

Lockheed Martin Mission Systems & Training
497 Electronics Parkway
Liverpool, NY 13088

September 11, 2014

Mr. Richard Mustico
Project Manager
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7010

Re: *Sunflower Drive Water Main Replacement Directional Drill Work Plan*
Bloody Brook, Onondaga County, New York
Voluntary Cleanup Agreement Index #D7-0001-01-09 (VCP Site No. V00501-7)

Dear Mr. Mustico:

Soil samples from locations within the Bloody Brook site were collected to define the boundaries of the site and to determine the proper management of the soils that will be disturbed to allow for Onondaga County Water Authority (OCWA) to install a water main under the Sunflower Drive culvert that conveys the West Branch of Bloody Brook (WBBB) beneath the road. The soil sampling activities were summarized in the *Sunflower Drive Water Main Replacement Soil Sampling Results* (Summary Letter) dated July 15, 2014. The soil sample locations in the area of the Sunflower Drive culvert are shown on Figure 1, and the analytical results are summarized in Table 1, enclosed with this letter. As stated in the Summary Letter, data summarized in Table 1 shows that the site is bound in the area of the Sunflower Drive culvert by boring locations DI-82-02 and DI-83-03.

Lockheed Martin Corporation (Lockheed Martin) worked with OCWA and New York State Department of Environmental Conservation (NYSDEC) to determine the proper handling and disposal of the soil within the site boundaries. Outlined below are the steps that will be taken to properly manage the potential, cadmium contaminated soils within the site boundary during the directional drilling below the Sunflower Drive culvert. The directional drilling will be performed by an OCWA subcontractor.

- a. The subcontractor will excavate a shallow trench (measuring approximately 4 foot long, 2 foot wide, and 1 foot deep) through the asphalt, outside of the WBBB site boundary in order to insert the drill head and rods (Figure 1). Water will be applied to the drill as it advances through the soil. The water will be provided by the subcontractor using a 250 gallon tank on their truck. Because this water will not be in contact with potential, cadmium contaminated soil, this water will be managed by the subcontractor.
- b. The subcontractor will create a pilot hole by drilling through the soil and under the culvert down to 15 feet below ground surface, adding rods as they go. The drill head

and rods will remain in place underground while the subcontractor connects the reamer, which will be used to make the pilot hole larger to allow for the installation of the water main pipe.

- c. The subcontractor will then dig two pits, outside of the WBBB site boundary, to uncover the rods (Figure 1). The pits will be approximately 10 feet long, 5 feet wide and 8 feet deep. A trench box will be inserted for personnel protection. These pits will have a sump on the end closest to the brook to capture the wastewater and will to be lined with 6-mil polyethylene sheeting.
- d. A reamer will be connected to the rods and pulled through the pilot hole. A water bentonite mix is used to slurry the soil. This water mixture will be collected in the polyethylene-lined pits. Lockheed Martin will provide a vacuum truck to collect the water mixture. The solid milling material, consisting of bentonite and soil, from the reaming process will be collected in the polyethylene sheeting lining the pits and will remain in place until the job is completed.
- e. As the rods are withdrawn from the hole, long handled brushes and clean water will be used to decontaminate the rods. The rods will then be extracted and collected in the machine rack. The water from the decontamination process will be captured in the lined pits and removed with the vacuum truck.
- f. Steps d and e will be repeated if a second reaming process is necessary.
- g. During the reaming process, the high-density polyethylene (HDPE) pipe to be installed and left in place, with a plug connected to it, will be pulled through the reamed hole. While installing the pipe any additional milling material extracted from the hole will be collected in the polyethylene sheeting, and any pipe pulled through the hole and exposed will be decontaminated with clean water using a long handled bush.
- h. When the reamer and pipe plug are pulled into the pit, they will be decontaminated in place using clean water and a long handled brush. The vacuum truck will continue to pull water from the pit until the process is complete.
- i. The polyethylene containing the milling material will then be wrapped and removed from the pits and placed in a truck provided by Lockheed Martin for transportation to the Bloody Brook construction site located upstream of the Sunflower Drive culvert as shown on Figure 2. Any saturated soil in the pits will be removed using an excavator and placed in the truck with the milling material. Prior to the placement of materials into the truck, the truck will be lined with 6 mil polyethylene sheeting. The truck will be covered with 6-mil polyethylene sheeting prior to the truck leaving the Sunflower Drive culvert.
- j. The excavator bucket will then be decontaminated with brushes and clean water into a pan. The vacuum truck will remove the water and place in a drum.
- k. The milling material and any soil excavated from the pits will be stored on Grid #16 within the Bloody Brook construction site on top of and covered by 6-mil polyethylene sheeting (Figure 3). Remediation activities within Grid #16 will be completed following off-site transportation and disposal of the material associated with the directional drilling activities. Water from or coming into contact with the stored material will be captured and treated on site using the Bloody Brook site construction water treatment system.

- l. The stored material will be sampled to be properly characterized for waste disposal. The samples will be submitted to a New York State Department of Health Environmental Laboratory Certification Program (ELAP) for laboratory analysis for the parameters presented in the table below.

Analyte(s)	Analytical Method
Sulfide (Reactive)	SW-846-C7
Reactivity	SW-846-C7
Ignitability	SW-846-C7
TCLP RCRA 8 Metals	SW-846-1311/SW846-7470 (Mercury); SW-846-1311/SW-846-6010 (other RCRA metals)
PCBs	SW-846-1311/SW-846-8082
TCLP SVOCs	SW-846-1311/SW-846-8270
TCLP VOCs	SW-846-1311/SW-846-8260
TCLP Pest/Herb	SW-846-1311/SW-846-8081
Percent Solids	SM-2540.B

After being characterized, the material will be transported off site for proper disposal at a permitted waste facility.

- m. The vacuum truck will transport the wastewater from the directional drilling activities to the Bloody Brook construction site. The wastewater will be transferred into 55 gallon drums, sampled, and stored until proper off-site disposal is determined. The samples will be submitted to a New York State Department of Health ELAP for laboratory analysis for the parameters presented in the table below.

Analyte(s)	Analytical Method
Ignitability	SW-846-C7
TCLP RCRA 8 Metals	SW-846-1311/SW846-7470 (Mercury); SW-846-1311/SW-846-6010 (other RCRA metals)
PCBs	SW-846-1311/SW-846-8082

Following waste characterization, Lockheed Martin will have the wastewater properly disposed of off site at permitted waste facility or treated on site using the Bloody Brook site construction water treatment system and discharge requirements.

The directional drilling activities within potential, cadmium contaminated soils will be conducted in conformance with the March 2014 *Site Community Air Monitoring Plan* (CAMP) and the May 2014 *Health and Safety Plan* (HASP).

OCWA plans to start the water main installation below the Sunflower Drive culvert as soon as possible. The proposed activities described above will be conducted shortly after receiving NYSDEC approval.

After you have reviewed this proposal for managing the soils below the Sunflower Drive culvert, please let me know if you have any questions and if you approve of the proposed activities.

If you have any questions or want to discuss the proposed soil sampling activities summarized in this letter, Please contact me at (315) 456-1993.

Sincerely,



Jill Fonte
Environmental Engineer

Enclosures: Table 1 – Summary of Soil Classification and Analytical Data Adjacent to
Sunflower Drive Culvert
Figure 1 – Directional Drill Site Plan
Figure 2 – Site Map
Figure 3 – Excavation Grid Layout

cc (with enclosure): Myron Parkolap – Lockheed Martin, Syracuse
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Table 1
Summary of Soil Classification and Analytical Data Adjacent to Sunflower Drive Culvert¹
West Branch of Bloody Brook (WBBB)
Bloody Brook Voluntary Cleanup Program
Onondaga County, New York

Boring ID	Sampling Interval	Analyte	Surface Elevation (ft)	Brook Elevation (ft)	Sample Elevation at Bottom of Interval (ft)	Sample Relation to Brook Level	General Soil Classification ²	Collection Date	Result (mg/kg)
DI-07-01	0' - 1'	Cadmium	---	---	---	---	Silt & sand/gravel & organics	8/14/2009	28.8 J
	1' - 2'	Cadmium		---	---	---	Silty clay/gravel	8/14/2009	32.2 J [36.1 J]
	2' - 3'	Cadmium		---	---	---	Silt & sand	8/14/2009	20.7 J
	3' - 4'	Cadmium		---	---	---	Silt & clay	8/14/2009	1.16 J
DI-07-02	0' - 1'	Cadmium	---	---	---	---	Silty clay/gravel & organics	8/14/2009	32.4 J
	1' - 2'	Cadmium		---	---	---	Silt & clay/gravel	8/14/2009	5.98 J
	2' - 3'	Cadmium		---	---	---	Silt & clay/gravel	8/14/2009	10.8 J
	3' - 4'	Cadmium		---	---	---	Silt & sand/clay	8/14/2009	12.1 J
	4' - 5'	Cadmium		---	---	---	Silt & sand/clay	8/14/2009	6.11 J
	5' - 6'	Cadmium		---	---	---	Silt & sand/clay	8/14/2009	5.25 J
DI-07-03	0' - 1'	Cadmium	---	---	---	---	Silt & clay/gravel & organics	8/14/2009	0.422
	1' - 2'	Cadmium		---	---	---	Silt & clay	8/14/2009	0.535
	2' - 3'	Cadmium		---	---	---	Silt & clay	8/14/2009	7.38
	3' - 4'	Cadmium		---	---	---	Silty clay	8/14/2009	3.39
	4' - 5'	Cadmium		---	---	---	Silt & sand/clay & gravel	8/14/2009	5.06
	5' - 6'	Cadmium		---	---	---	Silt & clay	8/14/2009	73
	6' - 7'	Cadmium		---	---	---	Silty clay/sand	8/14/2009	<0.267
	7' - 8'	Cadmium		---	---	---	Silt & sand	8/14/2009	<0.261
	8' - 9'	Cadmium		---	---	---	Silty clay/sand	8/14/2009	0.277 J
	9' - 10'	Cadmium		---	---	---	Silty clay to sand	8/14/2009	1.49
DI-08-01	0' - 1'	Cadmium	376.77	367.59	375.77	Above	Clayey silt, sand	4/26/2011	0.25
	1' - 2'	Cadmium		367.59	374.77	Above	Sand, silty clay	4/26/2011	0.24
	2' - 3'	Cadmium		367.59	373.77	Above	Silty clay	4/26/2011	0.38
	3' - 4'	Cadmium		367.59	372.77	Above	Silty clay	4/26/2011	0.10 J
	4' - 5'	Cadmium		367.59	371.77	Above	Clayey silt, silty clay	4/26/2011	5.6
	5' - 6'	Cadmium		367.59	370.77	Above	Silty clay, clayey silt	4/26/2011	1.0
DI-09-01	0 - 1'	Cadmium	---	---	---	---	Sand & Silt, trace organics & gravel	9/21/2009	0.601
	1 - 2'	Cadmium		---	---	---	Sand & silt, trace organics & gravel	9/21/2009	0.270
	2 - 3'	Cadmium		---	---	---	Sand & silt, trace organics & gravel	9/21/2009	5.74
	3 - 4'	Cadmium		---	---	---	Silt & sand, trace gravel	9/21/2009	0.246
	4 - 5'	Cadmium		---	---	---	Sand & silt	9/21/2009	0.254
	5 - 6'	Cadmium		---	---	---	Silt & sand, trace gravel	9/21/2009	4.21
	6 - 7'	Cadmium		---	---	---	Silt	9/21/2009	9.12
DI-09-02	0 - 1'	Cadmium	---	---	---	---	Sand & silt, organics	9/21/2009	3.45
	1 - 2'	Cadmium		---	---	---	Sand & silt, organics	9/21/2009	10.7
	2 - 3'	Cadmium		---	---	---	Sand & silt, organics & trace clay	9/21/2009	0.982
	3 - 4'	Cadmium		---	---	---	Silt & sand, trace organics	9/21/2009	0.77
	4 - 5'	Cadmium		---	---	---	Silt & sand, trace organics	9/21/2009	9.40
	5 - 6'	Cadmium		---	---	---	Silty clay & fine sand	9/21/2009	5.76
	6 - 7'	Cadmium		---	---	---	Fine sand & silt	9/21/2009	3.55
DI-09-03	0' - 1'	Cadmium	375.67	367.69	374.67	Above	Silt, silty sand, trace gravel	4/25/2011	0.98
	1' - 2'	Cadmium		367.69	373.67	Above	Silty sand, silt, clay, trace gravel	4/25/2011	6.6
DI-09-04	0' - 1'	Cadmium	376.02	367.29	375.02	Above	Silty clay, clay	4/25/2011	0.72
	1' - 2'	Cadmium		367.29	374.02	Above	Silty clay	4/25/2011	0.72
DI-32A-01	0 - 1'	Cadmium	---	---	---	---	Silt, organics and gravel	9/21/2009	0.276 [0.215 J]
	1 - 2'	Cadmium		---	---	---	Sand & silt, gravel	9/21/2009	1.72
	2 - 3'	Cadmium		---	---	---	Sand & silt, gravel	9/21/2009	4.71
	3 - 4'	Cadmium		---	---	---	Sand & silt, gravel	9/21/2009	0.591
	4 - 5'	Cadmium		---	---	---	Sand & silt, gravel	9/21/2009	78.6
	5 - 6'	Cadmium		---	---	---	Sand & silt, gravel	9/21/2009	6.53
DI-32C-01	0 - 1'	Cadmium	---	---	---	---	Sand & silt, organics	9/21/2009	0.444
	1 - 2'	Cadmium		---	---	---	Sand & silt, gravel	9/21/2009	1.19
	2 - 3'	Cadmium		---	---	---	Sand & silt, gravel	9/21/2009	0.238 [0.180 J]
	9 - 10'	Cadmium		---	---	---	Silty clay	9/21/2009	<0.255
	10 - 11'	Cadmium		---	---	---	Silty clay	9/21/2009	<0.235
DI-32C-02	0 - 1'	Cadmium	---	---	---	---	Sand & silt, organics	9/21/2009	0.460
	1 - 2'	Cadmium		---	---	---	Sand & silt, organics	9/21/2009	1.32
	2 - 3'	Cadmium		---	---	---	Silt & sand, trace clay	9/21/2009	0.164 J

Table 1
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West Branch of Bloody Brook (WBBB)
Bloody Brook Voluntary Cleanup Program
Onondaga County, New York

Boring ID	Sampling Interval	Analyte	Surface Elevation (ft)	Brook Elevation (ft)	Sample Elevation at Bottom of Interval (ft)	Sample Relation to Brook Level	General Soil Classification ²	Collection Date	Result (mg/kg)
DI-45-01	0' - 1'	Cadmium	375.04	369.27	374.04	Above	Clay, silty clay	4/25/2011	3.6
	1' - 2'	Cadmium		369.27	373.04	Above	Clay, silty clay, fine sand	4/25/2011	0.33
	2' - 3'	Cadmium		369.27	372.04	Above	Clay, silty clay, silt, trace fine sand	4/25/2011	0.62
	3' - 4'	Cadmium		369.27	371.04	Above	Clay, silty clay, organics	4/25/2011	530
	4' - 5'	Cadmium		369.27	370.04	Above	Clay, silty clay, occasional roots	4/25/2011	4.5
	5' - 6'	Cadmium		369.27	369.04	At	Clay, clayey silt, silt, sandy silt	4/25/2011	2.8
	6' - 7'	Cadmium		369.27	368.04	Below	Clayey silt, clay, sandy silt	4/25/2011	9.5
	7' - 8'	Cadmium		369.27	367.04	Below	Clay	4/25/2011	0.58
DI-45-02	0' - 1'	Cadmium	375.66	369.27	374.66	Above	Clay	4/25/2011	4.1
	1' - 2'	Cadmium		369.27	373.66	Above	Clay, silty clay	4/25/2011	1.9
	2' - 3'	Cadmium		369.27	372.66	Above	Clay, silty clay	4/25/2011	2.5
	3' - 4'	Cadmium		369.27	371.66	Above	Clay, silty clay	4/25/2011	2.6
DI-45-03	0' - 1'	Cadmium	376.01	369.27	375.01	Above	Clay, silty clay	4/25/2011	0.50
	1' - 2'	Cadmium		369.27	374.01	Above	Clay, silty clay	4/25/2011	0.21 J
DI-46-01	0' - 1'	Cadmium	377.47	367.00	376.47	Above	Clayey silt, silty clay, trace gravel	4/27/2011	3.6
	1' - 2'	Cadmium		367.00	375.47	Above	Silty clay, clayey silt, gravel	4/27/2011	0.83
DI-46-02	0' - 1'	Cadmium	377.39	367.00	376.39	Above	Clayey silt, silty clay, fine to coarse gravel	4/27/2011	0.79
	1' - 2'	Cadmium		367.00	375.39	Above	Fine to coarse gravel, silty clay	4/27/2011	0.70
DI-82-01	0' - 1'	Cadmium	---	---	---	---	Coarse to fine sand and coarse to fine gravel	4/29/2014	0.35
	1' - 2'	Cadmium		---	---	---	Coarse to fine gravel, some fine sand, some silt	4/29/2014	0.9
	2' - 3'	Cadmium		---	---	---	Silty clay, little sand	4/29/2014	0.6
	3' - 4'	Cadmium		---	---	---	Silty clay, little sand	4/29/2014	2.3
	4' - 5'	Cadmium		---	---	---	Clayey silt, some sand	4/29/2014	0.11
	5' - 6'	Cadmium		---	---	---	Clayey silt, some sand	4/29/2014	0.22
	6' - 7'	Cadmium		---	---	---	Clayey silt, some sand	4/29/2014	0.37
	7' - 8'	Cadmium		---	---	---	Clayey silt, some sand	4/29/2014	0.59
	8' - 9'	Cadmium		---	---	---	Coarse to fine gravel, some fine Sand, some Silt	4/29/2014	0.29
	9' - 10'	Cadmium		---	---	---	Coarse to fine gravel, some fine Sand, some Silt	4/29/2014	0.11
	10' - 11'	Cadmium		---	---	---	Coarse to fine gravel, some fine Sand, some Silt	4/29/2014	4.8
	11' - 12'	Cadmium		---	---	---	Coarse to fine gravel, some fine Sand, some Silt	4/29/2014	0.18
DI-82-02	8' - 9'	Cadmium	---	---	---	---	Clayey silt, some sand	4/29/2014	0.54 U
	9' - 10'	Cadmium		---	---	---	Clayey silt, some sand	4/29/2014	0.033
	10' - 11'	Cadmium		---	---	---	Clayey silt, some sand	4/29/2014	0.65 U
	11' - 12'	Cadmium		---	---	---	Clayey silt, some sand	4/29/2014	0.63 U
DI-83-01	0' - 1'	Cadmium	---	---	---	---	Coarse to fine sand and coarse to fine gravel	4/29/2014	0.12
	1' - 2'	Cadmium		---	---	---	Medium to fine sand and medium to fine gravel	4/29/2014	0.49
	2' - 3'	Cadmium		---	---	---	Sand and silt, some clay	4/29/2014	19.1
	3' - 4'	Cadmium		---	---	---	Fine sand and silt, some clay	4/29/2014	5.8
	4' - 5'	Cadmium		---	---	---	Fine sand and silt, some clay	4/29/2014	16.6
	5' - 6'	Cadmium		---	---	---	Fine sand and silt, some clay	4/29/2014	14.4 [4.5]
	6' - 7'	Cadmium		---	---	---	Fine sand and silt, some clay	4/29/2014	1.3
	7' - 8'	Cadmium		---	---	---	Fine sand and silt, some clay	4/29/2014	0.085
	8' - 9'	Cadmium		---	---	---	Fine sand and silt, some clay	4/29/2014	0.16 [0.15]
	9' - 10'	Cadmium		---	---	---	Fine sand and silt	4/29/2014	0.21
	10' - 11'	Cadmium		---	---	---	Fine sand and silt	4/29/2014	0.15
	11' - 12'	Cadmium		---	---	---	Fine sand and silt	4/29/2014	0.14
DI-83-02	2' - 3'	Cadmium	---	---	---	---	Sandy silt, some clay	4/29/2014	3.9
	4' - 5'	Cadmium		---	---	---	Sandy silt, some clay	4/29/2014	0.29
	5' - 6'	Cadmium		---	---	---	Sandy silt, some clay	4/29/2014	0.28
DI-83-03	0' - 1'	Cadmium	---	---	---	---	Coarse to fine sand and medium to fine gravel	4/29/2014	0.19
	1' - 2'	Cadmium		---	---	---	Silty clay, little sand	4/29/2014	0.63
	2' - 3'	Cadmium		---	---	---	Clayey silt, little sand	4/29/2014	0.031
	3' - 4'	Cadmium		---	---	---	Clayey silt, little sand	4/29/2014	0.57 U
	4' - 5'	Cadmium		---	---	---	Sandy silt, some clay	4/29/2014	0.2
DI-SB-05-05	0' - 1'	Cadmium	377.51	368.32	376.51	Above	Silty sand, trace clay	4/25/2011	0.94
	1' - 2'	Cadmium		368.32	375.51	Above	Sandy silt	4/25/2011	0.24 [0.23]
	2' - 3'	Cadmium		368.32	374.51	Above	Silty sand	4/25/2011	<0.26 U
	3' - 4'	Cadmium		368.32	373.51	Above	Fine sand with some gravel, trace silt	4/25/2011	0.52 B
	4' - 5'	Cadmium		368.32	372.51	Above	Grades to Sandy silt with little gravel	4/25/2011	0.33 B
	5' - 6'	Cadmium		368.32	371.51	Above	Sandy silt, trace gravel, trace clay	4/25/2011	0.54 B
	6' - 7'	Cadmium		368.32	370.51	Above	Sandy silt, trace gravel, trace clay	4/25/2011	0.88 B
	7' - 8'	Cadmium		368.32	369.51	Above	Clay, trace gravel at 7'	4/25/2011	1.0 B

Table 1
Summary of Soil Classification and Analytical Data Adjacent to Sunflower Drive Culvert¹
West Branch of Bloody Brook (WBBB)
Bloody Brook Voluntary Cleanup Program
Onondaga County, New York

Boring ID	Sampling Interval	Analyte	Surface Elevation (ft)	Brook Elevation (ft)	Sample Elevation at Bottom of Interval (ft)	Sample Relation to Brook Level	General Soil Classification ²	Collection Date	Result (mg/kg)
SA-SB-05-02	0' - 2'	Cadmium	376.93	368.32	376.76	Above	Topsoil	10/22/2003	1.4
	0' - 1'	Cadmium		368.32	375.93	Above	Silty Sand	10/22/2003	1.4
	1' - 2'	Cadmium		368.32	374.93	Above	Silty Sand	10/22/2003	<0.58
	2' - 3'	Cadmium		368.32	373.93	Above	Silty Sand	10/22/2003	1.4
	3' - 4'	Cadmium		368.32	372.93	Above	Silty Sand	10/22/2003	<0.60
	4' - 5'	Cadmium		368.32	371.93	Above	Clayey Silt	10/22/2003	<0.60
	5' - 6'	Cadmium		368.32	370.93	Above	Clayey Silt	10/22/2003	12.5
	6' - 7'	Cadmium		368.32	369.93	Above	Sandy Silt	10/22/2003	<0.58
	7' - 8'	Cadmium		368.32	368.93	Above	Sandy Silt to Organic Clayey Silt	10/22/2003	<0.59
	8' - 9'	Cadmium		368.32	367.93	At	Organic Clayey Silt	10/22/2003	5.1
	9' - 10'	Cadmium		368.32	366.93	Below	Organic Clayey Silt	10/22/2003	5.9
SA-SB-05-03	10' - 11'	Cadmium		368.32	365.93	Below	Organic Clayey Silt	10/22/2003	8.1
	0' - 2'	Cadmium	376.62	368.31	376.45	Above	Topsoil	10/22/2003	1.51
	0' - 1'	Cadmium		368.31	375.62	Above	Silty Sand	10/22/2003	<0.607
	1' - 2'	Cadmium		368.31	374.62	Above	Silty Sand	10/22/2003	<0.588
	2' - 3'	Cadmium		368.31	373.62	Above	Silty Sand	10/22/2003	<0.581
	3' - 4'	Cadmium		368.31	372.62	Above	Silty Sand	10/22/2003	<0.579
	4' - 5'	Cadmium		368.31	371.62	Above	Clayey Silt	10/22/2003	<0.607
	5' - 6'	Cadmium		368.31	370.62	Above	Organic Clayey Silt	10/22/2003	2.5
	6' - 7'	Cadmium		368.31	369.62	Above	Organic Clayey Silt	10/22/2003	0.587
	7' - 8'	Cadmium		368.31	368.62	At	Organic Clayey Silt	10/22/2003	20.5
	8' - 9'	Cadmium		368.31	367.62	Below	Clayey Silt	10/22/2003	21.8
	9' - 10'	Cadmium		368.31	366.62	Below	Clayey Silt	10/22/2003	<0.661
SA-SB-05-04	0' - 2'	Cadmium	375.98	368.27	375.81	Above	Topsoil	10/22/2003	4.3
	0' - 1'	Cadmium		368.27	374.98	Above	Silty Sand	10/22/2003	3.6
	1' - 2'	Cadmium		368.27	373.98	Above	Silty Sand	10/22/2003	27.9
	2' - 3'	Cadmium		368.27	372.98	Above	Silty Sand	10/22/2003	<0.57
	3' - 4'	Cadmium		368.27	371.98	Above	Organic clayey Silt	10/22/2003	11.8
	4' - 5'	Cadmium		368.27	370.98	Above	Organic Silty Clay	10/22/2003	7.5
	5' - 6'	Cadmium		368.27	369.98	Above	Organic Silty Clay	10/22/2003	2.4
	6' - 7'	Cadmium		368.27	368.98	Above	Organic Silty Clay	10/22/2003	12.0
	7' - 8'	Cadmium		368.27	367.98	At	Organic Clayey Silt	10/22/2003	11.3
	8' - 9'	Cadmium		368.27	366.98	Below	Organic Clayey Silt	10/22/2003	20.9
	9' - 10'	Cadmium		368.27	365.98	Below	Organic Sand/Silt	10/22/2003	<0.72
	10' - 11'	Cadmium		368.27	364.98	Below	Organic Sand/Silt	10/22/2003	<0.85
	11' - 12'	Cadmium		368.27	363.98	Below	Silty Sand	10/22/2003	<0.63
	12' - 13'	Cadmium		368.27	362.98	Below	Organic Silt/Sand	10/22/2003	<0.68
	13' - 14'	Cadmium		368.27	361.98	Below	Organic Silt/Sand	10/22/2003	<0.68
SA-SB-216-01	0' - 2'	Cadmium	375.03	368.96	374.86	Above	Topsoil	10/22/2003	3.3
	0' - 1'	Cadmium		368.96	374.03	Above	Silty Sand	10/22/2003	3.9
	1' - 2'	Cadmium		368.96	373.03	Above	Silty Sand	10/22/2003	<0.59
	2' - 3'	Cadmium		368.96	372.03	Above	Silty Sand	10/22/2003	<0.56
	3' - 4'	Cadmium		368.96	371.03	Above	Clayey Silt	10/22/2003	0.65
	4' - 5'	Cadmium		368.96	370.03	Above	Clayey Silt	10/22/2003	24.9
	5' - 6'	Cadmium		368.96	369.03	At	Clayey Silt	10/22/2003	0.77
	6' - 7'	Cadmium		368.96	368.03	Below	Clayey Silt	10/22/2003	4.7
	7' - 8'	Cadmium		368.96	367.03	Below	Clayey Silt	10/22/2003	<0.65
	8' - 9'	Cadmium		368.96	366.03	Below	Clayey Silt	10/22/2003	20.6
	9' - 10'	Cadmium		368.96	365.03	Below	Organic Clayey Silt	10/22/2003	<0.654
SA-SB-216-02	0' - 2'	Cadmium	376.08	368.88	375.91	Above	Topsoil	10/22/2003	1.26
	0' - 1'	Cadmium		368.88	375.08	Above	Silty Sand	10/22/2003	0.659
	1' - 2'	Cadmium		368.88	374.08	Above	Silty Sand	10/22/2003	<0.588
	2' - 3'	Cadmium		368.88	373.08	Above	Silty Sand	10/22/2003	<0.617
	3' - 4'	Cadmium		368.88	372.08	Above	Silty Sand	10/22/2003	<0.602
	4' - 5'	Cadmium		368.88	371.08	Above	Silty Sand	10/22/2003	5.38
	5' - 6'	Cadmium		368.88	370.08	Above	Organic Clayey Silt	10/22/2003	14.5
	6' - 7'	Cadmium		368.88	369.08	At	Organic Clayey Silt	10/22/2003	1.57 [0.823]
	7' - 8'	Cadmium		368.88	368.08	Below	Silty Clay	10/22/2003	<0.68
	8' - 9'	Cadmium		368.88	367.08	Below	Silty Clay	10/22/2003	0.903
	9' - 10'	Cadmium		368.88	366.08	Below	Organic Clayey Silt	10/22/2003	<0.756
	10' - 11'	Cadmium		368.88	365.08	Below	Organic Clayey Silt	10/22/2003	<0.719
	11' - 12'	Cadmium		368.88	364.08	Below	Silty Clay	10/22/2003	<0.62
	12' - 13'	Cadmium		368.88	363.08	Below	Silty Sand	10/22/2003	<0.616
	13' - 14'	Cadmium		368.88	362.08	Below	Silty Sand	10/22/2003	<0.60

Table 1
Summary of Soil Classification and Analytical Data Adjacent to Sunflower Drive Culvert¹
West Branch of Bloody Brook (WBBB)
Bloody Brook Voluntary Cleanup Program
Onondaga County, New York

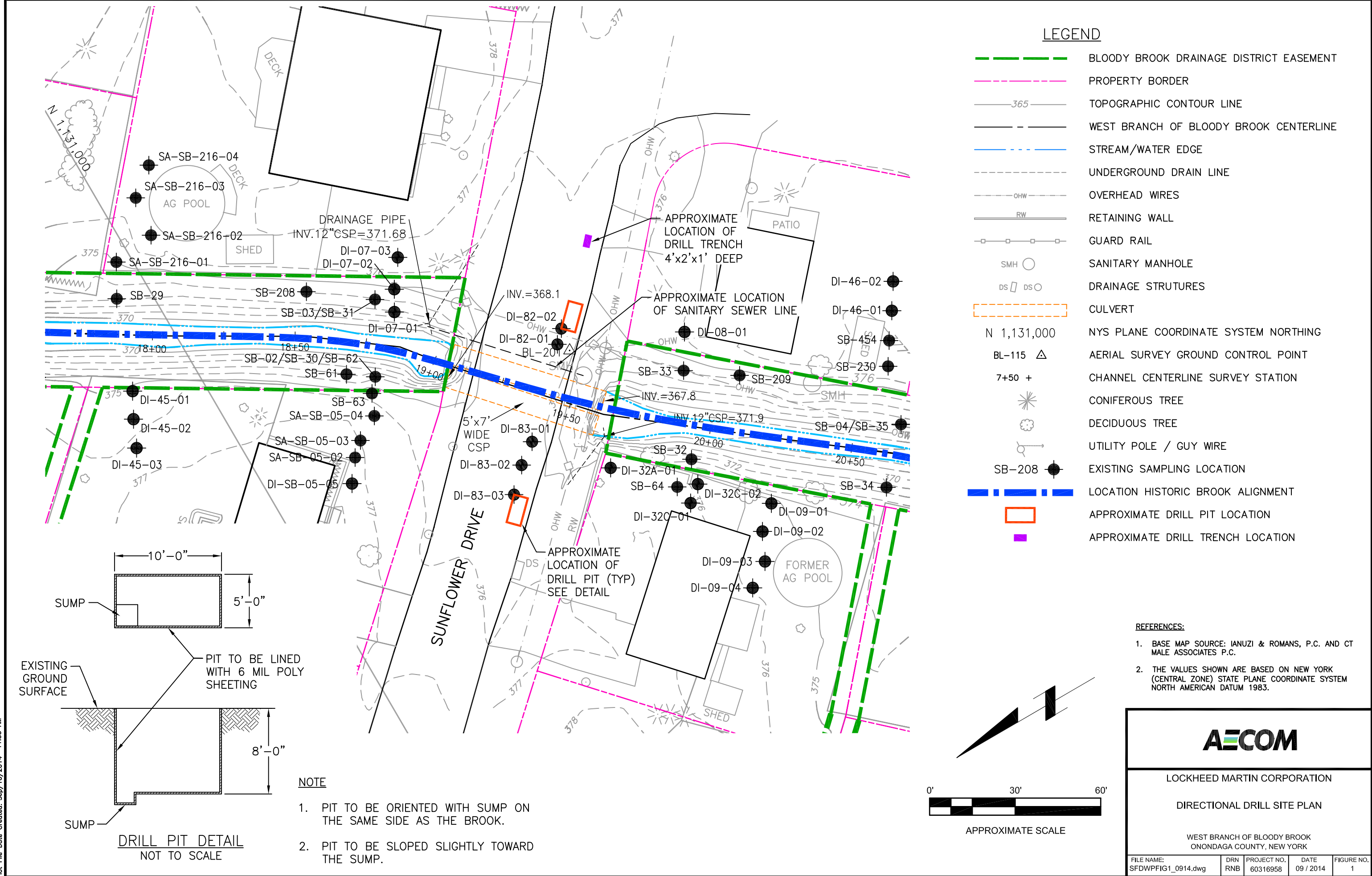
Boring ID	Sampling Interval	Analyte	Surface Elevation (ft)	Brook Elevation (ft)	Sample Elevation at Bottom of Interval (ft)	Sample Relation to Brook Level	General Soil Classification ²	Collection Date	Result (mg/kg)
SA-SB-216-03	0' - 2'	Cadmium	376.12	368.90	375.95	Above	Topsoil	10/22/2003	<0.652
	0' - 1'	Cadmium		368.90	375.12	Above	Silty Sand	10/22/2003	<0.60
	1' - 2'	Cadmium		368.90	374.12	Above	Silty Sand	10/22/2003	<0.598
	2' - 3'	Cadmium		368.90	373.12	Above	Silty Sand	10/22/2003	<0.617
	3' - 4'	Cadmium		368.90	372.12	Above	Silty Clay	10/22/2003	<0.624
	4' - 5'	Cadmium		368.90	371.12	Above	Silty Clay	10/22/2003	1.54
	5' - 6'	Cadmium		368.90	370.12	Above	Sandy Silt	10/22/2003	<0.632
	6' - 7'	Cadmium		368.90	369.12	At	Sandy Silt	10/22/2003	<0.641
	7' - 8'	Cadmium		368.90	368.12	Below	Sandy Silt	10/22/2003	<0.713
	8' - 9'	Cadmium		368.90	367.12	Below	Sandy Silt	10/22/2003	<0.635
	9' - 10'	Cadmium		368.90	366.12	Below	Organic Silt/Sand	10/22/2003	<0.635
SA-SB-216-04	0' - 1'	Cadmium	376.23	368.88	375.23	Above	Silty Sand	10/22/2003	<0.59
	1' - 2'	Cadmium		368.88	374.23	Above	Silty Sand	10/22/2003	<0.57
SB-02	0' - 1'	Cadmium	---	---	---	---	---	11/2001	203
	1' - 2'	Cadmium		---	---	---	---	11/2001	503
SB-03	0' - 1'	Cadmium	---	---	---	---	---	11/2001	37
	1' - 2'	Cadmium		---	---	---	---	11/2001	30.1
SB-04	0' - 1'	Cadmium	---	---	---	---	---	11/2001	30.4
	1' - 2'	Cadmium		---	---	---	---	11/2001	34.2
SB-29	0' - 2'	Cadmium	---	---	---	---	---	06/2002	10.5
SB-30	0' - 2'	Cadmium	---	---	---	---	---	06/2002	39.3
SB-31	0' - 2'	Cadmium	---	---	---	---	---	06/2002	22.9
SB-32	0' - 2'	Cadmium	---	---	---	---	---	06/2002	35.2
SB-33	0' - 2'	Cadmium	---	---	---	---	---	06/2002	11.3
SB-34	0' - 2'	Cadmium	---	---	---	---	---	06/2002	3.79
SB-35	0' - 2'	Cadmium	---	---	---	---	---	06/2002	19.0
SB-61	0' - 1'	Cadmium	---	---	---	---	Sandy Silt	11/2002	134
	1' - 2'	Cadmium		---	---	---	Sandy Silt	11/2002	22.9
	2' - 3'	Cadmium		---	---	---	Silty Sand	11/2002	26.2
	3' - 4'	Cadmium		---	---	---	Silty Sand/Peat	11/2002	864
SB-62	2' - 3'	Cadmium	---	---	---	---	Sandy Silt	11/2002	263
	3' - 4'	Cadmium		---	---	---	Silty Sand	11/2002	208
SB-63	0' - 2'	Cadmium	---	---	---	---	---	11/2002	22.6
SB-64	0' - 2'	Cadmium	---	---	---	---	---	11/2002	1.1
SB-208	0' - 2'	Cadmium	---	---	---	---	---	11/2002	32.7
	0' - 1'	Cadmium		---	---	---	Silty Sand	11/2002	63.7
	1' - 2'	Cadmium		---	---	---	Silty Sand	11/2002	27.3
	2' - 3'	Cadmium		---	---	---	Silty Sand	11/2002	600
	3' - 4'	Cadmium		---	---	---	Sandy Silt	11/2002	41.7
SB-209	0' - 2'	Cadmium	---	---	---	---	---	11/2002	14.7
	0' - 1'	Cadmium		---	---	---	Sandy Silt	11/2002	11.8
	1' - 2'	Cadmium		---	---	---	Silty Sand	11/2002	14.3
	2' - 3'	Cadmium		---	---	---	Silty Sand	11/2002	10.0
	3' - 4'	Cadmium		---	---	---	Silty Sand	11/2002	10.7
SB-230	0' - 2'	Cadmium	376.54	366.99	376.37	Above	Topsoil	10/23/2003	23.5
	0' - 1'	Cadmium		366.99	375.54	Above	Sandy Silt	10/23/2003	10.1
	1' - 2'	Cadmium		366.99	374.54	Above	Fill	10/23/2003	5.2 [1.50]
	2' - 3'	Cadmium		366.99	373.54	Above	Fill	10/23/2003	<0.57
	3' - 4'	Cadmium		366.99	372.54	Above	Silty Sand	10/23/2003	0.81
	4' - 5'	Cadmium		366.99	371.54	Above	Silty Sand	10/23/2003	<0.60
	5' - 6'	Cadmium		366.99	370.54	Above	Silty Sand to Silty Clay	10/23/2003	<0.61
	6' - 7'	Cadmium		366.99	369.54	Above	Organic Silty Clay	10/23/2003	6.0
	7' - 8'	Cadmium		366.99	368.54	Above	Organic Silty Clay	10/23/2003	<0.65 [<0.68]
	8' - 9'	Cadmium		366.99	367.54	Above	Silty Clay	10/23/2003	<0.62
	9' - 10'	Cadmium		366.99	366.54	At	Silty Clay	10/23/2003	<0.59
	10' - 11'	Cadmium		366.99	365.54	Below	Organic Silty Clay	10/23/2003	<0.67
	11' - 12'	Cadmium		366.99	364.54	Below	Silty Clay	10/23/2003	<0.62

Table 1
Summary of Soil Classification and Analytical Data Adjacent to Sunflower Drive Culvert¹
West Branch of Bloody Brook (WBBB)
Bloody Brook Voluntary Cleanup Program
Onondaga County, New York

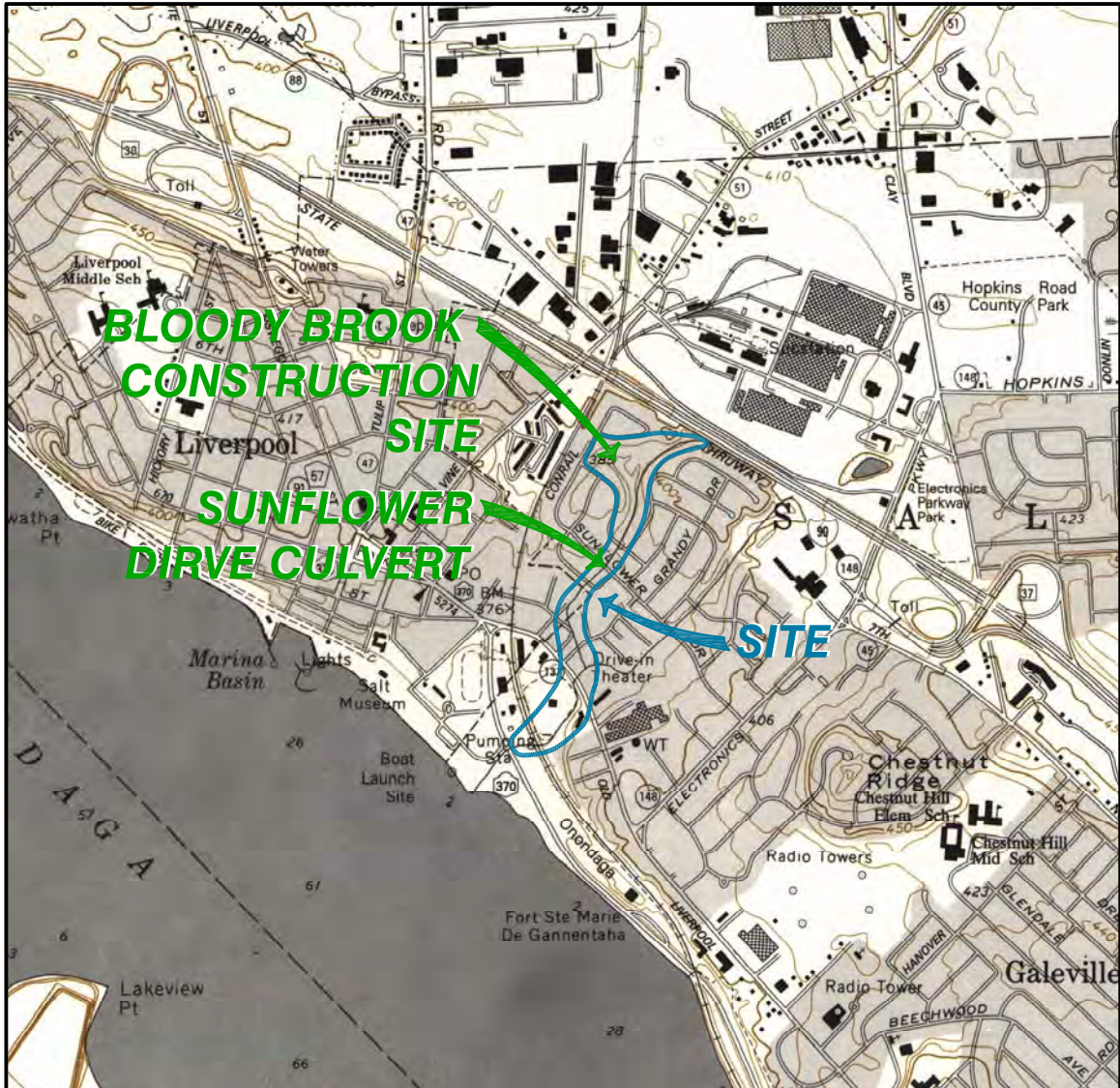
Boring ID	Sampling Interval	Analyte	Surface Elevation (ft)	Brook Elevation (ft)	Sample Elevation at Bottom of Interval (ft)	Sample Relation to Brook Level	General Soil Classification ²	Collection Date	Result (mg/kg)
SB-454	0" - 2"	Cadmium	376.79	367.00	376.62	Above	Topsoil	4/29/2004	4.9
	0' - 1'	Cadmium		367.00	375.79	Above	Silty Sand	4/29/2004	7.5

Notes:

1. Boring locations are shown on Figure 1.
2. The soil classification descriptions identified in the table represent the predominant soil type for the respective intervals.
3. mg/kg = milligrams/kilograms (equivalent to ppm = parts per million).
4. --- indicates that the information is not available.
5. Duplicate results are presented in brackets.
6. B - Compound was found in the blank and sample.
7. J - The detected concentration is an estimated value.
8. U - Result edited to reflect non-detect by data validation company due to presence of cadmium in the associated preparation blank at similar concentrations.
9. < - Analyte not detected at the reporting limit shown.
10. Information associated with the borings located in Sunflower Drive are highlighted in yellow.



Plotted By: bookasr
Layout-Sheet Name: FIGURE 1
Plot File Date Created: Sep/10/2014 11:53 AM



APPROXIMATE SCALE

REFERENCE:

1. NYSDOT 7.5 MIN TOPOGRAPHIC MAP OF SYRACUSE WEST, QUADRANGLE 1990, SCALE: 1" = 2000'.

AECOM

LOCKHEED MARTIN CORPORATION

SITE MAP

WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
SFDWPF2_0914.dwg	—	60316958	09 / 2014	2

