THE MJW COMPANIES

Radiological Consulting Professionals and Expert Technical Services

Summary Report of Fieldwork for Sinkhole Investigation at MODPAC BCP #915314 for Environmental Advantage

For survey conducted August 20, 2024

Prepared by:

MJWTS

MJW TECHNICAL SERVICES

15 Hazelwood Dr., Suite 112

Amherst, NY 14228

Introduction

MJW and Environmental Advantage have had a long-standing relationship for BCP #915314 site located at 1801 Elmwood Avenue in Buffalo, NY. In August 2024 a sinkhole was noticed in the parking lot off Elmwood Avenue. As crews went to investigate, MJW was called out to assist in any handling of potential TENORM that may occur.

This investigation was conducted over the course of four hours after MJW was called on site on Tuesday August 20, 2024. MJW investigated the roughly One (1) cy3 of material field scans with radiological instrumentation as well as sample gathering for lab analysis at GEL Labs.

Summary of Field Activities

On Tuesday August 20 2024, MJW Radiological Control Technician Paul Koch (PK) mobilized to the MODPAC site in support of Environmental Advantage personnel who were dealing with suspected TENORM well providing coverage for a dig to repair a leaking pipe that were causing a sinkhole. Upon arrival (PK) set up and took background and source measurements with a Ludlum 2241-2 gamma survey meter with a 44-10 2" x 2" NaI detector (background: 6748CPM). PK then spoke with Environmental Advantage personnel and was shown the dig area, the dig area consisted of an approximately 10ft long by 2ft wide trench with standing water and a visible slag like material.

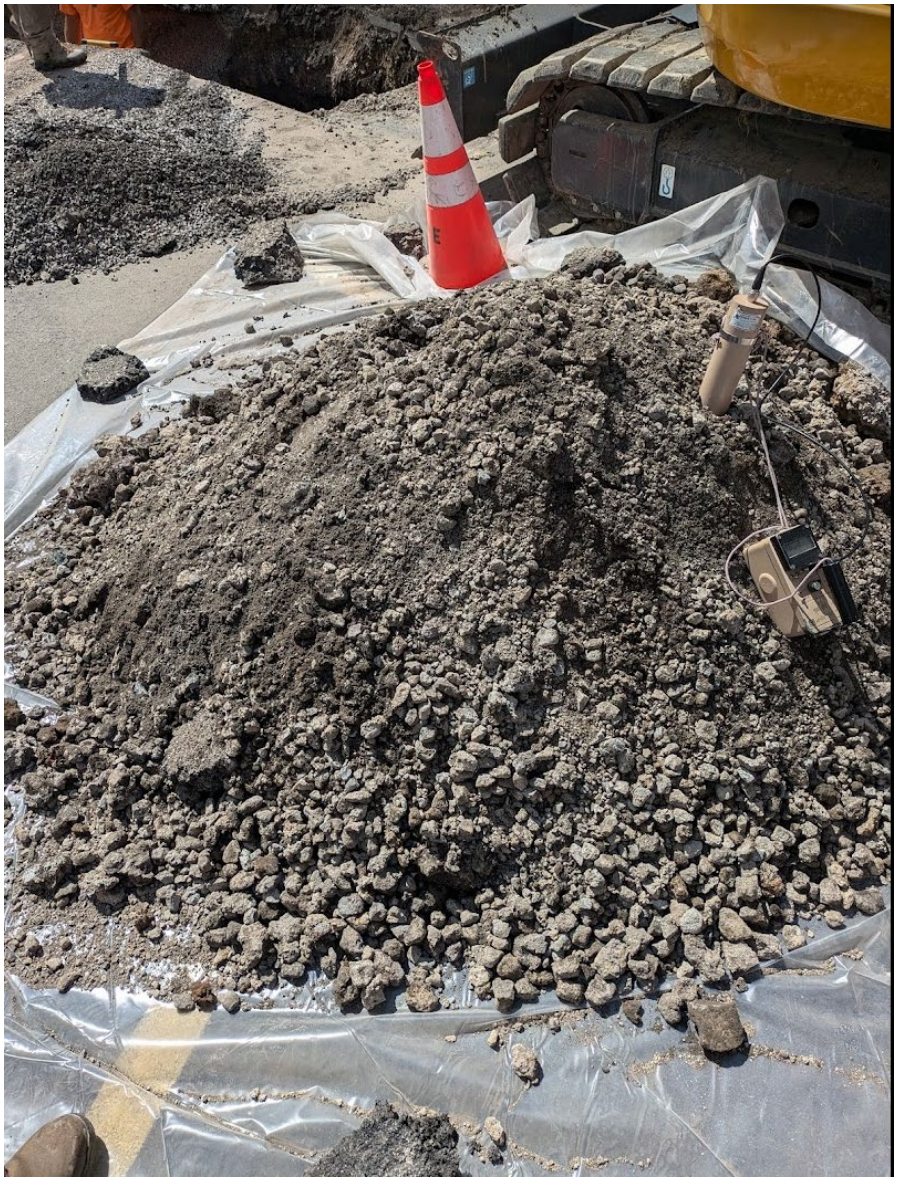
As the dig continued all suspected TENORM was segregated and placed on a large sheet of polyethylene. Approximately one (1) cy3 of slag like material was found. (PK) took measurements on the pile using a Ludlum 2241-2 gamma survey meter paired with a 44-10 2"x2" Nal probe.

Readings across the pile ranged from (8000 to 10,000cpm), with a background of(6748cpm). Dose rates were also taken on the pile at this time with readings showing a dose of (4 to 5uRem). Scaler measurements on the sections showed low level readings with small increases in certain locations, at which point (PK) then proceeded to take multiple samples from the pile for laboratory analysis. MJW will use historical data from WNY Area as a background reference for the sample analysis.

After the dig was complete the suspected TENORM was covered with another layer of polyethylene and the area was roped off to control access. MJW is awaiting further comments from Environmental Advantage. MJW took samples to send to GEL Labs. MJW included an **Attachment C** of the results for NYSDEC review and approval of appropriate waste facility for the mater

Figures and Photos

Photo 1 Slaglike Material at MODPAC Location



Attachment A: Field Survey Sheet

Radiological Survey Report Form

Activity: Mod PaC Sinkhole			Survey Number: 20240820-001		Page: 1 of 1
Survey Date: 8-20-24	Time: 1000		Surveyed By: Paul Koch		

Instrument/Detector Model #	Inst./Detector Serial #	BGK/units/type		% Eff.	Nuclide	Cal. Due Date
Ludlum 2241-2 / 43-90	219137/PR 277930	1	CPM α	18.2%	Pu-239	9-30-25
Ludlum 3 / 44-9	222619/PR112415	50	CPM β	21.1%	Tc-99	1-19-25
Thermo MicroRem	19263	4	µRem/hr γ	NA	NA	7-9-25
Ludlum 2241-2/44-10	196664/PR 413155	6000	CPM γ	13.6%	Cs-137	3-15-25

Area/Material Surveyed	Total (gross cpm)	Total (net cpm)	LAWs (net cpm)		Smear #	Smears (gross cpm)			Smears (dpm/100cm²)			Dose Rate * (µRem/hr)	
	2x2 Readings	2x2 Readings	alpha	beta		alpha	beta	H-3	alpha	beta	H-3	30 cm	1 cm
Pile (top)	9000	4000										5	6
Pile NE Corner	8000	3000										5	5
Pile NW Corner	9000	4000										5	6
Pile SE Corner	10000	5000										5	6
Pile SW Corner	9000	4000										5	6

* = Dose rates include background

Reviewed By (print/signature): Alex Bartlett / [signature] Date: 8/21/24

Attachment B: Daily QC and Calibration Paperwork

Single Channel Scaler Instrumentation Set-Up Sheet

Inst. Model/SN: 196664
Detector Model/SN: PR 413155
High Voltage: 5
Date/Time: 8-20-24

Source Type: thorium
Activity: unknown
Source ID: N/A
Technician: PK

Record 10, one-minute background counts:

1 6790
2 6903
3 6950
4 6868
5 6790
6 6905
7 6836
8 6818
9 6898
10 6861

Record 10, one-minute gross source counts:

1 70138
2 70141
3 70080
4 69912
5 70136
6 70571
7 69756
8 69898
9 70588
10 70222

Calculate the average background count:

Avg: 6857

Calculate the average background count:

Avg: 70,144

Calculate the Background Range +/- 20%*

Low: 5486
High: 8,228

Calculate the Source Count Range +/- 20%*

Low: 56115
High: 84,173

* Instrument is analog. Ranges adjusted to nearest whole number detectable per instrument scale.

RSO or designee Review/Date: _____ 8/21/22

Single Channel Scaler Response Test Sheet

Inst. Model/SN: 196664
Detector Model/SN: PR413155
High Voltage:

Source Type: thorium
Activity: unknown
Source ID: NA

Background Range +/- 20%*
Low: 5486
High: 8228

Source Count Range +/- 20%*
Low: 56,115
High: 84,173

* Instrument is analog. Ranges adjusted to nearest whole number detectable per instrument scale.

Date	Time	HV +/- 10v	Bkg Count	Gross Source	Battery Check (S/U)	Cal Due Date	Inst. QC (S/U)	Tech
8-20-24	1000	+	6748	70144	S	3-15-25	S	PCK

S = Satisfactory U = Unsatisfactory N/A = Not applicable for this instrument

RSO or designee Review/Date: 8/22/24

Multiscale Set-Up and Response Test Sheet

Inst. Model/SN: MicroRem 19263
Detector Model/SN: N/A
High Voltage: 5

Source Type: thorium
Activity: un known
Source ID:

Date/Time: 8-20-24 1000
Technician: PK
Units: uRem/hr

	Scale 1 (x 0.1)		Scale 2 (x 1.0)		Scale 3 (x 10)		Scale 4 (x 100)		Scale 5 (x 1000)	
Background	4		NA		NA		NA		NA	
Background Range +/- 20%	Low	High	Low	High	Low	High	Low	High	Low	High
	3	5								
Source Gross	NA		NA		300		NA		NA	
Source Range +/- 20%	Low	High	Low	High	Low	High	Low	High	Low	High
					200	400				

Response Test

Date	Time	Cal. Due	High Voltage (S/U)	Battery Check (S/U)	BKG	Scale 1 (x 0.1)	Scale 2 (x 1.0)	Scale 3 (x 10)	Scale 4 (x 100)	Scale 5 (x 1000)	Inst. QC (S/U)	Tech Initials
8-20-24	1000	7-9-25	S	S	40 Rem	NA	NA	300	NA	NA	S	PCK

S = Satisfactory U = Unsatisfactory N/A = Not applicable for this instrument

RSO or designee Review/Date: 8/21/24

Designer and Manufacturer of Scientific and Industrial Instruments

www.ludlums.com

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
501 Oak Street
325-235-5494
Sweetwater, TX 79556 U.S.

ACCREDITED
CERT # 4084.01

Customer MJW TECHNICAL SERVICES ORDER NO. 20464654/553031

Mfg. Ludlum Measurements, Inc. Model 2241 Serial No. 196664

Mfg. Ludlum Measurements, Inc. Model 44-10 Serial No. PR413155

Cal. Date 15-Mar-24 Cal Due Date 15-Mar-25 Cal. Interval 1 Year Meterface Digital

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 74 °F RH 31 % Alt 706.0 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☐ Meter Zeroed ☑ Background Subtract ☑ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☐ Window Operation
☑ Audio ck. ☐ Alarm Setting ck. ☑ Batt. ck.
☑ Calibrated in accordance with LMI SOP 14.8 ☐ Calibrated in accordance with LMI SOP 14.9

Instrument Volt Set 950 V Input Sens. 10 mV Det. Oper. 950 V at 10 mV Threshold Dial Ratio ____ = ____ mV

COMMENTS:

	Det1
Deadtime:	0 µSec
Cal Constant:	100e-2
Ratemeter Alarm:	0300 kcpm
Ratemeter Alert:	0200 kcpm

Firmware: P-0408
Calibrated using 6' C-cable.
Overload checked but not set.
Pulser calibration "RATEMETER READOUT" performed without deadtime.
*See attachment for efficiencies.

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.
Multimeter uncertainty within 1.3% of reading, Gamma uncertainty within 5.0% of reading, Neutron uncertainty within 7.0% of reading, Count rate uncertainty within 5.4% of reading

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING
AUTO			
AUTO			

Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Ratemeter Readout	800K cpm	796 kcPM	796 kcPM
	200K cpm	199	199
	80K cpm	79.6	79.6
	20K cpm	19.9	19.9
	8K cpm	7.96	7.96
	2K cpm	1.99	1.99
	800 cpm	800 cPM	800 cPM
	200 cpm	200	200
	80 cpm	80	80
	20 cpm	20	20

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Scaler Readout	800K cpm	79636 (0)	79636 (0)
	200K cpm	19891 (0)	19891 (0)
	80K cpm	7964 (0)	7964 (0)
	20K cpm	1989 (0)	1989 (0)
	8K cpm	796 (0)	796 (0)
	2K cpm	199 (0)	199 (0)
	800 cpm	80 (0)	80 (0)
	200 cpm	20 (0)	20 (0)
	80 cpm	8 (0)	8 (0)
	20 cpm	2 (0)	2 (0)

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.
All pass/fail determinations are based on the manufacturer's specifications without considering uncertainty factors.
Measurement results represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k=2.
The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323AB-2013
ISO/IEC 17025:2017(E)
State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: Cs-137 S/N: ☐ 059 ☐ 2171CP ☐ 2261CP ☐ 720 ☐ 734 ☐ 781 ☐ 1131 ☐ 1616 ☐ 1696 ☐ 1909 ☐ 1916CP ☐ 2324/2521
☐ 5717CO ☐ 5719CO ☐ 60646 ☐ 70897 ☐ 73410 ☐ E552 ☐ G112 ☐ 2168CP ☐ S-394 ☐ S-1054 ☐ T10081 ☐ T10082 Neutron Am-241 Be ☐ T-304 Ra-226 ☐ Y982
☐ E551 ☐ 5105 ☐ CSV280

☐ Alpha S/N ____ ☐ Beta S/N ____ ☐ Other ____

☑ m 500 S/N 247891 ☐ Oscilloscope S/N ____ ☑ Multimeter S/N 17500076

Calibrator Scot VanAllen Title Calibrator Date 15 MAR 24

QC'd By [signature] Title Final QC Date 18 Mar 24

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of
Scientific and Industrial
Instruments

501 Oak Street
325-235-5494
Sweetwater, TX 79556, U.S.A.

Bench Test Data For Detector

Detector 44-10 Serial No. PR413155

Customer MJW TECHNICAL SERVICES ORDER NO. 20464654/553031

Counter 2241 Serial No. 196664 Counter Input Sensitivity 10 mV

Count Time 60 SECOND Distance Source to Detector SURFACE

Other

High Voltage	Background	Isotope Am 241 Size ~0.79 μC;	Isotope Size	Isotope Size	Isotope Size
800	5855	132222			
850	5771	130424			
900	6376	131207			
→ 950	6593	130553			
1000	6296	131231			
1050	6513	136478			
1100	6975	135641			
1150	9633	142856			

Signature Scot VanAllen Date 15 MAR 24

Attachment 20464654/553031
Model 2241 s/n: 196664

Efficiencies for 44-10 (PR413155)

Am241 s/n: 1895
Activity: 23,797dpm
Source Count: 6,325cpm
Background: 4,308cpm
4pi Eff for Am241: 8.48%

Cs137 s/n: 0754
Activity: 130,602dpm
Source Count: 31,269cpm
Background: 4,308cpm
4pi Eff for Cs137: 20.64%

Date: 15 March 2024

Scot VanAllen

Designer and Manufacturer of Scientific and Industrial Instruments

www.ludlums.com

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
501 Oak Street
325-235-5494
Sweetwater, TX 7 S.A.

ACCREDITED
CERT # 4084.01

Customer MJW CORPORATION ORDER NO. 20473715/559208

Mfg. Thermo Model MICRO REM Serial No. 19263

Mfg. _____ Model _____ Serial No. _____

Cal. Date 9-Jul-24 Cal Due Date 9-Jul-25 Cal. Interval 1 Year Meterface _____

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 74 °F RH 40 % Alt 706.0 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☐ Meter Zeroed ☐ Background Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck ☑ Reset ck. ☐ Window Operation ☐ Geotropism
☐ Audio ck. ☐ Alarm Setting ck. ☐ Batt. ck.

☐ Calibrated in accordance with LMI SOP 14.8 ☑ Calibrated in accordance with LMI SOP 14.9

Instrument Volt Set _____ V Input Sens. _____ mV Det. Oper. _____ V at _____ mV Threshold Dial Ratio _____ = _____ mV

☐ HV Readout (2 points) Ref./Inst. _____ / _____ V Ref./Inst. _____ / _____ V

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.
Multimeter uncertainty within 1.3% of reading, Gamma uncertainty within 5.0% of reading, Neutron uncertainty within 7.0% of reading, Count rate uncertainty within 5.4% of reading

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING
x 1000	150 mrem/hr	150 mrem/hr	150 mrem/hr
x 1000	50 mrem/hr	50	50
x 100	15 mrem/hr	150	150
x 100	5 mrem/hr	50	50
x 10	1500 µrem/hr	150	150
x 10	500 µrem/hr	45	45
x 1	150 µrem/hr	135	150
x 1	100 µrem/hr	90	100
x0.1	15 µrem/hr	150	150
x0.1			

Range(s) Calibrated Electronically

Digital Readout	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING

Log Scale	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques.
All pass/fail determinations are based on the manufacturer's specifications without considering uncertainty factors.
Measurement results represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k=2.
The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323AB-2013
ISO/IEC 17025:2017(E)
State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: Cs-137 S/N: ☐ 059 ☐ 2171CP ☐ 2261CP ☐ 720 ☐ 734 ☐ 781 ☐ 1131 ☐ 1616 ☐ 1696 ☐ 1909 ☐ 1916CP ☐ 2324/2521
☐ 5717CO ☐ 5719CO ☐ 60646 ☐ 70897 ☐ 73410 ☐ E552 ☐ G112 ☐ 2168CP ☐ S-394 ☐ S-1054 ☐ T10081 ☐ T10082 Neutron Am-241 Be ☐ T-304 Ra-226 ☐ Y982
☑ E551 ☑ 5105 ☑ CSV280

☐ Alpha S/N _____ ☐ Beta S/N _____ ☑ Other Cs-137: 3561282A

☐ m 500 S/N _____ ☐ Oscilloscope S/N _____ ☐ Multimeter S/N _____

Calibrator Duaine Jackson Duaine Jackson Title Calibrator Date 9 JUL 24

QC'd By _____ Title Final QC Date 10 JUL 24

AC Inst. Only ☐ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed: _____

Attachment C: Gel Lab Data Analysis

Attachment C: Sample Analysis Results: SDG 684025

Upon review of the lab results from SDG 684025 provided by GEL Laboratories, LLC, MJW compiled Table C.1 below. The information found in the table is the pertinent information regarding TENORM analysis; additional information is present in the Electronic Data Deliverable (EDD). An estimated 1 CY of material was in the pile represented in the report and analysis. Table C.1 below provides the analytical data for the samples analyzed.

MJW sent two (2) samples for analysis at GEL Labs in Charleston, South Carolina. One (1) grab sample of material from the pile, a field duplicate the grab sample. All samples were analyzed using EPA 901.1 Gamma Spectroscopy for Ra-226 and parent/daughter isotopes. The sample and its field duplicate were all additionally analyzed via Alpha spectroscopy for Isotopic Uranium and Isotopic Thorium.

DMM-5 classifies material upon the concentration of Ra-226 in subject material. The subject material of this report is classified as TENORM (Background-comparable) as no sample exceeded the Ra-226 limit of 5.0 pCi/g. Of all samples analyzed, the maximum Ra-226 concentration was 1.81 ± 0.2365 pCi/g, with the average of all samples being 1.62 ± 0.230 pCi/g.

Typical background values in Western New York range between 0.85 – 1.10 pCi/g (ORNL/TM-7343, DOE/OR-21949-300 2_1993) and local background samples taken by MJW in the area return similar values.

Given the Background-comparable status of the subject material MJW recommends free release for unregulated disposal. The material may not be utilized in any manner of cover system at disposal locations, but internment of the material will present no concerns for human or environmental health and safety in the immediate or long-term time frames.

Table C.1

Nuclide Information Table										
↓Sample ID[1]							GS[3]		AS[3]	
Sample Concentration (pCi/g) →	[Ac-228]	UNC[2]	[K-40]	UNC	[Ra-226]	UNC	[U-238]	UNC	[U-238]	UNC
20240820-EA-MP-01	1.13	0.383	8.86	1.57	1.52	0.241	UI	UI	1.79	0.601
20240820-EA-MP-01 Dup	1.16	0.288	8.53	1.38	1.81	0.236	U	U	1.79	0.732
20240820-EA-MP-01(684025001DUP)	0.996	0.329	8.37	1.35	1.52	0.213	U	U	N/A	N/A
Average Concentrations	**1.10**	**0.336**	**8.59**	**1.44**	**1.62**	**0.230**	**U**	**U**	**1.79**	**0.670**
1. Sample ID - Date Collected (XXXX_year,XX_month,XX_day)-Client(EA)-Location(MP)-Sample#; DUP- Field Duplicate										
2. UNC - Counting Uncertainty										
3. GS - γ Spec, AS - α Spec										
4. U - Unidentified										
5. N/A - Not Analyzed										