.  
Project Manager: Angie Goodwin  
Client Project Name: 400 Dexter  
Client Project Number: 19028-00  
Date received: 03/31/15

Analytical Results		MS	MSD	RPD			
8260B, µg/L	MTH BLK	LCS	HC-3	HC-3	HC-3	HC-3	
Matrix	Water	Water	Water	Water	Water	Water	
Date analyzed	Reporting Limits	04/02/15	04/02/15	04/02/15	04/02/15	04/02/15	
MTBE	5.0	nd		nd			
Chloromethane	1.0	nd		nd			
Vinyl chloride(*)	0.2	nd		nd			
Bromomethane	1.0	nd		nd			
Chloroethane	1.0	nd		nd			
Trichlorofluoromethane	1.0	nd		nd			
1,1-Dichloroethene	1.0	nd		nd			
Methylene chloride	1.0	nd		nd			
trans-1,2-Dichloroethene	1.0	nd		nd			
1,1-Dichloroethane	1.0	nd		nd			
2,2-Dichloropropane	1.0	nd		nd			
cis-1,2-Dichloroethene	1.0	nd		nd			
Chloroform	1.0	nd		nd			
1,1,1-Trichloroethane	1.0	nd		nd			
Carbontetrachloride	1.0	nd		nd			
1,1-Dichloropropene	1.0	nd		nd			
Benzene	1.0	nd	107%	nd	101%	111%	9%
1,2-Dichloroethane(EDC)	1.0	nd		nd			
Trichloroethene	1.0	nd	114%	nd	100%	107%	7%
1,2-Dichloropropane	1.0	nd		nd			
Dibromomethane	1.0	nd		nd			
Bromodichloromethane	1.0	nd		nd			
cis-1,3-Dichloropropene	1.0	nd		nd			
Toluene	1.0	nd	95%	nd	93%	89%	4%
trans-1,3-Dichloropropene	1.0	nd		nd			
1,1,2-Trichloroethane	1.0	nd		nd			
Tetrachloroethene	1.0	nd		nd			
1,3-Dichloropropane	1.0	nd		nd			
Dibromochloromethane	1.0	nd		nd			
1,2-Dibromoethane (EDB)*	0.01	nd		nd			
Chlorobenzene	1.0	nd	117%	nd	108%	109%	1%
1,1,1,2-Tetrachloroethane	1.0	nd		nd			
Ethylbenzene	1.0	nd		nd			
Xylenes	1.0	nd		nd			
Styrene	1.0	nd		nd			
Bromoform	1.0	nd		nd			
Isopropylbenzene	1.0	nd		nd			
1,2,3-Trichloropropane	1.0	nd		nd			
Bromobenzene	1.0	nd		nd			
1,1,2,2-Tetrachloroethane	1.0	nd		nd			
n-Propylbenzene	1.0	nd		nd			
2-Chlorotoluene	1.0	nd		nd			
4-Chlorotoluene	1.0	nd		nd			
1,3,5-Trimethylbenzene	1.0	nd		nd			
tert-Butylbenzene	1.0	nd		nd			
1,2,4-Trimethylbenzene	1.0	nd		nd			
sec-Butylbenzene	1.0	nd		nd			

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Analytical Results		MS	MSD	RPD
8260B, µg/L	MTH BLK	LCS	HC-3	HC-3
Matrix	Water	Water	Water	Water
Date analyzed	Reporting Limits	04/02/15	04/02/15	04/02/15
MTBE	5.0	nd	nd	
1,3-Dichlorobenzene	1.0	nd	nd	
Isopropyltoluene	1.0	nd	nd	
1,4-Dichlorobenzene	1.0	nd	nd	
1,2-Dichlorobenzene	1.0	nd	nd	
n-Butylbenzene	1.0	nd	nd	
1,2-Dibromo-3-Chloropropane	1.0	nd	nd	
1,2,4-Trichlorobenzene	1.0	nd	nd	
Naphthalene	1.0	nd	nd	
1,2,3-Trichlorobenzene	1.0	nd	nd	
*-instrument detection limits				
Surrogate recoveries				
Dibromofluoromethane		130%	127%	124%
Toluene-d8		109%	103%	101%
1,2-Dichloroethane-d4		73%	76%	74%
4-Bromofluorobenzene		105%	98%	95%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits  
Acceptable Recovery limits: 70% TO 130%  
Acceptable RPD limit: 30%

AAL Job Number: B50331-3  
 Client: Hart Crowser, Inc.  
 Project Manager: Angie Goodwin  
 Client Project Name: 400 Dexter  
 Client Project Number: 19028-00  
 Date received: 03/31/15

Analytical Results		Dupl		
NWTPH-Dx, mg/L		MTH BLK	HC-3	HC-3
Matrix	Water	Water	Water	Water
Date extracted	Reporting	03/31/15	03/31/15	03/31/15
Date analyzed	Limits	03/31/15	03/31/15	03/31/15
Kerosene/Jet fuel	0.20	nd	nd	nd
Diesel/Fuel oil	0.20	nd	nd	nd
Heavy oil	0.50	nd	nd	nd

Surrogate recoveries:

Fluorobiphenyl	104%	108%	107%
o-Terphenyl	92%	95%	95%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

na - not analyzed

Acceptable Recovery limits: 70% TO 130%

Acceptable RPD limit: 30%

AAL Job Number: B50331-3  
 Client: Hart Crowser, Inc.  
 Project Manager: Angie Goodwin  
 Client Project Name: 400 Dexter  
 Client Project Number: 19028-00  
 Date received: 03/31/15

Analytical Results		Dupl		
NWTPH-Gx		MTH BLK	HC-3	HC-3
Matrix	Water	Water	Water	Water
Date analyzed	Reporting Limits	04/01/15	04/01/15	04/01/15

NWTPH-Gx, mg/L				
Mineral spirits/Stoddard	0.10	nd	nd	nd
Gasoline	0.10	nd	nd	nd

Surrogate recoveries:				
Trifluorotoluene		104%	108%	107%
Bromofluorobenzene		92%	95%	95%

Data Qualifiers and Analytical Comments  
 nd - not detected at listed reporting limits  
 na - not analyzed  
 C - coelution with sample peaks  
 Acceptable Recovery limits: 70% TO 130%  
 Acceptable RPD limit: 30%

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 Project Manager: Angie Goodwin  
 Client Project Name: 400 Dexter  
 Client Project Number: 19028-00  
 Date received: 03/31/15

Analytical Results		Dupl			MS	
Metals Total (7010/7470A), mg/l		MTH BLK	LCS	HC-3	HC-3	HC-3
Matrix	Water	Water	Water	Water	Water	Water
Date extracted	Reporting	04/01/15	04/01/15	04/01/15	04/01/15	04/01/15
Date analyzed	Limits	04/01/15	04/01/15	04/01/15	04/01/15	04/01/15
Lead (Pb)	0.002	nd	93%	0.003	0.003	102%
Chromium (Cr)	0.01	nd	92%	nd	nd	121%
Cadmium (Cd)	0.005	nd	99%	nd	nd	103%
Arsenic (As)	0.005	nd	92%	nd	nd	87%
Mercury (Hg) (7470A)	0.0005	nd	94%	nd	nd	88%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits  
 na - not analyzed  
 Acceptable Recovery limits: 65% TO 135%  
 Acceptable RPD limit: 30%