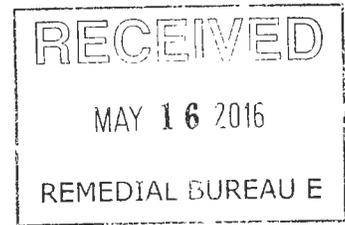




COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
1194 PROSPECT AVENUE
WESTBURY, NEW YORK 11590-2723



May 13, 2016

Benjamin Rung, P.E., Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Hazardous Site Control
625 Broadway
Albany, New York 12233

Re: Firemen's Training Center (Site #1-30-042)
Post Termination Monitoring Program Sampling Results – Spring 2016

Dear Mr. Rung:

The Nassau County Department of Public Works has completed the Spring 2016 Semi-Annual Post Termination Monitoring round at the Nassau County Fire Service Academy (A.K.A. Firemen's Training Center) site. This program replaces the original termination monitoring program stipulated in the approved 1994 Remediation Monitoring Program for this site. The Post Termination Monitoring results for the revised group of offsite monitoring wells have been included herewith for your review.

The twelve (12) offsite PTM wells selected for sampling in the revised post-termination monitoring program have been divided into two (2) groups for review. The first group has been designated as the ***FTC Core Wells***; and, it includes those monitoring wells (BP-2B, BP-4B, BP-12B, C) which are adjacent to and directly downgradient of the Nassau County Fire Service Academy (see map).

The second group has been designated the ***Eastern Plume wells***; and, these wells (MW-7Br, EW-14D, BP-3B,C, BP-15B,C, BP-10B,C) represent those wells which appear to have been impacted from unknown sources north and east of the original Nassau County Firemen's Training Center offsite monitoring well network and the former Offsite Recovery Well field.

Offsite Post Termination Monitoring Well Summary (FTC Core Wells)

Review of the groundwater sampling results obtained from the four (4) ***FTC Core Wells*** indicate that groundwater collected from these wells is below detectable limits (BDL) for all Volatile Organic Compounds (VOC's) tested; and, this includes the fifteen (15) volatile organic compounds designated for monitoring in the original Remediation Monitoring Plan (RMP) developed for the site in 1994.

Benjamin Rung, P.E., Project Manager
New York State Department of Environmental Conservation
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Re: Firemen's Training Center (Site #1-30-042)
Post Termination Monitoring Program Sampling Results – April 2016

Post Termination Monitoring Well Summary (Eastern Plume Wells)

Review of the volatile organic compound results obtained from the group of *Eastern Plume Wells* (see map) indicates that all eight (8) wells have been impacted by varying concentrations of volatile organic compounds. The highest concentration of volatile organic compounds is found in monitoring well BP-3B where a total of 310 ppb was measured. The lowest total volatile organic concentration was detected in monitoring well BP-10C where a total volatile organic compound concentration of 13 ppb was recorded. Please note Tert – Butyl Alcohol (TBA) was detected in monitoring wells BP-15B (24 ppb), BP-15C (25 ppb) and BP-10C at a concentration of 13 ppb.

The individual volatile organic compounds with the highest concentrations were Tetrachloroethylene (130 ppb/BP-3B), Trichloroethylene (150 ppb/EW-14D) and Cis-1, 2 Dichloroethylene (110 ppb/BP-3B). The highest concentration and widest variety of compounds were detected in the “B” Hydrogeologic zone (-80 to -140 ft. below msl). A significantly lower number of compounds at lower concentration are found in the “C” Hydrogeologic zone (-180 to -240 ft. below msl).

MW-11A/B cluster

In an attempt to identify potential sources of TBA, which was first detected and reported to be in Nassau County monitoring wells in May 2014, the county requested and received additional groundwater monitoring results from the Town of Oyster Bay. Review of these results indicate that both MW-11A and MW-11B have been impacted by volatile organic compounds (see attached table).

Total volatile organic concentrations as high as 56 ppb have been detected in MW-11A and 4 ppb in MW-11B. These detections are significant because it widens the extent of the eastern plume slightly, more importantly it “thickens” the plume by detecting the presence of VOC's 100 ft. higher in this portion of the B-Zone (Upper Magothy Aquifer). Both monitoring wells are screened above a dense grey lignitic clay in zones which are comparable with Farmingdale Village Supply Wells N-11004 and N-6644.

Pumping Effects

Following the detection of VOC contamination in TOBAY monitoring well MW-11A, Nassau County DPW looked for a county-owned monitoring well which was screened in a similar portion of the upper B-Zone and selected BP-9i for the installation of a remote datalogger to continuously measure changes in water elevation. Measurements were obtained during periods of high summer / fall usage and plotted to create a hydrograph for September 2015 (see attached). Review of the graph reveals two distinct periods of drawdown with secondary periods of cyclic pumpage creating a characteristic “saw tooth” pattern.

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New York State Department of Environmental Conservation
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Re: Firemen's Training Center (Site #1-30-042)
Post Termination Monitoring Program Sampling Results – April 2016

A datalogger had previously been installed in county-owned monitoring well BP-10B, which has also been impacted by VOC's and is screened in a deeper portion of the B-Zone which is comparable with TOBAY monitoring well MW-11B. A hydrograph (see attached) was also prepared for September 2015 with very similar results.

Summary

The spring 2016 PTM results indicate that the "Eastern Plume" of volatile organics is still present, it has expanded slightly to the southeast and has been determined to be present at elevations higher in the Upper Magothy Aquifer than previously observed. VOC's are present in the screen zones of monitoring wells which have elevations comparable to Village of Farmingdale Supply Wells N-6644, N-11004 and N-7852. Pumping effects have been observed during periods of high stress in some of these monitoring wells and in wells of similar construction.

If you require any additional information regarding this data, please contact Mr. Michael Flaherty, Hydrogeologist III at (516) 571-7514.

Very truly yours,



Shila Shah-Gavnoudias, P.E.
Commissioner of Public Works

SSG:KGA:JLD:rp
Attachment

c: Hon. Ralph Ekstrand, Mayor, Inc. Village of Farmingdale
Kenneth G. Arnold, Assistant to Commissioner of Public Works
Jane M. Houdek, Attorney for Public Works
Joseph L. Davenport, Unit Head, Water/Wastewater Engineering Unit
Joseph Defranco, Chief, Office of Soil and Groundwater Remediation, NCDH
Brian J. Schneider, Assistant to Deputy Commissioner for Administration
Michael Flaherty, Hydrogeologist III
Richard T. Betz, Commissioner, Town of Oyster Bay
Walter J. Parish, P.E., Regional Hazardous Waste Engineer, NYSDEC
Guy Bobersky, P.E., Section Chief, Remedial Bureau, NYSDEC
Tara Rutland, P.E., Environmental Engineer, NYSDEC
Bart Putzig, P.E. Chief Remedial Section C, NYSDEC
Michael Cruden, P.E., Director, Remedial Bureau E,
Division of Environmental Remediation, NYSDEC
Carrie M. Gallagher, Regional Director, NYSDEC

FIREMAN'S TRAINING CENTER
SEMI-ANNUAL PTM (revised) SAMPLING RESULTS FOR 2016 (FTC Core Wells)

VOLATILE ORGANIC COMPOUNDS (ppb)

	WELL BP-2B		WELL BP-4B		WELL BP-12B		WELL BP-12C	
	DATE SAMPLED		DATE SAMPLED		DATE SAMPLED		DATE SAMPLED	
	4/14/16		4/6/16		3/30/16		3/30/16	
1,1,1,2-Tetrachloroethane	BDL		BDL		BDL		BDL	
1,1,1-Trichloroethane	BDL		BDL		BDL		BDL	
1,1,2-Trichloro-1,1,2-trifluoroethane	BDL		BDL		BDL		BDL	
1,1,2-Trichloroethane	BDL		BDL		BDL		BDL	
1,1-Dichloroethane	BDL		BDL		BDL		BDL	
1,1-Dichloroethene	BDL		BDL		BDL		BDL	
1,2,3-Trichlorobenzene	BDL		BDL		BDL		BDL	
1,2,3-Trichloropropane	BDL		BDL		BDL		BDL	
1,2,4,5-Tetramethylbenzene	BDL		BDL		BDL		BDL	
1,2,4-Trimethylbenzene	BDL		BDL		BDL		BDL	
1,2-Dichlorobenzene	BDL		BDL		BDL		BDL	
1,2-Dichloroethane	BDL		BDL		BDL		BDL	
1,2-T-Dichloroethene	BDL		BDL		BDL		BDL	
1,3,5-Trimethylbenzene	BDL		BDL		BDL		BDL	
1,3-Dichlorobenzene	BDL		BDL		BDL		BDL	
1,4-Dichlorobenzene	BDL		BDL		BDL		BDL	
Acetone	BDL		BDL		BDL		BDL	
Benzene	BDL		BDL		BDL		BDL	
Bromochloromethane	BDL		BDL		BDL		BDL	
Carbon Tetrachloride	BDL		BDL		BDL		BDL	
Chlorobenzene	BDL		BDL		BDL		BDL	
Chlorodifluoromethane	BDL		BDL		BDL		BDL	
Chloroform	BDL		BDL		BDL		BDL	
Chloromethane	BDL		BDL		BDL		BDL	
cis-1,2-Dichloroethylene	BDL		BDL		BDL		BDL	
Dichlorodifluoromethane	BDL		BDL		BDL		BDL	
Ethyl Benzene	BDL		BDL		BDL		BDL	
2 - Hexanone	BDL		BDL		BDL		BDL	
Isopropylbenzene	BDL		BDL		BDL		BDL	
m,p-Xylene	BDL		BDL		BDL		BDL	
Methyl t-Butylether (MTBE)	BDL		BDL		BDL		BDL	
Methylene Chloride	BDL		BDL		BDL		BDL	
Methyl Ethyl Ketone	BDL		BDL		BDL		BDL	
Naphthalene	BDL		BDL		BDL		BDL	
n-Butyl Benzene	BDL		BDL		BDL		BDL	
n-Propylbenzene	BDL		BDL		BDL		BDL	
o-Xylene	BDL		BDL		BDL		BDL	
p-Ethyltoluene	BDL		BDL		BDL		BDL	
p-Isopropyltoluene	BDL		BDL		BDL		BDL	
sec-Butyl Benzene	BDL		BDL		BDL		BDL	
t-1,2 Dichloroethene	BDL		BDL		BDL		BDL	
tert-Butyl Alcohol	BDL		BDL		BDL		BDL	
tert-Butyl Benzene	BDL		BDL		BDL		BDL	
Tetrachloroethylene	BDL		BDL		BDL		BDL	
Toluene	BDL		BDL		BDL		BDL	
Trichlorodifluoromethane	BDL		BDL		BDL		BDL	
Trichloroethylene	BDL		BDL		BDL		BDL	
Vinyl Chloride	BDL		BDL		BDL		BDL	
TVOC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

BDL - Below detection limits

B - Analyte detected in associated Method Blank

All results in pp

- FTC / RMP compound

FIREMAN'S TRAINING CENTER
SEMI-ANNUAL PTM (revised) SAMPLING RESULTS FOR 2016 (*Eastern Plume Wells*)

VOLATILE ORGANIC COMPOUNDS (ppb)

	WELL MW-7Br		WELL EW-14D		WELL BP-3B		WELL BP-3C		WELL BP-15B		WELL BP-15C		WELL BP-10B		WELL BP-10C	
	DATE SAMPLED		DATE SAMPLED		DATE SAMPLED		DATE SAMPLED		DATE SAMPLED		DATE SAMPLED		DATE SAMPLED		DATE SAMPLED	
	2/29/16		3/26/16		3/14/16		3/14/16		3/22/16		3/22/16		3/24/16		3/24/16	
1,1,1,2-Tetrachloroethane	BDL															
1,1,1-Trichloroethane	BDL		15		BDL											
1,1,2-Trichloro-1,1,2-trifluoroethane	BDL		0.89		BDL											
1,1,2-Trichloroethane	BDL		0.31		BDL											
1,1-Dichloroethane	BDL		3.8		16		BDL		20.0		BDL		9.3		BDL	
1,1-Dichloroethene	1		14.0		BDL											
1,2,3-Trichlorobenzene	BDL															
1,2,3-Trichloropropane	BDL															
1,2,4,5-Tetramethylbenzene	BDL															
1,2,4-Trimethylbenzene	BDL															
1,2-Dichlorobenzene	BDL															
1,2-Dichloroethane	BDL															
1,2-T-Dichloroethene	BDL															
1,3,5-Trimethylbenzene	BDL															
1,3-Dichlorobenzene	BDL															
1,4-Dichlorobenzene	BDL		BDL		31.0		26.0		BDL		BDL		BDL		BDL	
Acetone	BDL		22		BDL											
Benzene	BDL		BDL		BDL		BDL		5.4		BDL		BDL		BDL	
Bromochloromethane	BDL															
Carbon Tetrachloride	BDL															
Chlorobenzene	BDL															
Chlorodifluoromethane	BDL															
Chloroform	BDL		0.69		BDL											
Chloromethane	BDL															
cis-1,2-Dichloroethylene	18.9		1.1		110		87.0		35.0		7.4		25		BDL	
Dichlorodifluoromethane	BDL		BDL		9.0		7.0		11.0		BDL		BDL		BDL	
Ethyl Benzene	BDL															
2 - Hexanone	BDL															
Isopropylbenzene	BDL															
m,p-Xylene	BDL															
Methyl t-Butylether (MTBE)	BDL															
Methylene Chloride	BDL															
Methyl Ethyl Ketone	BDL															
Naphthalene	BDL															
n-Butyl Benzene	BDL															
n-Propylbenzene	BDL															
o-Xylene	BDL															
p-Ethyltoluene	BDL															
p-Isopropyltoluene	BDL															
sec-Butyl Benzene	BDL															
1,1,2 Dichloroethene	BDL															
tert-Butyl Alcohol	BDL		BDL		BDL		BDL		24.0		25.0		BDL		13.0	
tert-Butyl Benzene	BDL															
Tetrachloroethylene	4.3		2.5		130		BDL		14		BDL		BDL		BDL	
Toluene	BDL															
Trichlorodifluoromethane	BDL															
Trichloroethylene	140		150		14.0		BDL		7.0		BDL		6.5		BDL	
Vinyl Chloride	BDL		BDL		BDL		BDL		7.1		BDL		BDL		BDL	
TVOC	164.2	0.0	210.3	0.0	310.0	0.0	120.0	0.0	123.5	0.0	32.4	0.0	40.8	0.0	13.0	0.0

BDL - Below detection limits

B - Analyte detected in associated Method Blank

All results in ppb

- FTC / RMP compound

**FIREMAN'S TRAINING CENTER
SAMPLING RESULTS FOR MW - 11A / MW-11B 2014 - 2016
VOLATILE ORGANIC COMPOUNDS (ppb)**

	MW - 11A						MW - 11B					
	5/22/14	8/21/14	12/4/14	4/13/15	10/16/15	3/1/16	5/22/14	8/22/14	12/4/14	4/13/15	10/16/15	3/1/16
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	BDL	BDL	BDL	1.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,1,2-trifluoroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	2.9	BDL	2.6	4.1	.2J	2.5	BDL	BDL	BDL	.6J	BDL	BDL
1,1-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BL L	BL L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4,5-Tetramethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-T-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Acetone	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	BDL	.4J	BDL	BDL	1.1B	BDL	BDL	BDL	BDL	BDL	1.2B	BDL
Bromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethylene	27.1	BDL	33.5	34.6	13	23	BDL	BDL	BDL	2.4	BDL	.4J
Dichlorodifluoromethane	5.5	BDL	4.7	6.3	BDL	2.0	BDL	BDL	BDL	1.8	BDL	BDL
Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2 - Hexanone	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Isopropylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
m,p-Xylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl t-Butylether (MTBE)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl Ethyl Ketone	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Butyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Propylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
o-Xylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
p-Ethyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
sec-Butyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2 Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
tert-Butyl Alcohol	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
tert-Butyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene	3	BDL	3.3	4.5	BDL	.8J	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	.8J	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethylene	2.8	BDL	3.3	5.3	BDL	.6J	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl Chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TVOC	41.3	0.0	47.4	55.9	13.0	27.5	0.0	0.0	0.0	4.2	0.0	0.0

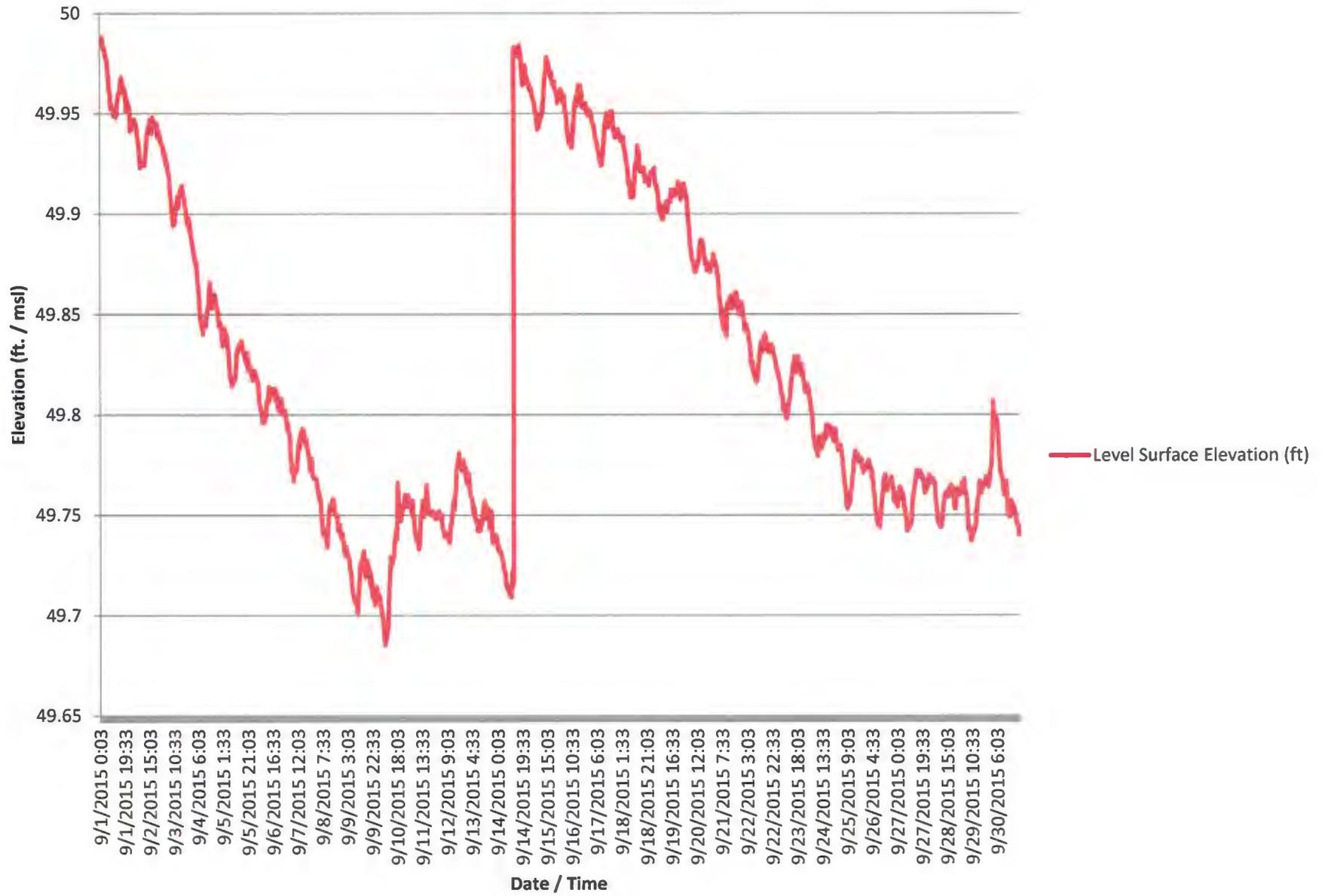
BDL - Below detection limits

B - Analyte detected in associated Method Blank

All results in ppb

- FTC / RMP compound

BP-9i September 2015



BP-10B September 2015

