
FIELD SAMPLING PLAN ADDENDUM 3

WEST LAKE LANDFILL SUPERFUND SITE OPERABLE UNIT 1

Prepared For:

The United States Environmental Protection Agency Region VII



Prepared on Behalf of:

The West Lake Landfill OU-1 Respondents

Prepared By:



301 Plainfield Road, Suite 350
Syracuse, New York 13212

In Association With:



3377 Hollenberg Drive
Bridgeton, Missouri 63044

And



9111 Cross Park Drive, Suite D200
Knoxville, TN 37923

SEPTEMBER 3, 2021

TABLE OF CONTENTS

LIST OF ACRONYMS	2
1.0 AREA 1 ADDITIONAL BORINGS	1
1.1 Introduction.....	1
1.2 Summary of Design Investigation Findings.....	1
1.3 Proposed Additional Boring Locations.....	3
1.3.1 Hollow-Stem Auger (HSA) Perimeter Step-Out Borings	3
1.3.2 Shallow Direct Push Technology (DPT) Perimeter Step-Out Borings.....	4
1.3.3 Sonic Drilling Perimeter Step-Out Boring in Waste	5
1.4 Drilling and Sampling Methods and Protocols.....	5

LIST OF TABLES

Table A3-1 Thickness of MSW A1
Table A3-2 Area 1 Archived Samples
Table A3-3 Area 1 Perimeter Boring Analytical Laboratory Data
Table A3-4 Proposed Step-out Boring Sample Collection Detail

LIST OF FIGURES

Figure A3-1 Area 1 – Site Location Map
Figure A3-2 Proposed Hollow-Stem Auger Step-out Borings
Figure A3-3 Proposed Shallow DPT Step-out Boring
Figure A3-4 Soil Samples From ERM Borings and Proposed Locations of Shallow DPT Borings

ATTACHMENTS

Attachment A3-1 F-1-D Boring Log
Attachment A3-2 A1-PB-118A Boring Plan

LIST OF ACRONYMS

<u>ACRONYM</u>	<u>Definition</u>
bgs	below ground surface
ft	foot/feet
DIWP	Design Investigation Work Plan
DMP	Data Management Plan
DOE	U.S. Department of Energy
DPT	direct push technology
EPA	U.S. Environmental Protection Agency
FSP	Field Sampling Plan
HSA	hollow-stem auger
MDNR	Missouri Department of Natural Resources
MSW	Municipal Solid Waste
NCC	non-combustible cover
OU	Operable Unit
pCi/g	picocurie/gram
QAPP	Quality Assurance Project Plan

1.0 AREA 1 ADDITIONAL BORINGS

1.1 Introduction

This Field Sampling Plan (FSP) Addendum 3 has been prepared on behalf of West Lake Landfill OU-1 Respondents Bridgeton Landfill, LLC, Cotter Corporation (N.S.L.), and the U.S. Department of Energy (DOE) (collectively, Respondents) for the design investigation for the selected Amended Remedy for Operable Unit-1 (OU-1) of the West Lake Landfill Superfund Site (Site). The United States Environmental Protection Agency (EPA) approved (with modifications) the Field Sampling Plan (FSP), with the associated Design Investigation Work Plan (DIWP), Quality Assurance Project Plan (QAPP), and Data Management Plan (DMP), in September 2020. The final version of the FSP is dated October 16, 2020.

Addendum 3 has been prepared in response to: (i) identification of municipal solid waste (MSW) greater than 2 feet (ft) in thickness and/or analytical results from soil samples greater than 7.9 picocuries per gram (pCi/g) for combined thorium and/or combined radium in a subset of the borings drilled between October 27, 2020 and December 9, 2020 around the perimeter of Area 1 in OU-1; (ii) detections of radionuclides greater than 7.9 pCi/g of combined thorium and/or combined radium in two Area 1 interior borings close to the perimeter; and (iii) detections of radionuclides greater than 7.9 pCi/g of combined thorium and/or combined radium in historically collected surface samples located close to the Area 1 boundary (see Figure A3-1).

Additional step-out boring locations are proposed as part of this Addendum that vary from certain aspects of the step-out protocols prescribed in Section 2.2.2.1 of the FSP to delineate the extent of MSW and/or combined radium and/or thorium greater than 7.9 pCi/g. Specifically, the selection of the boring locations for the step-outs varies from the location selection procedures in Section 2.2.2.1 of the FSP because of logistical challenges (i.e., presence of utilities, structures, and/or topographic constraints), the incorporation of borings advanced as part of the OU-3 monitoring well installations near potential step-out locations, or based on changes requested by the EPA.

1.2 Summary of Design Investigation Findings

Seven perimeter borings (A1-PB-101, A1-PB-102, A1-PB-102-R, A1-PB-103, A1-PB-104, A1-PB-114, and A1-PB-115) drilled along the border of OU-1 Area 1 encountered greater than 2 ft of MSW. A1-PB-102 was redrilled due to poor recovery. MSW was encountered in both borings (A1-PB-102 and A1-PB-102-R) at approximately 4 ft below ground surface (bgs). The MSW thicknesses encountered in each boring are summarized in Table A3-1.

Although greater than 2 ft of MSW was encountered in A1-PB-103, soil analytical results for combined radium and/or thorium from the boring are less than 7.9 pCi/g. Since the area west of A1-PB-103 is a high traffic area utilized to support the transfer station operations, a step-out boring at this location is not proposed at this time. The Respondents will further discuss with EPA the requirement for a step-out boring and whether an exception will be granted in this area. Note that boring A1-PB-067 has been added as a proposed boring between A1-PB-103 and A1-PB-104 at the request of EPA. This additional perimeter boring is necessary based on RIM >7.9 pCi/g in boring A1-SB-067, which is located very near the perimeter of Area 1, and to make the perimeter boring spacing consistent (approximately 100 feet or ft apart) with other areas of the site where RIM is located near an OU-1 perimeter.

A step-out boring for A1-PB-104 was drilled in accordance Section 2.2.2.1 of the FSP. Due to persistent methane venting through the borehole, A1-PB-104-A was abandoned at 14 ft bgs before reaching the target drill depth of

25 ft bgs prescribed in the FSP. A1-PB-104A had a 1.5-ft-thick layer of MSW at a depth of 7 to 8 ft. However, since no samples were collected in accordance with the approved FSP from boring A1-PB-104-A, and the boring did not go to full depth to evaluate the presence of MSW, no conclusions can be drawn from this step-out boring. Samples from the 6 to 8 ft and 8 to 13 ft bgs intervals in A1-PB-104 were sent for laboratory analysis on December 13, 2020. The remaining archived A1-PB-104 samples, as well as the archived samples from A1-PB-101 and A1-PB-102, were sent for laboratory analysis on June 7, 2021, at the request of EPA, and the results are included in Table A3-3.

Step-out borings for A1-PB-114 and A1-PB-115 were drilled in accordance with Section 2.2.2.1 of the FSP. Samples from A1-PB-114A and A1-PB-115A were sent in for analysis shortly after drilling. The samples from A1-PB-114 and A1-PB-115 are archived. Archived samples were not submitted for laboratory analysis at the time of drilling because step-out borings were drilled. Although no MSW was encountered in either A1-PB-114-A or A1-PB-115-A, the results of the soil sample analyses indicate the presence of combined thorium and/or combined radium greater than 7.9 pCi/g. Therefore, additional step out borings are proposed to define the extent of radiologically impacted material (RIM) along the eastern side of Area 1.

Soil samples collected from step-out borings A1-PB-114-A and A1-PB-115-A, from six other perimeter borings (A1-PB-104, A1-PB-106, A1-PB-107, A1-PB-110, A1-PB-111, and A1-PB-118), and from two interior borings, A1-SB-066 and A1-SB-067, all have detections of combined thorium and/or combined radium greater than 7.9 pCi/g. The interior borings (A1-SB-066 and A1-SB-067) are in close proximity to the Area 1 boundary and therefore are included in this Addendum. Figure A3-1 shows the locations of these 14 perimeter borings (A1-PB-101, A1-PB-102, A1-PB-102-R, A1-PB-103, A1-PB-104, A1-PB-106, A1-PB-107, A1-PB-110, A1-PB-111, A1-PB-114, A1-PB-114A, A1-PB-115, A1-PB-115A, and A1-PB-118) and two interior borings (A1-SB-066 and A1-SB-067). Analytical results are summarized in Table A3-3.

Due to detections of combined thorium and/or combined radium greater than 7.9 pCi/g in A1-SB-068, EPA requested a step-out boring to be placed between perimeter borings A1-PB-105 and A1-PB-106. Subsequent analytical results from interior boring A1-SB-140, located closer to A1-PB-105 and A1-PB-106, however, show no detections of RIM greater than 7.9 pCi/g, indicating that RIM is delineated in the interior of Area 1 in this vicinity. Therefore, a boring between perimeter borings A1-PB-105 and A1-PB-106 is not proposed, although a shallow step-out boring is proposed in Section 1.3.2 at A1-PB-106 due to the presence of surficial RIM.

Perimeter boring in waste A1-PB-118, in the North Quarry area, had detections of combined thorium greater than 7.9 pCi/g between depths of 55 and 65 feet bgs, as summarized in Table A3-3. A step-out boring, A1-PB-118A, is proposed in the southwest corner of Area 1 near the edge of the uppermost quarry bedrock ledge, as discussed further in Attachment A3-2 of this Addendum.

The sample depths shown in attached tables are reported with respect to both feet below the surveyed ground surface (bgs) at the boring location and feet below DI datum. In order to provide clarification on the sample depths and measuring points, the following definition is provided:

- DI datum: describes the landfill surface below surficial material¹ where such material exists. If no surficial material exists at a given location, then the current ground surface (at the time of the DI) is considered the DI datum. This datum was developed to eliminate the logging and sampling of surficial material (especially drilling pad and non-combustible cover [NCC]). In Areas 1 and 2, the DI datum is synonymous with the 2005 ground surface, as defined in Section 2.2.2 of the DIWP. Table A3-3 includes a column showing the thickness of surficial material (i.e., NCC, inert fill, and drilling pad).

¹ Surficial material consists of drilling pad, NCC, and/or inert fill.

1.3 Proposed Additional Boring Locations

1.3.1 Hollow-Stem Auger (HSA) Perimeter Step-Out Borings

As set forth in Section 1.1 above, step-out borings are required under the protocol in FSP Section 2.2.2.1 when MSW greater than 2 ft in thickness is encountered or analytical results identify combined radium and/or thorium greater than 7.9 pCi/g. Because one or both of these conditions were present for perimeter borings A1-PB-101, A1-PB-110, A1-PB-114-A, and A1-PB-115-A, step-out borings are proposed to delineate the boundary of Area 1 in the vicinity of these perimeter borings (see Tables A3-1 and A3-3, respectively).

The position of the step-out boring for A1-PB-101 was adjusted to consider logistical constraints with respect to the original boring location (i.e., retaining wall and building by A1-PB-101; see Figure A3-2) along the boundary of Area 1.

Two additional perimeter borings (not step-outs) are proposed here at the request of EPA. Specifically, A1-PB-067 is proposed between A1-PB-103 and A1-PB-104, and A1-PB-066 is proposed between A1-PB-104 and A1-PB-105, to reduce the spacing between perimeter borings in this area.

Although St. Charles Rock Road is known to have been used as a haul route to bring radiological material to the Site, haul route sampling conducted by the Missouri Department of Natural Resources (MDNR) in 2005 did not detect any radionuclide results above 7.9 pCi/g in any of the five samples (VPSCR081705SLOP through VPSCR081705SLOT, presented in Table A3-3) obtained along the west side of St. Charles Rock Road adjacent to Area 1. Additional step-out borings (A1-PB-114-B, A-PB-114-C, A1-PB-115-B, and A-PB-115-C) are proposed to explore the potential that RIM along the east side of Area 1 could be present near St. Charles Rock Road due to erosion off of Area 1 toward the east. A1-PB-114-B will be placed to the east of A1-PB-114-A and A1-PB-114-C will be located to the north of A1-PB-114-A. A1-PB-115-B will be placed to the east of A1-PB-115-A. A1-PB-115-C will be located between A1-PB-115 and A1-PB-116 to reduce spacing between perimeter borings and delineate the lateral extent of RIM in this area, per the request of EPA. The proposed step-out boring locations are shown in Figure A3-2. The step-out borings' locations were adjusted to consider logistical factors with respect to the proximity of the previously drilled A1-PB-114-A and A1-PB-115-A along the boundary of Area 1 to features such as an underground utility corridor, power lines, stormwater drain, and St Charles Rock Road (see Figure A3-2).

Five step-out borings are proposed to delineate soil with combined thorium and/or radium detected above 7.9 pCi/g (Table A3-3) at depth in A1-PB-110. A step-out boring will be advanced into the site access road perpendicular to the Area 1 perimeter at an off-set distance of approximately 10 ft from the original boring location following the protocol described in Section 2.2.2 of the FSP. Two additional borings will be placed at 45-degree angles into the site access road approximately 15 ft on either side of A1-PB-110, approximately the same distance from the Area 1 perimeter as the primary step-out boring. A fourth boring will be placed on the Area 1 perimeter approximately halfway between A1-PB-110 and A1-PB-109, and a fifth boring will be placed approximately halfway between A1-PB-110 and A1-PB-158 along the perimeter of Area 1 (Figures A3-1 and A3-2). These additional four borings are being proposed at the request of EPA. These HSA borings are proposed to address combined thorium and combined radium concentrations detected in A1-PB-110 above 7.9 pCi/g that do not appear to be the result of surficial stormwater sediment deposition, and are being performed in accordance with the clause in FSP Section 2.2.2.1 regarding exceptions to offset distances to account for other site data such as the potential presence of a former road in this area.

1.3.2 Shallow Direct Push Technology (DPT) Perimeter Step-Out Borings

Combined thorium and/or combined radium greater than 7.9 pCi/g was detected in soil samples collected from 0 to 2 ft bgs in borings A1-PB-106, A1-PB-107, A1-PB-111, and in historic surface soil samples collected from 1014S, 1015S, 1019S, 1022S, and 1023S (clustered around A1-PB-111) (see Figure A3-3, Table A3-3). Step-out borings will be advanced at an off-set distance of approximately 10 ft perpendicular to the original boring locations along the boundary of Area 1 for borings A1-PB-106, A1-PB-107, and A1-PB-111 following the protocol described in Section 2.2.2 of the FSP. At the request of EPA, two additional DPT borings will be placed at off-set distances of approximately 20 ft laterally to the west of A1-PB-111 (A1-PB-111-B) and 10 ft laterally to the east of A1-PB-111 (A1-PB-111-C) to delineate the historic surface soil sample exceedances of 7.9 pCi/g of combined thorium and/or combined radium. These sample locations will be drilled to a depth of 4 ft below the bottom of the pavement section per the protocol defined in Section 2.4.2.6 of the FSP.

The borings for two groundwater monitoring wells (MW-111, and PZ-112ASR) already installed by ERM (the OU-3 contractor) are proposed to serve as step-out borings (Figure A3-4) for A1-PB-102-R where greater than 2 ft of MSW was observed and A1-PB-104 because the step-out boring A1-PB-104A was terminated at a depth of 14 ft due to elevated methane readings. The MW-111 soil core from 7 to 25 ft bgs was described and sampled by Parsons in general accordance with the sampling protocols described in Section 2.2.1.2 of the FSP. Soil analytical results for this portion of the boring were less than 7.9 pCi/g for combined radium and/or thorium and no MSW was observed. Since the first 7 ft of the boring was cleared using a hydro vacuum, no soil was retrieved from the monitoring well boring for description or sampling. Therefore, a DPT boring will be advanced to a depth of 8 ft within 5 ft of MW-111 to collect data from the 0 to 7 ft interval that was hydro vacuumed.

Soil core from PZ-112-ASR has been archived and will be described and sampled by Parsons. Since the first 8 ft of this boring was also cleared using a hydro vacuum, no soil was retrieved from the monitoring well boring for description or sampling. A shallow boring will be advanced within 5 ft of PZ-112-ASR to collect data from the 0 to 8 ft interval that was hydro vacuumed. In addition, archived samples from A1-PB-104 (see Table A3-2) will be submitted for laboratory analysis per the request of EPA.

The logistical difficulties in implementing the step-out protocol prescribed in Section 2.2.2 of the FSP that have necessitated the alternate approaches for A1-PB-102-R and A1-PB-104-A discussed above are further described below.

A1-PB-102/A1-PB-102-R

The archived samples from A1-PB-102 were analyzed per the request of EPA to assess if RIM is present at that location. Soil analytical results (Table A3-3) for this boring were less than 7.9 pCi/g for combined radium and/or thorium. Based on previous investigations, several underground utilities (leachate conveyance piping and electrical conduit) are present at an offset distance of 10 ft from A1-PB-102-R. Beyond the utilities, the foundation wall of the transfer station tunnel would be encountered during drilling which would result in refusal. Between A1-PB-102R and historic boring F-1-D, the transfer station tunnel with sloping grade and transfer station west wall, create difficulties in drilling.

Historic boring F-1-D has previously demonstrated that MSW is not present and elevated gamma readings were not observed about 30 ft southwest of the transfer station tunnel. F-1-D was drilled by Foth and Van Dyke and Associates, Inc. on September 1, 1990. This boring is located approximately 85 feet from A1-PB-102-R, about halfway between A1-PB-102-R and MW-111 as shown on Figure A3-1. Boring F-1-D was advanced to a depth of 79.5 ft and no MSW or radiological readings above background were observed. The boring log for F-1-D is provided as Attachment A3-1.

As a consequence, the best location without infrastructure / transfer station encumbrances for a step-out boring to evaluate the potential for RIM is the MW-111 location, as proposed above.

A1-PB-104-A

A1-PB-104 had observed MSW from a depth of 9 ft to the base of the boring, which was terminated at 14 ft while still in MSW. Step-out boring A1-PB-104-A was advanced as a step-out boring and MSW was observed in a 1.5 ft thick layer from 7 to 8.5 ft. This boring was also terminated at a depth of 14 feet due to methane emanating from the boring, but there was no observed evidence of MSW below 8.5 ft. Samples from 0 to 14 ft in the soil and MSW materials in A1-PB-104 were analyzed. One soil sample in A1-PB-104 from 2 to 4 ft bgs had combined thorium greater than 7.9 pCi/g but the remaining samples did not have combined thorium or combined radium with activity greater than 7.9 pCi/g.

An offset distance of 10 ft from A1-PB-104-A places the step-out boring in the center of the entrance road, which will not allow a bypass lane during drilling. This entrance lane serves as critical infrastructure to the landfill and provides the primary entrance for First Responders. Therefore, access cannot be blocked even during Sunday / off hours. On the west side of the road, PZ-112 ASR and the proposed 8-foot-deep DPT boring discussed above provide data on the potential presence of MSW and RIM at that location.

1.3.3 Sonic Drilling Perimeter Step-Out Boring in Waste

Combined thorium greater than 7.9 pCi/g was detected in soil samples collected from 55 to 65 ft bgs in boring A1-PB-118 (see Table A3-3). A step-out boring, A1-PB-118A, will be advanced in the southwest corner of Area 1 near the edge of the upper quarry rock ledge. The location, rationale and logistics for a step-out boring associated with boring A1-PB-118 in order to delineate the extent of RIM in this area are provided in Attachment A3-2 to this FSP Addendum.

1.4 Drilling and Sampling Methods and Protocols

The FSP standardizes the field procedures to be performed during the design investigation activities for OU-1. The work proposed in this Addendum 3 uses those standard methods and protocols provided in the FSP. The specific provisions in the FSP that will be used are described below. The details regarding the proposed borings are summarized in Table A3-4.

Step-out borings for A1-PB-101, A1-PB-110, A1-PB-114A, and A1-PB-115A, and new perimeter borings near interior borings A1-SB-066, and A1-SB-067 (Figure A3-2), will be advanced to 25 ft bgs, if no MSW is encountered, using the HSA drilling method described in FSP Section 2.2.1.3. If greater than 2-ft thickness of MSW is encountered, the boring will be terminated at the base of waste and an additional step-out boring performed per FSP Section 2.2.2.1, if feasible. Soil samples will be logged and sampled following the procedures in FSP Sections 2.4.1 and 2.4.3, respectively. Samples will be submitted for laboratory analysis of the parameters listed in Section 2.4.5.2. Downhole gamma logging per FSP Section 2.3.2 will be performed.

Step-out borings for A1-PB-106, A1-PB-107, and A1-PB-111 (Figure A3-3) will be advanced using direct push technology (DPT), as described in Section 2.2.1.1 of the FSP, in lieu of HSA since there are no indications of impacts at depth (i.e., greater than 2 ft bgs). The DPT borings will be advanced 4 ft below the bottom of the surface pavement asphalt and stone subbase. Soil samples will be logged and sampled following the procedures in FSP Section 2.4.2.6. Samples will be submitted for laboratory analysis of the parameters listed in Section 2.4.5.2. If analytical data identifies RIM in the 1 to 2 ft interval, then the 2 to 3 ft and 3 to 4 ft sample intervals will be submitted to the laboratory for analysis.

The 8 to 25 ft bgs soil core from two borings (MW-111 and PZ-112ASR) drilled using sonic methods by ERM as part of the OU-3 groundwater investigation have been and will be collected, described, and sampled in general

accordance using the sampling protocols described in Section 2.2.1.2 of the FSP. In addition, a shallow boring will be advanced using DPT, as described in Section 2.2.1.1 of the FSP, about 5 ft from each of the sonic borings to collect data from the 0 to 8 ft interval that was hydro vacuumed. The soil samples from each DPT and each sonic core will be treated collectively as one boring. These collective borings will serve as step-outs for A1-PB-102 and A1-PB-104 (Figure A3-4). Soil samples have been and will be logged and sampled following the procedures in FSP Sections 2.4.1 and 2.4.3, respectively. Samples have been and will be submitted for laboratory analysis of the parameters listed in Section 2.4.5.2.

Proposed borings will be appropriately abandoned following the protocol described in FSP Section 2.2.3 immediately after drilling and/or gamma logging to minimize safety risks and potential for odors or other emissions to the atmosphere.

TABLES

TABLE A3-1 THICKNESS OF MSW A1

Location	Surficial Material Thickness ² (feet)	Start depth of MSW in Borehole (feet Below DI Datum ¹)	End depth of MSW in Borehole (feet Below DI Datum ¹)	Total Borehole Depth (feet Below DI Datum ¹)	Start depth of MSW in Borehole (feet BGS)	End depth of MSW in Borehole (feet BGS)	Total Borehole Depth (feet BGS)	Comments
A1-PB-101	0	10	14	14	10	14	14	End depth of MSW unknown.
A1-PB-102	0	4	9	9	4	9	9	End depth of MSW unknown.
A1-PB-102-R	0	4	7	7	4	7	7	End depth of MSW unknown.
A1-PB-103	5	3	23	23	8	28	28	Various intervals of MSW throughout, not continuous. End depth of MSW unknown.
A1-PB-104	1	9	13	13	10	14	14	End depth of MSW unknown.
A1-PB-104-A	0	7.3	8.5	14	7.3	8.5	14	Boring terminated due to persistent methane gas emanating from borehole.
A1-PB-114	1.3	15.2	20.7	20.7	16.5	22	22	End depth of MSW unknown.
A1-PB-115	0.8	22.7	26.2	26.2	23.5	27	27	End depth of MSW unknown.

Notes:

1. DI datum: describes the landfill surface below surficial material where such material exists. If no surficial material exists at a given location, then the current ground surface (at the time of the DI) is considered the DI datum. This datum was developed to eliminate the logging and sampling of surficial material (especially drilling pad and non-combustible cover [NCC]). In Areas 1 and 2, the DI datum is synonymous with the 2005 ground surface, as defined in Section 2.2.2 of the DIWP. Tables A2-1 and A2-2 include a column showing the thickness of surficial material (i.e. NCC, inert fill, and drilling pad).
2. Surficial material consists of drilling pad, NCC, and/or inert fill.

TABLE A3-2 - AREA 1 PERIMETER ARCHIVED SAMPLES

Boring ID	Sample Date	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (feet BGS)	End Depth (feet BGS)	Surficial Material Thickness ² (feet)
A1-PB-114	11/3/2020	0	0.5	1.3	1.8	1.3
A1-PB-114	11/3/2020	1	1.5	2.3	2.8	1.3
A1-PB-114	11/3/2020	2	4	3.3	5.3	1.3
A1-PB-114	11/3/2020	4	6	5.3	7.3	1.3
A1-PB-114	11/3/2020	6	8	7.3	9.3	1.3
A1-PB-114	11/3/2020	8	10	9.3	11.3	1.3
A1-PB-114	11/3/2020	10	12	11.3	13.3	1.3
A1-PB-114	11/3/2020	12	14	13.3	15.3	1.3
A1-PB-114	11/3/2020	14	16	15.3	17.3	1.3
A1-PB-114	11/3/2020	16	18	17.3	19.3	1.3
A1-PB-114	11/3/2020	18	20	19.3	21.3	1.3
A1-PB-115	11/3/2020	0	0.5	0.8	1.3	0.8
A1-PB-115	11/3/2020	0	1.5	0.8	2.3	0.8
A1-PB-115	11/3/2020	2	4	2.8	4.8	0.8
A1-PB-115	11/3/2020	6	8	6.8	8.8	0.8
A1-PB-115	11/3/2020	8	10	8.8	10.8	0.8
A1-PB-115	11/3/2020	4	6	4.8	6.8	0.8
A1-PB-115	11/3/2020	10	12	10.8	12.8	0.8
A1-PB-115	11/3/2020	12	14	12.8	14.8	0.8
A1-PB-115	11/3/2020	12	16	12.8	16.8	0.8
A1-PB-115	11/3/2020	16	18	16.8	18.8	0.8
A1-PB-115	11/3/2020	18	20	18.8	20.8	0.8
A1-PB-115	11/3/2020	20	22	20.8	22.8	0.8
A1-PB-115	11/3/2020	22	24	22.8	24.8	0.8
A1-PB-115	11/3/2020	24	26	24.8	26.8	0.8
A1-PB-115	11/3/2020	26	27	26.8	27.8	0.8

Notes:

1. DI datum: describes the landfill surface below surficial material where such material exists. If no surficial material exists at a given location, then the current ground surface (at the time of the DI) is considered the DI datum. This datum was developed to eliminate the logging and sampling of surficial material (especially drilling pad and non-combustible cover [NCC]). In Areas 1 and 2, the DI datum is synonymous with the 2005 ground surface, as defined in Section 2.2.2 of the DIWP. Tables A2-1 and A2-2 include a column showing the thickness of surficial material (i.e., NCC, inert fill, and drilling pad).
2. Surficial material consists of drilling pad, NCC, and/or inert fill.

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226		RADIUM-228		THORIUM-230		THORIUM-232		Combined Radium		Combined Thorium	
									pCi/g	J	pCi/g	J	pCi/g	J	pCi/g	J	pCi/g	J	pCi/g	J
A1-PB-101	A1-PB-101-0.5-1-N	546702	0	0.5	1	0.5	1	N	1.06	J	1.06	J	0.91	J	0.826	J	2.12	J	1.736	J
A1-PB-101	A1-PB-101-1.5-2-N	546702	0	1.5	2	1.5	2	N	1.04	J	1.16	J	1.2	J	1.17	J	2.2	J	2.37	J
A1-PB-101	A1-PB-101-2-4-N	546702	0	2	4	2	4	Y	1.02	J	1.00	J	1.21	J	1.02	J	2.02	J	2.23	J
A1-PB-101	A1-PB-101-4-6-N	546702	0	4	6	4	6	Y	1.06	J	1.11	J	1.07	J	0.978	J	2.17	J	2.048	J
A1-PB-101	A1-PB-101-6-8-N	546702	0	6	8	6	8	Y	1.02	J	1.01	J	0.72	J	1.03	J	2.03	J	1.75	J
A1-PB-101	A1-PB-101-8-10-N	546702	0	8	10	8	10	N	0.737	J	0.968	J	1.38	J	1.08	J	1.705	J	2.46	J
A1-PB-101	A1-PB-101-10-12-N	546702	0	10	12	10	12	N	0.659	J	0.543	J	1.47	J	0.517	J	1.202	J	1.987	J
A1-PB-101	A1-PB-101-12-14-N	546702	0	12	14	12	14	N	0.616	J	0.775	J	1.25	J	0.507	J	1.391	J	1.757	J
A1-PB-102	A1-PB-102-0-0.5-N	546702	0	0	0.5	0	0.5	N	0.895	J	0.801	J	1.66	J	1.06	J	1.696	J	2.72	J
A1-PB-102	A1-PB-102-1.5-2-N	546702	0	1.5	2	1.5	2	N	1.01	J	1.3	J	1.6	J	0.878	J	2.31	J	2.478	J
A1-PB-102	A1-PB-102-2-4-N	546702	0	2	4	2	4	N	1.16	J	1.39	J	1.34	J	1.13	J	2.55	J	2.47	J
A1-PB-102	A1-PB-102-4-6-N	546702	0	4	6	4	6	N	0.878	J	1.04	J	1.72	J	0.756	J	1.918	J	2.476	J
A1-PB-102-A_MW-111	A1-PB-102-A_MW-111-7-12-N	539764	0	7	12	7	12	Y	1.35		0.852		1.32	J	0.632		2.202		1.952	J
A1-PB-102-A_MW-111	A1-PB-102-A_MW-111-12-17-N	539764	0	12	17	12	17	Y	1.09		0.998		1.24		1.07		2.088		2.31	
A1-PB-102-A_MW-111	A1-PB-102-A_MW-111-17-22-N	539764	0	17	22	17	22	Y	0.807		1.05		0.57		1.17		1.857		1.74	
A1-PB-102-A_MW-111	A1-PB-102-A_MW-111-22-27-D	539764	0	22	27	22	27	Y	1.2		1.33		1.05		1.1		2.53		2.15	
A1-PB-102-A_MW-111	A1-PB-102-A_MW-111-22-27-N	539764	0	22	27	22	27	Y	1.1		1.18		1.22		1.29		2.28		2.51	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226		RADIUM-228		THORIUM-230		THORIUM-232		Combined Radium		Combined Thorium	
									pCi/g	J	pCi/g	J	pCi/g	J	pCi/g	J	pCi/g	J	pCi/g	J
A1-PB-103	A1-PB-103-0.5-1-N	541993	5	0.5	1	5.5	6	N	1.23	J	1.11	J	1.62	J	1.14	J	2.34	J	2.76	J
A1-PB-103	A1-PB-103-1.5-2-N	541993	5	1.5	2	6.5	7	N	1.06	J	1.36	J	1.4	J	1.03	J	2.42	J	2.43	J
A1-PB-103	A1-PB-103-2-3-N	541993	5	2	3	7	8	Y	1.26	J	0.936	J	1.44	J	0.991	J	2.196	J	2.431	J
A1-PB-103	A1-PB-103-3-5-N	541993	5	3	5	8	10	Y	0.601	J	0.579	J	0.857	J	0.6	J	1.18	J	1.457	J
A1-PB-103	A1-PB-103-5-7-N	541993	5	5	7	10	12	Y	1.07	J	1.07	J	3.76	J	1.05	J	2.14	J	4.81	J
A1-PB-103	A1-PB-103-7-11-N	541993	5	7	11	12	16	Y	0.498	J	0.225	J	0.768	J	0.375	J	0.723	J	1.143	J
A1-PB-103	A1-PB-103-11-13-N	541993	5	11	13	16	18	Y	0.718	J	0.429	J	2.34	J	0.723	J	1.147	J	3.063	J
A1-PB-103	A1-PB-103-13-15-N	541993	5	13	15	18	20	Y	0.737	J	0.19	UJ	0.949	J	0.0705	UJ	0.832	J	0.9843	J
A1-PB-103	A1-PB-103-15-19-N	541993	5	15	19	20	24	Y	0.553	J	0.244	J	1.59	J	0.279	J	0.797	J	1.869	J
A1-PB-103	A1-PB-103-19-23-N	541993	5	19	23	24	28	Y	0.689	J	0.381	J	2.59	J	0.263	J	1.07	J	2.853	J
A1-PB-104	A1-PB-104-0.5-1-N	546702	1	0.5	1	1.5	2	N	0.667	J	1.08	J	1.43	J	0.877	J	1.747	J	2.307	J
A1-PB-104	A1-PB-104-1.5-2-N	546702	1	1.5	2	2.5	3	N	0.704	J	0.541	J	2.32	J	0.82	J	1.245	J	3.14	J
A1-PB-104	A1-PB-104-2-4-N	546702	1	2	4	3	5	Y	1.19	J	0.61	J	8.99	J	0.583	J	1.8	J	9.573	J
A1-PB-104	A1-PB-104-4-6-N	546702	1	4	6	5	7	Y	1.09	J	0.969	J	2.93	J	0.926	J	2.059	J	3.856	J
A1-PB-104	A1-PB-104-6-8-N	530381	1	6	8	7	9	Y	0.748		0.369		1.81		0.361		1.117		2.171	
A1-PB-104	A1-PB-104-8-13-N	530381	1	8	13	9	14	Y	0.698		0.3		2.64		0.311		0.998		2.951	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-105	A1-PB-105-0-0.5-N	526807	0	0	0.5	0	0.5	N	0.652		0.356		0.626	UJ	-0.163	UJ	1.008		0.2315	UJ
A1-PB-105	A1-PB-105-1.5-2-N	526807	0	1.5	2	1.5	2	N	0.687		0.3		1.55	J	0.323	J	0.987		1.873	J
A1-PB-105	A1-PB-105-2-4-N	526807	0	2	4	2	4	Y	1.49		0.764		0.786		0.695		2.254		1.481	
A1-PB-105	A1-PB-105-4-6-N	526807	0	4	6	4	6	Y	1.04		0.936		0.587		0.668		1.976		1.255	
A1-PB-105	A1-PB-105-6-8-N	526807	0	6	8	6	8	Y	1.04		1.1		0.821		0.95		2.14		1.771	
A1-PB-105	A1-PB-105-8-10-N	526807	0	8	10	8	10	Y	1.06		1.19		0.624		0.787		2.25		1.411	
A1-PB-105	A1-PB-105-10-12-N	526807	0	10	12	10	12	Y	0.893		1.09		1.38		1.03		1.983		2.41	
A1-PB-105	A1-PB-105-12-14-N	526807	0	12	14	12	14	Y	0.978		1.15		0.747		0.845		2.128		1.592	
A1-PB-105	A1-PB-105-14-16-N	526807	0	14	16	14	16	Y	1.09		1.04		1.07		1.02		2.13		2.09	
A1-PB-105	A1-PB-105-16-18-N	526807	0	16	18	16	18	Y	1.05		1.12		1.05		1.07	J	2.17		2.12	J
A1-PB-105	A1-PB-105-18-20-N	526807	0	18	20	18	20	Y	0.988		1.33		1.61		0.782		2.318		2.392	
A1-PB-105	A1-PB-105-20-22-N	526807	0	20	22	20	22	Y	1.32		1.25		1.54	J	1.29		2.57		2.83	J
A1-PB-105	A1-PB-105-22-24-N	526807	0	22	24	22	24	Y	1.2		1.3		1.63		1.73		2.5		3.36	
A1-PB-105	A1-PB-105-24-25-N	526807	0	24	25	24	25	Y	0.921		1.16		1.07		0.627		2.081		1.697	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-106	A1-PB-106-0-1-N	527917	0	0	1	0	1	N	1.69		0.346		41.8		0.405		2.036		42.205	
A1-PB-106	A1-PB-106-1-2-N	527917	0	1	2	1	2	N	0.967		0.81		10.7		0.629		1.777		11.329	
A1-PB-106	A1-PB-106-2-4-N	527917	0	2	4	2	4	Y	1.22		1.18		1.43		0.966		2.4		2.396	
A1-PB-106	A1-PB-106-4-6-N	527917	0	4	6	4	6	Y	0.882		0.51		3.97		0.466		1.392		4.436	
A1-PB-106	A1-PB-106-6-8-N	527917	0	6	8	6	8	Y	0.903		1.02		1.09		1.22		1.923		2.31	
A1-PB-106	A1-PB-106-8-10-N	527917	0	8	10	8	10	Y	0.881		1.19		1.17		0.855		2.071		2.025	
A1-PB-106	A1-PB-106-10-12-N	527917	0	10	12	10	12	Y	1.02		0.975		1.26		1.07	J	1.995		2.33	J
A1-PB-106	A1-PB-106-12-14-N	527917	0	12	14	12	14	Y	1.52		1		1.45		0.944		2.52		2.394	
A1-PB-106	A1-PB-106-14-16-N	527917	0	14	16	14	16	Y	0.893		1.31		1.4		0.899		2.203		2.299	
A1-PB-106	A1-PB-106-16-18-N	527917	0	16	18	16	18	Y	0.946		1.1		1.08		0.888		2.046		1.968	
A1-PB-106	A1-PB-106-18-20-N	527917	0	18	20	18	20	Y	0.887		1.21	J	1.14		1.2	J	2.097	J	2.34	J
A1-PB-106	A1-PB-106-20-22-N	527917	0	20	22	20	22	Y	1		1.39		1.54		1.56		2.39		3.1	
A1-PB-106	A1-PB-106-22-24-N	527917	0	22	24	22	24	Y	1.22		1.38		1.57		1.72		2.6		3.29	
A1-PB-106	A1-PB-106-24-25-N	527917	0	24	25	24	25	Y	0.84		1.05		1.05		0.935		1.89		1.985	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-107	A1-PB-107-0-1-N	528284	0	0	1	0	1	N	1.11		0.258		27.6		0.46		1.368		28.06	
A1-PB-107	A1-PB-107-1-2-N	528284	0	1	2	1	2	N	1.17		0.701		2.65		0.845		1.871		3.495	
A1-PB-107	A1-PB-107-2-4-N	528284	0	2	4	2	4	Y	0.946		0.855		1.52		0.856		1.801		2.376	
A1-PB-107	A1-PB-107-4-6-N	528284	0	4	6	4	6	Y	1.13		0.97		1.07		1.32		2.1		2.39	
A1-PB-107	A1-PB-107-6-8-N	528284	0	6	8	6	8	Y	0.971		0.984		0.831		0.921		1.955		1.752	
A1-PB-107	A1-PB-107-10-12-N	528284	0	10	12	10	12	Y	1.16		0.91		0.414		0.79		2.07		1.204	
A1-PB-107	A1-PB-107-12-14-N	528284	0	12	14	12	14	Y	0.879		0.89		1.4		0.565		1.769		1.965	
A1-PB-107	A1-PB-107-14-16-N	527917	0	14	16	14	16	Y	0.765		0.991		1.04		0.853	J	1.756		1.893	J
A1-PB-107	A1-PB-107-16-18-N	527917	0	16	18	16	18	Y	0.792		1.13		1.14		0.998	J	1.922		2.138	J
A1-PB-107	A1-PB-107-18-20-N	527917	0	18	20	18	20	Y	0.971		0.956		1.07		0.987		1.927		2.057	
A1-PB-107	A1-PB-107-20-22-N	527917	0	20	22	20	22	Y	1.03		1.1		1.45		1.24		2.13		2.69	
A1-PB-107	A1-PB-107-22-24-N	527917	0	22	24	22	24	Y	1.22		1.29		1.77		1.44		2.51		3.21	
A1-PB-107	A1-PB-107-24-25-N	527917	0	24	25	24	25	Y	1.04		1.29		1.17		1.04	J	2.33		2.21	J

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-108	A1-PB-108-0-1-N	528625	8	0	1	8	9	N	1.13		0.845		1.16		0.45		1.975		1.61	
A1-PB-108	A1-PB-108-1-2-N	528625	8	1	2	9	10	N	1.01		1.25		0.491		0.803		2.26		1.294	
A1-PB-108	A1-PB-108-2-4-N	528625	8	2	4	10	12	Y	0.976		0.919		0.765		0.754		1.895		1.519	
A1-PB-108	A1-PB-108-4-6-N	528625	8	4	6	12	14	Y	1.04		0.986		0.946		0.504		2.026		1.45	
A1-PB-108	A1-PB-108-6-8-N	528625	8	6	8	14	16	Y	0.961		1.17		0.808		0.925		2.131		1.733	
A1-PB-108	A1-PB-108-8-10-N	528625	8	8	10	16	18	Y	1.29		1.61		0.513		0.913		2.9		1.426	
A1-PB-108	A1-PB-108-10-12-N	528625	8	10	12	18	20	Y	0.97		1.31		1.29		1.07		2.28		2.36	
A1-PB-108	A1-PB-108-12-14-N	528625	8	12	14	20	22	Y	1.11		1.41		2		1.77		2.52		3.77	
A1-PB-108	A1-PB-108-14-16-N	528625	8	14	16	22	24	Y	1.08		1.42		1.09		1.27		2.5		2.36	
A1-PB-108	A1-PB-108-16-18-N	528625	8	16	18	24	26	Y	1.04		0.961		0.954		0.844		2.001		1.798	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-109	A1-PB-109-0-1-N	528290	4	0	1	4	5	N	0.946		1.25		2.01		0.922		2.196		2.932	
A1-PB-109	A1-PB-109-1-2-N	528290	4	1	2	5	6	N	0.94		0.921		1.28		1.42	J	1.861		2.7	J
A1-PB-109	A1-PB-109-2-4-N	528290	4	2	4	6	8	Y	0.88		1.1		1.35		1.45		1.98		2.8	
A1-PB-109	A1-PB-109-4-6-N	528290	4	4	6	8	10	Y	1.03		1.24		0.895		0.838		2.27		1.733	
A1-PB-109	A1-PB-109-6-8-N	528290	4	6	8	10	12	Y	0.926		0.763	J	1.12		0.784		1.689	J	1.904	
A1-PB-109	A1-PB-109-8-10-N	528290	4	8	10	12	14	Y	1.04		0.895		1.18		0.966		1.935		2.146	
A1-PB-109	A1-PB-109-10-12-N	528290	4	10	12	14	16	Y	0.91		1.32		1.05		1.11		2.23		2.16	
A1-PB-109	A1-PB-109-12-14-N	528290	4	12	14	16	18	Y	0.86		1.03		1.23		1.09		1.89		2.32	
A1-PB-109	A1-PB-109-14-16-N	528290	4	14	16	18	20	Y	0.64		0.959		0.864		0.706		1.599		1.57	
A1-PB-109	A1-PB-109-16-18-N	528290	4	16	18	20	22	Y	0.932		0.946		1.09		1.17		1.878		2.26	
A1-PB-109	A1-PB-109-18-20-N	528290	4	18	20	22	24	Y	0.987		1.48		0.842		1.57		2.467		2.412	
A1-PB-109	A1-PB-109-20-21-N	528290	4	20	21	24	25	Y	1.11		1.47		0.936		0.855		2.58		1.791	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226		RADIUM-228		THORIUM-230		THORIUM-232		Combined Radium		Combined Thorium	
									pCi/g		pCi/g		pCi/g		pCi/g		pCi/g		pCi/g	
A1-PB-110	A1-PB-110-0-1-N	528287	5	0	1	5	6	N	58.3		1.36		2120		4.45		59.66		2124.45	
A1-PB-110	A1-PB-110-1-2-N	528287	5	1	2	6	7	N	2.02		1.21		27.9		0.944		3.23		28.844	
A1-PB-110	A1-PB-110-2-4-N	528287	5	2	4	7	9	Y	2.25		0.829		85.7		0.671		3.079		86.371	
A1-PB-110	A1-PB-110-4-6-N	528287	5	4	6	9	11	Y	2.13		0.809		36.4		0.802		2.939		37.202	
A1-PB-110	A1-PB-110-6-8-N	528287	5	6	8	11	13	Y	1.25		0.974		7.09		0.557		2.224		7.647	
A1-PB-110	A1-PB-110-8-10-N	528287	5	8	10	13	15	Y	1.1		0.855		9.67		0.876	J	1.955		10.546	J
A1-PB-110	A1-PB-110-10-12-N	528287	5	10	12	15	17	Y	0.973		1.18		1.18		1.06		2.153		2.24	
A1-PB-110	A1-PB-110-12-14-N	528287	5	12	14	17	19	Y	1.03		1.11		1.47		1.16		2.14		2.63	
A1-PB-110	A1-PB-110-14-16-N	528290	5	14	16	19	21	Y	1.2		1.3		2.45		1.24		2.5		3.69	
A1-PB-110	A1-PB-110-16-18-N	528290	5	16	18	21	23	Y	0.88		1.08		1.7		0.938		1.96		2.638	
A1-PB-110	A1-PB-110-18-19-N	528290	5	18	19	23	24	Y	1.04		1.06		1.74		0.972		2.1		2.712	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-111	A1-PB-111-0-1-N	528288	0	0	1	0	1	N	0.759		0.567		8.17		0.956		1.326		9.126	
A1-PB-111	A1-PB-111-1-2-N	528288	0	1	2	1	2	N	0.92		0.957		1.31		0.497	U	1.877		1.559	
A1-PB-111	A1-PB-111-2-4-N	528288	0	2	4	2	4	Y	1.14		0.897		0.724		1.03		2.037		1.754	
A1-PB-111	A1-PB-111-4-6-N	528288	0	4	6	4	6	Y	1.02		1.05		0.917		1.17	J	2.07		2.087	J
A1-PB-111	A1-PB-111-6-8-N	528288	0	6	8	6	8	Y	0.981		0.887		1.27		0.724		1.868		1.994	
A1-PB-111	A1-PB-111-8-10-N	528288	0	8	10	8	10	Y	1		0.967		1.13		0.803		1.967		1.933	
A1-PB-111	A1-PB-111-10-12-N	528288	0	10	12	10	12	Y	0.986		1.13		1.28		1.19	J	2.116		2.47	J
A1-PB-111	A1-PB-111-12-14-N	528288	0	12	14	12	14	Y	0.959		1.18		1.22		1.14		2.139		2.36	
A1-PB-111	A1-PB-111-14-16-N	528288	0	14	16	14	16	Y	1.28		1.3		1.26		0.946		2.58		2.206	
A1-PB-111	A1-PB-111-16-18-N	528288	0	16	18	16	18	Y	1.18		1.22		1.52		1.36	J	2.4		2.88	J
A1-PB-111	A1-PB-111-18-20-N	528288	0	18	20	18	20	Y	1.09		1.06		1.25		1.18		2.15		2.43	
A1-PB-111	A1-PB-111-20-22-N	528288	0	20	22	20	22	Y	1.05		0.784		1.46		1.01		1.834		2.47	
A1-PB-111	A1-PB-111-22-24-N	528288	0	22	24	22	24	Y	0.632		0.923		1.08		0.825		1.555		1.905	
A1-PB-111	A1-PB-111-24-25-N	528288	0	24	25	24	25	Y	0.721		0.815		0.827		0.878		1.536		1.705	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-112	A1-PB-112-0-1-N	527928	0	0	1	0	1	N	0.882		0.492		6.76		0.358	J	1.374		7.118	J
A1-PB-112	A1-PB-112-1-2-N	527928	0	1	2	1	2	N	0.779		0.482		1.72		0.162		1.261		1.882	
A1-PB-112	A1-PB-112-2-4-N	527928	0	2	4	2	4	Y	0.996		1.09		1.16		0.837		2.086		1.997	
A1-PB-112	A1-PB-112-4-6-N	527928	0	4	6	4	6	Y	0.865		0.924		1.58		1.09		1.789		2.67	
A1-PB-112	A1-PB-112-6-8-N	527928	0	6	8	6	8	Y	0.891		0.98		1.2		0.972		1.871		2.172	
A1-PB-112	A1-PB-112-8-10-N	527928	0	8	10	8	10	Y	1.24		1.17		1.22		0.723		2.41		1.943	
A1-PB-112	A1-PB-112-10-12-N	527928	0	10	12	10	12	Y	1.1		1.13		1.03		0.761		2.23		1.791	
A1-PB-112	A1-PB-112-12-14-N	527928	0	12	14	12	14	Y	1.06		1.11		1.7		0.937		2.17		2.637	
A1-PB-112	A1-PB-112-14-16-N	528292	0	14	16	14	16	Y	1.37		1.1	J	1.5		1.11		2.47	J	2.61	
A1-PB-112	A1-PB-112-16-18-N	528292	0	16	18	16	18	Y	0.79		0.817		0.835		0.831	J	1.607		1.666	J
A1-PB-112	A1-PB-112-18-20-N	528292	0	18	20	18	20	Y	0.979		0.99		0.994		0.992		1.969		1.986	
A1-PB-112	A1-PB-112-20-22-N	528292	0	20	22	20	22	Y	0.719		0.992		0.412		0.832		1.711		1.244	
A1-PB-112	A1-PB-112-22-24-N	528292	0	22	24	22	24	Y	0.695		0.84		0.406		0.467		1.535		0.873	
A1-PB-112	A1-PB-112-24-25-N	528292	0	24	25	24	25	Y	0.593		0.72		0.697		0.474		1.313		1.171	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-113	A1-PB-113-0.5-1-N	526807	0.6	0.5	1	1.1	1.6	N	0.73		1.35		1.4		1.24		2.08		2.64	
A1-PB-113	A1-PB-113-1-1.5-N	526807	0.6	1	1.5	1.6	2.1	N	0.839		0.872		1.15		0.827		1.711		1.977	
A1-PB-113	A1-PB-113-2-4-N	526807	0.6	2	4	2.6	4.6	Y	1.06		0.922		2.06		1.17		1.982		3.23	
A1-PB-113	A1-PB-113-4-6-N	526807	0.6	4	6	4.6	6.6	Y	1.15		1.15		1.52		0.781		2.3		2.301	
A1-PB-113	A1-PB-113-6-8-N	526807	0.6	6	8	6.6	8.6	Y	0.983		0.924		2.58		0.773		1.907		3.353	
A1-PB-113	A1-PB-113-8-10-N	526807	0.6	8	10	8.6	10.6	Y	0.731		0.428		0.559	J	0.0336	UJ	1.159		0.5758	J
A1-PB-113	A1-PB-113-10-12-N	527036	0.6	10	12	10.6	12.6	Y	1.17		1.15		4.55		1		2.32		5.55	
A1-PB-113	A1-PB-113-12-14-N	527036	0.6	12	14	12.6	14.6	Y	0.956		0.889		3.36		1.23		1.845		4.59	
A1-PB-113	A1-PB-113-14-16-N	527036	0.6	14	16	14.6	16.6	Y	1.17		1.35		1.47		1.05	J	2.52		2.52	J
A1-PB-113	A1-PB-113-16-18-N	527036	0.6	16	18	16.6	18.6	Y	0.769		0.895		0.794		0.883	J	1.664		1.677	J
A1-PB-113	A1-PB-113-18-20-N	527036	0.6	18	20	18.6	20.6	Y	0.813		1.04		1.19		0.981	J	1.853		2.171	J
A1-PB-113	A1-PB-113-20-22-N	527036	0.6	20	22	20.6	22.6	Y	0.817		0.928		1.04		0.842		1.745		1.882	
A1-PB-113	A1-PB-113-22-24-N	527036	0.6	22	24	22.6	24.6	Y	0.488		0.728		0.532		0.821		1.216		1.353	
A1-PB-113	A1-PB-113-24-25-N	527036	0.6	24	25	24.6	25.6	Y	0.784		0.87		0.68		0.993		1.654		1.673	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-114-A	A1-PB-114-A-0-1-N	530226	0	0	1	0	1	N	0.984		1.23		0.909		1.07	J	2.214		1.979	J
A1-PB-114-A	A1-PB-114-A-1-2-N	530226	0	1	2	1	2	N	0.857	J-	1.26		1.25		0.837		2.117	J-	2.087	
A1-PB-114-A	A1-PB-114-A-2-4-N	530226	0	2	4	2	4	Y	1.28		1.39		1.47		0.855		2.67		2.325	
A1-PB-114-A	A1-PB-114-A-4-6-N	530226	0	4	6	4	6	Y	1.09		1.04		1.64		0.938		2.13		2.578	
A1-PB-114-A	A1-PB-114-A-6-8-N	530226	0	6	8	6	8	Y	1.51		0.926		13.5		0.835		2.436		14.335	
A1-PB-114-A	A1-PB-114-A-8-10-N	530226	0	8	10	8	10	Y	1.37		1.13		15.9		0.598		2.5		16.498	
A1-PB-114-A	A1-PB-114-A-10-12-N	530226	0	10	12	10	12	Y	1.11		1.16		3.76		1.08		2.27		4.84	
A1-PB-114-A	A1-PB-114-A-12-14-N	530226	0	12	14	12	14	Y	1.07		1.26		2.14		1.28		2.33		3.42	
A1-PB-114-A	A1-PB-114-A-14-16-N	530226	0	14	16	14	16	Y	1.15		1.16		1.54		0.964		2.31		2.504	
A1-PB-114-A	A1-PB-114-A-16-18-N	530226	0	16	18	16	18	Y	0.834		0.955		0.93		0.727		1.789		1.657	
A1-PB-114-A	A1-PB-114-A-18-20-N	530226	0	18	20	18	20	Y	0.554		0.649		0.81		0.768		1.203		1.578	
A1-PB-114-A	A1-PB-114-A-20-22-N	530226	0	20	22	20	22	Y	0.485		0.688		0.617		0.645		1.173		1.262	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226		RADIUM-228		THORIUM-230		THORIUM-232		Combined Radium		Combined Thorium	
									pCi/g		pCi/g		pCi/g		pCi/g		pCi/g		pCi/g	
A1-PB-115-A	A1-PB-115-A-0-2-N	530227	0	0	2	0	2	Y	0.719	J-	0.705		1.17		1.25		1.424	J-	2.42	
A1-PB-115-A	A1-PB-115-A-2-4-N	530227	0	2	4	2	4	Y	1		1.43		1.14		1.15	J	2.43		2.29	J
A1-PB-115-A	A1-PB-115-A-4-6-N	530227	0	4	6	4	6	Y	1.29		1.12		1.43		1.23		2.41		2.66	
A1-PB-115-A	A1-PB-115-A-6-8-N	530227	0	6	8	6	8	Y	1.15		1.29		0.867		0.942		2.44		1.809	
A1-PB-115-A	A1-PB-115-A-8-10-N	530227	0	8	10	8	10	Y	1.12		1.27		7.62		1.23		2.39		8.85	
A1-PB-115-A	A1-PB-115-A-10-12-N	530227	0	10	12	10	12	Y	1.15		0.866		4.57		1.01		2.016		5.58	
A1-PB-115-A	A1-PB-115-A-12-14-N	530227	0	12	14	12	14	Y	1.18		0.969		6.04		1.12		2.149		7.16	
A1-PB-115-A	A1-PB-115-A-14-16-N	530227	0	14	16	14	16	Y	1.06		1.22		1.19		1.22		2.28		2.41	
A1-PB-115-A	A1-PB-115-A-16-18-N	530227	0	16	18	16	18	Y	1.24		1.1		1.33		1.18		2.34		2.51	
A1-PB-115-A	A1-PB-115-A-18-20-N	530227	0	18	20	18	20	Y	1.02		1.14		0.888		1.2	J	2.16		2.088	J
A1-PB-115-A	A1-PB-115-A-20-22-N	530227	0	20	22	20	22	Y	0.967		1.27		0.976		1.02		2.237		1.996	
A1-PB-115-A	A1-PB-115-A-22-24-N	530227	0	22	24	22	24	Y	0.571		0.573		0.642		0.322		1.144		0.964	
A1-PB-115-A	A1-PB-115-A-24-25-N	530227	0	24	25	24	25	Y	0.497		0.585		0.917		0.654		1.082		1.571	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226		RADIUM-228		THORIUM-230		THORIUM-232		Combined Radium		Combined Thorium	
									pCi/g		pCi/g		pCi/g		pCi/g		pCi/g		pCi/g	
A1-PB-116	A1-PB-116-0-1-N	530223	0	0	1	0	1	N	0.752	J-	1.06		2.78	J	0.783		1.812	J-	3.563	J
A1-PB-116	A1-PB-116-1-2-N	530223	0	1	2	1	2	N	1.08		1.09		2.69		0.927		2.17		3.617	
A1-PB-116	A1-PB-116-2-4-N	530223	0	2	4	2	4	Y	1.05		1.39		2.18		1.44		2.44		3.62	
A1-PB-116	A1-PB-116-4-6-N	530223	0	4	6	4	6	Y	1.16		1.25		1.09		0.966		2.41		2.056	
A1-PB-116	A1-PB-116-6-8-N	530223	0	6	8	6	8	Y	1.1		1.12		1.35		0.886		2.22		2.236	
A1-PB-116	A1-PB-116-8-10-N	530223	0	8	10	8	10	Y	1.05		1.34		1.22		1.21		2.39		2.43	
A1-PB-116	A1-PB-116-10-12-N	530223	0	10	12	10	12	Y	1.04		1.18		0.933		1.12		2.22		2.053	
A1-PB-116	A1-PB-116-12-14-N	530223	0	12	14	12	14	Y	0.884		1.15		0.816		0.816		2.034		1.632	
A1-PB-116	A1-PB-116-14-16-N	530223	0	14	16	14	16	Y	0.978		1.3		1.32		0.836		2.278		2.156	
A1-PB-116	A1-PB-116-16-18-N	530223	0	16	18	16	18	Y	0.829		1.18		0.568		1.36		2.009		1.928	
A1-PB-116	A1-PB-116-18-20-N	530223	0	18	20	18	20	Y	0.782		1.19		1.09		1.18		1.972		2.27	
A1-PB-116	A1-PB-116-20-22-N	530223	0	20	22	20	22	Y	0.995		0.969		0.908		1.27		1.964		2.178	
A1-PB-117	A1-PB-117-65-70-N	541281	1.4	65 ⁽³⁾	70 ⁽³⁾	63.6	68.6	Y	0.784		0.903		0.832		0.535		1.687		1.367	
A1-PB-117	A1-PB-117-70-75-N	541281	1.4	70 ⁽³⁾	75 ⁽³⁾	68.6	73.6	Y	0.724		0.669		0.859		0.752	J	1.393		1.611	J
A1-PB-117	A1-PB-117-75-80-N	541281	1.4	75 ⁽³⁾	80 ⁽³⁾	73.6	78.6	Y	0.887		1.17		0.943		0.697		2.057		1.64	
A1-PB-117	A1-PB-117-80-85-D	541281	1.4	80 ⁽³⁾	85 ⁽³⁾	78.6	83.6	Y	1.01		0.836		1.14		0.755		1.846		1.895	
A1-PB-117	A1-PB-117-80-85-N	541281	1.4	80 ⁽³⁾	85 ⁽³⁾	78.6	83.6	Y	0.98		1.21		1.09		0.64		2.19		1.73	
A1-PB-117	A1-PB-117-85-90-N	541281	1.4	85 ⁽³⁾	90 ⁽³⁾	83.6	88.6	Y	1.14		1.17		1.36		0.864		2.31		2.224	
A1-PB-117	A1-PB-117-90-95-N	541281	1.4	90 ⁽³⁾	95 ⁽³⁾	88.6	93.6	Y	0.777		0.494		1.35		0.342		1.271		1.692	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-PB-118	A1-PB-118-35-40-N	540984	1.9	35 ⁽³⁾	40 ⁽³⁾	33.1	38.1	Y	1.1		1.12		1.14		0.922		2.22		2.062	
A1-PB-118	A1-PB-118-40-45-N	540984	1.9	40 ⁽³⁾	45 ⁽³⁾	38.1	43.1	Y	0.735		0.905		0.799		0.615		1.64		1.414	
A1-PB-118	A1-PB-118-45-50-N	540984	1.9	45 ⁽³⁾	50 ⁽³⁾	43.1	48.1	Y	0.917		1.05		1.22		1.02		1.967		2.24	
A1-PB-118	A1-PB-118-50-55-D	540984	1.9	50 ⁽³⁾	55 ⁽³⁾	48.1	53.1	Y	1.08		1.1		2.9		0.961	J	2.18		3.861	J
A1-PB-118	A1-PB-118-50-55-N	540984	1.9	50 ⁽³⁾	55 ⁽³⁾	48.1	53.1	Y	1.08		0.721		3.63		0.553		1.801		4.183	
A1-PB-118	A1-PB-118-55-60-N	540984	1.9	55 ⁽³⁾	60 ⁽³⁾	53.1	58.1	Y	1.9		1.15		21.6		0.857		3.05		22.457	
A1-PB-118	A1-PB-118-60-65-N	540984	1.9	60 ⁽³⁾	65 ⁽³⁾	58.1	63.1	Y	1.72		0.518		17.4		0.604		2.238		18.004	
A1-PB-118	A1-PB-118-65-70-N	540984	1.9	65 ⁽³⁾	70 ⁽³⁾	63.1	68.1	Y	0.805		0.679		0.275	U	0.228	U	1.484		0.252	U
A1-PB-118	A1-PB-118-70.7-71.2-N	540984	1.9	70.7 ⁽³⁾	71.2 ⁽³⁾	68.8	69.3	N	0.477		0.547		0.738		0.818		1.024		1.556	
A1-PB-158	A1-PB-158-0-4-N	527928	0	0	4	0	4	Y	1		0.78		1.16		0.416		1.78		1.576	
A1-PB-158	A1-PB-158-4-6-N	527928	0	4	6	4	6	Y	0.914		0.791		0.814		1.05		1.705		1.864	
A1-PB-158	A1-PB-158-6-8-N	527928	0	6	8	6	8	Y	1.04		0.988		4.7		1.52		2.028		6.22	
A1-PB-158	A1-PB-158-8-10-N	527928	0	8	10	8	10	Y	0.876		1.1		1.19		0.778		1.976		1.968	
A1-PB-158	A1-PB-158-10-12-N	527928	0	10	12	10	12	Y	0.954		1.07		0.507		0.903		2.024		1.41	
A1-PB-158	A1-PB-158-12-14-N	527928	0	12	14	12	14	Y	0.916		1.19		0.814		1.25		2.106		2.064	
A1-PB-158	A1-PB-158-14-16-N	527928	0	14	16	14	16	Y	1.13		1.1		2.26		0.727		2.23		2.987	
A1-PB-158	A1-PB-158-16-18-N	527928	0	16	18	16	18	Y	0.982		1.26		1.3		0.918		2.242		2.218	
A1-PB-158	A1-PB-158-20-22-N	527928	0	20	22	20	22	Y	1.29		1.41		1.33		0.905		2.7		2.235	
A1-PB-158	A1-PB-158-22-24-N	527928	0	22	24	22	24	Y	0.893		0.836		0.802		0.869		1.729		1.671	
A1-PB-158	A1-PB-158-24-25-N	527928	0	24	25	24	25	Y	0.678		0.986		1.02		0.662		1.664		1.682	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226 pCi/g		RADIUM-228 pCi/g		THORIUM-230 pCi/g		THORIUM-232 pCi/g		Combined Radium pCi/g		Combined Thorium pCi/g	
A1-SB-066	A1-SB-066-0.6-1.1-N	534544	0.9	0.6	1.1	1.5	2	N	0.776		0.343		8.12		0.179	U	1.119		8.2095	
A1-SB-066	A1-SB-066-4.3-4.8-N	534544	0.9	4.3	4.8	5.2	5.7	N	14.1		0.449		376		2.05		14.549		378.05	
A1-SB-066	A1-SB-066-8.4-8.9-N	534544	0.9	8.4	8.9	9.3	9.8	N	1.36		0.922		8.22		1.03		2.282		9.25	
A1-SB-066	A1-SB-066-12.8-13.3-N	534544	0.9	12.8	13.3	13.7	14.2	N	0.909		0.831		2.78		0.839		1.74		3.619	
A1-SB-066	A1-SB-066-16.7-17.2-N	534544	0.9	16.7	17.2	17.6	18.1	N	1.92		1.72		2.52		1.63		3.64		4.15	
A1-SB-067	A1-SB-067-1.1-1.6-N	534694	0.5	1.1	1.6	1.6	2.1	N	1		1.22		1.17		1.08		2.22		2.25	
A1-SB-067	A1-SB-067-4.8-5.3-N	534694	0.5	4.8	5.3	5.3	5.8	N	0.647		0.108	U	0.619		0.0181	U	0.701		0.62805	
A1-SB-067	A1-SB-067-5.8-6.3-N	534694	0.5	5.8	6.3	6.3	6.8	N	1.17		0.384		1.69		0.192	U	1.554		1.786	
A1-SB-067	A1-SB-067-6.8-7.3-N	534694	0.5	6.8	7.3	7.3	7.8	N	0.931		0.869		1.47		0.887		1.8		2.357	
A1-SB-067	A1-SB-067-9.5-10-N	534694	0.5	9.5	10	10	10.5	N	1.17		1.01		1.31		0.976		2.18		2.286	
A1-SB-067	A1-SB-067-13.1-13.6-N	534694	0.5	13.1	13.6	13.6	14.1	N	0.924		0.643		2.56		0.638		1.567		3.198	
A1-SB-067	A1-SB-067-17-17.5-N	534694	0.5	17	17.5	17.5	18	N	0.852		0.0663	U	11.5		0.311	U	0.8852		11.656	

TABLE A3-3 AREA 1 PERIMETER BORING ANALYTICAL LABORATORY DATA

Location ID	Location ID	SDG	Surficial Material Thickness ² (feet)	Start Depth (feet below DI Datum) ¹	End Depth (feet below DI Datum) ¹	Start Depth (ft BGS)	End Depth (ft BGS)	Composite (Y/N)	RADIUM-226		RADIUM-228		THORIUM-230		THORIUM-232		Combined Radium		Combined Thorium		
									pCi/g		pCi/g		pCi/g		pCi/g		pCi/g		pCi/g		
1014S	1014S	-	-	-	-	-	-	-										3.7834949		82.486147	
1015S	1015S	-	-	-	-	-	-	-										2.196		31.1452	
1019S	1019S	-	-	-	-	-	-	-										3.214		63.0160	
1022S	1022S	-	-	-	-	-	-	-										1.665		13.5976	
1023S	1023S	-	-	-	-	-	-	-										2.005		19.3921	
-	VPSCR081705SLOP	-	-	-	-	-	-	-	1.19				3.57		0.96						
-	VPSCR081705SLOQ	-	-	-	-	-	-	-	1.13				1.75		1.14						
-	VPSCR081705SLOR	-	-	-	-	-	-	-	1.11				2.29		0.78						
-	VPSCR081705SLOS	-	-	-	-	-	-	-	1.29				1.45		0.84						
-	VPSCR081705SLOT	-	-	-	-	-	-	-	1.08				1.43		0.59						

Notes:

- DI datum: describes the landfill surface below surficial material where such material exists. If no surficial material exists at a given location, then the current ground surface (at the time of the DI) is considered the DI datum. This datum was developed to eliminate the logging and sampling of surficial material (especially drilling pad and non-combustible cover [NCC]). In Areas 1 and 2, the DI datum is synonymous with the 2005 ground surface, as defined in Section 2.2.2 of the DIWP. Tables A2-1 and A2-2 include a column showing the thickness of surficial material (i.e. NCC, inert fill, and drilling pad).
- Surficial material consists of drilling pad, NCC, and/or inert fill.
- A1-PB-117 and A1-PB-118 were "blind drilled" to a target depth interval. Sample name depths are measured below as-built elevation. Drilling pad is present above ground surface.

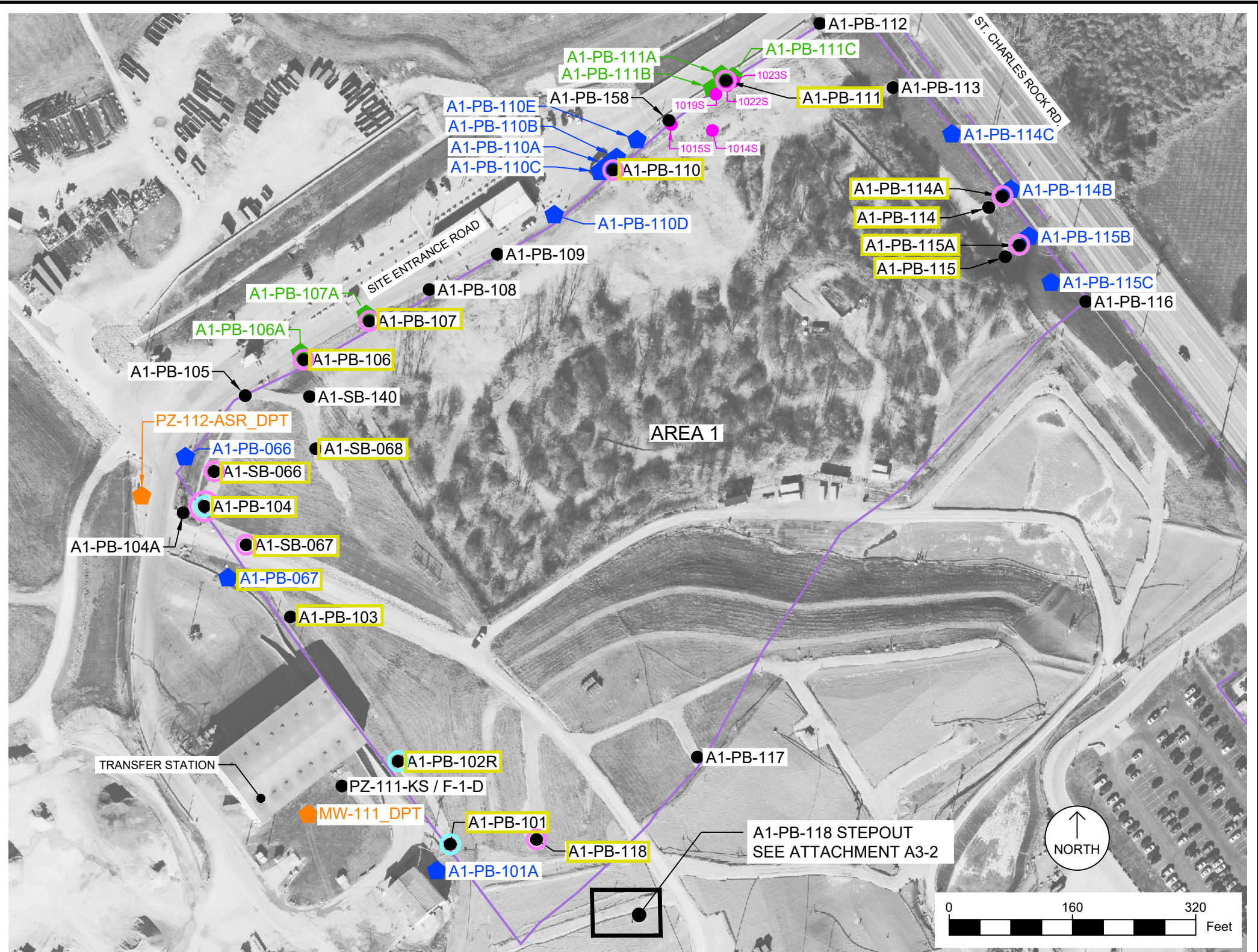
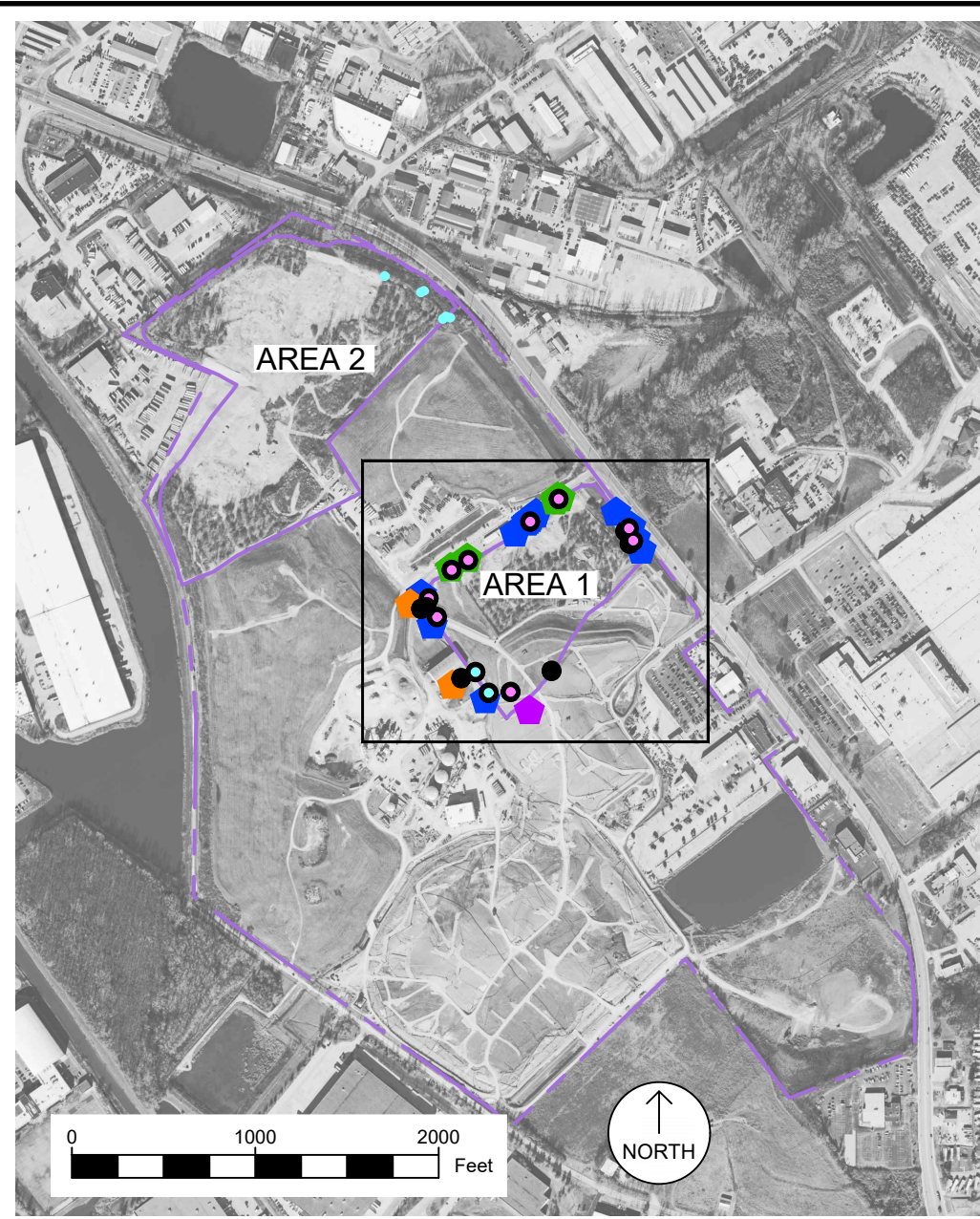
TABLE A3-4 PROPOSED STEP-OUT BORING SAMPLE COLLECTION DETAIL

Area	Northing (Local Site Coordinates)	Easting (Local Site Coordinates)	Location ID	Perimeter Borings Within Waste	Perimeter HSA Borings Outside Waste	Perimeter DPT Borings Outside Waste	Perimeter DPT Borings Outside Waste	Estimated Total Boring Depth (feet B2005GS)	Total Laboratory Analytical Samples	Core Scan Interval (feet B2005GS)	Downhole Gamma Interval (feet B2005GS)
Area 1	1068503.09	515981.59	A1-PB-101A		X			25	14	0 - 25	0 - 25
Area 1	1068580.85	515803.78	MW-111 DPT			X		8 DPT/25 MW	14	0 - 25	
Area 1	1068908.63	515692.61	A1-PB-067		X			25	14	0 - 25	0 - 25
Area 1	1069022.18	515573.13	PZ-112-ASR DPT			X		8 DPT/25 MW	14	0 - 25	
Area 1	1069076.21	515633.61	A1-PB-066		X			25	14	0 - 25	0 - 25
Area 1	1069220.20	515793.15	A1-PB-106A				X	4	4	0-4	
Area 1	1069273.41	515883.84	A1-PB-107A				X	4	4	0-4	
Area 1	1069481.10	516219.04	A1-PB-110A		X			25	14	0 - 25	0 - 25
Area 1	1069490.75	516230.52	A1-PB-110B		X			25	14	0 - 25	0 - 25
Area 1	1069471.52	516207.49	A1-PB-110C		X			25	14	0 - 25	0 - 25
Area 1	1069411.55	516144.28	A1-PB-110D		X			25	14	0 - 25	0 - 25
Area 1	1069515.46	516258.76	A1-PB-110E		X			25	14	0 - 25	0 - 25
Area 1	1069605.54	516375.75	A1-PB-111A				X	4	4	0-4	
Area 1	1069586.57	516363.11	A1-PB-111B				X	4	4	0-4	
Area 1	1069602.65	516391.42	A1-PB-111C				X	4	4	0-4	
Area 1	1069446.61	516776.28	A1-PB-114B		X			25	14	0 - 25	0 - 25
Area 1	1069523.46	516694.76	A1-PB-114C		X			25	14	0 - 25	0 - 25
Area 1	1069381.66	516801.73	A1-PB-115B		X			25	14	0 - 25	0 - 25
Area 1	1069317.73	516832.03	A1-PB-115C		X			25	14	0 - 25	0 - 25
Area 1	-	-	A1-PB-118A	X				-	-	-	-
TOTAL BORING/ SAMPLE COUNT	-	-	20	1	12	2	5	-	216	-	-

Notes:

1. Sample counts do not include follow-up samples that may be collected as a result of step-outs, or from resampling due to replicate failure.
2. All sample counts are estimates and may vary based on field conditions (e.g. core recovery)
3. If waste is encountered, total depth of perimeter borings will ultimately be determined in the field based on observations of waste thickness. Borings will be installed through the full extent of waste and 5-feet into native soils or refusal on bedrock
4. ERM monitoring well location (PZ-112ASR) is approximate.
5. Details related to A1-PB-118A are included in Attachment 1 of this Addendum 3.

FIGURES



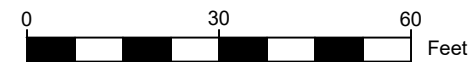
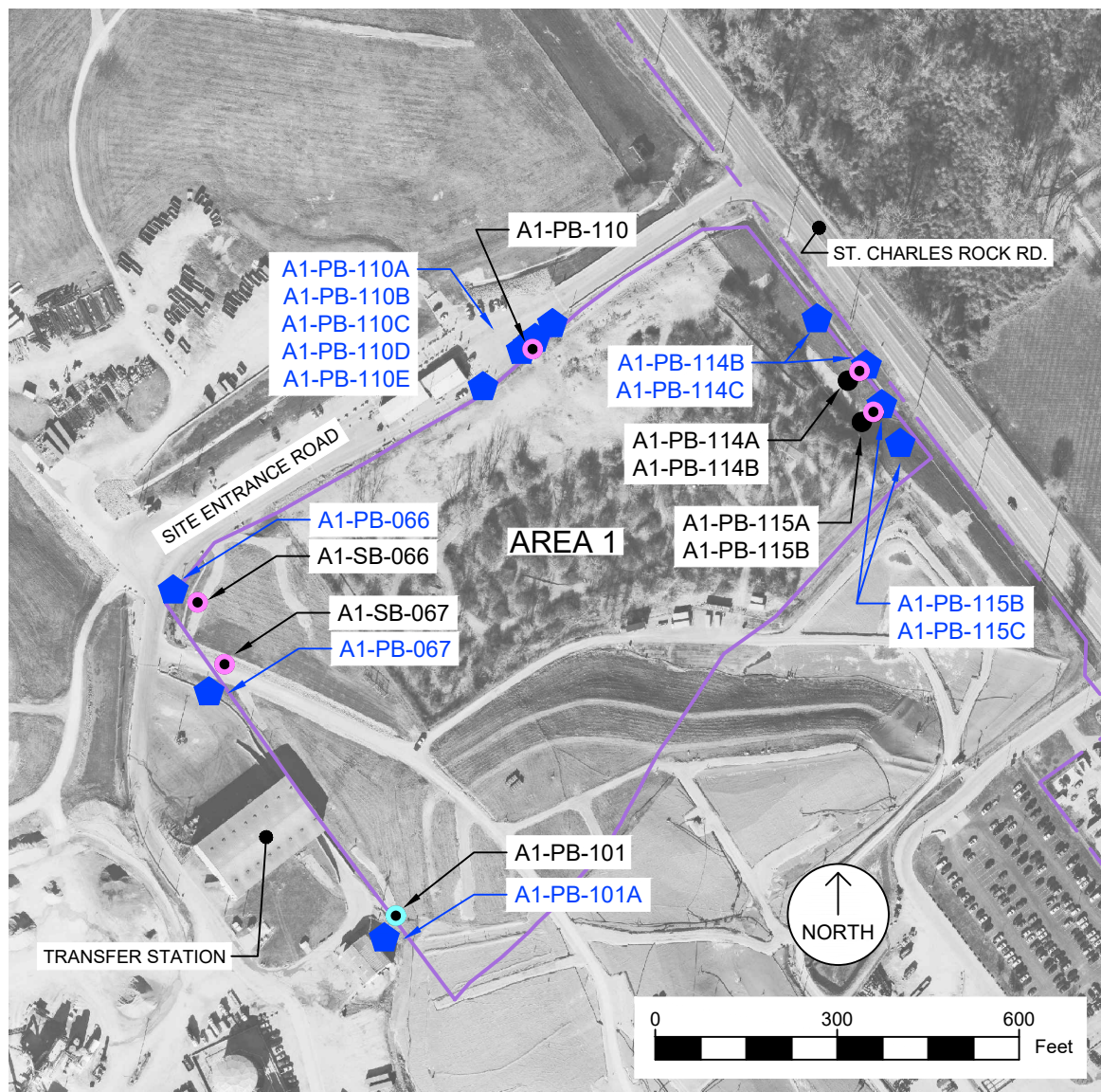
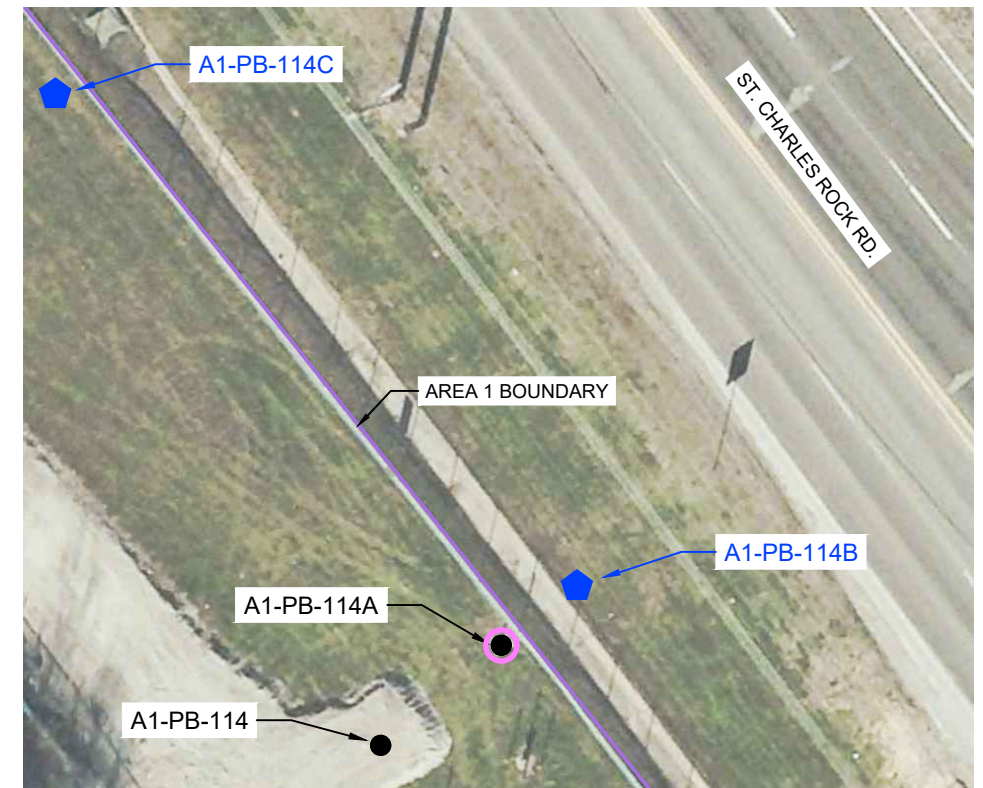
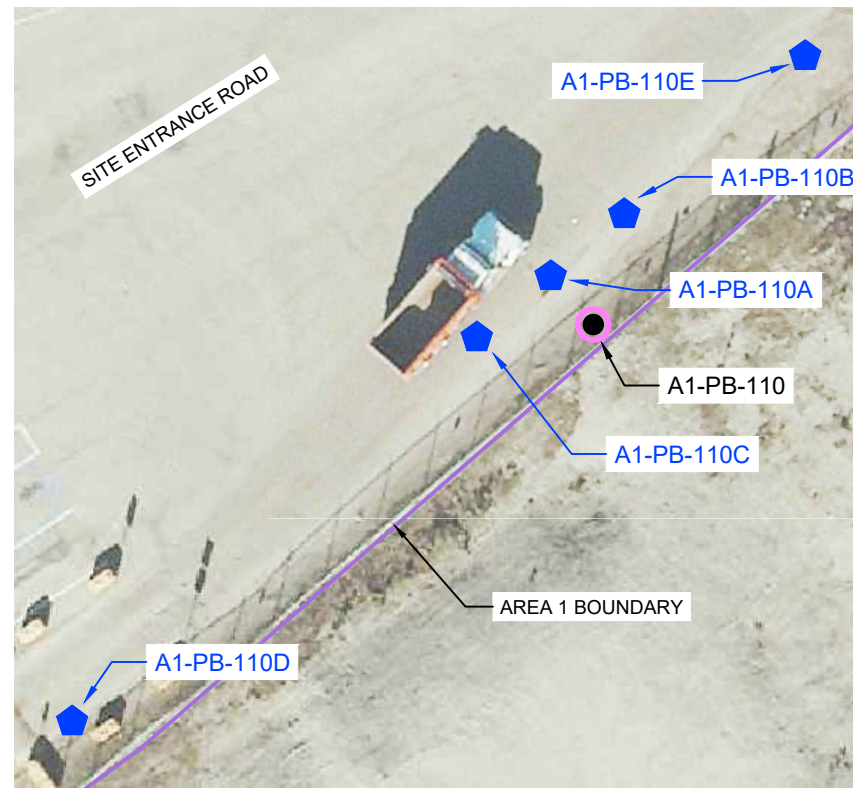
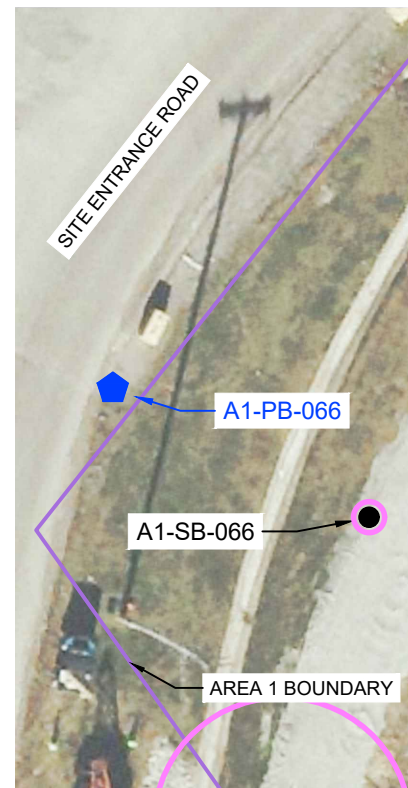
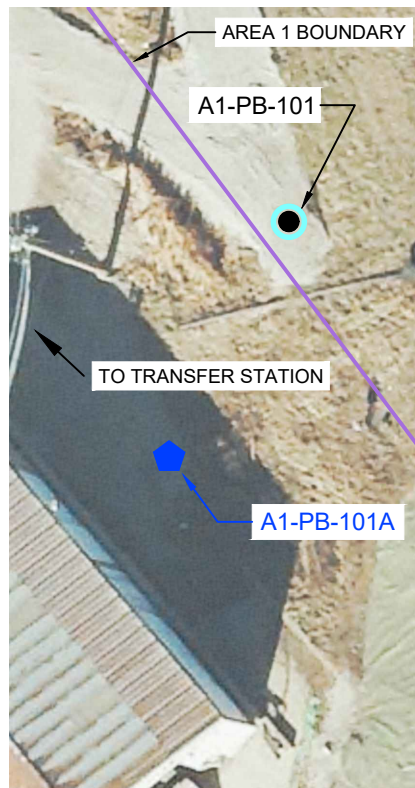
NOTES:

- AERIAL TOPOGRAPHY AND PHOTOGRAPH PROVIDED BY COOPER AERIAL SURVEYS, INC. AND IS DATED DECEMBER 09, 2020, SURVEYED IN LOCAL SITE COORDINATE SYSTEM.

LEGEND

- PROPERTY BOUNDARY
- AREA 1 & 2 BOUNDARIES
- A1-PB-108 EXISTING PERIMETER BORING
- A1-PB-101 BORING WITH ELEVATED ANALYTICAL RESULTS OR MSW
- 1015S HISTORIC SURFACE SAMPLE WITH ELEVATED ANALYTICAL RESULTS
- STEP-OUT PROPOSED DUE TO ELEVATED ANALYTICAL RESULTS
- STEP-OUT PROPOSED DUE TO ENCOUNTERING MSW
- A1-PB-118A ADDENDUM 3 PROPOSED STEP-OUT BORING - SONIC
- A1-PB-110B ADDENDUM 3 PROPOSED STEP-OUT BORING - HSA
- A1-PB-106A ADDENDUM 3 PROPOSED STEP-OUT BORING - DPT
- PZ-112-ASR_DPT ADDENDUM 3 PROPOSED SHALLOW DPT BORING LOCATIONS NEAR ERM BORINGS

PROJECT WEST LAKE LANDFILL SUPERFUND SITE OU-1 REMEDIAL DESIGN BRIDGETON, ST. LOUIS COUNTY, MO	PREPARED FOR WEST LAKE LANDFILL 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044	JUNE 2021 DESIGNED BY: PL APPROVED BY: ---	FIGURE A3-1
DRAWING TITLE AREA 1 - SITE LOCATION MAP		REVISIONS:	DATE DSN. APV.
PROJECT NUMBER: BT-191 FILE PATH: C:\Users\plins\Dropbox (Feezor Engineering)\Bridgeton\BT-191 (RDWP Design And Management)\To Be Filed\2021-03-02 Addenda Figures\addendum 3 (area 1)\Addendum 3 Figures		# _____	____/____/____



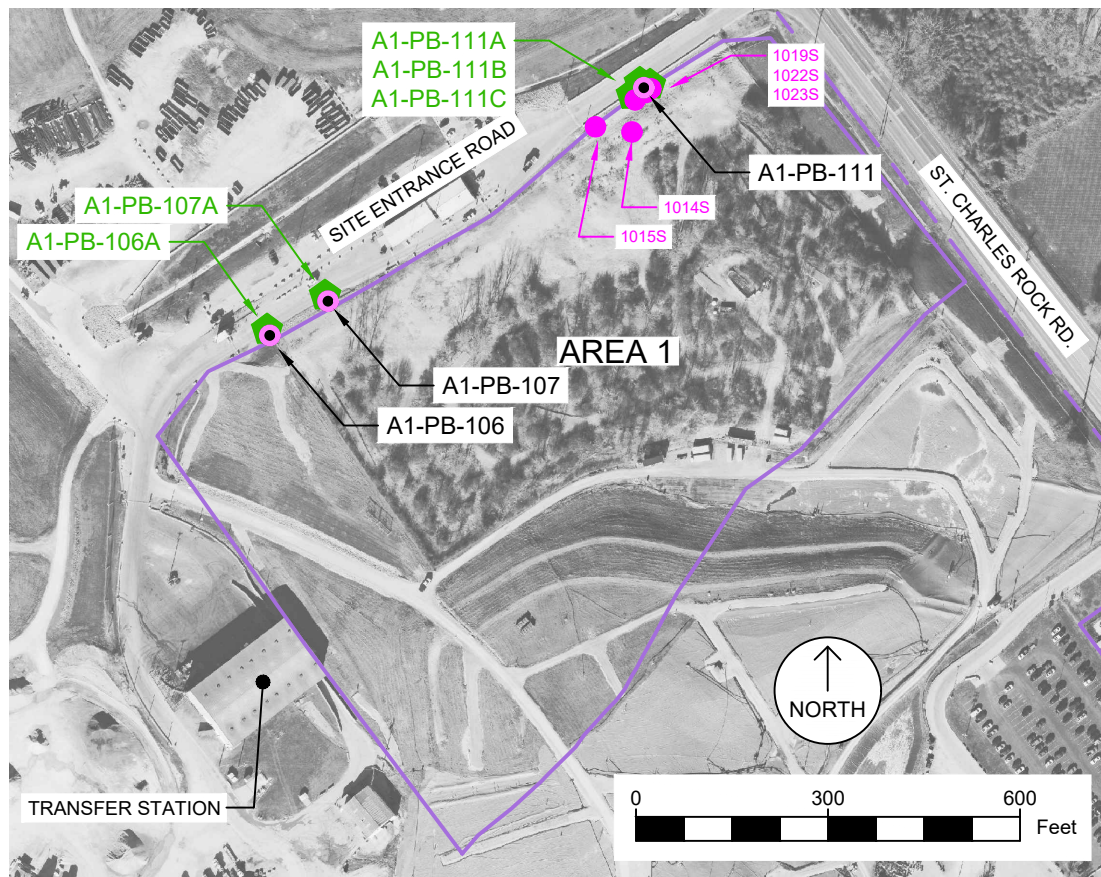
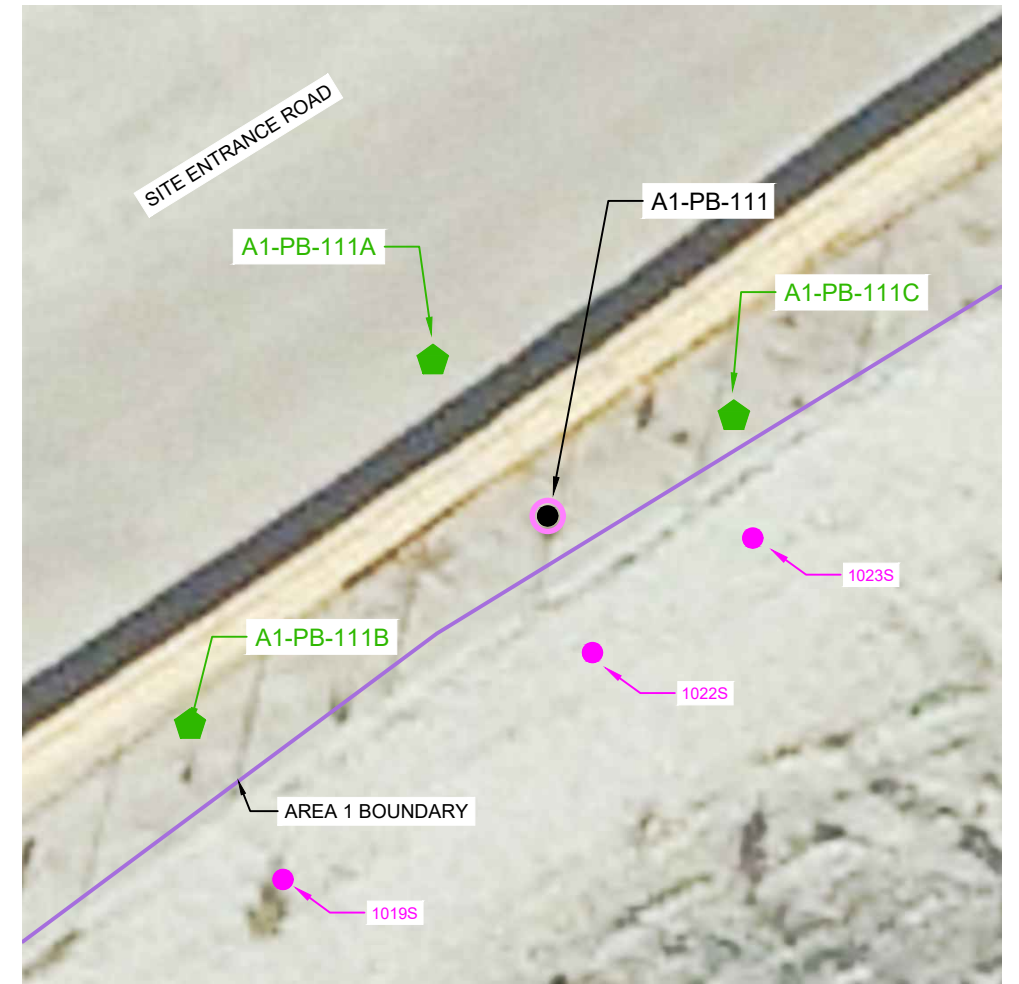
LEGEND

- PROPERTY BOUNDARY
- AREA 1 & 2 BOUNDARIES
- A1-PB-101
- BORING WITH ELEVATED ANALYTICAL RESULTS OR MSW
- STEP-OUT PROPOSED DUE TO ELEVATED ANALYTICAL RESULTS
- A1-PB-110B
- ADDENDUM 3 PROPOSED STEP-OUT BORING - HSA

NOTES:

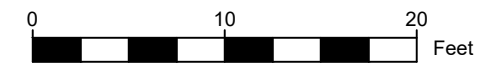
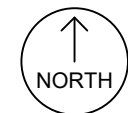
- AERIAL TOPOGRAPHY AND PHOTOGRAPH PROVIDED BY COOPER AERIAL SURVEYS, INC. AND IS DATED DECEMBER 09, 2020, SURVEYED IN LOCAL SITE COORDINATE SYSTEM.

PROJECT WEST LAKE LANDFILL SUPERFUND SITE OU-1 REMEDIAL DESIGN BRIDGETON, ST. LOUIS COUNTY, MO		PREPARED FOR WEST LAKE LANDFILL 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044		JUNE 2021 DESIGNED BY: PL APPROVED BY: ---		FIGURE A3-2		
DRAWING TITLE <h2 style="text-align: center;">PROPOSED HOLLOW STEM AUGER STEP-OUT BORINGS</h2>				REVISIONS:		DATE	DSN.	APV.
PROJECT NUMBER: BT-191 FILE PATH: C:\Users\plins\Dropbox (Feezor Engineering)\Bridgeton\BT-191 (RDWP Design And Management)\to Be Filed\2021-03-02 Addenda Figures\addendum 3 (area 1)\Addendum 3 Figures				#_ _____		___/___/___	___	___



LEGEND

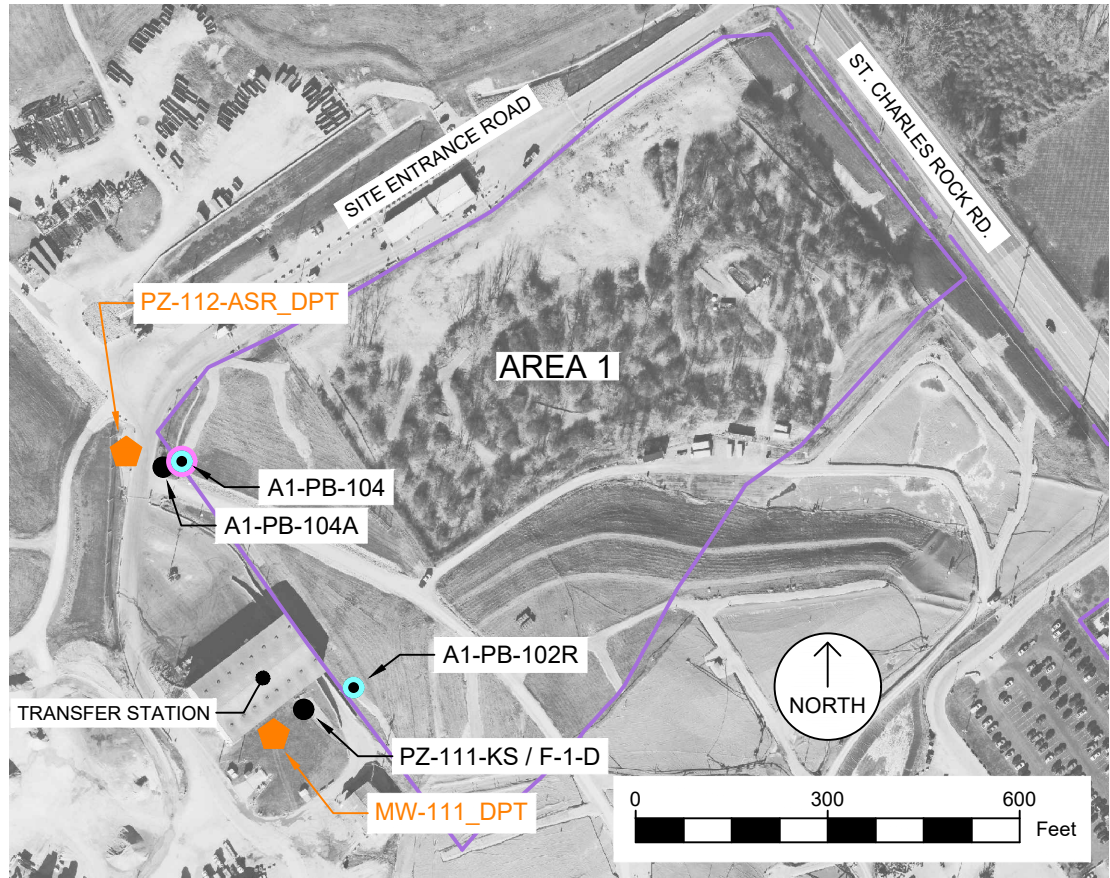
- PROPERTY BOUNDARY
 - AREA 1 & 2 BOUNDARIES
 - A1-PB-106
 - 1015S
 - 1014S
 - 1015S
 - 1019S
 - 1022S
 - 1023S
 - A1-PB-106A
 - A1-PB-107A
 - A1-PB-111A
 - A1-PB-111B
 - A1-PB-111C
- BORING WITH ELEVATED ANALYTICAL RESULTS OR MSW
 HISTORIC SURFACE SAMPLE WITH ELEVATED ANALYTICAL RESULTS
 STEP-OUT PROPOSED DUE TO ELEVATED ANALYTICAL RESULTS
 ADDENDUM 3 PROPOSED STEP-OUT BORING - DPT



NOTES:

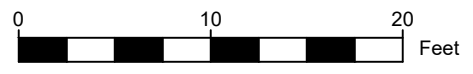
- AERIAL TOPOGRAPHY AND PHOTOGRAPH PROVIDED BY COOPER AERIAL SURVEYS, INC. AND IS DATED DECEMBER 09, 2020, SURVEYED IN LOCAL SITE COORDINATE SYSTEM.

PROJECT WEST LAKE LANDFILL SUPERFUND SITE OU-1 REMEDIAL DESIGN BRIDGETON, ST. LOUIS COUNTY, MO		PREPARED FOR WEST LAKE LANDFILL 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044		JUNE 2021 DESIGNED BY: PL APPROVED BY: ---		FIGURE A3-3		
DRAWING TITLE PROPOSED SHALLOW DPT STEP-OUT BORINGS				REVISIONS:		DATE	DSN.	APV.
				#_ _____	___/___/___	___	___	___
PROJECT NUMBER: BT-191 FILE PATH: C:\Users\plins\Dropbox (Feezor Engineering)\Bridgeton\BT-191 (RDWP Design And Management)\to Be Filed\2021-03-02 Addenda Figures\addendum 3 (area 1)\Addendum 3 Figures								



LEGEND

- - - - - PROPERTY BOUNDARY
- AREA 1 & 2 BOUNDARIES
- A1-PB-104 BORING WITH ELEVATED ANALYTICAL RESULTS OR MSW
- A1-PB-104A STEP-OUT PROPOSED DUE TO ENCOUNTERING MSW
- A1-PB-102R STEP-OUT PROPOSED DUE TO ELEVATED ANALYTICAL RESULTS
- ⬠ PZ-112-ASR_DPT ADDENDUM 3 PROPOSED SHALLOW DPT BORING LOCATIONS NEAR ERM BORINGS



NOTES:

- AERIAL TOPOGRAPHY AND PHOTOGRAPH PROVIDED BY COOPER AERIAL SURVEYS, INC. AND IS DATED DECEMBER 09, 2020, SURVEYED IN LOCAL SITE COORDINATE SYSTEM.

PROJECT WEST LAKE LANDFILL SUPERFUND SITE OU-1 REMEDIAL DESIGN BRIDGETON, ST. LOUIS COUNTY, MO	PREPARED FOR WEST LAKE LANDFILL 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044	JUNE 2021 DESIGNED BY: PL APPROVED BY: ---	FIGURE A3-4		
		REVISIONS:	DATE	DSN.	APV.
DRAWING TITLE SOIL SAMPLES FROM ERM BORINGS AND PROPOSED LOCATIONS OF SHALLOW DPT BORINGS		#_ _____	/ / /	_ _	_ _
PROJECT NUMBER: BT-191 FILE PATH: C:\Users\plins\Dropbox (Feezor Engineering)\Bridgeton\BT-191 (RDWP Design And Management)\to Be Filed\2021-03-02 Addenda Figures\addendum 3 (area 1)\Addendum 3 Figures					

ATTACHMENT A3-1 - F-1-D BORING LOG

Foth & Van Dyke & Associates, Inc.

LOG OF TEST BORING NO.: P-1-D										SURFACE ELEVATION:	
CLIENT: LAIDLAW/BRIDGETON PROJECT: AUG 90 WELL INSTALL PROJECT NUMBER: 89L46 LOCATION:										BORING DEPTH: 79.5	
										DATE: 9-1-90	
MSL ELEV	DEPTH FR LND SURF	SAMP DEPTH INTERVAL	TYPE	#	N	REC (ft)	DESCRIPTION OF MATERIAL	CLASS	FIELD INSTRUMENTS	DRILLING AND SAMPLING NOTES	
0.0	--0										
		0-5	SB	1	-	4.8	Top 4' dark yellowish brown (10YR 4/4) lean CLAY w/ sand, some silt and little gravel; (FILL) Bottom 1' dk. grey (5Y 4/1) SILT w/ some black colored intermixing.	FILL	RAD = < 0.01 mR/hr. TIP = 0 ppm		
-5.0	--5										
		5-10	SB	2	-	3.5	Intermixed grey silt (as above) w/ gravel, sand, and some clay (FILL)		RAD = < 0.01 mR/hr. TIP = 0 ppm		
-10.0	--10										
		10-15	SB	3	-	3.5	Mottled dk. grey (5Y 4/1), greenish grey (5BG 5/1) & dk. yellowish brown (10YR 4/4) lean CLAY w/ some silt.	cl	RAD = < 0.01 mR/hr. TIP = 0 ppm	Becomes v. moist to wet at 13.5'	
-15.0	--15										
		15-20	SB	4	-	3.9	Same as above w/ increasing silt content w/ depth.		RAD = < 0.01 mR/hr. TIP = 0 ppm		
-20.0	--20										
		20-25	SB	5	-	4.8	Top is dk. Grey (2.5Y 4/0) SILT w/ little clay. Bottom 2' grey (5Y 4/1) v. fine to fine, SAND stratified (lamina) w/ darker layers.	ml	RAD = < 0.01 mR/hr.		
-25.0	--25										
		25-30	SB	6	-	2.0	Dk. grey (5Y 4/1), f. to v. fine SAND a litter coarse than above.		RAD = < 0.01 mR/hr.		
-30.0	--30										
		30-32	SS	7	-	1.5	Same as above.			Water added and maintained in augers to prevent sand blows.	
		32.5-34.5	SS	8	38	1.1	Same as above.				
-35.0	--35										
		34.5-36.5	SS	9	50	1.0	Grey (5Y 5/1), f. to v. fine SAND; contains little gravel upto 1/4" in diameter bottom 3".			50 blows for 6"	
		37.5-39.5	SS	10	100	0.9	Grey (5Y 5/1), f. to v. fine SAND very dense (without gravel).	sp			
-40.0	--40										
		39.5-41.5	SS	11	11	0.8	Same as above but not as dense although density seems higher than blow counts indicate.				
-45.0	--45										
		42.5-44.5	SS	12	18	0.8	Grey (5Y 5/1), v.f. to c., poorly graded SAND w/ trace of f. gravel.				
		44.5-46.5	SS	13	86	0.7	Same as above.		SAMPLE #2 OXY = 21.1% H2S = 1 ppm CO = 0 ppm EXP = 0% TIP = 0 ppm		
-50.0	--50										
		49.5-51.5	SS	14	19	1.4	Top is same as above. Bottom 12" Dark grey (5Y 4/1) v.f. to fine SAND w/ some v. dark grey layers (?) stratified or intermixed (?).				

DRILLING DATA

START DATE: 8/6/90
COMPLETION DATE: 8/8/90
LOGGED BY: LDA
DRILLING METHOD: 4-1/4" I.D. HSA's
DRILLING CONTRACTOR: BROTCHE ENGR.

WATER LEVEL INFORMATION

DEPTH AT COMPLETION: approx. 20'
LATER TIME/DEPTH: 15 hrs / 25.2'
LATER TIME/DEPTH:
CAVE IN DEPTH:
DRILLING LOSSES:

Foth & Van Dyke & Associates, Inc.

LOG OF TEST BORING NO.: F-1-D

CLIENT: LAYDLAW/BRIDGETON
 PROJECT: AUG 90 WELL INSTALL
 PROJECT NUMBER: 89E46
 LOCATION:

SURFACE ELEVATION:

BORING DEPTH: 79.5

DATE: 9-2-90

MSL ELEV	DEPTH FR LND SURF	SAMP DEPTH INTERVAL	TYPE	#	N	REC (ft)	DESCRIPTION OF MATERIAL	CLASS	FIELD INSTRUMENTS	DRILLING AND SAMPLING NOTES
-55.0	--55	54.5-56.5	SS	15	21	1.4	Upper 3.5" v. dark grey (2.5Y 3/0) lean CLAY w/ no to some sand. Bottom v. dark grey, v. fine to c, stratified SAND; find pc of wood.	cl		
-60.0	--60	59.5-61.5	SS	16	27	0.8	Very dark grey (2.5Y 3/0), v. fine to coarse, poorly graded SAND.	sp		
-65.0	--65	64.5-66.5	SS	17	37	2.0	2" v. f. to f. v. dark grey SAND. 2" v. f. to v. c., v. dk grey SAND. 3" v. dk grey lean CLAY. 1/2" fine GRAVEL; sub rnded. 1" v. c. to c., grey SAND. Bottom f. to v. f., v. dk grey SAND.	cl gp		
-70.0	--70	69.5-71.5	SS	18	28	0.0	No recovery.			
-75.0	--75	74.5-76.5	SS	19	25	1.8	Top is v. dark to dark grey (2.5Y-3/0 to 4/0), m. to v. f. SAND. Middle 3" is v. f. to v. c. SAND w/ tr. to little v. f. gravel. Bottom 7" is black to v. dk. grey (2.5Y 2/0 to 3/0) v. f. to f. SAND w/ silt & organics (black color).	sp		
-80.0	--80	78.5-79.5	SS	20	100	0.9	Fine to coarse, poorly graded GRAVEL (rnded to angular) w/ v. f. to c. sand. Limestone bedrx @ 79.4	gp ls		100 blows for last 1"
-85.0	--85						R.O.B. = 79.5'			Auger refusal at 79.5'
-90.0	--90						Piezometer F-1-D installed.			
-95.0	--95									
-100.0	--100									
-105.0	--105									

DRILLING DATA
 START DATE: 8/6/90
 COMPLETION DATE: 8/8/90
 LOGGED BY: LDA
 DRILLING METHOD: 4-1/4" I.D. HSA's
 DRILLING CONTRACTOR: BROTCHE ENGR.

WATER LEVEL INFORMATION
 DEPTH AT COMPLETION: approx. 20'
 LATER TIME/DEPTH: 15 hrs / 25.2'
 LATER TIME/DEPTH:
 CAVE IN DEPTH:
 DRILLING LOSSES:

ATTACHMENT A3-2 - A-1-PB 118A BORING PLAN

FIELD SAMPLING PLAN ADDENDUM 3: ATTACHMENT A3-2

WEST LAKE LANDFILL SUPERFUND SITE OPERABLE UNIT 1

Prepared For:

The United States Environmental Protection Agency Region VII



Prepared on Behalf of:

The West Lake Landfill OU-1 Respondents

Prepared By:



301 Plainfield Road, Suite 350
Syracuse, New York 13212

In Association With:



3377 Hollenberg Drive
Bridgeton, Missouri 63044

And



9111 Cross Park Drive, Suite D200
Knoxville, TN 37923

SEPTEMBER 3, 2021

TABLE OF CONTENTS

LIST OF ACRONYMS	2
1.0 AREA 1 ADDITIONAL BORINGS	1
1.1 Introduction.....	1
1.2 Summary of Design Investigation Findings	1
1.3 Proposed Additional Boring Locations.....	1
1.3.1 Sonic Drilling Perimeter Step-Out Boring in Waste	1
1.4 Drilling and Sampling Methods and Protocols.....	2

LIST OF FIGURES

Figure A31-1 Proposed A1-PB-118A Boring

LIST OF ACRONYMS

<u>ACRONYM</u>	<u>Definition</u>
Bgs	below ground surface
ft	foot/feet
DIWP	Design Investigation Work Plan
DMP	Data Management Plan
DOE	U.S. Department of Energy
DPT	direct push technology
EPA	U.S. Environmental Protection Agency
FSP	Field Sampling Plan
HSA	hollow-stem auger
MSW	Municipal Solid Waste
OU	Operable Unit
pCi/g	picocurie/gram
QAPP	Quality Assurance Project Plan
RIM	Radiologically Impacted Material

1.0 AREA 1 ADDITIONAL BORINGS

1.1 Introduction

This Field Sampling Plan (FSP) Addendum 3 has been prepared on behalf of West Lake Landfill OU-1 Respondents Bridgeton Landfill, LLC, Cotter Corporation (N.S.L.), and the U.S. Department of Energy (DOE) (collectively, Respondents) for the design investigation for the selected Amended Remedy for Operable Unit 1 (OU-1) of the West Lake Landfill Superfund Site (Site). The United States Environmental Protection Agency (EPA) approved (with modifications) the Field Sampling Plan (FSP), with the associated Design Investigation Work Plan (DIWP), Quality Assurance Project Plan (QAPP), and Data Management Plan (DMP), in September 2020. The final version of the FSP is dated October 16, 2020. Addendum 3 Attachment 2 has been prepared in response to analytical results from soil samples at A1-PB-118 greater than 7.9 picocuries per gram (pCi/g) for combined thorium. This Attachment A3-2 further evaluates and discusses the rationale and logistics for locating a step out-boring associated with boring A1-PB-118 in order to delineate the extent of Radiologically Impacted Material (RIM) in this area.

1.2 Summary of Design Investigation Findings

Perimeter boring in waste A1-PB-118, in the North Quarry area, had detections of combined thorium greater than 7.9 pCi/g between depths of 55 and 65 feet bgs (ft bgs), as summarized in Table A3-3. A step-out boring, A1-PB-118A, is proposed in the southwest corner of Area 1 near the edge of the uppermost quarry bedrock ledge, as shown on Figure A3-2 .

1.3 Proposed Additional Boring Locations

1.3.1 Sonic Drilling Perimeter Step-Out Boring in Waste

Combined thorium greater than 7.9 pCi/g was detected in soil samples collected from 55 to 65 ft bgs in boring A1-PB-118 (see Addendum 3, Figure A3-3 and Table A3-3). A step-out boring, A1-PB-118A, will be advanced near the southwest corner of Area 1 near the edge of the upper quarry rock ledge.

Potential step-out boring locations from A1-PB-118 are located on the Bridgeton Landfill geomembrane cover system within the active gas collection system. Some potential locations are also on steep slopes (approximately 25%). Because of the potential impacts to the geomembrane cover and active gas collection system, an objective of the identification of step-out boring locations in this area is to reduce the number of potential step-out borings required to delineate materials with greater than 7.9 pCi/g of combined radium and/or combined thorium. Due to these considerations, the proposed step-out location is greater than the 50-ft step-out distance set out in FSP Section 2.2.2.2.

The proposed location has been selected within the limits of an existing rock pad used to ballast the exposed geomembrane to minimize additional pad/site preparation requirements on the geomembrane. In addition, the selected location will intersect the first bedrock shelf of the quarry, and therefore, would be the first potential location which could have collected erosional transported material. Figure A3-2-1 depicts the proposed location and the current understanding of bottom of quarry grades, including cross sections which depict historical

topographies. The surveyed elevation of proposed A1-PB-118A has a current elevation of 514.2 ft, while the estimated bottom of quarry is 405.6 ft. Assuming the drilling would terminate at the estimated bedrock surface, the total boring depth should be approximately 109 ft.

1.4 Drilling and Sampling Methods and Protocols

The FSP standardizes the field procedures to be performed during the design investigation activities for OU-1. The work proposed in this Addendum 3 Attachment A3-2 uses those standard methods and protocols provided in the FSP. The specific provisions in the FSP that will be used are described below.

The location for A1-PB-118A is located in the area of active gas collection of the North Quarry of Bridgeton Landfill. A drilling pad will be modified on the existing geomembrane cover ballast road as described above. Per the protocols of the Bridgeton Landfill (in accordance with Bridgeton Landfill Operation, Maintenance and Monitoring Plan), any oxygen intrusion potential (such as an excavation or boring) requires the temporary cessation of gas collection for all active gas collection wells within a 150-ft radius prior to disturbance. The affected active gas collection wells will be turned off (vacuum only) a few hours prior to disturbance. After the boring is advanced, sampled, grouted, and the geomembrane is repaired, the vacuum to the idled wells will be reestablished; once reestablished, oxygen content will be tested. The vacuum and oxygen content will be rechecked within 24 hours of the initial vacuum reestablishment. Based upon the proposed location of A1-PB-118A, the affected gas collection wells will likely be GEW-50 and GEW-52.

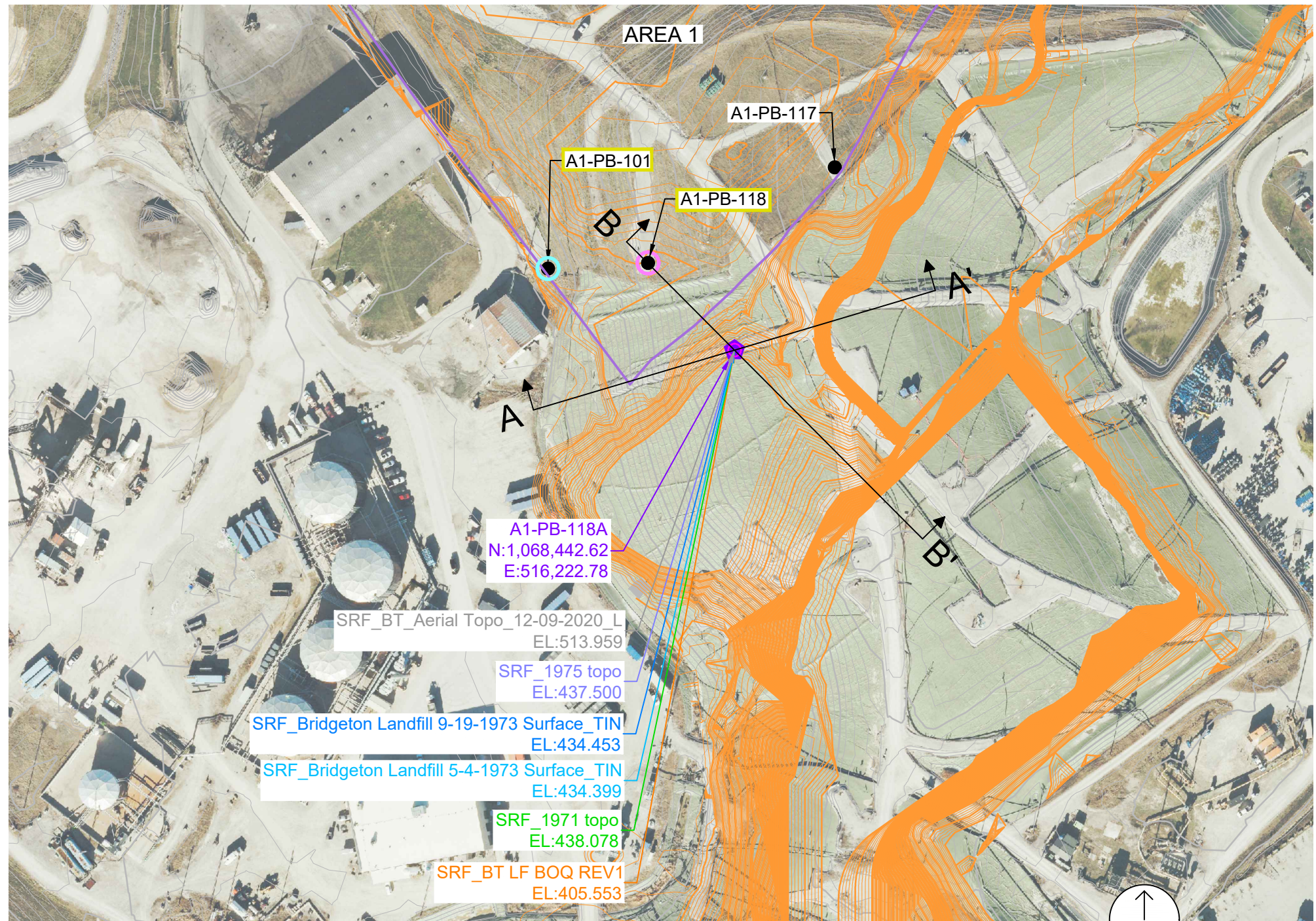
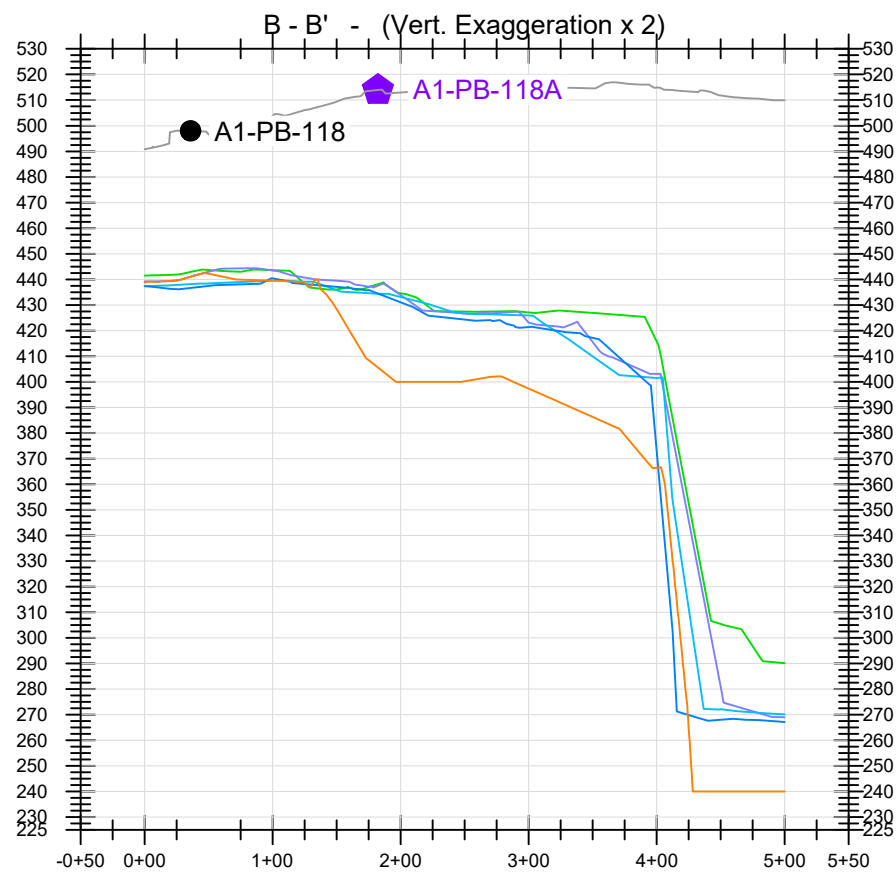
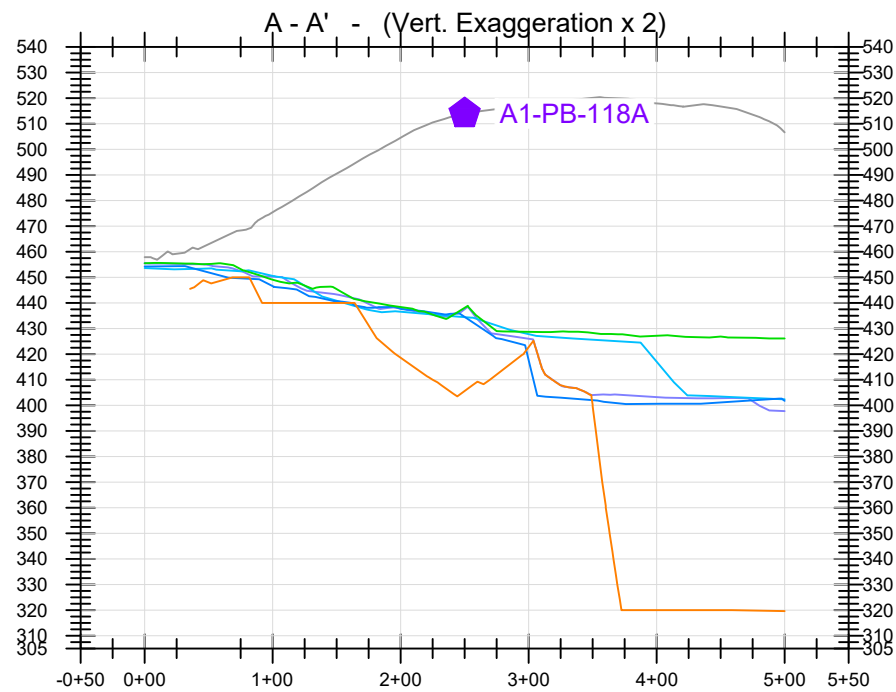
A1-PB-118A will be advanced using sonic drilling techniques per FSP Section 2.2.1.2. It will be sampled following the protocols in FSP Section 2.4.3.1 Perimeter Borings in Waste ("PB" Prefix). Due to the North Quarry overlay of newer refuse, and the need to minimize the duration the active gas collection system is turned off, the following protocols will be followed.

1. Use the 1975 surface to define the elevation of interest, where below this elevation, sampling and downhole gamma logging will be initiated. Due to possible variation in the 1975 topography from photogrammetric methods, the sampling and downhole gamma will begin 20 ft above this 1975 elevation. For A1-PB-118A, 20 ft above 1975 elevation would be 457.5 ft (local site elevation).
2. After the final stakeout survey, the depth to the 20 ft above 1975 elevation will be determined and conveyed to the driller and field geologist.
3. The driller would either blind drill down to these depths with the inner casing, and then install the outer casing to the same depth, or sample using 10 ft sample runs and this core material will be saved in the Conex. However, it will not be scanned, sampled, nor logged. From this point forward (the 20 ft above the 1975 elevation), the sampling will proceed as described in the FSP (5 ft runs). This would continue until the driller and the field geologist agreed they have encountered bedrock.
4. The driller will install the temporary 3 inch solid PVC pipe for the downhole gamma survey, and remove the inner casing. The outer casing will be removed to a point slightly above the 20 ft above the 1975 elevation. This outer casing above the 20 ft above the 1975 elevation will be left in place which will help keep landfill gas from entering the annular space. At the surface, temporary plastic sheeting will be applied between the drilling tub and the outer casing to make a temporary gas seal.
5. Once it is verified that the air quality is safe to proceed around the drilling platform, the HPT will conduct a downhole gamma survey from the 20 ft above the 1975 elevation to the bottom of the PVC pipe (bottom of borehole) as described in the FSP.
6. After the downhole gamma data has been collected and verified, the drillers will grout and abandon the borehole in accordance with the FSP. The surveyor will record the top of pad elevation after abandonment has been completed.

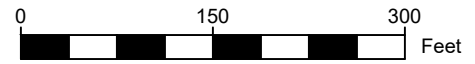
The boring is expected to encounter bedrock, which will cause the boring to be terminated. The core samples will be logged and sampled following the procedures in FSP Section 2.4.1. Radiological analytical samples will be submitted to the laboratory for analysis of the radiological parameters listed in FSP Section 2.4.5.2. The data will be reviewed and discussed with EPA prior to proposal of additional exploration points in lieu of using the step-out procedure provided in the Perimeter Borings in waste protocol per the reasons discussed in Section 1.3.3. The proposed borings will be appropriately abandoned following the protocol described in FSP Section 2.2.3 immediately after drilling and/or gamma logging to minimize safety risks and potential for odors or other emissions to the atmosphere.

The procedures described above are consistent with those utilized for the installation of the previously installed A1-PB-117 and A1-PB-118.

FIGURES



NOTES:
 • AERIAL TOPOGRAPHY AND PHOTOGRAPH PROVIDED BY COOPER AERIAL SURVEYS, INC. AND IS DATED DECEMBER 09, 2020, SURVEYED IN LOCAL SITE COORDINATE SYSTEM.



LEGEND

- PROPERTY BOUNDARY
- AREA 1 & 2 BOUNDARIES
- A1-PB-117 EXISTING PERIMETER BORING
- A1-PB-101 BORING WITH ELEVATED ANALYTICAL RESULTS OR MSW
- STEP-OUT PROPOSED DUE TO ELEVATED ANALYTICAL RESULTS
- STEP-OUT PROPOSED DUE TO ENCOUNTERING MSW
- ◆ A1-PB-118A ADDENDUM 3 PROPOSED STEP-OUT BORING - SONIC

PROJECT WEST LAKE LANDFILL SUPERFUND SITE OU-1 REMEDIAL DESIGN BRIDGETON, ST. LOUIS COUNTY, MO	PREPARED FOR WEST LAKE LANDFILL 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044	SEPTEMBER 2021 DESIGNED BY: PL APPROVED BY: ---	FIGURE A3-2-1		
DRAWING TITLE PROPOSED A1-PB-118A HISTORIC ELEVATIONS		REVISIONS:	DATE	DSN.	APV.
		#	---	---	---
PROJECT NUMBER: BT-191		FILE PATH: C:\Users\plins\Dropbox (Feezor Engineering)\Bridgeton\BT-191 (RDWP Design And Management)\to Be Filed\2021-03-02 Addenda Figures\addendum 3 (area 1)\2021-06-28 Proposed A1-PB-118A\Addendum 3 Figures-A3-5 A1-PB-118A 8-31-21			