

# **RADON INVESTIGATION REPORT**

**CENTRAL BOULEVARD  
ELEMENTARY SCHOOL  
60 CENTRAL BOULEVARD  
BETHPAGE, NEW YORK 11714**

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

**JCB PROJECT #: 20-46058  
APRIL 2020**

**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 (JCB) was retained by the Bethpage Union Free School District (Bethpage) to perform an indoor air survey for radon gas as a result of identifying radium in the local groundwater by the Bethpage Water District and by JCB during our annual groundwater investigation at the Bethpage High School and Central Boulevard Elementary School.

### **Section No. 2.0: Site Description and Location**

The Subject Site is located at 60 Central Boulevard, Bethpage, New York 11714, at the western terminus of Central Boulevard. According to the United States Geological Survey (USGS) *Amityville, New York, 2016 7.5 Minute Series Topographical Map*, the Subject Site is situated at an approximate elevation of 98 feet (ft.) above mean sea level. Groundwater is estimated at approximately 40 feet below surface grade (bsg). The location of the Subject Site is shown on the Site Location Map, Appendix-A Figure-1.

### **Section No. 3.0: Previous Radon Screening Sampling and Analysis**

The detection of Radium 226 and 228 during annual testing of the groundwater at Bethpage High School prompted the sampling and analysis of the groundwater for Radium at the Central Boulevard Elementary School. In August 2017, JCB installed three (3) groundwater monitoring wells at the Central Boulevard Elementary School campus. During this investigation Radium was detected in the groundwater, as a result the building was tested for Radon. The laboratory analysis results from the Radon screening revealed concentrations of Radon exceeding 4.0 pCi/L; however, only in not frequently occupied rooms and spaces.

As a result of these findings in August 2017 an isolation barrier was installed over the sand floor of the crawl spaces throughout the school building. After the installation of the isolation barrier, JCB performed follow-up testing at the same sampling locations. The laboratory analysis results from the Radon in Air samples submitted indicated radon levels below 4.0 pCi/L at all sampling locations tested.

### **Section No. 4.0: Radon Sampling and Analysis**

The United States Environmental Protection Agency (EPA) *Radon Measurement in Schools Revised Edition* (EPA 402-R-92-014), dated July 1993 guidance document recommends that a Radon assessment should be performed under closed conditions during the heating season. JCB coordinated with the school district to conduct the sampling during the spring recess.

On April 13, 2020, JCB set up short-term Radon in Air test kits in six (6) basement storage rooms and spaces and eight (8) crawlspaces within the basement of the elementary school building that were in contact with the ground. The sampling devices were collected on April 17, 2020 after at least three days of exposure.

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

Table No. 1: Summary of Radon Samples Submitted for Laboratory Analysis					
Sample Device Number	Location	Sample Start Date	Sample End Date	Description of Sample	Analysis Method
418241	Crawlspace – 0002	04/13/20	04/17/20	Crawlspace	Radon in Air
418103	Crawlspace – 0002	04/13/20	04/17/20	Crawlspace – Dup	Radon in Air
418195	Crawlspace – 0002A	04/13/20	04/17/20	Crawlspace	Radon in Air
417974	Crawlspace – 0002B	04/13/20	04/17/20	Crawlspace	Radon in Air
418216	Basement Storage Rm – 0003	04/13/20	04/17/20	Basement Storage Room	Radon in Air
417944	Basement Storage Rm - 0004	04/13/20	04/17/20	Basement Storage Room	Radon in Air
418205	Basement Storage Rm - 0005	04/13/20	04/17/20	Basement Storage Room	Radon in Air
418146	Basement Storage Rm - 0005	04/13/20	04/17/20	Basement Storage Room - Blank	Radon in Air
418125	Basement Storage Rm - 0006	04/13/20	04/17/20	Basement Storage Room	Radon in Air
418157	Basement Storage Rm - 0006	04/13/20	04/17/20	Basement Storage Room - Dup	Radon in Air
418159	Basement Storage Rm - 0007	04/13/20	04/17/20	Basement Storage Room	Radon in Air
417960	Crawlspace – 0008	04/13/20	04/17/20	Crawlspace	Radon in Air
418070	Crawlspace – 0009	04/13/20	04/17/20	Crawlspace	Radon in Air
418165	Crawlspace – 0010	04/13/20	04/17/20	Crawlspace	Radon in Air
418243	Crawlspace – 0010	04/13/20	04/17/20	Crawlspace – Dup	Radon in Air
418100	Crawlspace – 0010A	04/13/20	04/17/20	Crawlspace	Radon in Air
418222	Crawlspace – 0010A	04/13/20	04/17/20	Crawlspace – Blank	Radon in Air
419553	Basement Hallway – 0011	04/13/20	04/17/20	Basement Hallway	Radon in Air
418276	Basement Hallway – 0011A	04/13/20	04/17/20	Basement Hallway	Radon in Air
<b>Notes:</b> Rm = Room Crawl = Crawl Space Dup = Duplicate Sample Blank = Field Blank					

## Section No. 5.0: Radon Laboratory Analytical Summary

The short-term Radon in Air sampling was performed utilizing laboratory supplied test kits, assigned individual identification numbers and were secured. 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 of Radon in Air.

EMSL Analytical Inc. (EMSL) of Cinnaminson, New Jersey provided laboratory analytical services. Copies of EMSL's NYSDOH certifications are available upon request.

The laboratory analytical results for the Radon in Air samples were reviewed and compared to the United States Environmental Protection Agency (EPA) recommended action level of 4.0 pCi/L as reported in *Radon Measurement in Schools Revised Edition* (EPA 402-R-92-014), dated July 1993.

The following table summarizes the Radon Analytical Results:

<b>Table No. 2: Summary of Radon Samples Analysis Results - April 17, 2020</b>		
<b>Sample Device Number</b>	<b>Location</b>	<b>Radon Activity pCi/L</b>
418241	Crawlspace – 0002	2.6
418103	Crawlspace – 0002 Dup	2.1
418195	Crawlspace – 0002A	2.9
417974	Crawlspace – 0002B	2.8
418216	Basement Storage Rm – 0003	2.8
417944	Basement Storage Rm - 0004	1.6
418205	Basement Storage Rm - 0005	0..8
418146	Basement Storage Rm – 0005 Blank	-0.1
418125	Basement Storage Rm - 0006	0.7
418157	Basement Storage Rm – 0006 Dup	0.9
418159	Basement Storage Rm - 0007	0.8
417960	Crawlspace – 0008	2.0
418070	Crawlspace – 0009	2.4
418165	Crawlspace – 0010	1.8
418243	Crawlspace – 0010 Dup	1.9
418100	Crawlspace – 0010A	2.0
418222	Crawlspace – 0010A Blank	-0.2
419553	Basement Hallway – 0011	0.6
418276	Basement Hallway – 0011A	0.5

The laboratory analysis results from the Radon in Air samples and duplicates submitted did not reveal any elevated concentrations of Radon exceeding 4.0 pCi/L, the referenced guidance value established by the EPA.

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

To ensure that measurement results are reliable, JCB performed unexposed control detectors (blanks) side-by-side with the sampling device at each sampling location.

The field sampling team-maintained Radon sampling chain of custody records used to track samples from sampling point to analysis which summarized the following:

- Sample identification;
- Test Kit ID number;
- Device ID number;
- Sampling beginning date and time;
- Sampling ending date and time;
- Temperature, °F;
- Humidity, %;

**Section No. 7.0: Recommendations**

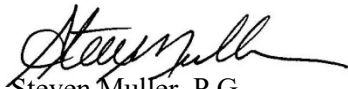
Based upon the sampling results reported, the USEPA decision matrix does not recommend any additional mitigation for Radon.

Due to the detection of Radium 226 and 228 in the local groundwater, JCB does recommend that continued monitoring for Radon in Air within the school building be performed to confirm the effectiveness of the installed isolation barrier.

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



Jeffrey V. Nannini  
Environmental Scientist



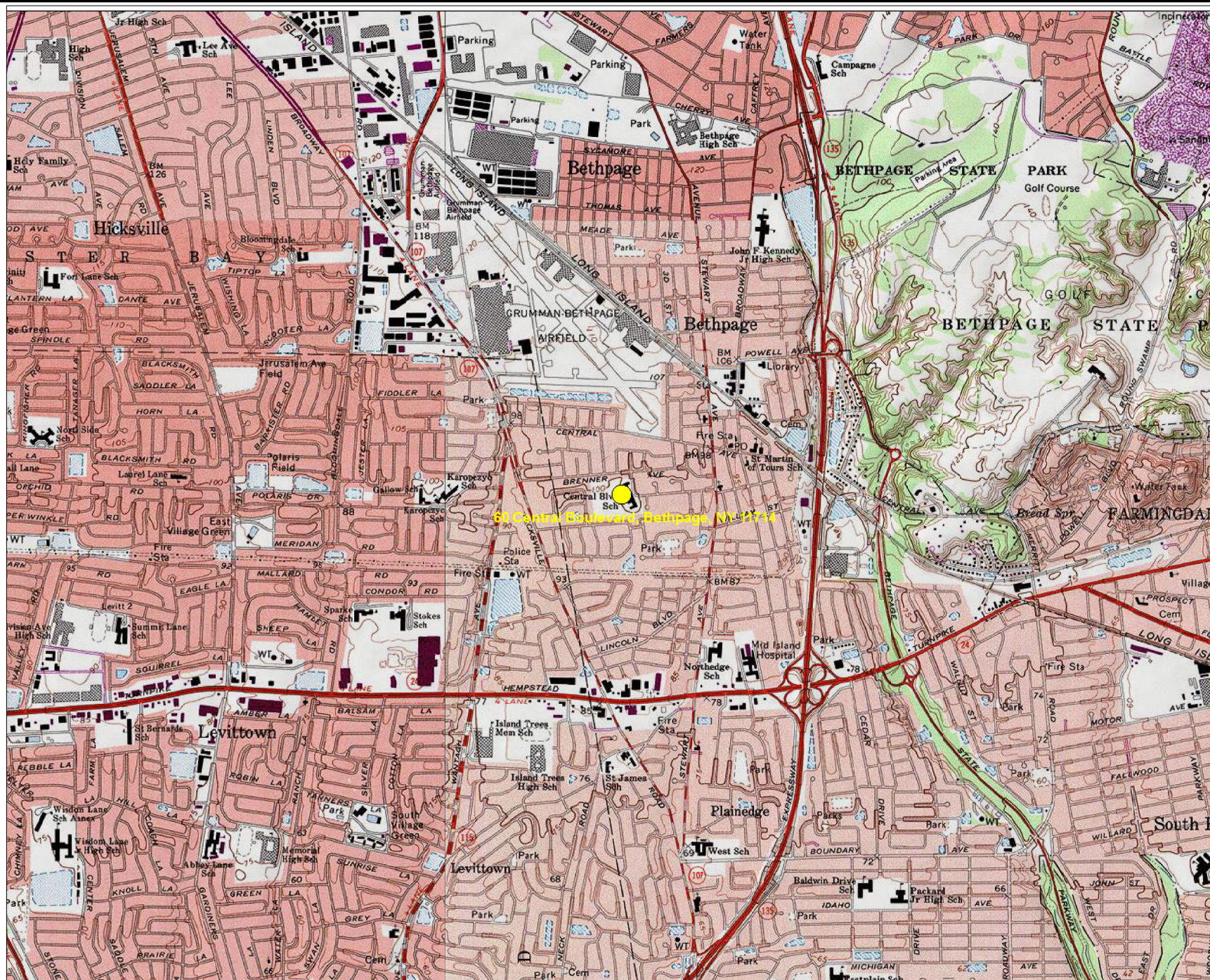
Steven Muller, P.G.  
Project Manager

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# **Appendix A**

## **Figures**





**JCB LEGEND**  
 ● SUBJECT SITE

0 1 2 3 4 5 MILE  
 0 1000 FEET 0 500 1000 METERS  
 Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)



**J.C. BRODERICK**

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

**Notes:**

Central Boulevard  
 Elementary School  
 60 Central Boulevard  
 Bethpage, NY 11714

**Drawing Title**

Figure No. 1  
 Site Location Map

Scale As Noted Project No. 20-46058 Date 04-17-2020

Drawn By J.V.N. Checked By S.W.M. Page No. 1 of 2

**Drawing No.**

1





J.C. BRODERICK

& Associates

Environmental Consulting and  
Testing

1775 Express Drive North

Hauppauge, NY 11788

Phone: (631).584.5492

Fax: (631).584.3395

Notes:

Central Boulevard  
Elementary School  
60 Central Boulevard  
Bethpage, NY 11714

Drawing Title

Figure No. 2

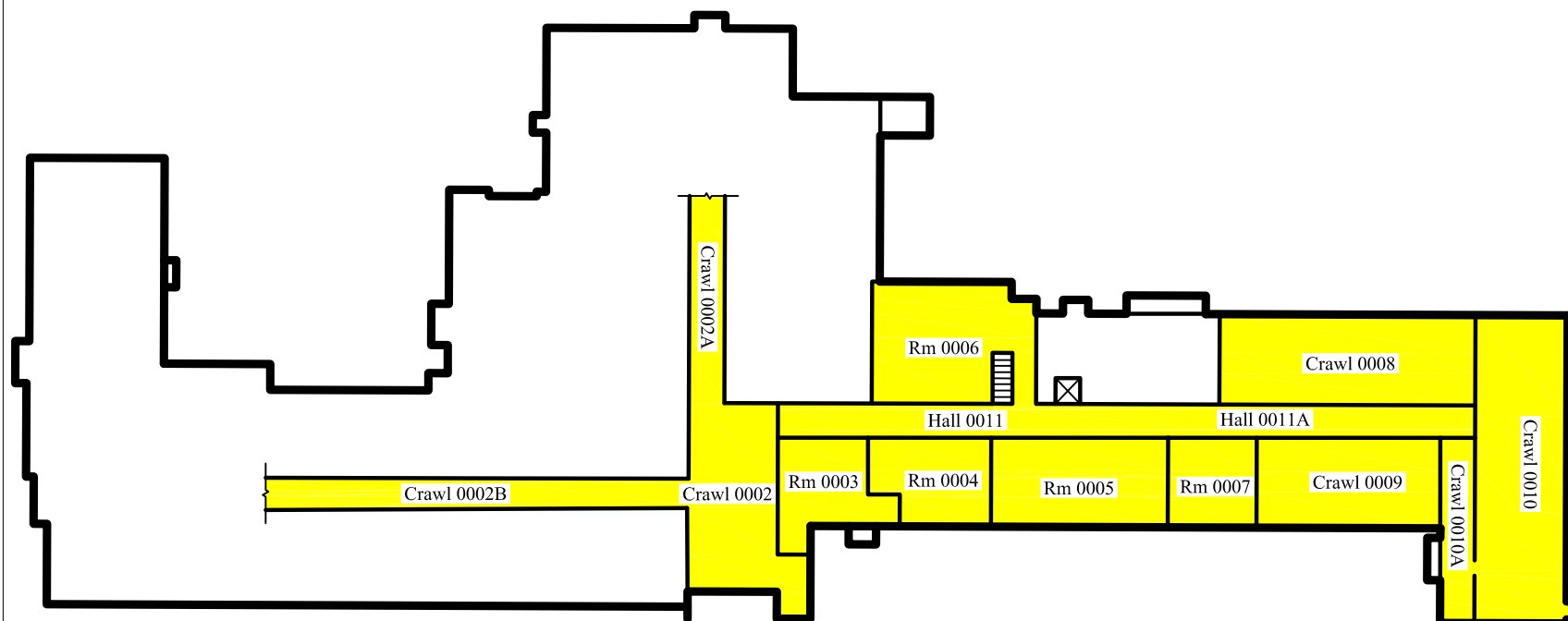
Crawlspace  
and  
Basement  
Sampling  
Locations

Scale	Project No.	Date
N.T.S.	20-46058	04-17-2020

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

Drawing No.

2



PROJECT



NORTH

JCB LEGEND  
■ RADON SAMPLE LOCATION

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# **Appendix B**

## **Field Photograph Logs**

## **Radon Sampling Location Within Storage Room in Basement**



## **Field Photograph Log**

### **Radon Investigation Report**

**Central Boulevard Elementary School  
60 Central Boulevard  
Bethpage, New York 11714**

**Photo No. 01**

**JCB#: 20-46058**

## **Radon Sampling Location Within Hallway in Basement**



## **Field Photograph Log**

### **Radon Investigation Report**

**Central Boulevard Elementary School  
60 Central Boulevard  
Bethpage, New York 11714**

**Photo No. 02**

**JCB#: 20-46058**



## **Radon Sampling Location Within Crawlspace**



## **Field Photograph Log**

### **Radon Investigation Report**

**Central Boulevard Elementary School  
60 Central Boulevard  
Bethpage, New York 11714**

**Photo No. 03**

**JCB#: 20-46058**

## **Radon Sampling Location Within Basement Office**



## **Field Photograph Log**

### **Radon Investigation Report**

**Central Boulevard Elementary School  
60 Central Boulevard  
Bethpage, New York 11714**

**Photo No. 04**

**JCB#: 20-46058**

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# **Appendix C**

## **Laboratory Analysis Reports**

**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](mailto:cinnaminsonradonlab@emsl.com)

EMSL Order: 382003574

CustomerID: JCBR50

CustomerPO:

ProjectID:

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

Phone: (631) 584-5492  
 Fax:  
 Received: 04/20/20 10:41 AM  
 Analysis Date: 4/21/2020  
 Collected: 4/13/2020

Project: **Central Blvd. ES / 20-46058 / 60 Central Blvd.**

Test **Central Blvd. ES / 20-46058**  
 Site: **60 Central Blvd.**  
**Bethpage, NY 11714**

**Test Report: Radon in Air Test Results**

Liquid Scintillation ID	Location	Radon Activity (pCi/L)	Start	Stop	Temperature F	Humidity %	Sample Type
418241 382003574-0001	Crawlspace / 0002	2.6	4/13/2020 7:35:00 AM	4/17/2020 8:49:00 AM	64	33	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418103 382003574-0002	Crawlspace / 0002	2.1	4/13/2020 7:35:00 AM	4/17/2020 8:49:00 AM	64	33	Duplicate
<b>Sample Notes:</b> Duplicate's Customer Sample:382003574-0001 Radon device exposed >96 hours						<b>Duplicate RPD = 21.3%</b>	
418195 382003574-0003	Crawlspace / 0002A	2.9	4/13/2020 7:37:00 AM	4/17/2020 8:50:00 AM	66	30	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
417974 382003574-0004	Crawlspace / 0002B	2.8	4/13/2020 7:39:00 AM	4/17/2020 8:51:00 AM	67	31	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418216 382003574-0005	Crawlspace / 0003	2.8	4/13/2020 7:44:00 AM	4/17/2020 8:53:00 AM	68	30	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
417944 382003574-0006	Basement / 0004	1.6	4/13/2020 7:47:00 AM	4/17/2020 8:52:00 AM	68	20	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418205 382003574-0007	Basement / 0005	0.8	4/13/2020 7:50:00 AM	4/17/2020 8:55:00 AM	68	19	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418146 382003574-0008	Basement / 0005	-0.1	4/13/2020 7:50:00 AM	4/17/2020 8:55:00 AM	68	19	Blank
<b>Sample Notes:</b> Radon device exposed >96 hours							
418125 382003574-0009	Basement / 0006	0.7	4/13/2020 7:52:00 AM	4/17/2020 8:57:00 AM	69	18	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418157 382003574-0010	Basement / 0006	0.9	4/13/2020 7:52:00 AM	4/17/2020 8:57:00 AM	69	18	Duplicate
<b>Sample Notes:</b> Duplicate's Customer Sample:382003574-0009 Radon device exposed >96 hours						<b>Duplicate RPD = 25.0%</b>	

Please visit [www.radontestinglab.com](http://www.radontestinglab.com)



**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](mailto:cinnaminsonradonlab@emsl.com)

EMSL Order: 382003574

CustomerID: JCBR50

CustomerPO:

ProjectID:

**Test Report: Radon in Air Test Results**

Liquid Scintillation ID	Location	Radon Activity (pCi/L)	Start	Stop	Temperature F	Humidity %	Sample Type
418159 382003574-0011	Basement / 0007	0.8	4/13/2020 7:58:00 AM	4/17/2020 9:00:00 AM	69	15	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
417960 382003574-0012	Crawlspace / 0008	2	4/13/2020 8:00:00 AM	4/17/2020 9:05:00 AM	66	22	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418070 382003574-0013	Crawlspace / 0009	2.4	4/13/2020 8:03:00 AM	4/17/2020 9:07:00 AM	67	22	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418165 382003574-0014	Crawlspace / 0010	1.8	4/13/2020 8:05:00 AM	4/17/2020 9:03:00 AM	66	21	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418243 382003574-0015	Crawlspace / 0010	1.9	4/13/2020 8:05:00 AM	4/17/2020 9:03:00 AM	66	21	Duplicate
<b>Sample Notes:</b> Duplicate's Customer Sample:382003574-0014 Radon device exposed >96 hours						<b>Duplicate RPD = 5.4%</b>	
418100 382003574-0016	Crawlspace / 0010A	2	4/13/2020 8:07:00 AM	4/17/2020 9:04:00 AM	66	23	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418222 382003574-0017	Crawlspace / 0010A	-0.2	4/13/2020 8:07:00 AM	4/17/2020 9:04:00 AM	66	23	Blank
<b>Sample Notes:</b> Radon device exposed >96 hours							
419553 382003574-0018	Hallway / 0011	0.6	4/13/2020 8:09:00 AM	4/17/2020 9:08:00 AM	68	16	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							
418276 382003574-0019	Hallway / 0011A	0.5	4/13/2020 8:10:00 AM	4/17/2020 9:01:00 AM	69	15	Customer
<b>Sample Notes:</b> Radon device exposed >96 hours							

**Report Notes**



## 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](mailto:cinnaminsonradonlab@emsl.com)

EMSL Order: 382003574

CustomerID: JCBR50

CustomerPO:

ProjectID:

### Test Report: Radon in Air Test Results

Liquid Scintillation ID	Location	Radon Activity (pCi/L)	Start	Stop	Temperature F	Humidity %	Sample Type
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The United States Environmental Protection Agency (EPA) has established a radon action level of 4.0pCi/L. EPA recommends mitigation of a structure if the confirmed radon level is equal to or greater than 4.0pCi/L.

The radon tests were performed using liquid scintillation radon detectors and counted on a liquid scintillation counter following EPA Method # 402-R-92-004 testing protocol for Radon in Air testing. EPA recommends retesting every two years.

Please contact EMSL Analytical, Inc. or your State Health Department for further information.

All procedures used for generating this report are in complete accordance with the current EPA protocols for the analysis of Radon in Air.

Analyst(s)

Dominic Gehret, Radiochemistry Laboratory Manager, 10872

In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder. The test results meets all NELAC requirements unless otherwise specified.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ FL RB2034/R2687,IL RNL2008202,IN RTL00935,IA RNLAB10005,KS KS-LB-0005/KS-MS-0482,ME SPC202,MN RL-0005,NE 474/RMB-1083,NJ 03036/MEB92525/MES13910,NY 10872,OH RL39,OK D9952,PA 2573/3393/68-00367,RI RMB-108/RI00179,WV RL000220,NRSB-ARL6006,NRPP

Initial report from 04/21/2020 11:07:43



EMSL ANALYTICAL, INC.

2020 APR 20

EMSL Job #: 382003574

# CHAIN OF CUSTODY RADON LABORATORY SERVICES (COMMERCIAL USE)

EMSL ANALYTICAL, INC.  
200 ROUTE 130 NORTH  
CINNAMINSON, NJ 08077  
PHONE: 800-220-3675  
www.emsl.com

## Company Information:

EMSL Acct #: JCBR50

Company Name: JCBRODERICK &amp; ASSOC.

Contact: S. MULLER

Address: 1775 EXPRESSWAY DR. N.

City: HAUPPAUGE

State: N.Y. Zip: 11788

Phone: 631-584-5492 Fax: 631-584-3395

Email: SMULLER@JCBRODERICK.COM

## Technician Certification #:

Tech Name: STEVEN MULLER

Tech Signature:

## Project/Site Information:

\*Required

Project Name: CENTRAL BLVD ES

Project #/PO: 20-46058

\*Address: 60 CENTRAL BLVD.

\*City: BETHPAGE \*State: NY \*Zip: 11714

\*Building type? ☐ Residential ☐ Non-Residential☒ School ☐ Other: \_\_\_\_\_\*Building foundation type? ☒ Basement ☒ Crawlspace☒ Slab on Grade ☒ Other SAND CRAWLSPACE

Special Notes / Instructions:

## \*Turnaround Time (TAT) Options

☐ 1 Day☐ 2 Day☐ 3 Day☒ 4 Day

Disclaimer: In no event shall EMSL be liable for indirect, special, consequential, or incidental damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages arising out of or in connection with EMSL's services there under or the delivery, use, reliance upon or interpretation of test results by client or third party. We accept no legal responsibility for the purposes for which the client uses the test results. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereafter.

(S) Sample (B) Blank (D) Duplicate	Device Number	Location	Room #	Exposure Period Beginning Date		Exposure Period Ending Date		Temp, °F	Humidity, %
				Date	Time	Date	Time		
(S) Sample	418241	CRAWLSPACE	0002	4/13/20	7:35 AM	4/17/20	8:49	64	33
D	418103								
S	418195	CRAWLSPACE	0002A	4/13/20	7:37	4/17/20	8:50	66	30
S	417974	CRAWLSPACE	0002B	4/13/20	7:39	4/17/20	8:51	69	31
S	418216	CRAWLSPACE	0003	4/13/20	7:44	4/17/20	8:53	68	30
S	417944	BASEMENT	0004	4/13/20	7:47	4/17/20	8:52	68	20
S	418205	BASEMENT	0005	4/13/20	7:50	4/17/20	8:55	68	19
B	418146								
S	418125	BASEMENT	0006	4/13/20	7:52	4/17/20	8:57	69	18
D	418157								

Relinquished by (Sign):

Date: 4/17/20 Time: 10:00

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Date: Time:

EMSL Job #: 382003574

EMSL ANALYTICAL INC.

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