Stan A. Huber Consultants, Inc.
Health Physics and Radiation Safety Services

200 North Cedar Road – New Lenox, Illinois 60451-1751 – (800) 383-0468 or (815) 485-6161 – FAX (815) 485-4433 – Email sahci@sahci.com – Home Page www.sahci.com

April 2, 2022

974048

Angel Camacho
SET Environmental
450 Sumac Road
Wheeling, Illinois 60090

RE: Thorium Monitoring – City of Chicago Department of Transportation
CDOT Permits: 1536857, 1527635, 1527384
E. South Water St. between N. Michigan Ave. and N. Stetson Ave.

Dear Mr. Camacho:

Stan A. Huber Consultants, Inc (SAHCI) was hired by your firm to provide radiation monitoring during City of Chicago Department of Transportation excavation work on Lower E. South Water St. between N. Michigan Ave. and N. Stetson Ave. in Chicago, Illinois. The monitoring for these tasks was performed by Brian Schmidt, SAHCI Health Physics Technician. All activities were conducted under the guidance of document *SET General Procedure for Thorium Monitoring.*

This document is being provided as an interim report on radiation monitoring activities that have taken place from December 29, 2021, through April 1, 2022. The following tasks were performed over the monitoring period:

City Lights Conduit Replacement:	2/14/22
Street and Sidewalk Concrete Removal:	2/16/22 – 3/16/22
Storm Sewer and Catch Basin Installation:	2/23/22 – 3/16/22

Instrumentation

Surface gamma scans were performed using a Ludlum Model 2221 Scaler / Ratemeter (serial no. 134542) with attached Ludlum Model 44-10 2”x2” NaI Detector (w/ 6” collimated lead shield). The instrument was calibrated on May 5, 2021. The US Environmental Protection Agency (USEPA) action level of 7.1 picocuries per gram (pCi/g) total thorium for this instrument is 7,396 counts per minute (cpm).

The background count rate for this location ranged from 1,642 cpm to 1,791 cpm.

Surface Gamma Scans – City Lights Conduit Replacement

Gamma surface scans were performed adjacent to excavations at columns Q12 and Q13 using the Ludlum Model 2221 Scaler / Ratemeter detailed above. Survey data was collected by entering the excavations and recording the highest count rate for the floor and walls to an excavation depth of 3 feet below ground surface.

The maximum gamma count rate for each lift was recorded on the attached Radiation Survey Form. See Attachment 1. The count rates in the excavation ranged from 1,600 cpm to 2,800 cpm. No count rates were found at any time that exceeded the instrument specific count rate threshold limit of 7,396 cpm.

Surface Gamma Scans – Street and Sidewalk Removal

Gamma surface scans were performed on street and sidewalk concrete removal using the Ludlum Model 2221 Scaler / Ratemeter detailed above. Survey data was collected by scanning the surface of the concrete prior to removal and then again after removal to an excavation depth of 1 foot below ground surface.

The maximum gamma count rate for each lift was recorded on the attached Radiation Survey Form. See Attachment 2. The count rates in the excavation ranged from 1,500 cpm to 3,300 cpm. No count rates were found at any time that exceeded the instrument specific count rate threshold limit of 7,396 cpm.

Surface Gamma Scans – Storm Sewer and Catch Basin Installation

Gamma surface scans were performed during excavation for storm sewer catch basins and piping using the Ludlum Model 2221 Scaler / Ratemeter detailed above. Survey data was collected by entering the excavations and recording the highest count rate for the floor and walls to an excavation depth of 3 feet below ground surface. Material excavated from 3 feet deep to 10.5 feet deep was monitored in the excavator bucket as it was removed.

The maximum gamma count rate for each lift was recorded on the attached Radiation Survey Form. See Attachment 3. The count rates in the excavation ranged from 1,400 cpm to 3,500 cpm. No count rates were found at any time that exceeded the instrument specific count rate threshold limit of 7,396 cpm.

Additional Monitoring

Since no count rates were identified above the 7.1 pCi/gram threshold limit, no additional soil sampling, air monitoring, or personnel monitoring were performed.

I will be providing a copy of this report to both the City of Chicago Department of Public Health and US Environmental Protection Agency, as required.

Thank you for your assistance with this project. If you have any questions or need additional information, please call me at (815) 485-6161.

Sincerely,
Stan A. Huber Consultants, Inc.

Glenn Huber, CHP
President

Attachment 1 – City Lights Conduit Repair

CDOT Water St. Project

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Radiation Survey Form

Location/ Project ID: CDOT - S. WATER ST. - CITY LIGHT CONDUIT REPLACEMENT EXCAVATION - ROW RADIOLOGICAL SOIL SURVEY

Date: 2/14/2022 **Technician:** BRIAN SCHMIDT

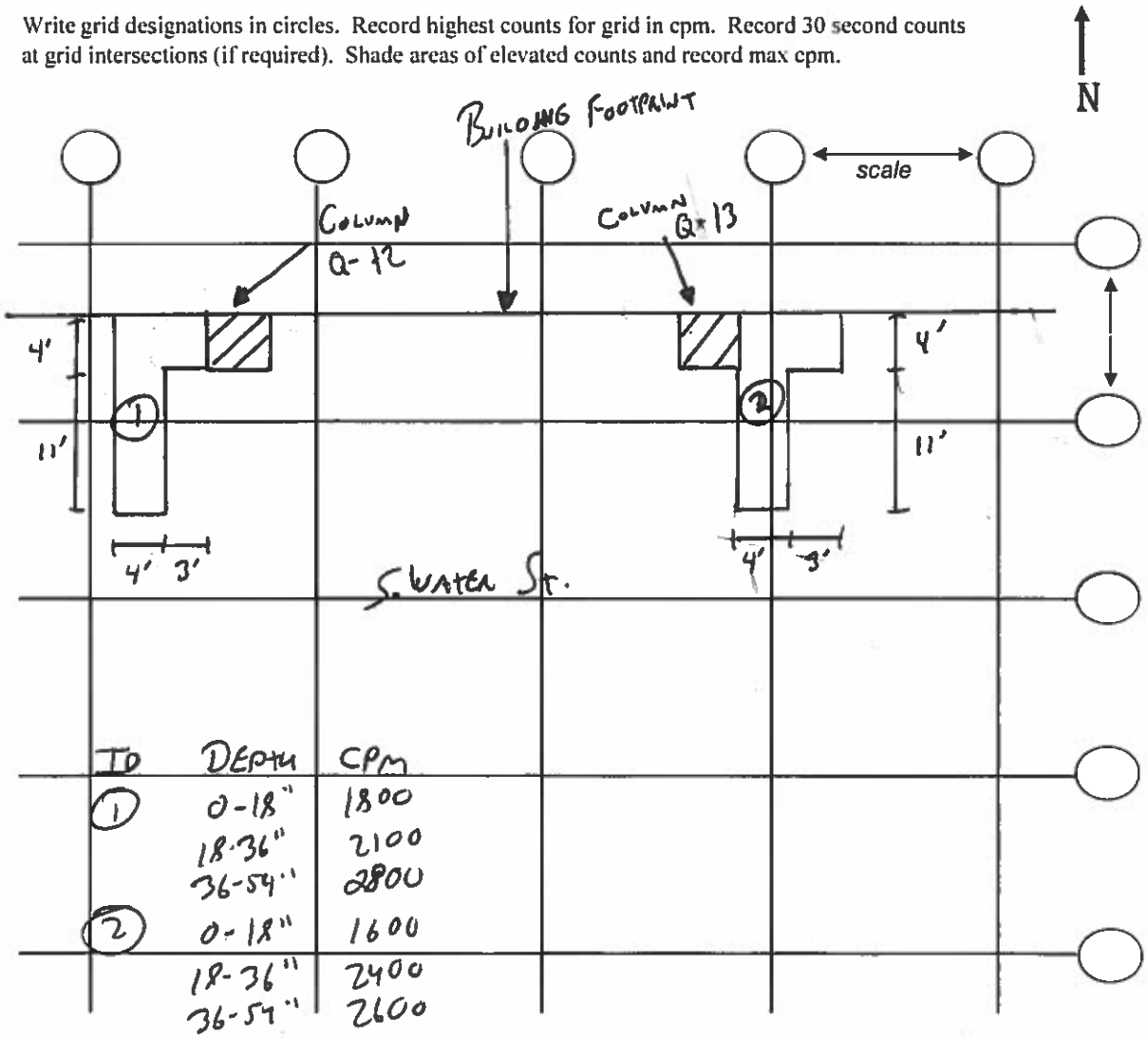
Inst Model: LUDLUM - 2221 **Serial No. :** 134542

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** 0 - 36"

7,396 GAH 4-2-22

Background 1642 cpm **Action Level:** ~~6758~~ cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



ID	DEPTH	CPM
1	0-18"	1800
	18-36"	2100
	36-54"	2800
2	0-18"	1600
	18-36"	2400
	36-54"	2600

Attachment 2 – Street and Sidewalk Removal

CDOT Water St. Project

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Radiation Survey Form

Location/ Project ID: FH Paschen - S. Water St - CDOT - Street + Sidewalk Concrete Removal - ROW Radiological Soil Survey

Date: 2/16/2022 to 3/16/2022 **Technician:** Brian Schmidt

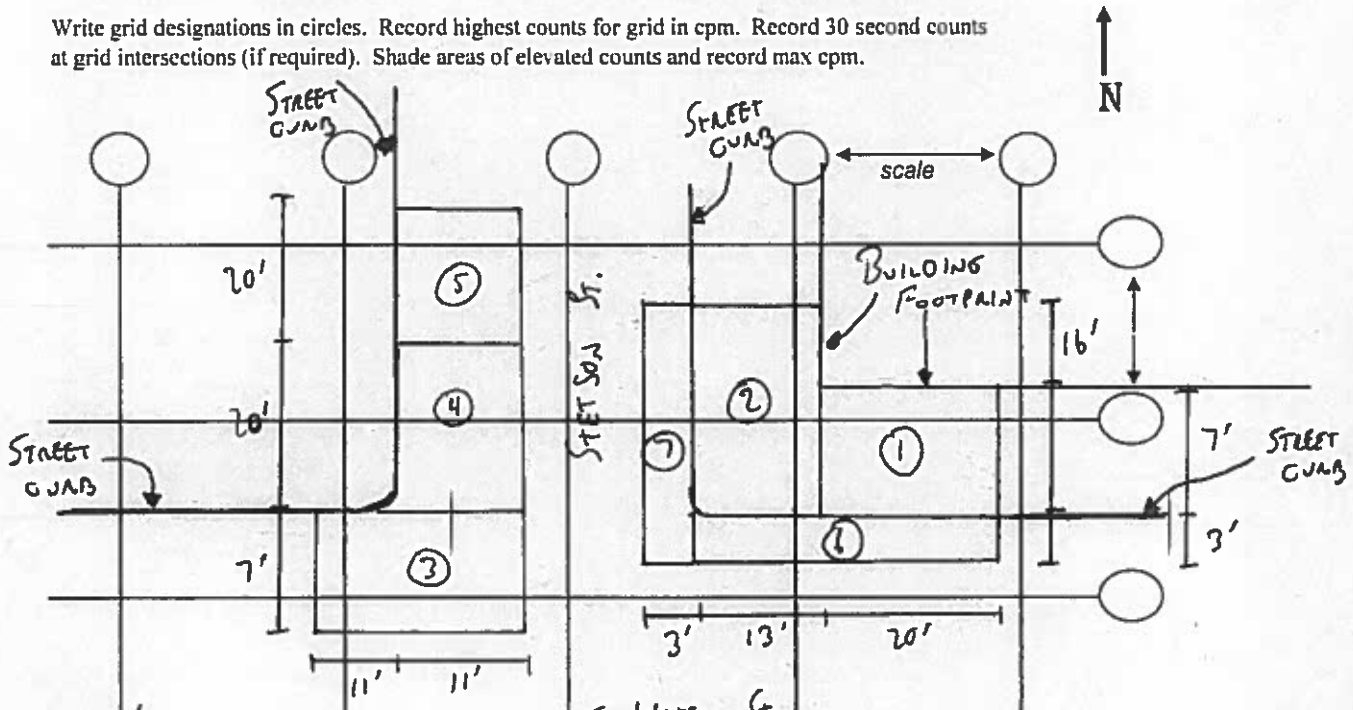
Inst Model: Ludlum-2221 **Serial No. :** 134572

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** 0-12"

7,396 cpm GAH 4-2-22

Background 1791 cpm **Action Level:** ~~6758~~ cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



2/16 - 2/17/2022

S. Water St.

ID	Depth	CPM
1	0-12"	1500
	12-30"	1700
2	0-12"	1700
	12-30"	1900
3	0-12"	1900
	12-30"	2800
4	0-12"	1800
	12-30"	2100
5	0-12"	1700
	12-30"	1900

ID	Depth	CPM
6	0-12"	1500
	12-30"	2200
7	0-12"	1700
	12-30"	1800

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Radiation Survey Form

Location/ Project ID: FH Paschen - S. Water St - CDOT - Street + Sidewalk Concrete Removal - Rad Radiological Soil Survey

Date: 2/21 to 3/16/2022 **Technician:** Brian Schmidt

Inst Model: Ludlum-2221 **Serial No.:** 83542

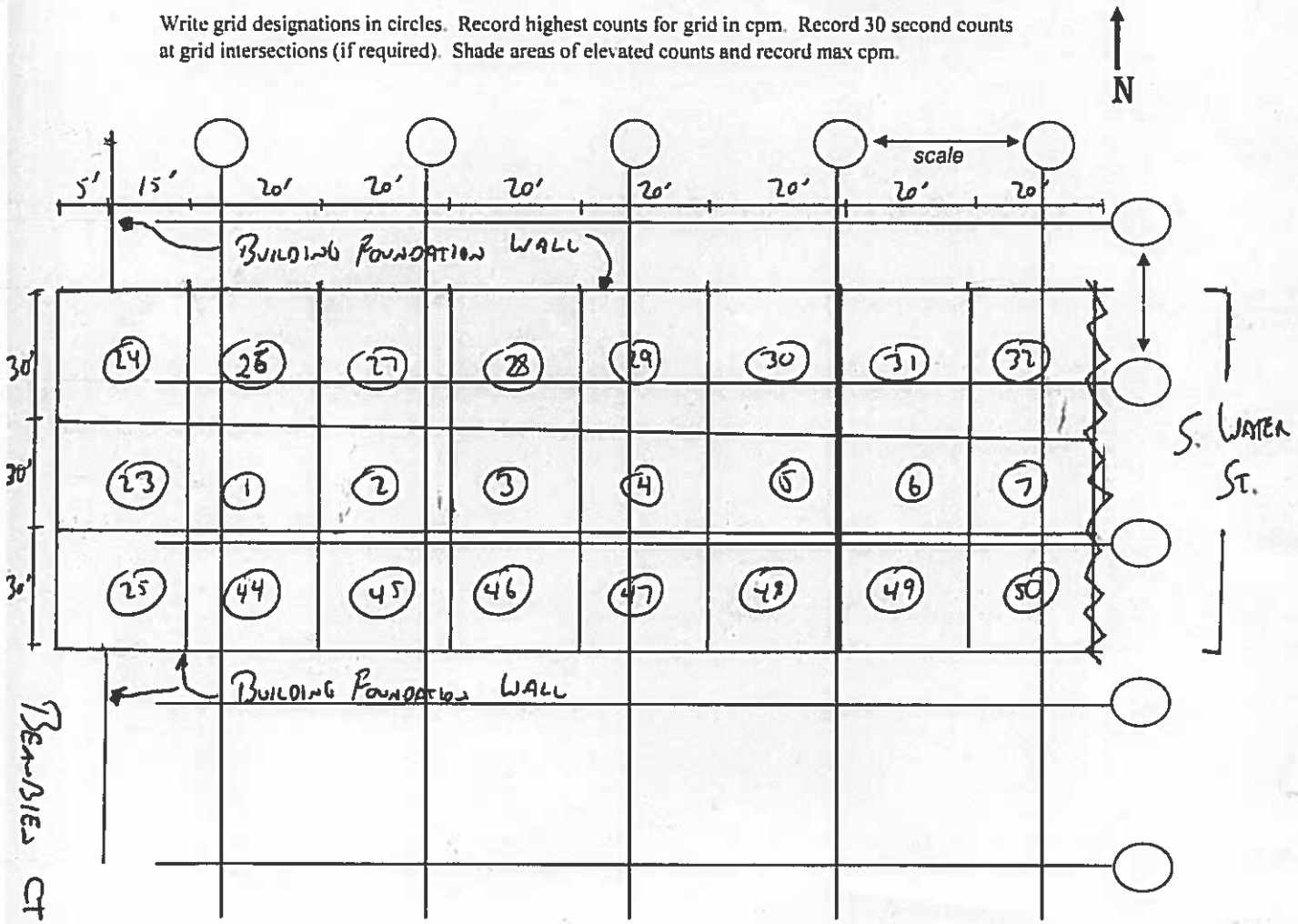
Probe Type: 1"x1" NaI / 2"x2" NaI
Shielded / Not Shielded

Lift Elevation: 0-12"

7,396 cpm GAH 4-2-22

Background 1642 cpm **Action Level:** 6758 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Radiation Survey Form

Location/ Project ID: Ft Pascher - S. Water St. - CDOT - Street + Sidewalk Concrete Removal - Low Radiological Soil Survey

Date: 2/21/2022 to 3/16/2022 **Technician:** Brad Schmidt

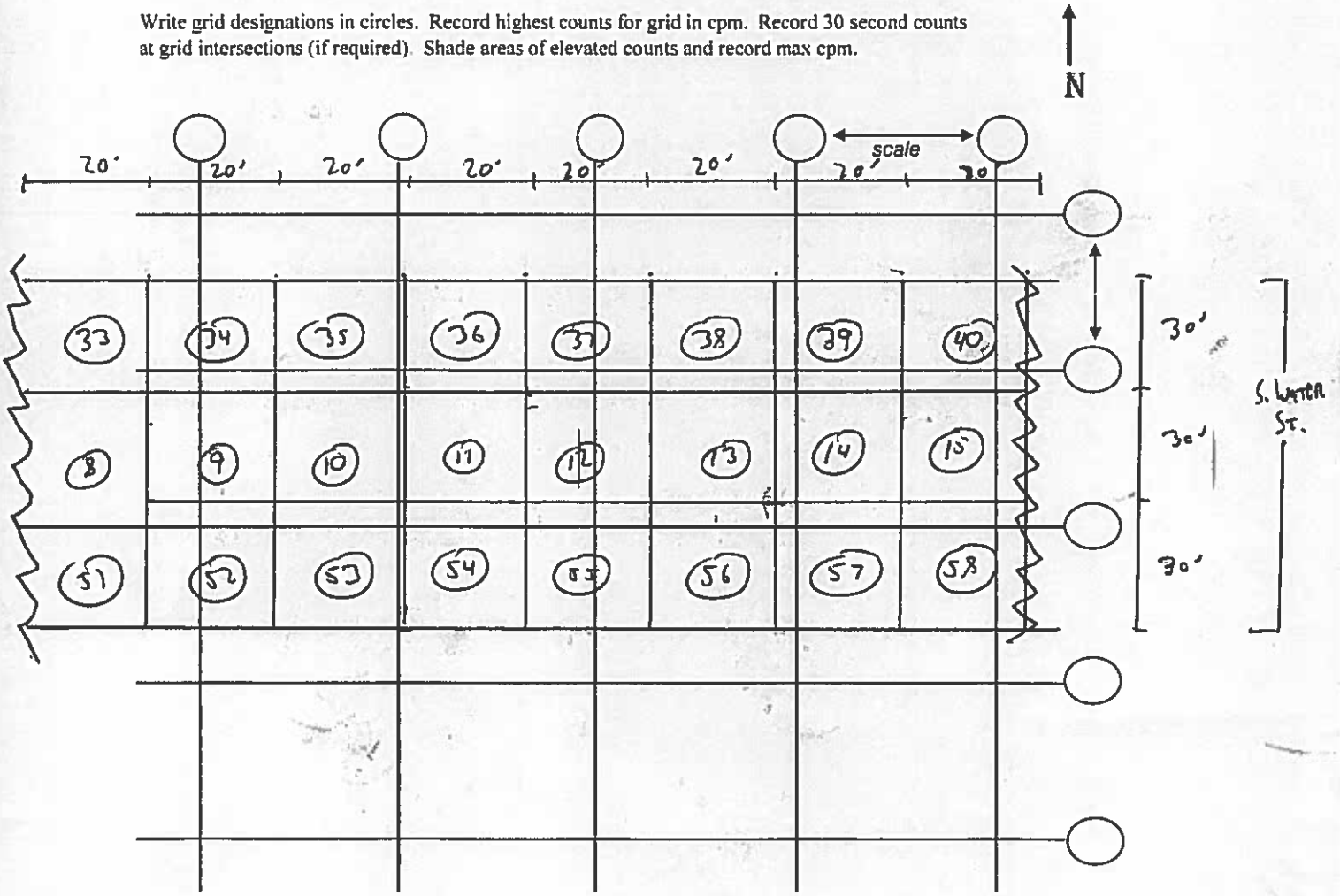
Inst Model: Ludlum-2221 **Serial No. :** 134542

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** 0-12"

7,396 cpm GAH 4-2-22

Background 1642 cpm **Action Level:** ~~6758~~ cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Radiation Survey Form

Location/ Project ID: FT PASCHEN – S. WATER ST. – CDOT – STREET + SIDEWALK CONCRETE REMOVAL – ROW RADIOLOGICAL SOIL SURVEY

Date: 2/21/2022 to 3/16/2022 **Technician:** BRIAN SCHMIDT

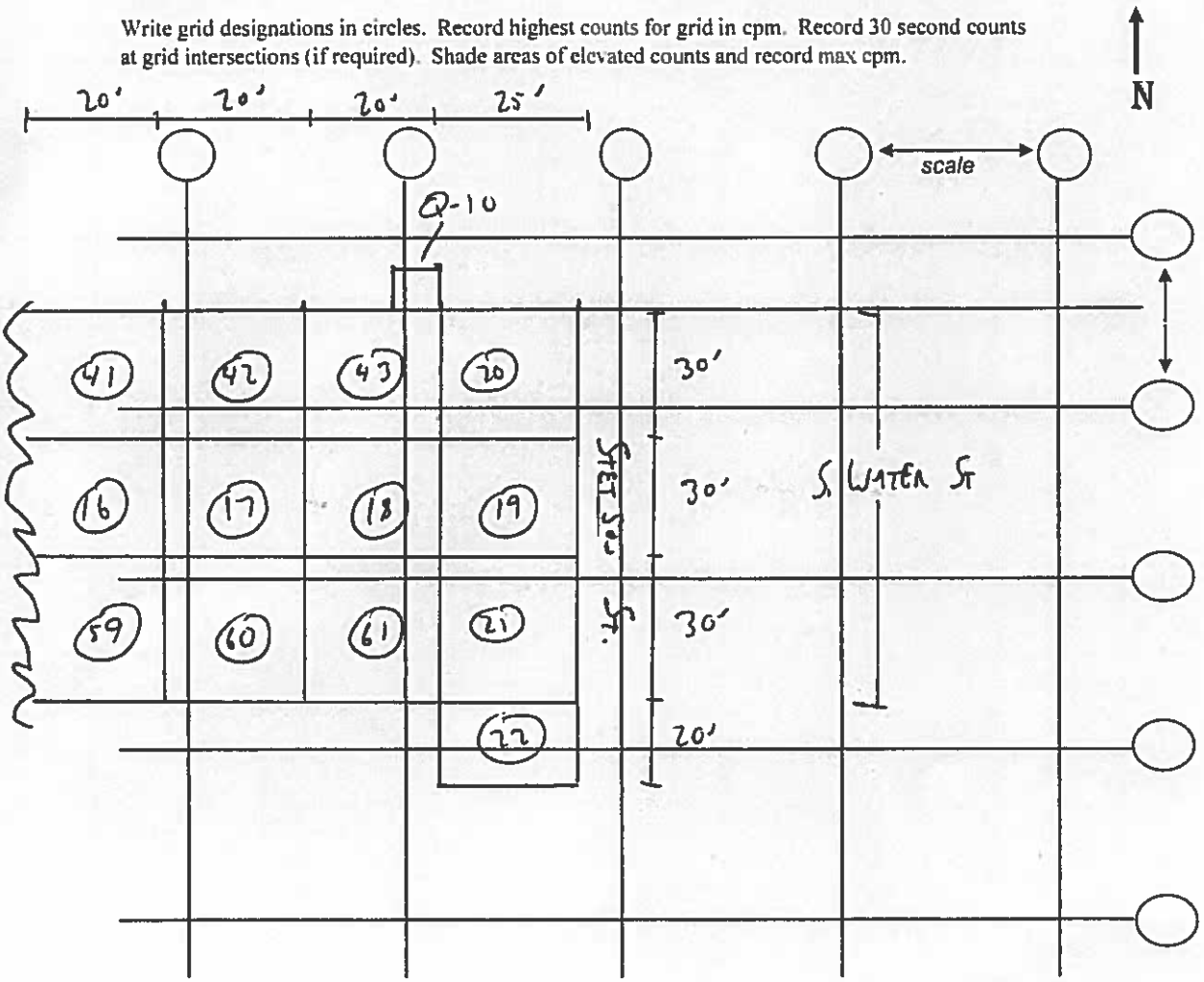
Inst Model: LUDLUM – 2221 **Serial No. :** 134542

Probe Type: 1"x1" NaI / ~~2"x2" NaI~~ ~~Shielded~~ / Not Shielded **Lift Elevation:** 0-12"

7,396 cpm GAH 4-2-22

Background 1642 cpm **Action Level:** ~~6758~~ cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Radiation Survey Form

Location/ Project ID: FM PASCHEN - S. WATER ST - CDOT - STUBB + SIDEWALK CONCRETE REMOVAL - ROW RADIOLOGICAL SOIL SURVEY

Date: 2/28/2022 to 3/16/2022 **Technician:** BRIAN SCHMIDT

Inst Model: LUDLUM - 2221 **Serial No. :** 194542

Probe Type: 1"x1" NaI / 2"x2" NaI (circled) Shielded (circled) / Not Shielded **Lift Elevation:** 0-12"

7,396 cpm GAH 4-2-22

Background 1642 cpm **Action Level:** 1758 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.

N

scale

ID	Depth	cpm	ID	Depth	cpm	ID	Depth	cpm
1	0-12"	1800	15	0-12"	2100	31	12-30"	2600
	12-30"	2400		12-30"	2800	32	12-30"	2800
2	0-12"	1700	16	0-12"	1800	33	12-30"	2500
	12-30"	2800		12-30"	2400	34	12-30"	2300
3	0-12"	1900	17	0-12"	1900	35	12-30"	2300
	12-30"	2100		12-30"	2300	36	12-30"	2000
4	0-12"	1700	18	0-12"	1700	37	12-30"	2100
	12-30"	2800		12-30"	2200	38	12-30"	2400
5	0-12"	1900	19	0-12"	1500	39	12-30"	2200
	12-30"	2500		12-30"	2400	40	12-30"	2700
6	0-12"	2100	20	0-12"	1900	41	12-30"	2500
	12-30"	2600		12-30"	2100	42	12-30"	2500
7	0-12"	1600	21	0-12"	1700	43	12-30"	2100
	12-30"	2200		12-30"	2400	44	12-30"	1800
8	0-12"	1900	22	0-12"	1500	45	12-30"	1800
	12-30"	2200		12-30"	2500	46	12-30"	2900
9	0-12"	1800	23	0-12"	1700	47	12-30"	1900
	12-30"	2400		12-30"	2500	48	12-30"	2600
10	0-12"	1600	24	0-12"	2400	49	12-30"	2500
	12-30"	1900		12-30"	3300	50	12-30"	2000
11	0-12"	1500	25	0-12"	1900	51	12-30"	2400
	12-30"	2000		12-30"	2600	52	12-30"	2800
12	0-12"	1600	26	12-30"	2400	53	12-30"	2500
	12-30"	2200				54	12-30"	2400
13	0-12"	1500	27	12-30"	2100	55	12-30"	2400
	12-30"	2100	28	12-30"	2500	56	12-30"	2100
14	0-12"	1800	29	12-30"	2800	57	12-30"	2600
	12-30"	2300				58	12-30"	2000
			30	12-30"	3300	59	12-30"	1900
						60	12-30"	2400
						61	12-30"	2300

Attachment 3 – Storm Sewer Installation

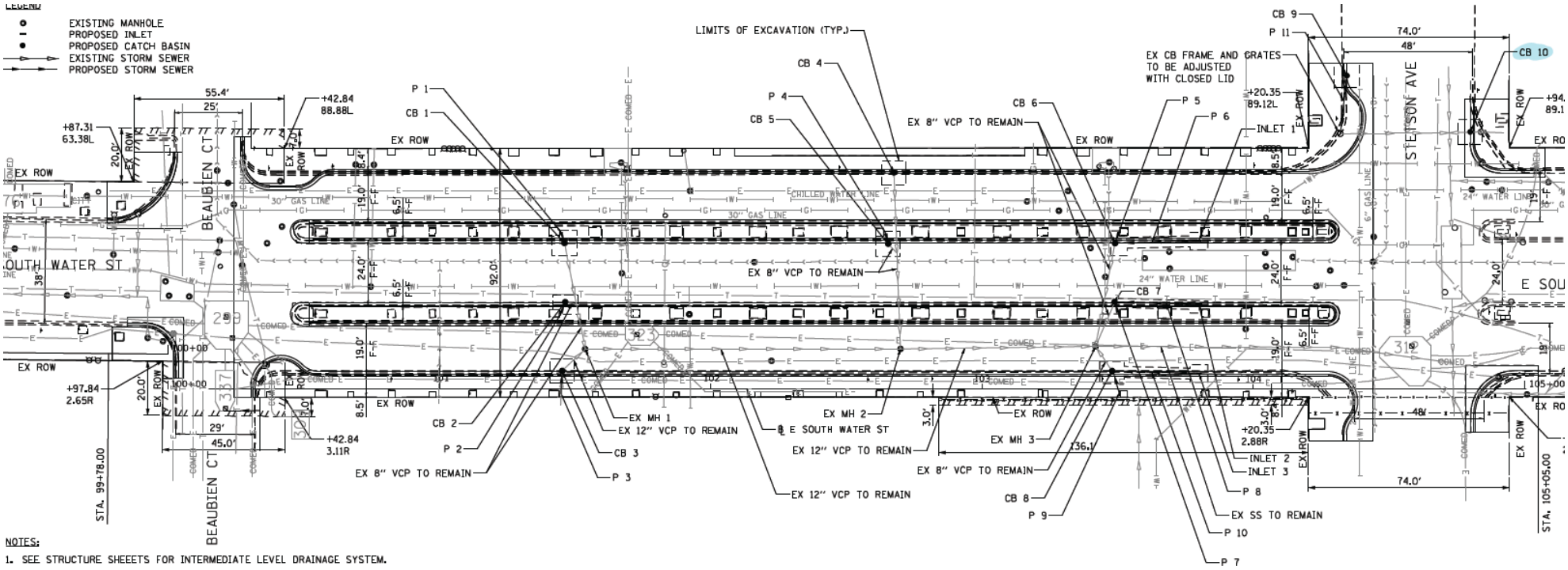
CDOT Water St. Project

Radiological Soil Investigation of Sewer Structure Excavation
CDOT S. Water St. - Chicago, IL

	Depth	0"-18" (bgs)	18"-36" (bgs)	36"-54" (bgs)	54"-72" (bgs)	72"-90" (bgs)	90"-108" (bgs)	108"-126" (bgs)	126"-144" (bgs)
Date	Excavation ID	Survey Results (counts per minute)							
2/28/2022	CB-1	1800	2600	2700	2900				
2/25/2022	CB-2	1700	2500	2900	3100				
2/24/2022	CB-3	1600	1800	1400	1700	1900	1500		
3/3/2022	CB-4	1500	1900	2600	2600				
3/2/2022	CB-5	1700	2600	2700	2400	2200	2300		
3/4-7/2022	CB-6	1900	2600	3500	3100	2100			
3/8/2022	CB-7	1900	2200	2600					
3/8-9/2022	CB-8	1600	1900	2100	2700	2300	2500	2700	2500
2/23-3/4/2022	CB-9	1400	2100	2400	2200				
3/15-16/2022	CB-10	1900	2100	2400	2500	2400	2100	2200	2500
3/7/2022	Inlet #1	1500	1900	2200	2700	2400			
3/11/2022	Inlet #2	1600	2400	2900					
3/10/2022	Inlet #3	1600	2200	2800					
3/7/2022	P-5	1600	1800	1900					
3/8/2022	P-6	1800	2300	2600					
3/11/2022	P-8	2100	2700	3300					
3/10/2022	P-10	1800	2400	2500					
3/4/2022	P-11	2200	2300	2100	1900	2400			

- All Excavation locations surveyed with a Ludlum-2221 Survey Meter w/ Shielded 2x2 NAI Probe
- Ludlum S/N - 134542
- 7.1 pCi/g Action Level for Shielded NAI Probe = 7,396 counts per minute
- Excavation Depth Not Performed

CB = Catch Basin
P = Sewer Pipe
Inlet = mini-catch basin



NOTES:

1. SEE STRUCTURE SHEEETS FOR INTERMEDIATE LEVEL DRAINAGE SYSTEM.