INVESTIGATION SUMMARY REPORT

"BETHPAGE HIGH SCHOOL"
10 CHERRY AVENUE
BETHPAGE, NEW YORK 11714

PREPARED FOR:
BETHPAGE UNION FREE SCHOOL DISTRICT
10 CHERRY AVENUE
BETHPAGE, NEW YORK 11714

JCB PROJECT #: 17-37391
AUGUST 2017

J.C. BRODERICK & ASSOCIATES, INC.
Environmental Consulting & Testing

1775 Expressway Drive North
Hauppauge, New York 11788
631-584-5492 Fax: 631-584-3395

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Section No. 1.0: Introduction

J.C. Broderick and Associates, Inc. (JCB) was retained by the Bethpage Union Free School District to install three (3) replacement groundwater monitoring wells at Bethpage High School as a result of a significant lowering of the groundwater table.

Section No. 2.0: Site Description and Location

The subject site is located at 10 Cherry Avenue, Bethpage, New York 11714. The subject site is located on the south side of Cherry Avenue, between Stewart Avenue to the west and Broadway to the east. According to the United States Geological Survey (USGS) *Huntington, New York 1992 7.5 Minute Series* Topographical Map, the subject site is situated at an approximate elevation of 121 feet above mean sea level. The location of the subject site is shown on the Site Location Map Appendix-A Figure-1.

Section No. 3.0: Subsurface Investigation Procedures

The following sections summarizes the subsurface investigation performed. Please refer to the attachments of this document for additional details.

Section No. 3.1: Monitoring Well Installation

On August 9, 10 and 11, 2017 the three (3) groundwater monitoring wells (MW-5, MW-6, and MW-7) were installed on the west side of the school building within close proximity to the existing wells (MW-1, MW-2, and MW-3), with the use of a track-mounted Geoprobe® Model 7822 DT utilizing a 3.25 inch outside diameter probe rod methodology. The wells were constructed of ten (10) feet of two (2) inch diameter 0.020 inch slotted schedule 40 PVC screen and fifty-five (55) feet of two (2) inch diameter Schedule 40 PVC riser pipe. A sand pack consisting of Morie grit #1 was installed to one (1) foot above the top of the PVC screen. A one (1) foot thick bentonite seal was installed above the sand pack, followed by backfilling with clean sand to approximately two (2) inches below the top of the well casing. The wells were then finished to grade with a locking compression J-plug and a flush mount road box was concreted in place. Monitoring well construction diagrams are included in the attachments of this report. Subsequent to installation, the monitoring wells were properly developed by over-pumping.

On August 14, 2017, JCB checked the monitoring wells for the presence of light non-aqueous phase liquid (LNAPL) utilizing a Solinst® Model 122 Product/Water Interface Meter and depth to the groundwater table was recorded to the nearest 0.01 ft.

The following table summarizes the groundwater data:

Table No. 1:
Depth to Groundwater Gauged with Interface Meter

Well Number	Casing Elevation (ft)	Depth to Product (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)
MW-5	118.88	No Product	45.09	73.79
MW-6	119.04	No Product	42.62	76.42
MW-7	118.72	No Product	42.80	75.92

Notes:
ft = Feet

Section No. 3.2: Soil Sampling

On August 9 & 11, 2017, JCB collected three (3) soil samples at each boring location subsequent to drilling, but prior to the installation of the monitoring wells. The soil samples were collected from the groundwater interface at each boring location, from approximately 57-60 feet below surface grade (bsg).

The following table summarizes the soil samples submitted for laboratory analysis:

Table No. 2:
Summary of Soil Samples Submitted for Laboratory Analysis

Sample ID#	Date Sampled	Description of Sample	Analysis Method
B-05	08-09-17	Boring No. 5: 57'-60'	EPA 903.0, EPA 904
B-06	08-09-17	Boring No. 6: 59'-60'	EPA 903.0, EPA 904
B-07	08-11-17	Boring No. 7: 57.5'-60'	EPA 903.0, EPA 904

Notes:
EPA = Environmental Protection Agency

Section No. 3.3: Groundwater Sampling

On August 18, 2017, JCB collected three (3) groundwater samples from the new groundwater monitoring wells. The sample collection was witnessed and split samples were collected by a representative of the NYSDEC Region 2. Prior to sampling, the casing volume of each monitoring well was calculated and a minimum of three (3) casing volumes of water were purged utilizing a disposable polyethylene bailer. During the purging process, specific groundwater parameters were monitored by a YSI Multi-meter.

The following table summarizes the purged water testing.

Table No. 3:
Groundwater Monitoring During Sample Collection

MW-5	DTW (ft)	TD (ft)	Water Column (ft)		
	57.02	63.10	6.08		
Time	**Temp (°C)**	**TDS (g/l)**	**DO (%)**	**pH**	**ORP (mV)**
8:25	16.43	0.370	54.1	7.81	-70.0
8:28	16.96	0.374	59.9	7.68	-64.0
8:31	17.14	0.378	62.8	7.56	-61.1
8:34	16.67	0.382	65.2	7.49	-57.8
8:37	16.56	0.386	65.7	7.42	-53.0
8:40	Samples Collected				
MW-6	**DTW (ft)**	**TD (ft)**	**Water Column (ft)**		
	57.51	63.91	6.40		
Time	**Temp (°C)**	**TDS (g/l)**	**DO (%)**	**pH**	**ORP (mV)**

9:12	17.80	0.435	65.10	7.24	-58.7
9:15	17.49	0.423	47.50	7.31	-86.7
9:18	17.68	0.425	33.60	7.37	-99.1
9:21	18.47	0.450	18.70	7.42	-117.0
9:24	18.59	0.468	8.10	7.46	-128.3
9:27	18.07	0.483	7.00	7.49	-132.8
9:30	Samples Collected				
MW-7	**DTW (ft)**	**TD (ft)**	**Water Column (ft)**		
	57.55	62.49	4.94		
Time	**Temp (°C)**	**TDS (g/l)**	**DO (%)**	**pH**	**ORP (mV)**
10:41	18.96	0.311	65.8	7.64	-65.9
10:44	19.33	0.298	64.2	7.47	-63.3
10:47	18.30	0.313	65.7	7.38	-61.3
10:51	17.94	0.316	53.5	7.32	-53.1
10:54	18.04	0.319	63.2	7.29	-47.9
10:57	18.07	0.316	64.0	7.22	-41.7
11:00	Samples Collected				

Notes:
DTW = Depth to Groundwater Table
TD = Total Depth of Well
Temp = Temperature in degrees celceous
TDS = Total Dissolved Solids on grams per liter
DO = Dissolved Oxygen in percent
pH = Potential of Hydrogen, unitless
ORP = Oxygen-Reduction Potential in millivolts

The following table summarizes the groundwater samples submitted for laboratory analysis:

Table No. 4:
Summary of Groundwater Samples Submitted for Laboratory Analysis

Sample ID#	Date Sampled	Description of Sample	Analysis Method
MW-5	08-18-17	Monitoring Well No. 5	EPA 903.0, EPA 904
MW-6	08-18-17	Monitoring Well No. 6	EPA 903.0, EPA 904
MW-7	08-18-17	Monitoring Well No. 7	EPA 903.0, EPA 904

Notes:
EPA = Environmental Protection Agency

Section No. 4.0: Soil Laboratory Analytical Summary

Soil samples selected for laboratory analysis were placed into laboratory supplied containers, assigned individual identification numbers and then placed into an appropriately conditioned cooler. Chain of Custody documents were prepared and the samples were then delivered to an independent New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory for analysis.

Soil samples submitted for laboratory analysis were analyzed for Radium 226 utilizing Environmental Protection Agency (EPA) Method 903.0, and for Radium 228 utilizing EPA Method 904. EMSL Analytical, Inc. (EMSL) provided laboratory analytical services. Copies of EMSL's NYSDOH certifications are available upon request.

The following table summarizes the Soil Samples Analytical Results:

Table No. 5:
Summary of Soil Samples Analysis Results

Client Sample ID	Allowable Standards	B-05	B-06	B-07
EPA 903.0 & EPA 904	**pCi/g**	**8/9/2017**	**8/9/2017**	**8/11/2017**
Radium 226 (pCi/g)	N/A	0.03	0.06	0.03
Radium 228 (pCi/g)	N/A	0.09	0.13	0.06

Notes:
pCi/g = picocuries per gram
N/A = Guidance Value Not Established by the New York State Department of Environmental Conservation at the time of this report

The laboratory analysis results from the soil samples submitted from B-05, B-06, and B-07 indicated detection of Radium-226 and Radium-228. At the time of the writing of this report there are no Radium in soil guidance values established by the New York State Department of Environmental Conservation (NYSDEC).

Section No. 5.0: Groundwater Laboratory Analytical Summary

Groundwater samples selected for laboratory analysis were placed into laboratory supplied containers, assigned individual identification numbers and then placed into an appropriately conditioned cooler. Chain of Custody documents were prepared and the samples were then delivered to an independent New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory for analysis.

Groundwater samples submitted for laboratory analysis were analyzed for Radium 226 utilizing Environmental Protection Agency (EPA) Method 903.0, and for Radium 228 utilizing EPA Method 904. EMSL Analytical, Inc. (EMSL) provided laboratory analytical services. Copies of EMSL's NYSDOH certifications are available upon request

The laboratory analytical results for the groundwater samples were reviewed and compared to Table No. 1 of the *Ambient Water Quality Standards and Guidance Values of the New York State Department of Environmental Conservation, Division of Water, Technical and Operational Guidance Series (TOGS) (1.1.1).*

The review of the laboratory analysis revealed the following significant findings:

Table No. 6:
Summary of Groundwater Samples Analysis Results

Client Sample ID	Allowable Standards	MW-5	MW-6	MW-7
EPA 903.0 & EPA 904	**pCi/L**	**8/18/2017**	**8/18/2017**	**8/18/2017**
Radium 226 (pCi/g)	3.0	**9.29**	**17.31**	**15.24**
Radium 228 (pCi/g)	5.0	0.34	**6.64**	4.08

Notes:
pCi/L = picocuries per liter
N/A = Guidance Value Not Established by the New York State Department of Environmental Conservation at the time of this report

The laboratory analysis results from the groundwater samples submitted from MW-5, MW-6, and MW-7 did indicate elevated concentrations of Radium 226 exceeding the above refenced guidance values for the analytical method conducted. The laboratory analysis results from the groundwater sample submitted from MW-6 did indicate elevated concentrations of Radium 228 exceeding the above referenced guidance values for the analytical method conducted.

Section No. 6.0: Quality Assurance and Quality Control (QA/QC) Procedures

In order to prevent cross-contamination between sampling locations, all re-usable sampling equipment which came into contact with sample materials was decontaminated prior to each use. Equipment used for sample collection was wiped clean, washed in a solution of Alconox and thoroughly rinsed with potable water. All down-hole equipment which did not come into contact with sample material was pressure rinsed with potable water prior to the start of each boring. New and dedicated polyethylene tubing was used for collection of each groundwater sample. All sampling personnel wore disposable latex, nylon, or nitrile gloves during sampling events. At a minimum, gloves were changed between boring locations and before each laboratory sample was collected. All collected samples were placed into an appropriately conditioned cooler for storage and were transported to the laboratory. Samples were maintained between 0°C and 8°C.

Section No. 7.0: Conclusions and Recommendations

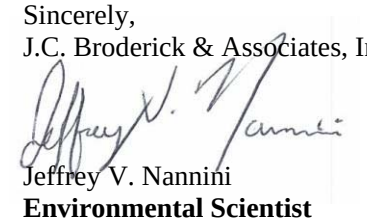
Based on the findings of the current data collected during the subsurface investigation performed and reported to JCB, the following observations are made:

The laboratory analysis results from the soil samples submitted did indicate concentrations of Radium 226 or Radium 228, although at the time of the writing of this report there are no guidance values established by the NYSDEC for these compounds.

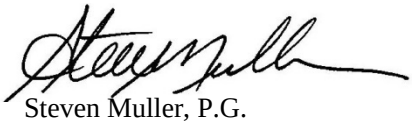
The laboratory analysis results from the groundwater samples submitted did indicate elevated concentrations of Radium 226 and Radium 228 above the NYSDEC TOGS 1.1.1 guidance values for groundwater.

It is recommended that periodic groundwater and volatile vapor intrusion sampling be continued to monitor site conditions.

Sincerely,
J.C. Broderick & Associates, Inc.

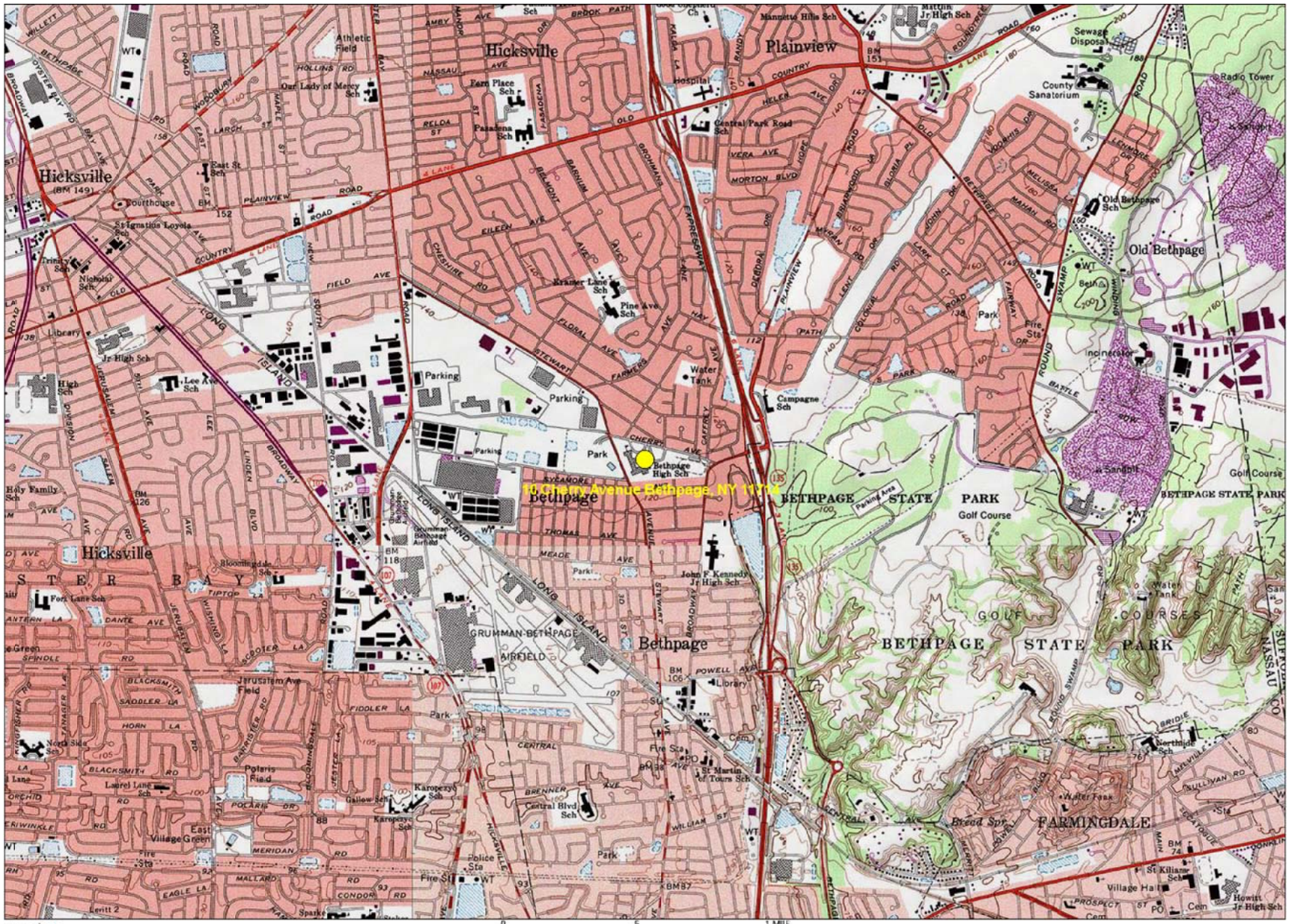


Jeffrey V. Nannini
Environmental Scientist



Steven Muller, P.G.
Director – Subsurface Division

Appendix A
Figures



JCB LEGEND

SUBJECT SITE

J.C. BRODERICK & Associates
Environmental Consulting and Testing
1775 Express Drive North
Hauppauge, NY 11788
Phone: (631).584.5492
Fax: (631).584.3395

Notes:

Bethpage High School
10 Cherry Avenue
Bethpage, NY 11714

Drawing Title

Figure No. 1

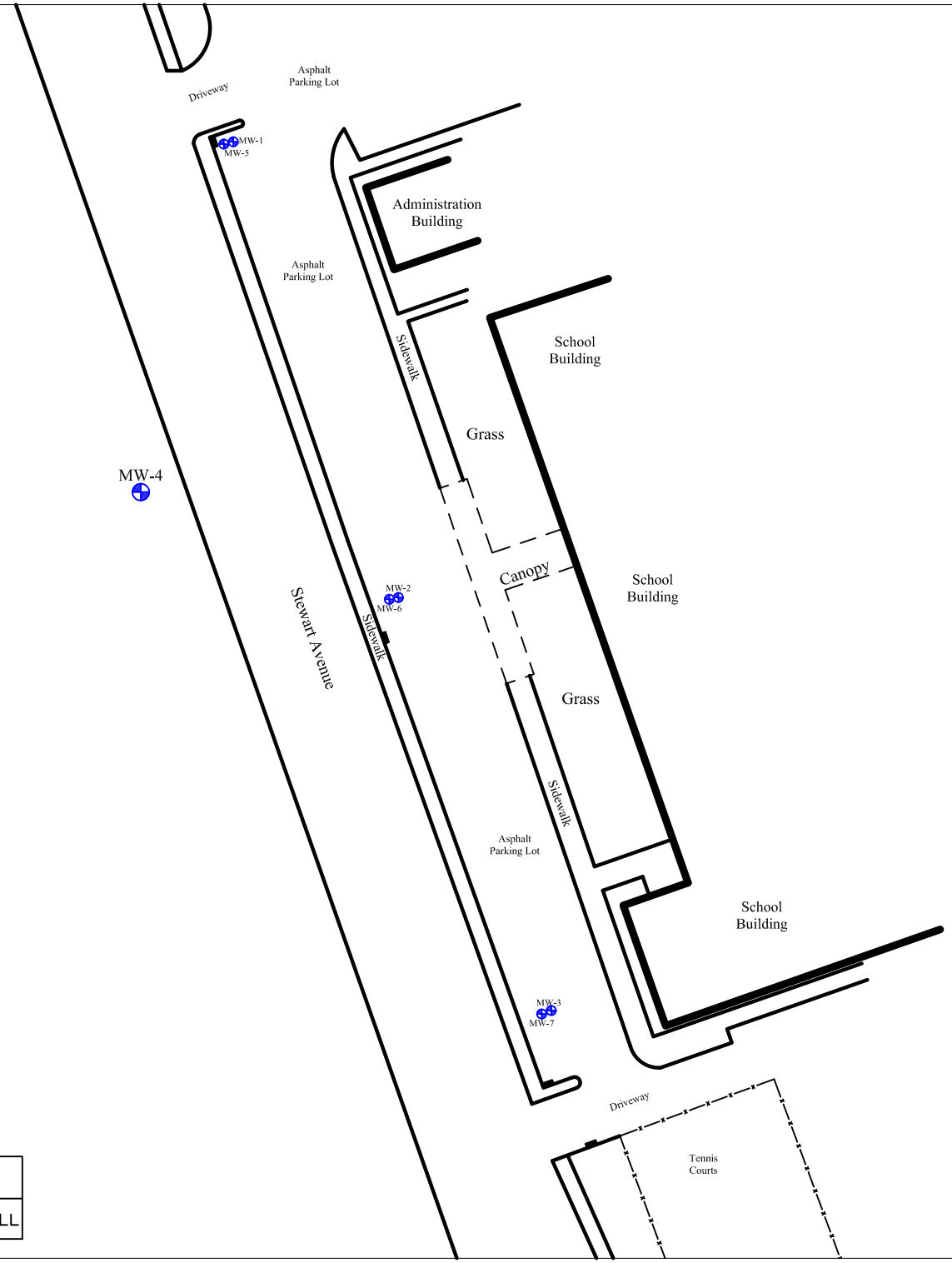
Site Location Map

Scale	Project No.	Date
As Noted	16-35984	02-24-17

Drawn By	Checked By	Page No.
J.V.N.	S.W.M.	1 of 4

Drawing No.

1



PROJECT NORTH

20 0 40 80

Scale in feet

JCB LEGEND

GROUNDWATER MONITORING WELL

J.C. BRODERICK & Associates
Environmental
Consulting and Testing
1775 Expressway Drive North
Hauppauge, NY 11788
Phone: (631).584.5492
Fax: (631).584.3395

Notes:

Bethpage High School
10 Cherry Avenue
Bethpage, NY 11714

Drawing Title

Figure No. 2

Groundwater Monitoring Well Locations Map

Scale	Project No.	Date
As Noted	15-32442	08-18-17

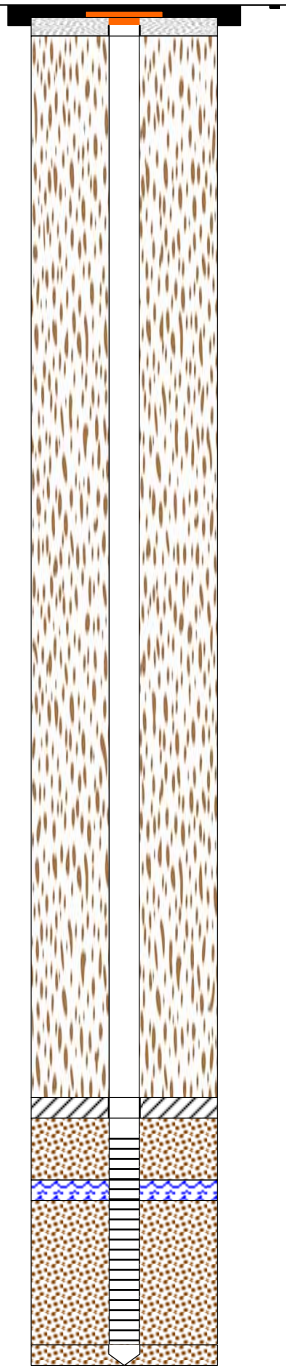
Drawn By	Checked By	Page No.
J.V.N.	S.W.M.	2 of 3

Drawing No.

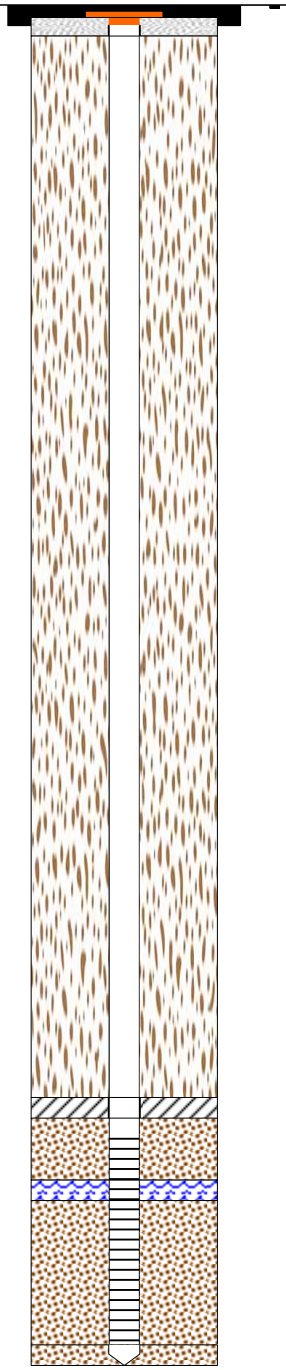
2

Appendix B
Monitoring Well Completion Logs

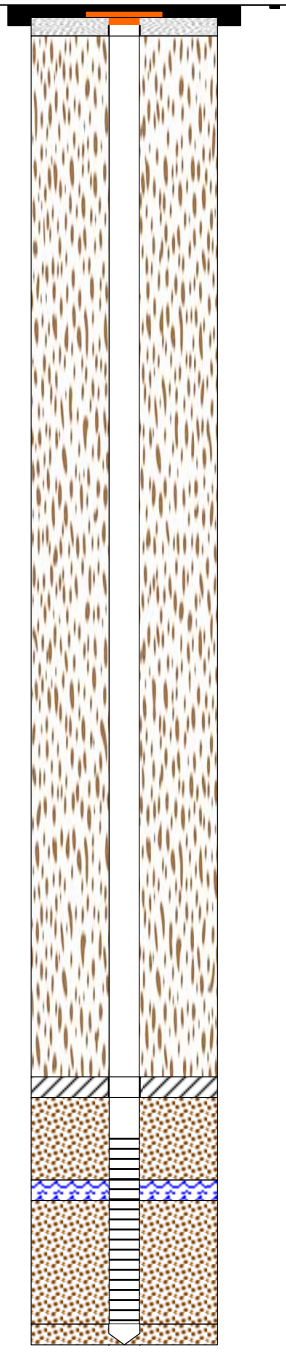
PROJECT NAME:	Bethpage HS	BORING NUMBER:	MW-5
PROJECT ADDRESS:	10 Cherry Avenue, Bethpage, NY, 11714		
DRILLING CONTRACTOR:	JC Broderick & Associates, Inc.	BORING LOCATION:	North Side of West Parking Lot
DRILLING METHOD:	3.25 inch OD Probe Rods	TOTAL DEPTH: 65 Feet bsg	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT:	Geoprobe® 7822DT	GROUND SURFACE ELEVATION: 123 Feet Above Sea Level	DATE COMPLETED: 8/9/17
SAMPLING METHOD:	DT325 Soil Sampling System	DEPTH TO GROUNDWATER: 57 Feet bsg	
HAMMER WEIGHT: N/A	DROP: N/A	RESPONSIBLE PROFESSIONAL: Jeffrey Nannini	LOGGED BY: Edward Combs

DEPTH (feet)	WELL CONSTRUCTION	WELL LOG
0.0	Traffic Rated Well Box	
4.0	Locking J-Plug	
	Concrete	
8.0		
12.0		
16.0		
20.0		
24.0	Clean Sand Backfill	
28.0		
32.0	2" diameter Schedule 40 PVC Riser	
36.0		
40.0		
44.0		
48.0		
52.0		
	Bentonite Chip Seal	
56.0	Tan/Brown Fine to Medium SAND	
	Groundwater Interface	
60.0	#1 Morie Sand Pack	
64.0	2" diameter 0.020" Slot, Schedule 40 PVC Screen	
	End Cap	
68.0		

PROJECT NAME:	Bethpage HS	BORING NUMBER:	MW-6
PROJECT ADDRESS:	10 Cherry Avenue, Bethpage, NY, 11714		
DRILLING CONTRACTOR:	JC Broderick & Associates, Inc.	BORING LOCATION:	Center of School Building
DRILLING METHOD:	3.25 inch OD Probe Rods	TOTAL DEPTH: 65 Feet bsg	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT:	Geoprobe® 7822DT	GROUND SURFACE ELEVATION: 123 Feet Above Sea Level	DATE COMPLETED: 8/10/17
SAMPLING METHOD:	DT325 Soil Sampling System	DEPTH TO GROUNDWATER: 57 Feet bsg	
HAMMER WEIGHT: N/A	DROP: N/A	RESPONSIBLE PROFESSIONAL: Jeffrey Nannini	LOGGED BY: Edward Combs

DEPTH (feet)	WELL CONSTRUCTION	WELL LOG
0.0	Traffic Rated Well Box	
4.0	Locking J-Plug	
	Concrete	
8.0		
12.0		
16.0		
20.0		
24.0	Clean Sand Backfill	
28.0		
32.0	2" diameter Schedule 40 PVC Riser	
36.0		
40.0		
44.0		
48.0		
52.0		
56.0	Bentonite Chip Seal #1 Morie Sand Pack Groundwater Interface	
60.0		
64.0	2" diameter 0.020" Slot, Schedule 40 PVC Screen	
	End Cap	
68.0		

PROJECT NAME:	Bethpage HS	BORING NUMBER:	MW-7
PROJECT ADDRESS:	10 Cherry Avenue, Bethpage, NY, 11714		
DRILLING CONTRACTOR:	JC Broderick & Associates, Inc.	BORING LOCATION:	South Side of West Parking Lot
DRILLING METHOD:	3.25 inch OD Probe Rods	TOTAL DEPTH: 64 Feet bsg	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT:	Geoprobe® 7822DT	GROUND SURFACE ELEVATION: 123 Feet Above Sea Level	DATE COMPLETED: 8/11/17
SAMPLING METHOD:	DT325 Soil Sampling System	DEPTH TO GROUNDWATER: 57 Feet bsg	
HAMMER WEIGHT: N/A	DROP: N/A	RESPONSIBLE PROFESSIONAL: Jeffrey Nannini	LOGGED BY: Edward Combs

DEPTH (feet)	WELL CONSTRUCTION	WELL LOG
0.0	Traffic Rated Well Box	
	Locking J-Plug	
4.0	Concrete	
8.0		
12.0		
16.0		
20.0		
24.0	Clean Sand Backfill	
28.0		
32.0	2" diameter Schedule 40 PVC Riser	
36.0		
40.0		
44.0		
48.0		
52.0	Bentonite Chip Seal	
	Tan/Brown Fine to Medium SAND	
56.0	#1 Morie Sand Pack	
	Groundwater Interface	
60.0	Tan Medium to Coarse SAND	
64.0	2" diameter 0.020" Slot, Schedule 40 PVC Screen	
	End Cap	
68.0		

Appendix C
Photo Log

Groundwater Monitoring Well Locations
MW-1 **MW-5**

Field Photograph Log

Investigation Summary Report

Bethpage High School
10 Cherry Avenue
Bethpage, New York 11714

Photo No. 01 **JCB#: 17-37391**

Groundwater Monitoring Well Locations
MW-2 **MW-6**

Field Photograph Log

Investigation Summary Report

Bethpage High School
10 Cherry Avenue
Bethpage, New York 11714

Photo No. 02 **JCB#: 17-37391**

Groundwater Monitoring Well Locations
MW-3 **MW-7**

Field Photograph Log

Investigation Summary Report

Bethpage High School
10 Cherry Avenue
Bethpage, New York 11714

Photo No. 03 **JCB#: 17-37391**

Typical Soil Sample at the Groundwater Interface

Field Photograph Log

Investigation Summary Report

Bethpage High School
10 Cherry Avenue
Bethpage, New York 11714

Photo No. 04

JCB#: 17-37391

Groundwater Sampling

Field Photograph Log

Investigation Summary Report

Bethpage High School
10 Cherry Avenue
Bethpage, New York 11714

Photo No. 05 **JCB#: 17-37391**

Appendix D
Laboratory Analysis Report

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800)220-3675 / (856)786-0327
http://www.emsl.com cinnaminsonradonlab@emsl.com

EMSL Order #: **781702730**
Customer ID: **JCBR50**
Customer PO:

Attn: **Steven Muller**
J.C. Broderick & Associates
1775 Expressway Drive North, Suite 1
Hauppauge, NY 11788

Phone: **631-584-5492**
Fax: **Not Available**

Project: **B-05@57'-60'**

Collected: **08/09/2017**
Received: **08/17/2017**

NELAC Certification #: ***03036***

Analytical Report

Sample Identification: B-05@57'-60' ***Lab Sample #: 781702730-0001*** ***Date/Time Collected: 8/9/2017***

Test Parameter	***Result pCi/g***	***Uncertainty pCi/g***	***MDC pCi/g***	***Start Count Date/ Time***	***Analyst***	***Status Count***	***Method***
Radium 228	*0.09*	*0.02*	*0.06*	*8/22/17 1:30 PM*	*PM*	*First Count*	*EPA 904*
Radium 226	*0.03*	*0.01*	*0.03*	*9/1/17 1:53 PM*	*PM*	*First Count*	*EPA 903.0*

* All analysis met quality control acceptance criteria unless otherwise specified.

Report Date	**Report Revision**	**Revision Comments**
09/05/2017	R0	Initial Report

Kishor Paudel, **Laboratory Manager**

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800)220-3675 / (856)786-0327
http://www.emsl.com cinnaminsonradonlab@emsl.com

EMSL Order #: **781702731**
Customer ID: **JCBR50**
Customer PO:

Attn: **Steven Muller**
J.C. Broderick & Associates
1775 Expressway Drive North, Suite 1
Hauppauge, NY 11788

Phone: **631-584-5492**
Fax: **Not Available**

Project: **B-06@59'-60'**

Collected: **08/09/2017**
Received: **08/17/2017**

NELAC Certification #: ***03036***

Analytical Report

Sample Identification: B-06@59'60' ***Lab Sample #: 781702731-0001*** ***Date/Time Collected: 8/9/2017***

Test Parameter	***Result pCi/g***	***Uncertainty pCi/g***	***MDC pCi/g***	***Start Count Date/ Time***	***Analyst***	***Status Count***	***Method***
Radium 228	*0.13*	*0.02*	*0.05*	*8/22/17 1:30 PM*	*PM*	*First Count*	*EPA 904*
Radium 226	*0.06*	*0.01*	*0.03*	*9/1/17 1:53 PM*	*PM*	*First Count*	*EPA 903.0*

* All analysis met quality control acceptance criteria unless otherwise specified.

Report Date	**Report Revision**	**Revision Comments**
09/05/2017	R0	Initial Report

Kishor Paudel, **Laboratory Manager**

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800)220-3675 / (856)786-0327
http://www.emsl.com cinnaminsonradonlab@emsl.com

EMSL Order #: **781702732**
Customer ID: **JCBR50**
Customer PO:

Attn: **Steven Muller**
J.C. Broderick & Associates
1775 Expressway Drive North, Suite 1
Hauppauge, NY 11788

Phone: **631-584-5492**
Fax: **Not Available**

Project: **B-07@57.5'-60'**

Collected: **08/11/2017**
Received: **08/17/2017**

NELAC Certification #: ***03036***

Analytical Report

Sample Identification: B-07@57.5'-60' ***Lab Sample #: 781702732-0001*** ***Date/Time Collected: 8/11/2017***

Test Parameter	***Result pCi/g***	***Uncertainty pCi/g***	***MDC pCi/g***	***Start Count Date/ Time***	***Analyst***	***Status Count***	***Method***
Radium 228	*0.06*	*0.02*	*0.06*	*8/22/17 1:30 PM*	*PM*	*First Count*	*EPA 904*
Radium 226	*0.03*	*0.01*	*0.03*	*9/1/17 1:53 PM*	*PM*	*First Count*	*EPA 903.0*

* All analysis met quality control acceptance criteria unless otherwise specified.

Report Date	**Report Revision**	**Revision Comments**
09/05/2017	R0	Initial Report

Kishor Paudel, **Laboratory Manager**

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800)220-3675 / (856)786-0327
http://www.emsl.com cinnaminsonradonlab@emsl.com

EMSL Order #: **781702736**
Customer ID: **JCBR50**
Customer PO:

Attn: **Steven Muller**
J.C. Broderick & Associates
1775 Expressway Drive North, Suite 1
Hauppauge, NY 11788

Phone: **631-584-5492**
Fax: **Not Available**

Project: **MW-5**

Collected: **08/18/2017**
Received: **08/21/2017**

NELAC Certification #: ***03036***

Analytical Report

Sample Identification: MW-5 ***Lab Sample #: 781702736-0001*** ***Date/Time Collected: 8/18/2017 08:40 AM***

Test Parameter	***Result pCi/L***	***Uncertainty pCi/L***	***SDWA DL pCi/L***	***Start Count Date/ Time***	***Analyst***	***Status Count***	***Method***
Radium 226	*9.29*	*0.57*	*0.36*	*8/24/17 3:31 PM*	*KP*	*First Count*	*EPA 903.0*
Radium 228	*3.27*	*0.34*	*0.42*	*8/29/17 2:15 PM*	*KP*	*First Count*	*EPA 904*

* All analysis met quality control acceptance criteria unless otherwise specified.

* Listed activity by EPA 903.0 represents total alpha radium.

Report Date	**Report Revision**	**Revision Comments**
08/31/2017	R0	Initial Report

Kishor Paudel, Analyst

Kishor Paudel, **Laboratory Manager**

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800)220-3675 / (856)786-0327
http://www.emsl.com cinnaminsonradonlab@emsl.com

EMSL Order #: **781702737**
Customer ID: **JCBR50**
Customer PO:

Attn: **Steven Muller**
J.C. Broderick & Associates
1775 Expressway Drive North, Suite 1
Hauppauge, NY 11788

Phone: **631-584-5492**
Fax: **Not Available**

Project: **MW-6**

Collected: **08/18/2017**
Received: **08/21/2017**

NELAC Certification #: ***03036***

Analytical Report

Sample Identification: MW-6 ***Lab Sample #: 781702737-0001*** ***Date/Time Collected: 8/18/2017 09:30 AM***

Test Parameter	***Result pCi/L***	***Uncertainty pCi/L***	***SDWA DL pCi/L***	***Start Count Date/ Time***	***Analyst***	***Status Count***	***Method***
Radium 226	*17.31*	*0.80*	*0.39*	*8/24/17 3:31 PM*	*KP*	*First Count*	*EPA 903.0*
Radium 228	*6.64*	*0.52*	*0.41*	*8/29/17 2:15 PM*	*KP*	*First Count*	*EPA 904*

* All analysis met quality control acceptance criteria unless otherwise specified.

* Listed activity by EPA 903.0 represents total alpha radium.

Report Date	**Report Revision**	**Revision Comments**
08/31/2017	R0	Initial Report

Kishor Paudel, Analyst

Kishor Paudel, **Laboratory Manager**

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
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http://www.emsl.com cinnaminsonradonlab@emsl.com

EMSL Order #: **781702738**
Customer ID: **JCBR50**
Customer PO:

Attn: **Steven Muller**
J.C. Broderick & Associates
1775 Expressway Drive North, Suite 1
Hauppauge, NY 11788

Phone: **631-584-5492**
Fax: **Not Available**

Project: **MW-7**

Collected: **08/18/2017**
Received: **08/21/2017**

NELAC Certification #: ***03036***

Analytical Report

Sample Identification: MW-7 ***Lab Sample #: 781702738-0001*** ***Date/Time Collected: 8/18/2017 10:00 AM***

Test Parameter	***Result pCi/L***	***Uncertainty pCi/L***	***SDWA DL pCi/L***	***Start Count Date/ Time***	***Analyst***	***Status Count***	***Method***
Radium 226	*15.24*	*0.73*	*0.50*	*8/24/17 3:31 PM*	*KP*	*First Count*	*EPA 903.0*
Radium 228	*4.08*	*0.43*	*0.49*	*8/29/17 2:15 PM*	*KP*	*First Count*	*EPA 904*

* All analysis met quality control acceptance criteria unless otherwise specified.

* Listed activity by EPA 903.0 represents total alpha radium.

Report Date	**Report Revision**	**Revision Comments**
08/31/2017	R0	Initial Report

Kishor Paudel, Analyst

Kishor Paudel, **Laboratory Manager**

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Radiochemical Analysis Chain of Custody

EMSL Order Number (Lab Use Only):

Contact Name: Steven Muller	**Bill To Company:** J.C. Broderick & Assoc., Inc.	**Sampled By (Sign):** Steven Muller
Company Name: J.C. Broderick & Assoc., Inc.	**Attention To:** Steven Muller	**Sampled By (Name):** Steven Muller
Address: 1775 Expressway Drive N	**Address:** 1775 Expressway Drive N	**Total # of Samples:** 3
City: Hauppauge **State:** NY **Zip Code:** 11788	**City:** Hauppauge **State:** NY **Zip Code:** 11788	**Date of Shipping:** 8/16/17
Telephone #: 631-584-5492 **Fax :** 631-584-3395	**Telephone #:** 631-584-5492 **Fax :** 631-584-3395	**Sample State/ Zip Code:** NY/11706
Email: smuller@jcbroderick.com	**Project Name:** Bethpage High School	**Purchase Order:**

Turn Around Time: ☐ 4 weeks (Standard) **Client Specific:** ☐ 48 Hours ☐ 96 Hours ☐ 1 week ☒ 2 weeks ☐ 3 Weeks

Field Use - All Information Required!					Analytes													
					Gross Alpha													
Client Sample ID	Lab ID (For Lab Use only)	Matrix	Size (mL, g)	Date/Time	NJ 48 Hrs	EPA 900	Gross Beta	Ra-228	Ra-226	Total Uranium	Gamma Emitters	*Actinides (U, Th, Pu, Am)*	Sr-89, Sr-90	I-131	Radon	Tritium	Tc-99	Note
B-05@57'-60'		S	56 g	8/9/17				X	X									
B-06@59'-60'		S	56 g	8/9/17				X	X									
B-07@57.5'-60'		S	56 g	8/11/17				X	X									

Report Requirement*: ☐ Level One ☒ Level Two ☐ Level Three

Relinquished by:	Date/ Time	Received by:	Date/ Time		Note
Steven Muller	8/16/17/1600				

*Level One =Results only; Level Two = Results and QC; Level Three = Results, QC, Logs, Worksheets, Printout/Spectrum and Calibrations

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Radiochemical Analysis
Chain of Custody

EMSL Order Number (Lab Use Only):

Contact Name: Steven Muller	**Bill To Company:** JC Broderick & Associates, Inc.	**Sampled By (Sign):**
Company Name: JC Broderick & Assocaites, Inc.	**Attention To:** Steven Muller	**Sampled By (Name):** Steven Muller
Address: 1775 Express Drive North	**Address:** 1775 Express Drive North	**Total # of Samples:** 3
City: Hauppauge **State:** NY **Zip Code:** 11788	**City:** Hauppauge **State:** NY **Zip Code:** 11788	**Date of Shipping:** 8-18-17
Telephone #: 631-584-5492 **Fax :** 631-584-3395	**Telephone #:** 631-584-5492 **Fax :** 631-584-3395	**Sample State/ Zip Code:** NY/1111714
Email: SMuller@JCBroderick.com	**Project Name:** Bethpage High School	**Purchase Order:**

Turn Around Time: ☐ 4 weeks (Standard) **Client Specific:** ☐ 48 Hours ☐ 96 Hours ☐ 1 week ■ 2 weeks ☐ 3 Weeks

Field Use - All Information Required!					Analytes													
					Gross Alpha													
Client Sample ID	Lab ID (For Lab Use only)	Matrix	Size (mL, g)	Date/Time	NJ 48 Hrs	EPA 900	Gross Beta	Ra-228	Ra-226	Total Uranium	Gamma Emitters	*Actinides (U, Th, Pu, Am)*	Sr-89, Sr-90	I-131	Radon	Tritium	Tc-99	Note
MW-5		GW	1,000 mL	8-18-17/8:40 am														
MW-6		GW	1,000 mL	8-18-17/9:30 am														
MW-7		GW	1,000 mL	8-18-17/11:00 am														

Report Requirement*: ☐ Level One ■ Level Two ☐ Level Three

Relinquished by:	Date/ Time	Received by:	Date/ Time		Note

*Level One =Results only; Level Two = Results and QC; Level Three = Results, QC, Logs, Worksheets, Printout/Spectrum and Calibrations