Appendix E

Scott's Mill Dissolved Oxygen Sampling

JAMES RIVER DO SAMPLING:

Riverbank DO sampling, 9/9/16, sunny, 90 degrees F, no rain within 4 days									
	Site	**DO (%)**	**DO (mg/L)**	**Temp (°C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Location/Notes**	**Latitude**	**Longitude**
Upstream	001	130.4	9.63	31.5	752.8	0.6	10m u/s of Reusen's Dam (SW side)	37 27 47.6 N	-79 11 13.5 W
	002	96.0	7.58	27.5	753.6	0.5	100m d/s of Reusen's Dam, 5,900m u/s of Scotts Mill Dam (SW side)	37 27 43.9 N	-79 11 12.0 W
	003	84.2	6.43	29.3	753.3	0.3	1,500m u/s of Scott's Mill Dam (NE side)	37 26 10.2 N	-79 08 53.8 W
	004	104.1	7.97	29.2	753.3	0.3	1,100m u/s of Scott's Mill Dam, at Red and Dot's boat ramp (NE side)	37 26 02.1 N	-79 08 42.3 W
	005	99.7	7.58	29.7	753.1	0.3	300m u/s of Scott's Mill Dam (NE side)	37 25 37.2 N	-79 08 26.4 W
	006	94.9	7.37	29.5	752.8	0.3	5m u/s of Scott's Mill Dam straight section (NE side)	37 25 29.4 N	-79 08 23.6 W
	011	*96.9*	*7.51*	*28.7*	*752.6*	*0.3*	*50m u/s of Scott's Mill Dam arch section (SW side)*	*37 25 27.7 N*	*-79 08 35.0 W*
	007	98.2	7.69	28.0	753.4	0.3	15m d/s of Scott's Mill Dam straight section (NE side)	37 25 28.5 N	-79 08 23.4 W
	008	102.9	8.06	27.9	753.3	0.3	390m d/s of Scott's Mill Dam, across from Griffin Pipe (NE side)	37 25 15.8 N	-79 08 19.9 W
	009	103.6	8.11	28.0	753.2	0.3	990m d/s of Scott's Mill Dam, at Riverside Park boat ramp (NE side, d/s of Blackwater Creek)	37 24 57.9 N	-79 08 12.8 W
Downstream	010	102.8	8.06	27.9	753.1	0.3	670m d/s of Scotts Mill Dam, Griffin Pipe boat ramp (SW side, u/s of Blackwater Creek)	37 25 06.2 N	-79 08 22.2 W

Deployed DO Meter 50m u/s of Scott's Mill Dam Arch Section, 9/9/16-9/10/16, site 012, Beginning at 16:24pm, No Rain Within 4 days							
Meter Time	**Actual Time**	**DO (%)**	**DO (mg/L)**	**Temp (°C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Notes**
0:37	17:01	100.9	7.91	27.9	753.1	0.3	16:24
1:37	18:01	99.6	7.81	27.9	752.9	0.3	6pm, 9/9/16
2:37	19:01	99.0	7.76	27.9	752.9	0.3	
3:37	20:01	96.5	7.58	27.8	752.8	0.3	8pm
4:37	21:01	95.1	7.47	27.8	753.2	0.3	
5:37	22:01	94.1	7.40	27.7	753.2	0.3	10pm
6:37	23:01	92.0	7.24	27.7	753.9	0.3	
7:37	0:01	89.8	7.08	27.6	754.3	0.3	12 midnight, 9/9/16
8:37	1:01	88.7	6.99	27.6	754.9	0.3	
9:37	2:01	86.0	6.78	27.6	755.5	0.3	2am, 9/10/16
10:37	3:01	**83.9**	**6.63**	27.5	755.9	0.3	
11:37	4:01	89.8	7.08	27.6	756.2	0.3	4am
12:37	5:01	91.8	7.22	27.8	756.1	0.3	
13:37	6:01	95.8	7.51	27.9	755.8	0.3	6am
14:37	7:01	97.5	7.63	28.0	755.6	0.3	
15:37	8:01	108.0	8.43	28.2	755.4	0.3	8am
16:37	9:01	**114.9**	**8.96**	28.2	755.0	0.3	
17:37	10:01	113.2	8.81	28.3	754.9	0.3	10am
18:37	11:01	109.2	8.53	28.1	755.2	0.3	
19:37	12:01	102.2	8.00	28.0	755.9	0.3	12 noon, 9/10/16
20:37	13:01	98.8	7.75	27.9	756.8	0.3	
21:37	14:01	95.3	7.49	27.8	757.3	0.3	2pm
Average		97.4	7.64	27.9	754.9		

Scott's Mill Dam Impoundment Sampling, 9/12/16, 85 degrees F, No Rain Within 5 Days						
Cross-Section 1	**DO (%)**	**DO (mg/L)**	**Temp (°C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Notes**
Left Riverbank (Amherst/NE side)	96.4	7.69	26.9	757.9	1	1m of cable deployed, 50m u/s of bouys, 10s logging interval
↓	91.0	7.27	26.9	757.9	1	
	100.4	7.91	27.6	757.9	1	
	107.2	8.35	28.3	757.9	1	
	107.1	8.34	28.3	758.0	1	
	106.8	8.32	28.3	758.0	1	
	106.7	8.31	28.3	758.0	1	
	106.7	8.30	28.4	758.0	1	
	107.1	8.32	28.4	757.9	1	
	107.2	8.34	28.4	758.0	1	
	107.2	8.33	28.4	758.0	1	
	107.7	8.37	28.4	757.9	1	
	108.0	8.40	28.4	758.0	1	
	108.0	8.40	28.4	758.0	1	
	107.6	8.38	28.3	758.0	1	
	107.9	8.40	28.3	758.0	1	
Daniel Island	108.4	8.46	28.2	757.9	1	
Average	105.4	8.23	28.1	758.0		

Scott's Mill Dam Impoundment Sampling, 9/12/16, 85 degrees F, No Rain Within 5 Days						
Cross-Section 2	**DO (%)**	**DO (mg/L)**	**Temp (^{o}C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Notes**
Left Riverbank (Amherst/NE side)	94.3	7.56	26.7	758.0	2	2m of cable deployed, 50m u/s of bouys, 10s logging interval
	94.4	7.51	27.1	757.9	2	
	91.7	7.31	27.0	758.0	2	
	85.8	6.87	26.7	758.0	2	
	98.5	7.84	27.1	758.0	2	
	101.8	8.08	27.2	757.9	2	
	99.7	7.93	27.1	758.0	2	
	102.4	8.10	27.4	758.0	2	
	105.1	8.28	27.6	758.0	2	
	107.4	8.46	27.7	758.0	2	
	106.3	8.37	27.7	757.9	2	
	106.4	8.39	27.6	757.9	2	
	106.2	8.34	27.6	757.9	2	
	106.1	8.29	28.1	757.9	2	
	105.8	8.26	28.2	758.0	2	
	106.0	8.27	28.2	757.9	2	
	108.4	8.46	28.2	757.9	2	
	106.0	8.27	28.2	757.9	2	
	106.2	8.29	28.2	757.9	2	
Daniel Island	106.8	8.31	28.3	757.9	2	
Average	102.3	8.06	27.6	757.9		

Scott's Mill Dam Impoundment Sampling, 9/12/16, 85 degrees F, No Rain Within 5 Days						
Cross-Section 3a	**DO (%)**	**DO (mg/L)**	**Temp (^{o}C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Notes**
Left Riverbank (Amherst/NE side)	96.5	7.83	26.0	757.6	3	3m of cable deployed, 50m u/s of bouys, 10s logging interval
↓	91.7	7.40	26.3	757.6	3	
	99.8	7.95	27.0	757.7	3	
	106.4	8.39	27.6	757.7	3	
	107.2	8.47	27.5	757.6	3	
	103.0	8.18	27.2	757.6	3	
	102.9	8.17	27.2	757.7	3	
	103.2	8.17	27.3	757.7	3	
	105.1	8.18	27.5	757.6	3	
	107.8	8.30	27.6	757.6	3	
	108.4	8.51	27.8	757.6	3	
	109.3	8.59	27.8	757.7	3	
	109.1	8.54	28.0	757.7	3	
Daniel Island	109.5	8.55	28.1	757.6	3	
Average	104.3	8.23	27.4	757.6		

Scott's Mill Dam Impoundment Sampling, 9/12/16, 85 degrees F, No Rain Within 5 Days						
Cross-Section 3b	**DO (%)**	**DO (mg/L)**	**Temp (^{o}C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Notes**
Left Riverbank (Amherst/NE side)	91.8	7.37	26.6	757.6	3	3m of cable deployed, 50m u/s of bouys, 10s logging interval
↓	91.8	7.37	26.6	757.6	3	
	94.2	7.55	26.7	757.7	3	
	100.0	7.95	27.1	757.7	3	
	105.0	8.28	27.6	757.6	3	
	108.6	8.51	27.9	757.6	3	
	109.6	8.56	28.1	757.6	3	
	109.7	8.54	28.3	757.6	3	
	109.7	8.56	28.2	757.6	3	
	109.5	8.52	28.3	757.6	3	
Daniel Island	109.4	8.50	28.4	757.6	3	
Average	103.6	8.16	27.6	757.6		

Scott's Mill Dam Impoundment Sampling, 9/12/16, 85 degrees F, No Rain Within 5 Days						
Vertical Profile 1	**DO (%)**	**DO (mg/L)**	**Temp (^{o}C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Notes**
	108.4	8.44	28.3	757.8	0	8m of cable deployed gradually, 50m u/s of bouys, 1s logging interval
	108.4	8.43	28.3	757.7		
	108.4	8.44	28.3	757.8		
	108.4	8.43	28.4	757.8		
	108.5	8.43	28.4	757.8		
	108.5	8.43	28.4	757.7		
	108.4	8.44	28.3	757.8		
	108.2	8.44	28.2	757.7		
	107.8	8.41	28.2	757.7		
	107.5	8.40	28.1	757.7		
	107.2	8.39	28.0	757.8	2	
	106.9	8.38	27.9	757.8		
	106.5	8.37	27.8	757.8		
	106.1	8.35	27.7	757.9		
	105.5	8.32	27.6	757.8		
	104.6	8.26	27.5	757.8		
	103.9	8.22	27.4	757.7		
	103.1	8.17	27.3	757.8		
	102.7	8.14	27.3	757.8		
	102.5	8.14	27.2	757.8		
	101.7	8.09	27.1	757.7		
	101.4	8.06	27.1	757.8	4	
	100.4	8.00	27.0	757.8		
	99.3	7.93	26.9	757.8		
	98.4	7.86	26.9	757.8		
	97.4	7.79	26.8	757.8		
	95.9	7.67	26.8	757.8		
	94.8	7.59	26.7	757.8		
	93.2	7.47	26.7	757.8		
	92.2	7.38	26.7	757.8		
	91.2	7.32	26.6	757.8		
	90.0	7.22	26.6	757.8		
	89.2	7.16	26.6	757.8	6	
	88.6	7.11	26.6	757.8		
	87.6	7.04	26.5	757.8		

	87.2	7.02	26.5	757.8	
	86.6	6.96	26.5	757.8	
	85.9	6.91	26.5	757.8	
	85.6	6.89	26.5	757.8	
	85.2	6.85	26.5	757.7	
	84.9	6.82	26.5	757.8	
	84.7	6.81	26.5	757.7	
	84.5	6.79	26.5	757.8	
	84.1	6.78	26.4	757.7	8
Minimum	84.1	6.78	26.4	757.7	
Maximum	108.5	8.44	28.4	757.9	
Average	98.2	7.79	27.2	757.8	

Scott's Mill Dam Impoundment Sampling, 9/12/16, 85 degrees F, No Rain Within 5 Days						
Vertical Profile 2	**DO (%)**	**DO (mg/L)**	**Temp (^{o}C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Notes**
	108.1	8.42	28.3	757.8	0	8m of cable deployed gradually, 50m u/s of bouys, 1s logging interval
	108.1	8.42	28.3	757.8		
	108.1	8.42	28.3	757.8		
	108.1	8.41	28.4	757.8		
	108.2	8.41	28.4	757.8		
	108.3	8.42	28.4	757.8		
	108.3	8.42	28.4	757.8		
	108.3	8.42	28.4	757.8		
	108.1	8.42	28.3	757.8		
	107.3	8.37	28.2	757.8	2	
	106.9	8.37	28.0	757.8		
	106.0	8.32	27.9	757.8		
	105.2	8.28	27.7	757.8		
	104.8	8.25	27.7	757.8		
	104.4	8.23	27.6	757.9		
	104.0	8.21	27.5	757.9		
	103.7	8.20	27.4	757.8		
	103.3	8.19	27.3	757.9		
	102.8	8.15	27.3	757.8	4	
	102.2	8.12	27.2	757.9		
	100.8	8.02	27.1	757.9		
	99.8	7.95	27.0	757.8		
	98.7	7.86	27.0	757.8		
	97.5	7.79	26.9	757.8		
	96.1	7.67	26.9	757.9		
	95.1	7.60	26.8	757.8		
	93.8	7.50	26.8	757.8		
	92.9	7.45	26.7	757.8	6	
	92.1	7.38	26.7	757.8		
	91.0	7.29	26.7	757.8		
	90.2	7.24	26.6	757.8		
	89.2	7.16	26.6	757.8		
	88.6	7.11	26.6	757.8		
	87.8	7.05	26.6	757.8		
	87.1	7.00	26.5	757.8		

	86.7	6.97	26.5	757.8	
	86.3	6.94	26.5	757.8	
	85.7	6.89	26.5	757.8	8
Minimum	85.7	6.89	26.5	757.8	
Maximum	108.3	8.42	28.4	757.9	
Average	99.6	7.88	27.4	757.8	

Scott's Mill Dam Impoundment Sampling, 9/12/16, 85 degrees F, No Rain Within 5 Days						
Vertical Profile 3	**DO (%)**	**DO (mg/L)**	**Temp (^{o}C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Notes**
	107.7	8.56	27.1	757.7	0	10m of cable deployed gradually, 50m u/s of bouys, 1s logging interval, main channel?
	108.0	8.54	27.4	757.7		
	108.1	8.52	27.6	757.7		
	108.3	8.52	27.7	757.7		
	108.4	8.51	27.8	757.8		
	108.4	8.50	27.9	757.8		
	108.4	8.50	27.9	757.8		
	108.1	8.49	27.8	757.8		
	107.6	8.45	27.8	757.8	2	
	107.1	8.43	27.7	757.8		
	106.6	8.37	27.6	757.8		
	105.9	8.32	27.5	757.7		
	105.2	8.28	27.4	757.8		
	104.5	8.29	27.3	757.8		
	103.6	8.23	27.2	757.7		
	102.9	8.19	27.1	757.7		
	102.2	8.15	27.0	757.7		
	101.4	8.10	26.9	757.7	4	
	100.1	7.99	26.9	757.8		
	98.7	7.90	26.8	757.7		
	97.7	7.81	26.8	757.8		
	96.3	7.71	26.7	757.7		
	95.5	7.66	26.7	757.8		
	94.6	7.60	26.6	757.8		
	93.9	7.54	26.6	757.8		
	93.1	7.47	26.6	757.7		
	92.3	7.42	26.5	757.7	6	
	91.2	7.34	26.5	757.7		
	90.2	7.25	26.5	757.7		
	89.4	7.19	26.5	757.7		
	88.6	7.14	26.4	757.7		
	87.8	7.07	26.4	757.7		
	87.1	7.01	26.4	757.7		
	86.3	6.95	26.4	757.7		

	85.7	6.90	26.4	757.7	
	85.3	6.88	26.4	757.7	8
	85.1	6.86	26.4	757.7	
	84.6	6.82	26.4	757.7	
	84.3	6.80	26.3	757.7	
	83.9	6.77	26.3	757.7	
	83.7	6.75	26.3	757.7	
	83.1	6.70	26.3	757.7	
	82.6	6.67	26.3	757.8	
	82.5	6.66	26.3	757.8	10
Minimum	82.5	6.66	26.3	757.7	
Maximum	108.4	8.51	27.9	757.8	
Average	96.3	7.68	26.9	757.7	

Scott's Mill Dam Impoundment Sampling, 9/12/16, 85 degrees F, No Rain Within 5 Days						
Vertical Profile 4	**DO (%)**	**DO (mg/L)**	**Temp (^{o}C)**	**Pressure (mm Hg)**	**Approx. Depth (m)**	**Notes**
	103.6	8.20	27.4	757.6	0	8m of cable deployed gradually, 50m u/s of bouys, 1s logging interval, near island
	103.8	8.20	27.5	757.7		
	104.1	8.21	27.6	757.6		
	105.2	8.28	27.7	757.6		
	106.1	8.35	27.7	757.6		
	107.0	8.41	27.8	757.6		
	107.3	8.45	27.7	757.6		
	107.1	8.44	27.6	757.6	2	
	106.4	8.39	27.6	757.6		
	105.1	8.30	27.5	757.7		
	103.9	8.22	27.4	757.6		
	102.6	8.14	27.3	757.7		
	102.0	8.10	27.2	757.6		
	101.6	8.08	27.1	757.7		
	100.6	8.01	27.1	757.7		
	99.9	7.96	27.0	757.6	4	
	99.0	7.91	26.9	757.6		
	97.5	7.78	26.9	757.7		
	96.0	7.68	26.8	757.7		
	93.9	7.51	26.8	757.7		
	91.9	7.36	26.7	757.7		
	90.6	7.26	26.7	757.6		
	89.2	7.16	26.6	757.6	6	
	88.4	7.09	26.6	757.6		
	87.8	7.03	26.6	757.7		
	87.2	7.00	26.6	757.6		
	87.0	6.98	26.6	757.7		
	86.8	6.96	26.6	757.7		
	86.5	6.95	26.6	757.7		
	86.5	6.94	26.6	757.7	8	
Minimum	86.5	6.94	26.6	757.6		
Maximum	107.3	8.45	27.8	757.7		
Average	97.8	7.78	27.1	757.6		

Appendix F

PCB Soil/Sediment Sampling Analysis

January 9, 2017

Mr. Mark Fendig
Luminaire Technologies
9932 Wilson Highway
Mouth of Wilson, VA 24363

HURT & PROFFITT INCORPORATED

Subject: Scott's Mill Dam Hydropower Project
PCB Soil/Sediment Sampling Analysis
H&P Project 20150824

Dear Mark:

We have completed the sediment/soil analysis effort for the proposed Scott's Mill Dam Hydropower Project. The purpose of this study was to collect soil/sediment samples from the James River substrate and Daniel's Island, then have these samples analyzed for the potential presence of polychlorinated biphenyls (PCB's). We understand that some substrate/soil dredging and excavation may be necessary in the study area as part of the proposed project. We also understand that the data provided by this sampling and analysis will be provided to the Virginia Department of Environmental Quality (VDEQ), to help answer agency comments and questions regarding the project.

Study Area / Background

For this effort, soil/sediment samples were collected on November 11, 2016 at two locations: Station "Daniel Island 001" was located approximately 250' upstream of the dam (on Daniel's Island). Station "James River 002" was located approximately 160' upstream of the dam (in the main channel of the James River itself). Samples were collected using a hand auger and extensions, from the soil/sediment surface to a depth of approximately three feet. Samples were composited (mixed) in the field, and were then sent to the Cape Fear Analytical laboratory (in Wilmington, NC) for PCB analysis using US Environmental Protection Agency (USEPA) Method 1668A (low-level PCB / 209 congener analysis).

<u>Sampling locations:</u>
Station "Daniel Island 001" location: 37.425502 N, -79.142365 W
Station "James River 002" location: 37.424936 N, -79.140754 W

DRAFT

Results

For the Daniel's Island sample (001), PCB concentrations ranged from approximately 9 to 422 pg/g (or parts per trillion [ppt]). This is equivalent to approximately 0.000009-0.000422 parts per million (ppm). For the James River sample (002), the PCB concentrations ranged from approximately 9 to 75 pg/g (or ppt). This is equivalent to 0.000009-0.000075 ppm. For comparison, typical remediation projects (e.g., chemical spill/leak clean-up or treatment efforts) require that PCB levels be below 1.0 ppm for the site to be considered clean/complete.

Conclusions

Based on these data, it appears that the sampled sediment/soil would not likely be a significant source of elevated PCB concentrations from soil re-suspension. Please contact us with any questions you may have. We can be reached at 434.847.7796 or via email at bll@handp.com.

Sincerely,
HURT & PROFFITT, INC.

Ben Leatherland, PWD, PWS, CPESC
Sr. Environmental Scientist

Attachments: CFA Lab Data

CFA | Cape Fear Analytical LLC
an affiliate of The GEL Group INC

3306 Kitty Hawk Road, Suite 120 Wilmington, NC 28405
P 910.795.0421

www.capefearanalytical.com

December 08, 2016

Mr. Ben Leatherland
Hurt & Proffitt Engineering
2524 Langhorne Road
Lynchburg, Virginia 24501

Re: VA DEQ PCB's
Work Order: 10095
SDG: Scotts_Mill_Dam

Dear Mr. Leatherland:

Cape Fear Analytical LLC (CFA) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on November 16, 2016. This original data report has been prepared and reviewed in accordance with CFA's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at 910-795-0421.

Sincerely,

Cynde Larkins

Cynde Larkins
Project Manager

Enclosures

Page: _____ of _____
Project #:
CFA Quote #: _____
COC Number [1]: _____
PO Number:

Cape Fear Analytical, LLC
Chain of Custody and Analytical Request

CFA Work Order Number: 10095

Cape Fear Analytical, LLC
3306 Kitty Hawk Rd. Suite 120
Wilmington, NC 28405
Phone: (910) 795-0421

Client Name: Hurt & Proffitt (Ben Leatherland) Phone #:

Project/Site Name: Scotts Mill Dam Fax #:

Address: 2524 Langhorne Rd, Lynchburg, VA 24501

Collected by: BL Send Results To: bll@handp.com (Ben L)

Sample Analysis Requested [5] (Fill in the number of containers for each test)

Sample ID (* For composites - indicate start and stop date/time)	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code [2]	Field Filtered [3]	Sample Matrix [4]	Total number of containers	Low-level PCB											<-- Preservative Type (6)	Comments
Daniel Island (001)	11/11/16	11:05	N	N	SW	1	1												Note: extra sample is required for sample specific QC
James River (002)	11/11/16	11:30	N	N	SW	1	1												

TAT Requested: Normal: X Rush: _____ Specify: _____ (Subject to Surcharge) Fax Results: Yes / (No)

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: *Are there any known hazards applicable to these samples? If so, please list the hazards*
No known hazards. Please email and mail results/data. Please return cooler to us.

Sample Collection Time Zone: (Eastern) Pacific Central Other _____ Mountain

Chain of Custody Signatures

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1	[signature]	11/15/16	13:14	[signature]	16 NOV 2016	11:40
2						
3						

Sample Shipping and Delivery Details

CFA PM:
Method of Shipment: UPS Next Day Date Shipped: 11/15/16
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a- Y - for yes the sample was field filtered or- N - for sample was not field filtered.
4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e.*8290B*, **1668B**) and number of containers provided for each (i.e.*8290B* - 3, **1668B** - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

For Lab Receiving Use Only
Custody Seal Intact? YES NO
Cooler Temp: 2.8 C

WHITE = LABORATORY **YELLOW = FILE** **PINK = CLIENT**

PCB Congeners Analysis

Case Narrative

PCBC Case Narrative
Hurt & Proffitt Engineering (HPEN)
SDG Scotts_Mill_Dam
Work Order 10095

Method/Analysis Information

Product:	**PCB Congeners by EPA Method 1668A in Solids**
Analytical Method:	EPA Method 1668A
Extraction Method:	SW846 3540C
Analytical Batch Number:	33410
Clean Up Batch Number:	33409
Extraction Batch Number:	33408

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA Method 1668A:

Sample ID	Client ID
10095001	Daniel Island (001)
10095002	James River (002)
12017426	Method Blank (MB)
12017427	Laboratory Control Sample (LCS)
12017428	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by Cape Fear Analytical LLC (CFA) as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with CF-OA-E-003 REV# 6.

Raw data reports are processed and reviewed by the analyst using the TargetLynx software package.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information

Certification Statement
The test results presented in this document are certified to meet all requirements of the 2009 TNI Standard.

Method Blank (MB) Statement
The MB(s) analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
All surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery
The LCSD spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement
The RPD(s) between the LCS and LCSD met the acceptance limits.

QC Sample Designation
A matrix spike and matrix spike duplicate analysis was not required for this SDG.

Technical Information

Holding Time Specifications
CFA assigns holding times based on the associated methodology, which assigns the date and time from sample collection. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

Sample Dilutions
Samples 10095001 (Daniel Island (001)) and 10095002 (James River (002)) were diluted due to the presence of non-target interferences.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Nonconformance (NCR) Documentation
A NCR was not required for this SDG.

Manual Integrations
Manual integrations were required for data files in this SDG. Certain standards and QC samples required manual integrations to correctly position the baseline as set in the calibration standard injections. Where manual integrations were performed, copies of all manual integration peak profiles are included in the raw data section of this fraction.

System Configuration
This analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
HRP875_1	PCB Analysis	PCB Analysis	SPB-Octyl	30m x 0.25mm, 0.25um

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Sample Data Summary

Cape Fear Analytical, LLC

3306 Kitty Hawk Road Suite 120, Wilmington, NC 28405 - (910) 795-0421 - www.capefearanalytical.com

Qualifier Definition Report
for

HPEN001 Hurt & Proffitt Engineering

Client SDG: Scotts_Mill_Dam CFA Work Order: 10095

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

Review/Validation

Cape Fear Analytical requires all analytical data to be verified by a qualified data reviewer.

The following data validator verified the information presented in this case narrative:

Signature: Heather Patterson **Name: Heather Patterson**

Date: 08 DEC 2016 **Title: Group Leader**

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095001**	**Date Collected:**	**11/11/2016 11:05**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**22.1**
Client ID:	**Daniel Island (001)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 20:34**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-7**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.5 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
2051-60-7	1-MoCB		17.9	pg/g	8.86
2051-61-8	2-MoCB	U	8.86	pg/g	8.86
2051-62-9	3-MoCB		68.4	pg/g	8.86
13029-08-8	4-DiCB	U	8.86	pg/g	8.86
16605-91-7	5-DiCB	U	8.86	pg/g	8.86
25569-80-6	6-DiCB	U	8.86	pg/g	8.86
33284-50-3	7-DiCB	U	8.86	pg/g	8.86
34883-43-7	8-DiCB		34.9	pg/g	8.86
34883-39-1	9-DiCB	U	8.86	pg/g	8.86
33146-45-1	10-DiCB	U	8.86	pg/g	8.86
2050-67-1	11-DiCB	U	88.6	pg/g	88.6
2974-92-7	12-DiCB	CU	17.7	pg/g	17.7
2974-90-5	13-DiCB	C12			
34883-41-5	14-DiCB	U	8.86	pg/g	8.86
2050-68-2	15-DiCB		128	pg/g	8.86
38444-78-9	16-TrCB		12.6	pg/g	8.86
37680-66-3	17-TrCB		12.9	pg/g	8.86
37680-65-2	18-TrCB	C	25.7	pg/g	17.7
38444-73-4	19-TrCB	U	8.86	pg/g	8.86
38444-84-7	20-TrCB	C	105	pg/g	17.7
55702-46-0	21-TrCB	C	48.4	pg/g	17.7
38444-85-8	22-TrCB		32.5	pg/g	8.86
55720-44-0	23-TrCB	U	8.86	pg/g	8.86
55702-45-9	24-TrCB	U	8.86	pg/g	8.86
55712-37-3	25-TrCB	U	8.86	pg/g	8.86
38444-81-4	26-TrCB	CU	17.7	pg/g	17.7
38444-76-7	27-TrCB	U	8.86	pg/g	8.86
7012-37-5	28-TrCB	C20			
15862-07-4	29-TrCB	C26			
35693-92-6	30-TrCB	C18			
16606-02-3	31-TrCB		82.1	pg/g	8.86
38444-77-8	32-TrCB		10.1	pg/g	8.86

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095001**	**Date Collected:**	**11/11/2016 11:05**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**22.1**
Client ID:	**Daniel Island (001)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 20:34**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-7**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.5 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
38444-86-9	33-TrCB	C21			
37680-68-5	34-TrCB	U	8.86	pg/g	8.86
37680-69-6	35-TrCB	U	8.86	pg/g	8.86
38444-87-0	36-TrCB	U	8.86	pg/g	8.86
38444-90-5	37-TrCB		102	pg/g	8.86
53555-66-1	38-TrCB	U	8.86	pg/g	8.86
38444-88-1	39-TrCB	U	8.86	pg/g	8.86
38444-93-8	40-TeCB	CU	17.7	pg/g	17.7
52663-59-9	41-TeCB	U	8.86	pg/g	8.86
36559-22-5	42-TeCB		12.1	pg/g	8.86
70362-46-8	43-TeCB	U	8.86	pg/g	8.86
41464-39-5	44-TeCB	C	38.3	pg/g	26.6
70362-45-7	45-TeCB	CU	17.7	pg/g	17.7
41464-47-5	46-TeCB	U	8.86	pg/g	8.86
2437-79-8	47-TeCB	C44			
70362-47-9	48-TeCB	U	8.86	pg/g	8.86
41464-40-8	49-TeCB	C	41.8	pg/g	17.7
62796-65-0	50-TeCB	CU	17.7	pg/g	17.7
68194-04-7	51-TeCB	C45			
35693-99-3	52-TeCB		51.1	pg/g	8.86
41464-41-9	53-TeCB	C50			
15968-05-5	54-TeCB	U	8.86	pg/g	8.86
74338-24-2	55-TeCB	U	8.86	pg/g	8.86
41464-43-1	56-TeCB		51.6	pg/g	8.86
70424-67-8	57-TeCB	U	8.86	pg/g	8.86
41464-49-7	58-TeCB	U	8.86	pg/g	8.86
74472-33-6	59-TeCB	CU	26.6	pg/g	26.6
33025-41-1	60-TeCB		42.4	pg/g	8.86
33284-53-6	61-TeCB	C	224	pg/g	35.4
54230-22-7	62-TeCB	C59			
74472-34-7	63-TeCB	U	8.86	pg/g	8.86
52663-58-8	64-TeCB		82.4	pg/g	8.86

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095001**	**Date Collected:**	**11/11/2016 11:05**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**22.1**
Client ID:	**Daniel Island (001)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 20:34**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-7**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.5 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
33284-54-7	65-TeCB	C44			
32598-10-0	66-TeCB		114	pg/g	8.86
73575-53-8	67-TeCB	U	8.86	pg/g	8.86
73575-52-7	68-TeCB	U	8.86	pg/g	8.86
60233-24-1	69-TeCB	C49			
32598-11-1	70-TeCB	C61			
41464-46-4	71-TeCB	C40			
41464-42-0	72-TeCB	U	8.86	pg/g	8.86
74338-23-1	73-TeCB	U	8.86	pg/g	8.86
32690-93-0	74-TeCB	C61			
32598-12-2	75-TeCB	C59			
70362-48-0	76-TeCB	C61			
32598-13-3	77-TeCB		37.2	pg/g	8.86
70362-49-1	78-TeCB	U	8.86	pg/g	8.86
41464-48-6	79-TeCB	U	8.86	pg/g	8.86
33284-52-5	80-TeCB	U	8.86	pg/g	8.86
70362-50-4	81-TeCB	U	8.86	pg/g	8.86
52663-62-4	82-PeCB	U	8.86	pg/g	8.86
60145-20-2	83-PeCB	U	8.86	pg/g	8.86
52663-60-2	84-PeCB	U	8.86	pg/g	8.86
65510-45-4	85-PeCB	C	62.6	pg/g	26.6
55312-69-1	86-PeCB	C	55.2	pg/g	53.1
38380-02-8	87-PeCB	C86			
55215-17-3	88-PeCB	CU	17.7	pg/g	17.7
73575-57-2	89-PeCB	U	8.86	pg/g	8.86
68194-07-0	90-PeCB	C	98.8	pg/g	26.6
68194-05-8	91-PeCB	C88			
52663-61-3	92-PeCB		18.1	pg/g	8.86
73575-56-1	93-PeCB	CU	17.7	pg/g	17.7
73575-55-0	94-PeCB	U	8.86	pg/g	8.86
38379-99-6	95-PeCB		28.0	pg/g	8.86
73575-54-9	96-PeCB	U	8.86	pg/g	8.86

Comments:

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095001**	**Date Collected:**	**11/11/2016 11:05**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**22.1**
Client ID:	**Daniel Island (001)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 20:34**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-7**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.5 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
41464-51-1	97-PeCB	C86			
60233-25-2	98-PeCB	CU	17.7	pg/g	17.7
38380-01-7	99-PeCB		59.1	pg/g	8.86
39485-83-1	100-PeCB	C93			
37680-73-2	101-PeCB	C90			
68194-06-9	102-PeCB	C98			
60145-21-3	103-PeCB	U	8.86	pg/g	8.86
56558-16-8	104-PeCB	U	8.86	pg/g	8.86
32598-14-4	105-PeCB		142	pg/g	8.86
70424-69-0	106-PeCB	U	8.86	pg/g	8.86
70424-68-9	107-PeCB		23.3	pg/g	8.86
70362-41-3	108-PeCB	CU	17.7	pg/g	17.7
74472-35-8	109-PeCB	C86			
38380-03-9	110-PeCB	C	185	pg/g	17.7
39635-32-0	111-PeCB	U	8.86	pg/g	8.86
74472-36-9	112-PeCB	U	8.86	pg/g	8.86
68194-10-5	113-PeCB	C90			
74472-37-0	114-PeCB	U	8.86	pg/g	8.86
74472-38-1	115-PeCB	C110			
18259-05-7	116-PeCB	C85			
68194-11-6	117-PeCB	C85			
31508-00-6	118-PeCB		241	pg/g	8.86
56558-17-9	119-PeCB	C86			
68194-12-7	120-PeCB	U	8.86	pg/g	8.86
56558-18-0	121-PeCB	U	8.86	pg/g	8.86
76842-07-4	122-PeCB	U	8.86	pg/g	8.86
65510-44-3	123-PeCB	U	8.86	pg/g	8.86
70424-70-3	124-PeCB	C108			
74472-39-2	125-PeCB	C86			
57465-28-8	126-PeCB	U	8.86	pg/g	8.86
39635-33-1	127-PeCB	U	8.86	pg/g	8.86
38380-07-3	128-HxCB	C	97.8	pg/g	17.7

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095001**	**Date Collected:**	**11/11/2016 11:05**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**22.1**
Client ID:	**Daniel Island (001)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 20:34**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-7**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.5 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
55215-18-4	129-HxCB	C	634	pg/g	26.6
52663-66-8	130-HxCB		25.7	pg/g	8.86
61798-70-7	131-HxCB	U	8.86	pg/g	8.86
38380-05-1	132-HxCB		38.4	pg/g	8.86
35694-04-3	133-HxCB	U	8.86	pg/g	8.86
52704-70-8	134-HxCB	U	8.86	pg/g	8.86
52744-13-5	135-HxCB	C	80.0	pg/g	17.7
38411-22-2	136-HxCB	U	8.86	pg/g	8.86
35694-06-5	137-HxCB		28.6	pg/g	8.86
35065-28-2	138-HxCB	C129			
56030-56-9	139-HxCB	CU	17.7	pg/g	17.7
59291-64-4	140-HxCB	C139			
52712-04-6	141-HxCB		63.6	pg/g	8.86
41411-61-4	142-HxCB	U	8.86	pg/g	8.86
68194-15-0	143-HxCB	U	8.86	pg/g	8.86
68194-14-9	144-HxCB	U	8.86	pg/g	8.86
74472-40-5	145-HxCB	U	8.86	pg/g	8.86
51908-16-8	146-HxCB		73.4	pg/g	8.86
68194-13-8	147-HxCB	C	146	pg/g	17.7
74472-41-6	148-HxCB	U	8.86	pg/g	8.86
38380-04-0	149-HxCB	C147			
68194-08-1	150-HxCB	U	8.86	pg/g	8.86
52663-63-5	151-HxCB	C135			
68194-09-2	152-HxCB	U	8.86	pg/g	8.86
35065-27-1	153-HxCB	C	533	pg/g	17.7
60145-22-4	154-HxCB	U	8.86	pg/g	8.86
33979-03-2	155-HxCB	U	8.86	pg/g	8.86
38380-08-4	156-HxCB	C	73.1	pg/g	17.7
69782-90-7	157-HxCB	C156			
74472-42-7	158-HxCB		58.6	pg/g	8.86
39635-35-3	159-HxCB	U	8.86	pg/g	8.86
41411-62-5	160-HxCB	U	8.86	pg/g	8.86

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095001**	**Date Collected:**	**11/11/2016 11:05**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**22.1**
Client ID:	**Daniel Island (001)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 20:34**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-7**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.5 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
74472-43-8	161-HxCB	U	8.86	pg/g	8.86
39635-34-2	162-HxCB	U	8.86	pg/g	8.86
74472-44-9	163-HxCB	C129			
74472-45-0	164-HxCB		33.9	pg/g	8.86
74472-46-1	165-HxCB	U	8.86	pg/g	8.86
41411-63-6	166-HxCB	C128			
52663-72-6	167-HxCB		27.5	pg/g	8.86
59291-65-5	168-HxCB	C153			
32774-16-6	169-HxCB	U	8.86	pg/g	8.86
35065-30-6	170-HpCB		185	pg/g	8.86
52663-71-5	171-HpCB	C	55.5	pg/g	17.7
52663-74-8	172-HpCB		39.7	pg/g	8.86
68194-16-1	173-HpCB	C171			
38411-25-5	174-HpCB		176	pg/g	8.86
40186-70-7	175-HpCB	U	8.86	pg/g	8.86
52663-65-7	176-HpCB		14.1	pg/g	8.86
52663-70-4	177-HpCB		123	pg/g	8.86
52663-67-9	178-HpCB		65.9	pg/g	8.86
52663-64-6	179-HpCB		86.4	pg/g	8.86
35065-29-3	180-HpCB	C	553	pg/g	17.7
74472-47-2	181-HpCB	U	8.86	pg/g	8.86
60145-23-5	182-HpCB	U	8.86	pg/g	8.86
52663-69-1	183-HpCB	C	147	pg/g	17.7
74472-48-3	184-HpCB	U	8.86	pg/g	8.86
52712-05-7	185-HpCB	C183			
74472-49-4	186-HpCB	U	8.86	pg/g	8.86
52663-68-0	187-HpCB		422	pg/g	8.86
74487-85-7	188-HpCB	U	8.86	pg/g	8.86
39635-31-9	189-HpCB	U	8.86	pg/g	8.86
41411-64-7	190-HpCB		46.9	pg/g	8.86
74472-50-7	191-HpCB	U	8.86	pg/g	8.86
74472-51-8	192-HpCB	U	8.86	pg/g	8.86

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095001**	**Date Collected:**	**11/11/2016 11:05**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**22.1**
Client ID:	**Daniel Island (001)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 20:34**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-7**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.5 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
69782-91-8	193-HpCB	C180			
35694-08-7	194-OcCB		218	pg/g	8.86
52663-78-2	195-OcCB		71.5	pg/g	8.86
42740-50-1	196-OcCB		101	pg/g	8.86
33091-17-7	197-OcCB	C	39.8	pg/g	17.7
68194-17-2	198-OcCB	C	421	pg/g	17.7
52663-75-9	199-OcCB	C198			
52663-73-7	200-OcCB	C197			
40186-71-8	201-OcCB		34.9	pg/g	8.86
2136-99-4	202-OcCB		108	pg/g	8.86
52663-76-0	203-OcCB		253	pg/g	8.86
74472-52-9	204-OcCB	U	8.86	pg/g	8.86
74472-53-0	205-OcCB		10.3	pg/g	8.86
40186-72-9	206-NoCB		413	pg/g	8.86
52663-79-3	207-NoCB		37.2	pg/g	8.86
52663-77-1	208-NoCB		175	pg/g	8.86
2051-24-3	209-DeCB		366	pg/g	8.86
1336-36-3	Total PCB Congeners		8370	pg/g	8.86

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		96.0	177	pg/g	54.2	(15%-150%)
13C-3-MoCB		103	177	pg/g	58.4	(15%-150%)
13C-4-DiCB		110	177	pg/g	62.4	(25%-150%)
13C-15-DiCB		148	177	pg/g	83.5	(25%-150%)
13C-19-TrCB		126	177	pg/g	70.9	(25%-150%)
13C-37-TrCB		158	177	pg/g	89.2	(25%-150%)
13C-54-TeCB		137	177	pg/g	77.2	(25%-150%)
13C-77-TeCB		195	177	pg/g	110	(25%-150%)
13C-81-TeCB		196	177	pg/g	111	(25%-150%)
13C-104-PeCB		134	177	pg/g	75.5	(25%-150%)
13C-105-PeCB		177	177	pg/g	99.8	(25%-150%)
13C-114-PeCB		175	177	pg/g	99.0	(25%-150%)
13C-118-PeCB		172	177	pg/g	97.3	(25%-150%)
13C-123-PeCB		180	177	pg/g	101	(25%-150%)
13C-126-PeCB		181	177	pg/g	102	(25%-150%)
13C-155-HxCB		151	177	pg/g	85.5	(25%-150%)
13C-156-HxCB	C	339	354	pg/g	95.6	(25%-150%)
13C-157-HxCB	C156L					
13C-167-HxCB		173	177	pg/g	97.5	(25%-150%)
13C-169-HxCB		175	177	pg/g	99.0	(25%-150%)
13C-188-HpCB		141	177	pg/g	79.6	(25%-150%)
13C-189-HpCB		165	177	pg/g	93.0	(25%-150%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095001**	**Date Collected:**	**11/11/2016 11:05**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**22.1**
Client ID:	**Daniel Island (001)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 20:34**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-7**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.5 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-202-OcCB		141	177	pg/g	79.8	(25%-150%)
13C-205-OcCB		165	177	pg/g	93.2	(25%-150%)
13C-206-NoCB		146	177	pg/g	82.4	(25%-150%)
13C-208-NoCB		139	177	pg/g	78.2	(25%-150%)
13C-209-DeCB		166	177	pg/g	94.0	(25%-150%)
13C-111-PeCB		159	177	pg/g	89.8	(30%-135%)
13C-28-TrCB		145	177	pg/g	82.1	(30%-135%)
13C-178-HpCB		170	177	pg/g	96.2	(30%-135%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095002**	**Date Collected:**	**11/11/2016 11:30**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**25.6**
Client ID:	**James River (002)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 21:40**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-8**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.31 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
2051-60-7	1-MoCB	U	9.39	pg/g	9.39
2051-61-8	2-MoCB	U	9.39	pg/g	9.39
2051-62-9	3-MoCB	U	9.39	pg/g	9.39
13029-08-8	4-DiCB	U	9.39	pg/g	9.39
16605-91-7	5-DiCB	U	9.39	pg/g	9.39
25569-80-6	6-DiCB	U	9.39	pg/g	9.39
33284-50-3	7-DiCB	U	9.39	pg/g	9.39
34883-43-7	8-DiCB	U	9.39	pg/g	9.39
34883-39-1	9-DiCB	U	9.39	pg/g	9.39
33146-45-1	10-DiCB	U	9.39	pg/g	9.39
2050-67-1	11-DiCB	U	93.9	pg/g	93.9
2974-92-7	12-DiCB	CU	18.8	pg/g	18.8
2974-90-5	13-DiCB	C12			
34883-41-5	14-DiCB	U	9.39	pg/g	9.39
2050-68-2	15-DiCB	U	9.39	pg/g	9.39
38444-78-9	16-TrCB	U	9.39	pg/g	9.39
37680-66-3	17-TrCB	U	9.39	pg/g	9.39
37680-65-2	18-TrCB	CU	18.8	pg/g	18.8
38444-73-4	19-TrCB	U	9.39	pg/g	9.39
38444-84-7	20-TrCB	CU	18.8	pg/g	18.8
55702-46-0	21-TrCB	CU	18.8	pg/g	18.8
38444-85-8	22-TrCB	U	9.39	pg/g	9.39
55720-44-0	23-TrCB	U	9.39	pg/g	9.39
55702-45-9	24-TrCB	U	9.39	pg/g	9.39
55712-37-3	25-TrCB	U	9.39	pg/g	9.39
38444-81-4	26-TrCB	CU	18.8	pg/g	18.8
38444-76-7	27-TrCB	U	9.39	pg/g	9.39
7012-37-5	28-TrCB	C20			
15862-07-4	29-TrCB	C26			
35693-92-6	30-TrCB	C18			
16606-02-3	31-TrCB	U	9.39	pg/g	9.39
38444-77-8	32-TrCB	U	9.39	pg/g	9.39

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095002**	**Date Collected:**	**11/11/2016 11:30**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**25.6**
Client ID:	**James River (002)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 21:40**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-8**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.31 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
38444-86-9	33-TrCB	C21			
37680-68-5	34-TrCB	U	9.39	pg/g	9.39
37680-69-6	35-TrCB	U	9.39	pg/g	9.39
38444-87-0	36-TrCB	U	9.39	pg/g	9.39
38444-90-5	37-TrCB	U	9.39	pg/g	9.39
53555-66-1	38-TrCB	U	9.39	pg/g	9.39
38444-88-1	39-TrCB	U	9.39	pg/g	9.39
38444-93-8	40-TeCB	CU	18.8	pg/g	18.8
52663-59-9	41-TeCB	U	9.39	pg/g	9.39
36559-22-5	42-TeCB	U	9.39	pg/g	9.39
70362-46-8	43-TeCB	U	9.39	pg/g	9.39
41464-39-5	44-TeCB	CU	28.2	pg/g	28.2
70362-45-7	45-TeCB	CU	18.8	pg/g	18.8
41464-47-5	46-TeCB	U	9.39	pg/g	9.39
2437-79-8	47-TeCB	C44			
70362-47-9	48-TeCB	U	9.39	pg/g	9.39
41464-40-8	49-TeCB	CU	18.8	pg/g	18.8
62796-65-0	50-TeCB	CU	18.8	pg/g	18.8
68194-04-7	51-TeCB	C45			
35693-99-3	52-TeCB	U	9.39	pg/g	9.39
41464-41-9	53-TeCB	C50			
15968-05-5	54-TeCB	U	9.39	pg/g	9.39
74338-24-2	55-TeCB	U	9.39	pg/g	9.39
41464-43-1	56-TeCB	U	9.39	pg/g	9.39
70424-67-8	57-TeCB	U	9.39	pg/g	9.39
41464-49-7	58-TeCB	U	9.39	pg/g	9.39
74472-33-6	59-TeCB	CU	28.2	pg/g	28.2
33025-41-1	60-TeCB	U	9.39	pg/g	9.39
33284-53-6	61-TeCB	CU	37.6	pg/g	37.6
54230-22-7	62-TeCB	C59			
74472-34-7	63-TeCB	U	9.39	pg/g	9.39
52663-58-8	64-TeCB	U	9.39	pg/g	9.39

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095002**	**Date Collected:**	**11/11/2016 11:30**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**25.6**
Client ID:	**James River (002)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 21:40**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-8**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.31 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
33284-54-7	65-TeCB	C44			
32598-10-0	66-TeCB	U	9.39	pg/g	9.39
73575-53-8	67-TeCB	U	9.39	pg/g	9.39
73575-52-7	68-TeCB	U	9.39	pg/g	9.39
60233-24-1	69-TeCB	C49			
32598-11-1	70-TeCB	C61			
41464-46-4	71-TeCB	C40			
41464-42-0	72-TeCB	U	9.39	pg/g	9.39
74338-23-1	73-TeCB	U	9.39	pg/g	9.39
32690-93-0	74-TeCB	C61			
32598-12-2	75-TeCB	C59			
70362-48-0	76-TeCB	C61			
32598-13-3	77-TeCB	U	9.39	pg/g	9.39
70362-49-1	78-TeCB	U	9.39	pg/g	9.39
41464-48-6	79-TeCB	U	9.39	pg/g	9.39
33284-52-5	80-TeCB	U	9.39	pg/g	9.39
70362-50-4	81-TeCB	U	9.39	pg/g	9.39
52663-62-4	82-PeCB	U	9.39	pg/g	9.39
60145-20-2	83-PeCB	U	9.39	pg/g	9.39
52663-60-2	84-PeCB	U	9.39	pg/g	9.39
65510-45-4	85-PeCB	CU	28.2	pg/g	28.2
55312-69-1	86-PeCB	CU	56.3	pg/g	56.3
38380-02-8	87-PeCB	C86			
55215-17-3	88-PeCB	CU	18.8	pg/g	18.8
73575-57-2	89-PeCB	U	9.39	pg/g	9.39
68194-07-0	90-PeCB	CU	28.2	pg/g	28.2
68194-05-8	91-PeCB	C88			
52663-61-3	92-PeCB	U	9.39	pg/g	9.39
73575-56-1	93-PeCB	CU	18.8	pg/g	18.8
73575-55-0	94-PeCB	U	9.39	pg/g	9.39
38379-99-6	95-PeCB	U	9.39	pg/g	9.39
73575-54-9	96-PeCB	U	9.39	pg/g	9.39

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095002**	**Date Collected:**	**11/11/2016 11:30**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**25.6**
Client ID:	**James River (002)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 21:40**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-8**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.31 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
41464-51-1	97-PeCB	C86			
60233-25-2	98-PeCB	CU	18.8	pg/g	18.8
38380-01-7	99-PeCB	U	9.39	pg/g	9.39
39485-83-1	100-PeCB	C93			
37680-73-2	101-PeCB	C90			
68194-06-9	102-PeCB	C98			
60145-21-3	103-PeCB	U	9.39	pg/g	9.39
56558-16-8	104-PeCB	U	9.39	pg/g	9.39
32598-14-4	105-PeCB	U	9.39	pg/g	9.39
70424-69-0	106-PeCB	U	9.39	pg/g	9.39
70424-68-9	107-PeCB	U	9.39	pg/g	9.39
70362-41-3	108-PeCB	CU	18.8	pg/g	18.8
74472-35-8	109-PeCB	C86			
38380-03-9	110-PeCB	CU	18.8	pg/g	18.8
39635-32-0	111-PeCB	U	9.39	pg/g	9.39
74472-36-9	112-PeCB	U	9.39	pg/g	9.39
68194-10-5	113-PeCB	C90			
74472-37-0	114-PeCB	U	9.39	pg/g	9.39
74472-38-1	115-PeCB	C110			
18259-05-7	116-PeCB	C85			
68194-11-6	117-PeCB	C85			
31508-00-6	118-PeCB	U	9.39	pg/g	9.39
56558-17-9	119-PeCB	C86			
68194-12-7	120-PeCB	U	9.39	pg/g	9.39
56558-18-0	121-PeCB	U	9.39	pg/g	9.39
76842-07-4	122-PeCB	U	9.39	pg/g	9.39
65510-44-3	123-PeCB	U	9.39	pg/g	9.39
70424-70-3	124-PeCB	C108			
74472-39-2	125-PeCB	C86			
57465-28-8	126-PeCB	U	9.39	pg/g	9.39
39635-33-1	127-PeCB	U	9.39	pg/g	9.39
38380-07-3	128-HxCB	CU	18.8	pg/g	18.8

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095002**	**Date Collected:**	**11/11/2016 11:30**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**25.6**
Client ID:	**James River (002)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 21:40**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-8**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.31 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
55215-18-4	129-HxCB	CU	28.2	pg/g	28.2
52663-66-8	130-HxCB	U	9.39	pg/g	9.39
61798-70-7	131-HxCB	U	9.39	pg/g	9.39
38380-05-1	132-HxCB		9.72	pg/g	9.39
35694-04-3	133-HxCB	U	9.39	pg/g	9.39
52704-70-8	134-HxCB	U	9.39	pg/g	9.39
52744-13-5	135-HxCB	CU	18.8	pg/g	18.8
38411-22-2	136-HxCB	U	9.39	pg/g	9.39
35694-06-5	137-HxCB	U	9.39	pg/g	9.39
35065-28-2	138-HxCB	C129			
56030-56-9	139-HxCB	CU	18.8	pg/g	18.8
59291-64-4	140-HxCB	C139			
52712-04-6	141-HxCB	U	9.39	pg/g	9.39
41411-61-4	142-HxCB	U	9.39	pg/g	9.39
68194-15-0	143-HxCB	U	9.39	pg/g	9.39
68194-14-9	144-HxCB	U	9.39	pg/g	9.39
74472-40-5	145-HxCB	U	9.39	pg/g	9.39
51908-16-8	146-HxCB	U	9.39	pg/g	9.39
68194-13-8	147-HxCB	C	22.8	pg/g	18.8
74472-41-6	148-HxCB	U	9.39	pg/g	9.39
38380-04-0	149-HxCB	C147			
68194-08-1	150-HxCB	U	9.39	pg/g	9.39
52663-63-5	151-HxCB	C135			
68194-09-2	152-HxCB	U	9.39	pg/g	9.39
35065-27-1	153-HxCB	CU	18.8	pg/g	18.8
60145-22-4	154-HxCB	U	9.39	pg/g	9.39
33979-03-2	155-HxCB	U	9.39	pg/g	9.39
38380-08-4	156-HxCB	CU	18.8	pg/g	18.8
69782-90-7	157-HxCB	C156			
74472-42-7	158-HxCB	U	9.39	pg/g	9.39
39635-35-3	159-HxCB	U	9.39	pg/g	9.39
41411-62-5	160-HxCB	U	9.39	pg/g	9.39

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095002**	**Date Collected:**	**11/11/2016 11:30**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**25.6**
Client ID:	**James River (002)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33410**	**Method:**	**EPA Method 1668A**		
Run Date:	**12/01/2016 21:40**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-8**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.31 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
74472-43-8	161-HxCB	U	9.39	pg/g	9.39
39635-34-2	162-HxCB	U	9.39	pg/g	9.39
74472-44-9	163-HxCB	C129			
74472-45-0	164-HxCB	U	9.39	pg/g	9.39
74472-46-1	165-HxCB	U	9.39	pg/g	9.39
41411-63-6	166-HxCB	C128			
52663-72-6	167-HxCB	U	9.39	pg/g	9.39
59291-65-5	168-HxCB	C153			
32774-16-6	169-HxCB	U	9.39	pg/g	9.39
35065-30-6	170-HpCB		9.48	pg/g	9.39
52663-71-5	171-HpCB	CU	18.8	pg/g	18.8
52663-74-8	172-HpCB	U	9.39	pg/g	9.39
68194-16-1	173-HpCB	C171			
38411-25-5	174-HpCB		11.4	pg/g	9.39
40186-70-7	175-HpCB	U	9.39	pg/g	9.39
52663-65-7	176-HpCB	U	9.39	pg/g	9.39
52663-70-4	177-HpCB	U	9.39	pg/g	9.39
52663-67-9	178-HpCB	U	9.39	pg/g	9.39
52663-64-6	179-HpCB	U	9.39	pg/g	9.39
35065-29-3	180-HpCB	C	24.2	pg/g	18.8
74472-47-2	181-HpCB	U	9.39	pg/g	9.39
60145-23-5	182-HpCB	U	9.39	pg/g	9.39
52663-69-1	183-HpCB	CU	18.8	pg/g	18.8
74472-48-3	184-HpCB	U	9.39	pg/g	9.39
52712-05-7	185-HpCB	C183			
74472-49-4	186-HpCB	U	9.39	pg/g	9.39
52663-68-0	187-HpCB		15.5	pg/g	9.39
74487-85-7	188-HpCB	U	9.39	pg/g	9.39
39635-31-9	189-HpCB	U	9.39	pg/g	9.39
41411-64-7	190-HpCB	U	9.39	pg/g	9.39
74472-50-7	191-HpCB	U	9.39	pg/g	9.39
74472-51-8	192-HpCB	U	9.39	pg/g	9.39

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

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PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095002**	**Date Collected:**	**11/11/2016 11:30**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**25.6**
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Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.31 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
69782-91-8	193-HpCB	C180			
35694-08-7	194-OcCB	U	9.39	pg/g	9.39
52663-78-2	195-OcCB	U	9.39	pg/g	9.39
42740-50-1	196-OcCB	U	9.39	pg/g	9.39
33091-17-7	197-OcCB	CU	18.8	pg/g	18.8
68194-17-2	198-OcCB	CU	18.8	pg/g	18.8
52663-75-9	199-OcCB	C198			
52663-73-7	200-OcCB	C197			
40186-71-8	201-OcCB	U	9.39	pg/g	9.39
2136-99-4	202-OcCB	U	9.39	pg/g	9.39
52663-76-0	203-OcCB	U	9.39	pg/g	9.39
74472-52-9	204-OcCB	U	9.39	pg/g	9.39
74472-53-0	205-OcCB	U	9.39	pg/g	9.39
40186-72-9	206-NoCB		40.1	pg/g	9.39
52663-79-3	207-NoCB	U	9.39	pg/g	9.39
52663-77-1	208-NoCB		19.7	pg/g	9.39
2051-24-3	209-DeCB		75.4	pg/g	9.39
1336-36-3	Total PCB Congeners		228	pg/g	9.39

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1-MoCB		59.9	188	pg/g	31.9	(15%-150%)
13C-3-MoCB		76.5	188	pg/g	40.7	(15%-150%)
13C-4-DiCB		74.1	188	pg/g	39.5	(25%-150%)
13C-15-DiCB		122	188	pg/g	65.0	(25%-150%)
13C-19-TrCB		88.7	188	pg/g	47.2	(25%-150%)
13C-37-TrCB		157	188	pg/g	83.6	(25%-150%)
13C-54-TeCB		116	188	pg/g	61.6	(25%-150%)
13C-77-TeCB		195	188	pg/g	104	(25%-150%)
13C-81-TeCB		194	188	pg/g	103	(25%-150%)
13C-104-PeCB		122	188	pg/g	65.0	(25%-150%)
13C-105-PeCB		171	188	pg/g	91.2	(25%-150%)
13C-114-PeCB		167	188	pg/g	89.2	(25%-150%)
13C-118-PeCB		168	188	pg/g	89.6	(25%-150%)
13C-123-PeCB		175	188	pg/g	93.3	(25%-150%)
13C-126-PeCB		172	188	pg/g	91.7	(25%-150%)
13C-155-HxCB		150	188	pg/g	80.0	(25%-150%)
13C-156-HxCB	C	340	376	pg/g	90.6	(25%-150%)
13C-157-HxCB	C156L					
13C-167-HxCB		173	188	pg/g	92.3	(25%-150%)
13C-169-HxCB		175	188	pg/g	93.4	(25%-150%)
13C-188-HpCB		146	188	pg/g	77.9	(25%-150%)
13C-189-HpCB		170	188	pg/g	90.3	(25%-150%)

PCB Congeners
Certificate of Analysis
Sample Summary

SDG Number:	**Scotts_Mill_Dam**	**Client:**	**HPEN001**	**Project:**	**HPEN00112**
Lab Sample ID:	**10095002**	**Date Collected:**	**11/11/2016 11:30**	**Matrix:**	**SOIL**
Client Sample:	**1668A Soil**	**Date Received:**	**11/16/2016 11:40**	**%Moisture:**	**25.6**
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Run Date:	**12/01/2016 21:40**	**Analyst:**	**MJC**	**Instrument:**	**HRP875**
Data File:	**d01dec16b-8**			**Dilution:**	**5**
Prep Batch:	**33408**	**Prep Method:**	**SW846 3540C**	**Prep SOP Ref:**	**CF-OA-E-001**
Prep Date:	**28-NOV-16**	**Prep Aliquot:**	**14.31 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-202-OcCB		150	188	pg/g	79.7	(25%-150%)
13C-205-OcCB		174	188	pg/g	92.5	(25%-150%)
13C-206-NoCB		152	188	pg/g	81.1	(25%-150%)
13C-208-NoCB		147	188	pg/g	78.5	(25%-150%)
13C-209-DeCB		179	188	pg/g	95.4	(25%-150%)
13C-111-PeCB		179	188	pg/g	95.6	(30%-135%)
13C-28-TrCB		164	188	pg/g	87.5	(30%-135%)
13C-178-HpCB		194	188	pg/g	103	(30%-135%)

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data

U Analyte was analyzed for, but not detected above the specified detection limit.

Appendix G

Terrestrial Habitat Assessment

December 27, 2016

Mr. Mark Fendig
Luminaire Technologies
9932 Wilson Highway
Mouth of Wilson, VA 24363

HURT & PROFFITT INCORPORATED

Subject: Scott's Mill Dam Hydropower Project
Terrestrial Habitat Assessment
H&P Project 20150824

Dear Mark:

We have completed the terrestrial habitat assessment effort for the proposed Scott's Mill Dam Hydropower Project. The study area for this effort extended approximately 2.8 miles upstream from the existing Scott's Mill Dam, from the water surface to an elevation approximately 10 feet above the water surface. The study area includes existing terrestrial habitat that would be affected by the proposed project (with or without three-foot flashboards. In general, no unique or high-quality habitat areas were noted, though a variety of wildlife species were observed.

Study Area / Background

The study area extent was determined by estimating the maximum extent of upstream inundation/impoundment associated with the proposed hydropower project, if three-foot (3') flashboards were installed along the crest of the existing dam. Flood Insurance Rate Map (FIRM) data from Federal Emergency Management Agency (FEMA) and topographic mapping from the City of Lynchburg, Amherst County and the US Geological Survey (USGS) were used in this effort. Based on these data, the addition of three-foot flashboards at Scott's Mill Dam would likely increase inundation/impoundment depths approximately 2.1 miles upstream (to the midpoint of Woodruff Island). It is worth noting that the increased inundation would 'taper' upstream, such that only 1.5' of increased inundation would be present halfway through the study area, and at the upstream end of the study area there would likely be less than 0.1' difference in average water depths. The riverbanks in this affected portion of the James River are both steep (generally greater than 2:1 slopes) and high (six to ten feet, on average). The eroded shorelines of some islands here are as generally as steep and high as these riverbanks, though gravel bars and low-gradient slopes are present in isolated areas of lower-velocity water flow. Because of these factors, terrestrial habitat that may be affected by the proposed project will likely be limited largely to the actual riverbanks and island shorelines themselves.

Field Assessment

Following background data collection, mapping, and protected species database review efforts, H&P staff conducted a field assessment of the affected riverbank habitat areas on November 11, 2016. Access was from generally the river itself, by canoe/kayak (in order to avoid potential private property trespass issues). Observed wildlife species were noted, and habitat resources were documented/photographed.

Observations

This portion of the James River has been highly affected by human activities and land use changes during the past 200 years. The majority of the southwestern riverbank is currently 'armored' with riprap/rock placement (to protect the two adjacent railroad tracks by minimizing soil erosion), while over 60% of the northeastern riverbank has been developed as single-family detached residential properties (along River Road/State Route 685). The remaining 40% of the northeastern riverbank is too narrow to permit development (approximately 30-50' between River Road and the riverbank itself). One railroad track currently crosses Woodruff Island, while only the stone piers and abutments of another previous railroad track crossing of Daniel's Island remain. Decades ago, a large portion of Treasure Island was in use as athletic fields, and structures/buildings are still present (and visible) on the island now. Anecdotal information indicates that a small airstrip may have even been in use at one time on Treasure Island. Prior to that time, it appears that all three major islands (Daniel's Island, Treasure Island, and Woodruff Island) were previously used for agricultural (crop) production. The two parallel railroad tracks present along the southwestern riverbank are located on the route of a previous canal system present here in the 1800's (whose stone structures are still visible in some areas). Prior to the canal system, records indicate that batteaux (narrow cargo boats) likely passed regularly through this portion of the James River (carrying agricultural products between Buchanan [upstream] and Richmond [downstream]).

Vegetation

Riparian vegetation along the southwestern riverbank is primarily limited to a narrow area between the railroad tracks and the edge of water (typically 15'-25' in width). Approximately 60-70% of this riverbank through the study area has been stabilized with hard armor (riprap/rock), and there is evidence that trees and vegetation closest to the railroad tracks may be regularly cut. In some of these areas, tree stumps were visible, but no living trees/shrubs with diameters greater than 3" were present. The riprap and active maintenance here have largely favored the establishment of pioneer species.

The northeastern riverbank has more mature trees, and a more diverse assemblage of species than the southwestern riverbank. However, significant portions of the riparian area along this riverbank are currently in use as residential lawns. Multiple piers, boat docks, and floating wooden platforms are also present along the riverbank here. At many residential properties, significant vegetation has been cleared (except for scattered mature trees) along the riverbank, to increase visibility of the river.

The greatest abundance and diversity of vegetative species was observed on the islands themselves. This is likely due to the relative absence of land use activities here. The three primary islands (Daniel's Island, Treasure Island, and Woodruff Island) are predominately forested at this point. However, along the actual shorelines of the islands, there is significant erosion. In these eroded areas, there is very little vegetation present. The erosion is likely due to periodic floodwater flows and the alluvial soils of the islands themselves.

Table 1: Vegetative Species Observed *(on riverbanks and islands)*

Trees:
River birch (*Betula nigra*)
Tuliptree (*Liriodendron tulipifera*)
Sycamore (*Platanus occidentalis*)
Red maple (*Acer rubrum*)
Tree-of-Heaven (*Ailanthus altissima*)
Black locust (*Robinia pseudoacacia*)
Flowering dogwood (*Cornus florida*)
Shagbark hickory (*Carya ovata*)
American beech (*Fagus grandifolia*)
Chestnut oak (*Quercus prinus*)
Northern red oak (*Quercus rubra*)
Sweetgum (*Liquidambar styraciflua*)
Green ash (*Fraxinus pennsylvanica*)

Shrubs:
Hazel alder (*Alnus serrulata*)
Boxedler (*Acer negundo*)
Chinese privet (*Ligustrum sinense*)
Sweetbay (*Magnolia virginiana*)
And saplings of the tree species above

Herbaceous/Woody Vines:
Wild grape (*Vitis* spp.)
Poson ivy (*Toxicodendron radicans*)
Blackberry (*Rubus* spp.)
Greenbrier (*Smilax* spp.)
Soft rush (*Juncus effusus*)

Wildlife

Wildlife observations for this terrestrial habitat assessment effort were largely limited to mammals and birds. The fieldwork was scheduled during autumn, in order to help improve visibility. However, this schedule also resulted in few insect observations. Since this study's purpose was to assess terrestrial habitat that would be affected by hydropower operations, no aquatic species assessment was conducted.

Table 2: Avian (Bird) Species Observed

Carolina Wren (*Thryothorus ludovicianus*)
Northern Cardinal (*Cardinalis cardinalis*)
Bald Eagle (*Haliaeetus leucocephalus*)
American Crow (*Corvus brachyrhyncos*)
Blue Jay (*Cyanocitta cristata*)
Black Cap Chickadee (*Poecile atricapillus*)
Tufted Titmouse (*Baeolophus bicolor*)
Eastern Bluebird (*Sialia sialis*)
Song Sparrow (*Melospiza melodia*)
Slate Junco (*Junco hyemalis*)
Redtailed Hawk (*Buteo jamaicensis*)
Northern Flicker (*Colaptes auratus*)
Double-Crested Cormorant (*Phalacrocorax auritus*)
Red-Bellied Woodpecker (*Melanerpes carolinus*)
Canada Goose (*Branta canadensis*)
Black Vulture (*Coragyps atratus*)
Turkey Vulture (*Cathartes aura*)
Belted Kingfisher (*Megaceryle alcyon*)
Pileated Woodpecker (*Dryocopus pileatus*)
Great Blue Heron (*Ardea Herodias*)
Rock Dove (*Columba livia*)
American Goldfinch (*Spinus tristis*)

Table 3: Mammalian Species Observed *(or inferred by observed tracks/sign/scat)*

Virginia Opossum *(Didelphis virginiana)*
Raccoon *(Procyon lotor)*
Whitetail Deer *(Odocoileus virginianus)*
Gray Fox (*Urocyon cinereoargentus*)
Gray Squirrel (*Sciurus carolinensis*)
Muskrat *(Ondatra zibethicus)*
River Otter *(Lontra Canadensis)*

Protected Species

Protected species (federal and state-listed Threatened and/or Endangered Species) records from the US Fish and Wildlife Service (USFWS), the Virginia Department of Game and Inland Fisheries (VDGIF), Virginia Department of Conservation and Recreation (VDCR) Natural Heritage (NH), and Virginia Department of Agriculture and Consumer Services (VDCAS) records were reviewed as part of this terrestrial habitat assessment. USFWS records indicate northern long-eared bat (Myotis septentrionalis, Federal Threatened) as potentially present in proximity to the project area. A previous USFWS review also included James spinymussel (*Pleurobema collina*, a freshwater aquatic mussel, Federal Endangered) as potentially present nearby. VDGIF records suggest that the following protected species may be present within approximately two miles of the study area:

Table 3: Protected Species

James River spinymussel (*Pleurobema collina*, FESE)
Northern long-eared bat (*Myotis septentrionalis*, FTST)
Little brown bat (*Myotis lucifugus lucifugus*, SE)
Tri-colored bat (*Perimyotis subflavus*, SE)
Peregrine falcon (*Falco peregrinus*, ST)
Loggerhead shrike (*Lanius ludovicianus*, ST)
Atlantic pigtoe (*Fusconaia masoni*, ST)
Green floater (*Lasmigona subviridis*, ST)
Migrant loggerhead shrike (*Lanius ludovicianus migrans*, ST)

FE – Federally Endangered, FT – Federally Threatened, SE – State Endangered, ST – State Threatened

Conclusions

Based on background research and field observations, it appears that the proposed hydropower project should not significantly affect unique or high-quality terrestrial habitats. Increased inundation would likely be noticeable from the Scott's Mill Dam to a point approximately 2.1 miles upstream. Within this area, flashboards would increase water depths by an estimated one to three feet. However, the majority of suitable terrestrial habitat present along these riverbanks and islands exists at least four to six feet higher the James River baseflow elevation. Within the area to be most affected by increased inundation, many sections of riverbank are already stabilized with hard armoring (riprap, stone, tires, or concrete fragments)). In contrast, much of the comparable island shorelines are significantly eroded (since they have not been artificially stabilized in a similar manner). Hard armoring and eroded shorelines provide only very limited opportunities for vegetative growth and wildlife use.

Approximately 60-70% of the riverbank areas that will experience increased inundation as a result of flashboard installation and hydropower operations have already been modified by placement of hard armoring materials, along with constructed piers, wooden stairs, and boat docks. Approximately half of the remaining 30-40% of riverbank length is maintained as residential lawn. On the islands themselves, an estimated 50-60% of the shorelines are eroded or severely eroded, with cut-banks frequently in excess of eight feet. The remaining 40-50% of island shorelines are lower-gradient and vegetated by herbaceous species (particularly those that are also underlain by gravel bars). Two railroad tracks parallel the southwestern riverbank, while River Road and adjacent houses line the northeastern riverbank.

In summary, previous development and land uses along this portion of the James River have significantly affected terrestrial habitat resources within the study area. The islands themselves appear to provide higher quality habitat than the riverbanks, though these too were previously developed decades ago. Since the devastating flood of 1985 destroyed pedestrian/vehicle access to Treasure Island, the island is now becoming more naturalized. The proposed inundation change of one to three feet is unlikely to affect more than the lower 30% of the eight to ten-foot high riverbanks and island shorelines within the study area.

Please contact us with any questions you may have. We can be reached at 434.847.7796 or via email at bll@handp.com.

Sincerely,
HURT & PROFFITT, INC.

Ben Leatherland, PWD, PWS, CPESC
Sr. Environmental Scientist

Attachments: Site maps
Site photographs

Photograph 1 – Southwestern shoreline of Daniel's Island (note erosion), view N

Photograph 2 – River between Daniel's Island (to R) and railroad track (to L), view NW

Photograph 3 – Typical southwestern riverbank (note railroad riprap), view SW

Photograph 4 – Shallow water area between Daniel's Island and Treasure Island (view E)

Photograph 5 – Relic structure on Treasure Island (note 6-8’ high shoreline), view NE

Photograph 6 – Relic bridge abutment on SW riverbank (view NW)

Photograph 7 – Bridge abutment (?) / structure on Treasure Island, view E

Photograph 8 – Relic stone railroad bridge pier, view SW

Photograph 9 – Existing railroad bridge across Woodruff Island, view NW

Photograph 10 – Typical SW riverbank, with railroad and >10’ high riprap stabilization (view W)

Photograph 11 – Whitetail deer at upstream end of Woodruff Island, view N

Photograph 12 – Low gradient Woodruff Island upstream shoreline (view NW)

Photograph 13 – Typical NE riverbank development and boat dock, view N

Photograph 14 – Typical NE riverbank land use/development (note rock/riprap), view N

Photograph 15 – Typical NE riverbank pier/dock (note 10’ riverbank), view N

Photograph 16 – Typical NE riverbank (undeveloped section), view NE

Photograph 17 – Typical NE riverbank land use/development, view NE

Photograph 18 – Typical NE riverbank land use, view E

Photograph 19 – Roadway along NE riverbank (note >8’ riverbank height), view NE

Photograph 20 – NE riverbank stabilization using waste tires, view NE

Appendix H

James River Freshwater Mussel Survey Report

James River Freshwater Mussel Survey Report

Scott's Mill Hydropower Project (FERC No. 144525)

Lynchburg City and Amherst Counties, Virginia

James River below Scott's Mill Dam

Prepared For:

Liberty University &

Dyok Consulting

Prepared by:

Three Oaks Engineering

November 23, 2016

TABLE OF CONTENTS

1.0 INTRODUCTION

The Scott's Mill Hydro Project (FERC No. 14425, the Project) is a proposed 3.8 megawatt hydropower project being undertaken by Liberty University (LU) and partners. The Project proposes modification of the existing 875-foot-long by 15-foot-high Scott's Mill dam that creates an approximately 3.5-mile-long, 316 acre run of the river impoundment on the James River in Lynchburg City and Amherst Counties.

The Federal Energy Regulatory Commission (FERC) license application for the project includes participation of stakeholders such as the state and federal resource agencies. In their review of the Project, the Virginia Department of Game and Inland Fisheries (VDGIF) requested updated survey data for freshwater mussels within the pool above Scott's Mill Dam and the mainstem James River downstream to the vicinity of its confluence with Blackwater Creek (project boundary). Previous survey efforts within the project boundary near John Lynch Bridge documented the presence of three species of freshwater mussel including the state Threatened Green Floater (*Lasmigona subviridis*) in 2002.

Three Oaks Engineering (Three Oaks) was retained to conduct this mussel study, with the objective of characterizing mussel presence/absence and relative abundance within the project boundary.

2.0 TARGET SPECIES DESCRIPTION

As the Green Floater is known from the project area, a brief description of the species characteristics, biology and distribution is provided below.

2.1 Lasmigona subvirdis (Green Floater) *Conrad 1835*

2.1.1 Characteristics

The Green Floater, described by Conrad (1835) from the Schuylkill River in Lancaster County, Pennsylvania, is relatively small with a thin, slightly inflated, sub ovate shell that is narrower in front, and broader behind. The dorsal margin forms a blunt angle with the posterior margin. The shell is dull yellow or tan to brownish green, usually with concentrations of dark green rays.

2.1.2 Distribution and Habitat Requirements

The Green Floater occurs along the Atlantic Slope from the Savannah River in Georgia north to the Hudson River in New York, as well as in the "interior" basins New, Kanawha, and Watauga (of the Tennessee River) basins. Ortmann (1919) observed that the Green Floater is "adverse to very strong current, and prefers more quiet parts, pools or eddies with gravelly and sandy bottoms, and it also goes into canals, where it seems to flourish." Clarke (1985) agreed with this assessment, adding that it seemed to have a preference for streams as opposed to rivers and that it is not consistently found but when located, it is often abundant. These observations are consistent with where Green Floater has been recently observed, with the species showing a preference for stable, relatively low energy habitats, most often being found along shallow

stream margins that often have a component of silt and or clay (T. Dickinson, personal observations). A silt/detritus component has also been shown to be important in propagation efforts, where survival of juveniles grown in hatcheries increases where it is provided (B. Watson, personal communication). The Green Floater has experienced major declines throughout its entire range.

2.1.3 Threats to Species

The cumulative effects of several factors, including sedimentation, point and non-point discharge, stream modification (e.g., impoundment, channelization) are believed to have contributed to the decline of this species throughout its range. When mussel populations are reduced to a small number of individuals and are restricted to short reaches of isolated streams, they are extremely vulnerable to extirpation from a single catastrophic event or activity (Strayer et al. 1996). Catastrophic events may consist of natural events such as flooding or drought, as well as human influenced events, such as toxic spills.

Siltation resulting from improper erosion control of various land usage, including agriculture, silviculture, and development activities, has been recognized as a major contributing factor to degradation of mussel populations (USFWS 1996). Siltation has been documented to be extremely detrimental to mussel populations by degrading substrate and water quality, increasing potential exposure to other pollutants, and by directly smothering mussels (Ellis 1936, Marking and Bills 1979). Sediment accumulations of less than 1 inch have been shown to cause high mortality in most mussel species (Ellis 1936).

Sewage treatment effluent has been documented to significantly affect the diversity and abundance of mussel fauna (Goudreau et al. 1988). Goudreau et al. (1988) found that recovery of mussel populations might not occur for up to two miles below points of chlorinated sewage effluent. Clarke and Neves (1984) suggested that sewage and industrial pollution might have contributed to the extirpation of the James Spinymussel from the North River in Virginia. The impact of impoundments on freshwater mussels has been well-documented (USFWS 1992, Neves 1993). Construction of dams transforms lotic habitats into lentic habitats, which results in changes with aquatic community composition. These changes associated with inundation adversely affect both adult and juvenile mussels as well as fish community structure, which could eliminate possible fish hosts for glochidia (Fuller 1974).

The introduction of exotic species, such as the Asian Clam (*Corbicula fluminea*) and Zebra Mussel (*Dreissena polymorpha*), has also been shown to pose significant threats to native freshwater mussels. The Asian Clam is now established in most of the major river systems in the United States (Fuller and Powell 1973) including those streams still supporting surviving populations of the green floater. Concern has been raised over competitive interactions for space, food, and oxygen between this species and native mussels, possibly at the juvenile stages (Neves and Widlak 1987, Alderman 1997). The Asian clam is common to abundant within the James River. The zebra mussel, native to the drainage basins of the Black, Caspian, and Aral Seas, is an exotic freshwater mussel that was introduced into the Great Lakes in the 1980s and has rapidly expanded its range into the surrounding river basins, including those of the South Atlantic Slope (O'Neill and MacNeill 1991). This species competes for food resources and

space with native mussels, and is expected to contribute to the extinction of at least 20 freshwater mussel species if it becomes established throughout most of the eastern United States (USFWS 1992). This species has not been recorded in the James River Basin in Virginia, but has been recorded in a quarry in Prince William County VA, within the Potomac River Basin.

The Green Floater is listed as Threatened in Virginia. The species is listed by Williams et al. (1993) as threatened throughout its range. The most recent status assessment and conservation strategy for this species was completed in 2014 (VDGIF 2014).

3.0 SURVEY EFFORTS

To provide current data on the freshwater mussel fauna with regards to species composition, distribution, and relative abundance within the project boundary, mussel surveys were conducted at seven locations in the reservoir pool between Scott's Mill dam and Reusens dam, and in the James River tailrace below the dam downstream to the vicinity of its confluence with Blackwater Creek (Appendix A, Figures 1 & 2).

3.1 Mussel Surveys for this Project

Surveys were conducted by Three Oaks personnel Tom Dickinson, Chris Sheats, and Evan Morgan on October 6-7, 2016, with assistance from VDGIF State Malacologist Brian Watson on October 6th.

3.2 Methodology

Survey sites were selected after initial habitat evaluations were performed, with special preference given to areas with appropriate habitat for rare target mussel species. Impoundment sites were accessed via powerboat and the James River below the dam was accessed on foot from available public access points. Visual and tactile surveys were performed using mask/snorkel, glass bottom view buckets (bathyscopes), and/or SCUBA, depending on the habitat type and depth. Shoreline surveys utilized mask/snorkel and bathyscopes. SCUBA was used at depths over 3 feet during transect surveys and deeper sites in the impoundment. Timed searches were employed at all the survey sites to provide Catch Per Unit Effort (CPUE) data for each species found.

All areas of appropriate habitat were searched within a site. All freshwater mollusks were recorded and returned to the substrate. Representative photographs of each species were taken. Timed survey efforts provided Catch Per Unit Effort (CPUE) data for each species found. Relative abundance estimates for freshwater snails and freshwater clam species were developed using the following criteria:

- (VA) Very abundant > 30 per square meter
- (A) Abundant 16-30 per square meter
- (C) Common 6-15 per square meter
- (U) Uncommon 3-5 per square meter
- (R) Rare 1-2 per square meter
- (P-) Ancillary adjective "Patchy" indicates an uneven distribution of the species within the sampled site.

4.0 RESULTS

The survey sites/reaches conducted for the Project are depicted in Appendix A Figures, with select photographs in Appendix B. The survey results for each survey site are presented as follows.

4.1 Scott's Mill Tailrace

This reach included the James River tailrace below Scott's Mill from the vicinity of the Blackwater Creek confluence to the dam. The main channel is greater than 90 meters wide with mostly boulder/cobble lined banks; a large amount of metal debris was present in the river adjacent to the Griffin Pipe factory. Several cobble/gravel bars were present near the Blackwater Creek confluence and a large sandbar/island was present just below the dam. American water-willow (*Justicia americana*) stabilized the bars and banks where it was present. Most the reach consisted of deeper run habitat, with a riffle complex near the downstream extent of the survey and occasional slackwater areas along banks and behind bars. Substrates consisted of a variable mix of sand, gravel, and cobble, with silt and sand accumulations in lower flow and depositional areas. Surveys were concentrated along the river margins of the main channel and surveys were to depths of approximately 3 feet for a total of 11.67 person hours, during which two species of freshwater mussel, the Eastern Ellipito (*Elliptio complanata*) and Northern Lance (*Elliptio fisheriana*), were found (Table 1). Mussels were found in relative low densities, with most located below John Lynch Bridge. Other mollusks located included the invasive exotic Asian Clam (*Corbicula fluminea*), which was very abundant, with shells comprising a large portion of the substrate in areas, as well as the aquatic snails Pointed Campeloma (*Campeloma decisum*), Piedmont Elimia (*Elimia virginica*), and Crested Mudalia (*Leptoxis carinata*). The Pointed Campeloma was only represented by a few individuals, while the Piedmont Elmia and Crested Mudalia were abundant and often found in concentrations on rocks and other stable substrates, particularly in areas of steady flow.

Table 1. Scotts Mill Tailrace Shoreline Results

Scientific Name	Common Name	Number	CPUE (#/hr)
Freshwater Mussels			
Elliptio complanata	Eastern Elliptio	235	20.14/hr
Elliptio fisheriana	Northern Lance	4	0.34/hr
Freshwater Snails and Clams			**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	R
Corbicula fluminea	Asian Clam	~	VA

Elimia virginica	Piedmont Elimia	~	A
Leptoxis carinata	Crested Mudalia	~	A

In order to characterize habitat and relative abundance of mussels across the river, three cross river transects were surveyed utilizing SCUBA at the locations shown in figure 1. Surveyors covered an approximately one meter wide swath during each pass. The results for each are summarized below.

4.1.1 Transect 1

This transect was surveyed by three divers for a total of 1.9 person hours. Substrate consisted of a mix of sand, gravel, cobble, and boulder, with areas of bedrock. The majority of mussels were found on the left descending side of the channel, but were consistently found throughout the transect. A total of 102 Eastern Elliptio (53.7/hr) and 3 Northern Lance (1.6/hr) were located.

4.1.2 Transect 2

This transect was surveyed by two divers for a total of 0.9 person hours. Substrate consisted of a mix of sand, gravel, cobble, boulder, and bedrock; bedrock was the dominant substrate along the left descending half of the channel. As such, the right descending side was most productive. A total of 22 Eastern Elliptio (24.4/hr) were found

4.1.3 Transect 3

This transect was located just downriver of the mill dam turbulence for 0.4 person hours. Substrate consisted of a shifting sand, gravel, and shell mix. No live mussels were found, however, a shell of the Eastern Floater (*Pyganadon cataracta*) was located.

4.2 Site 1

This most downriver impoundment site was surveyed from the right descending river bank to the middle of the channel. The maximum depth was approximately 5 meters. Substrate ranged from the silt/mud shoreline and slope with abundant woody debris to unconsolidated sand along the river bottom. One live Northern Lance was found in the river bank shallows; no other mussel evidence was located in 1.25 person hours of search.

Table 2. Site 1 Results

Scientific Name	Common Name	Number	CPUE (#/hr)
Freshwater Mussels			
Elliptio fisheriana	Northern Lance	1	0.8/hr
Freshwater Snails and Clams			**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	R
Corbicula fluminea	Asian Clam	~	C
Elimia virginica	Piedmont Elimia	~	U

4.3 Site 2

This shallow interisland site consisted of several smaller channels with some flow. Substrate was dominated by gravel mixed with sand, mollusk (Corbicula and snail) shell, and silt. American water-willow lined the island margins. Surveys were conducted for 1.25 person hours. While the habitat presented as high quality, only a few Eastern Elliptio were located.

Table 3. Site 2 Results

Scientific Name	Common Name	Number	CPUE (#/hr)
Freshwater Mussels			
Elliptio complanata	Eastern Elliptio	5	4.0/hr
Freshwater Snails and Clams			**Relative Abundance**
Corbicula fluminea	Asian Clam	~	A
Elimia virginica	Piedmont Elimia	~	U

4.4 Site 3

This site consisted of a gradual sloping silt shoreline to the river bottom with a maximum depth of approximately 4 meters. Substrate was dominated by sand with patches of gravel and boulder. Surveys were conducted for 1.17 person hours. A single Northern Lance shell comprised the only mussel evidence found.

Table 4. Site 3 Results

Scientific Name	Common Name	Number	CPUE (#/hr)
Freshwater Mussels			
Elliptio fisheriana	Northern Lance	Shell	~
Freshwater Snails and Clams			**Relative Abundance**
Corbicula fluminea	Asian Clam	~	C
Elimia virginica	Piedmont Elimia	~	U

4.5 Site 4

This shallow site consisted of a channel lined with American water-willow between islands. Substrate was dominated by silt, sand, and mollusk shell; however, no freshwater mussel evidence was found in 1.2 person hours of search.

4.6 Site 5

This site was surveyed from the left descending river bank near a rail road trestle. Surveys were conducted along the shoreline and to the center channel to a maximum depth of 3 meters. Substrate consisted of boulder and debris with patches of silt, sand, and gravel in-between. Surveys were conducted for 1.0 person hour during which two Eastern Ellitpio were found.

Table 5. Site 5 Results

Scientific Name	Common Name	Number	CPUE (#/hr)
Freshwater Mussels			
Elliptio complanata	Eastern Elliptio	2	2.0/hr
Freshwater Snails and Clams			**Relative Abundance**
Corbicula fluminea	Asian Clam	~	C
Elimia virginica	Piedmont Elimia	~	C

4.7 Site 6

This site was surveyed from a bar covered in dense American water-willow to the head of the next island downriver. Substrates consisted of sand, gravel, cobble, and shell covered in a layer of silt. Surveys were conducted to a maximum depth of approximately 2 meters. No live mussels were found in 1.5 person hours of search, however shell evidence of the Eastern Elliptio and Northern Lance were present.

Table 6. Site 6 Results

Scientific Name	Common Name	Number	CPUE (#/hr)
Freshwater Mussels			
Elliptio complanata	Eastern Elliptio	Shell	~
Elliptio fisheriana	Northern Lance	Shell	~
Freshwater Snails and Clams			**Relative Abundance**
Corbicula fluminea	Asian Clam	~	C
Elimia virginica	Piedmont Elimia	~	C
Leptoxis carinata	Crested Mudalia	~	C

4.8 Site 7

This most upriver site was conducted within sight of Reusens dam from a dense water-willow bar. Habitat consisted of run with mixed cobble, gravel, and sand substrate. A few older Eastern Elliptio were located in 2.0 person hours of search.

Table 7. Site 7 Results

Scientific Name	Common Name	Number	CPUE (#/hr)
Freshwater Mussels			
Elliptio complanata	Eastern Elliptio	2	1.0/hr
Freshwater Snails and Clams			**Relative Abundance**
Corbicula fluminea	Asian Clam	~	C
Elimia virginica	Piedmont Elimia	~	C
Leptoxis carinata	Crested Mudalia	~	C

5.0 CONCLUSIONS

This report provides current freshwater mussel survey data for the Scott's Mill Hydro Project. The target Green Floater was not found during these efforts, however, appropriate habitat conditions coupled with the known record from 2002 suggest this and other rare species may be present, but were not detected during these one-time efforts.

These surveys documented the presence of three freshwater mussel species; the Eastern Elliptio, Northern Lance, and Eastern Floater. The highest quality habitats and greatest relative abundances were observed in the lower tailrace reach, below John Lynch bridge. The impoundment results suggest that the Scott's Mill dam pool supports a very low density mussel fauna for the available habitat observed.

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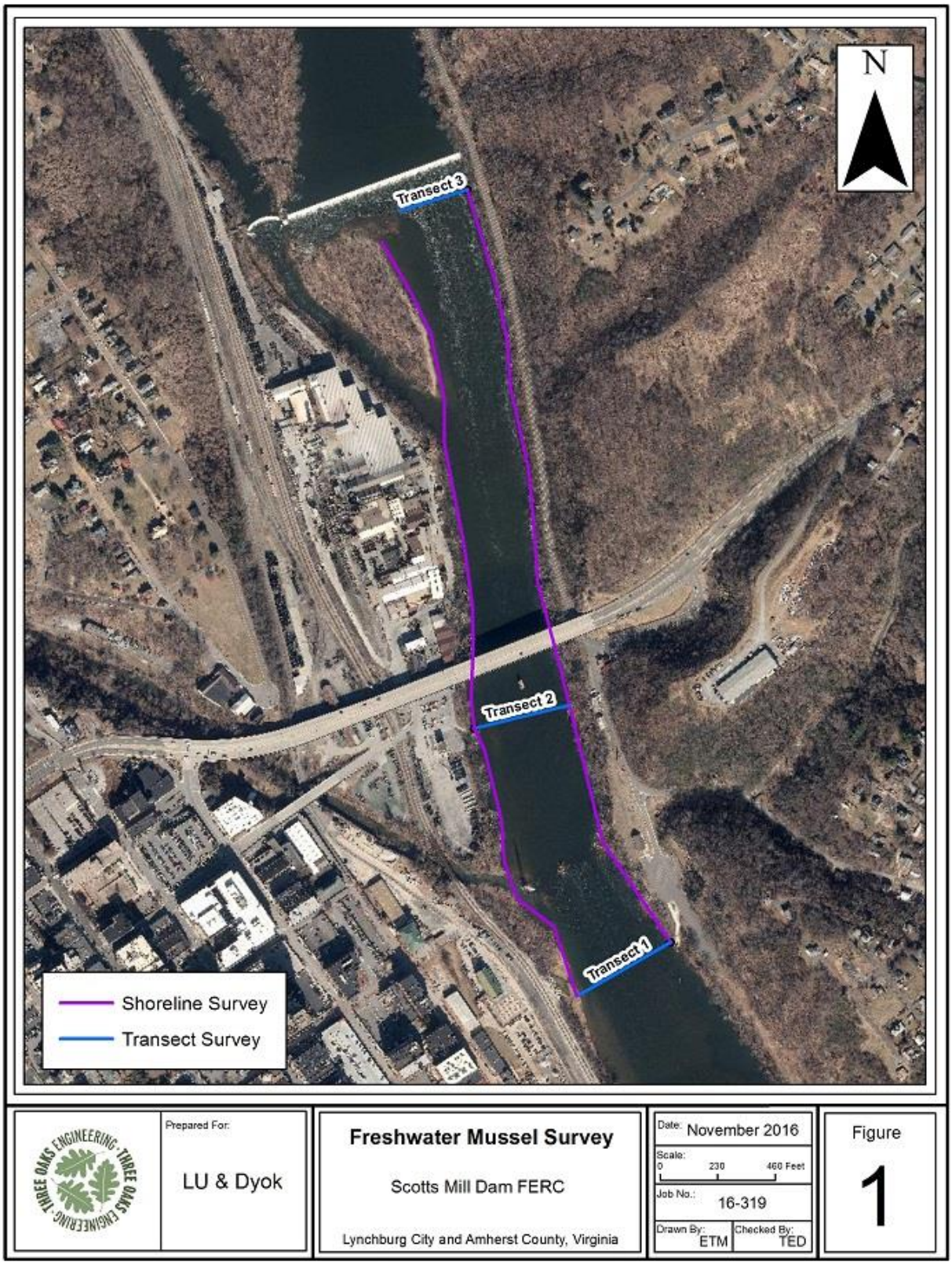
APPENDIX A: Figures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Transect 2
Transect 1
Shoreline Survey
Transect Survey
Prepared For:
LU & Dyok
Freshwater Mussel Survey
Scotts Mill Dam FERC
Lynchburg City and Amherst County, Virginia
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Scale:
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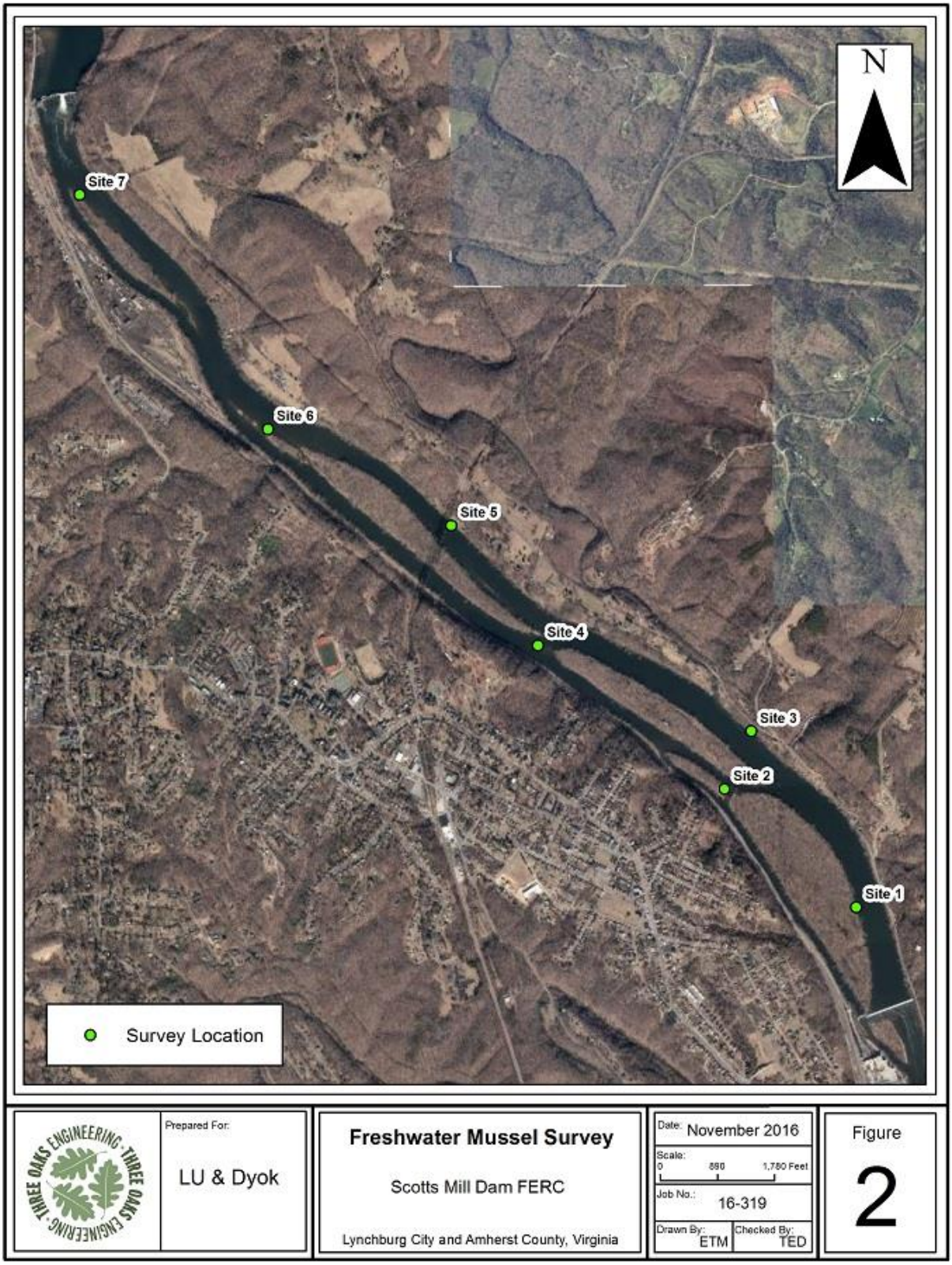
Job No.: 16-319
Drawn By: ETM
Checked By: TED
Figure
1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Site 6
Site 5
Site 4
Site 3
Site 2
Site 1
Survey Location
Prepared For:
LU & Dyok
Freshwater Mussel Survey
Scotts Mill Dam FERC
Lynchburg City and Amherst County, Virginia
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Scale:
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Job No.: 16-319
Drawn By: ETM
Checked By: TED
Figure
2

APPENDIX B: Select Photographs

Tailrace Reach Riffle Habitat in vicinity of Blackwater Creek

Tailrace Reach Eastern Elliptio (top and right) and Northern Lance (left and bottom)

Juvenile Eastern Elliptio and Pointed Campeloma-tailrace reach

Boulder lined shoreline tailrace reach

Snorkeling run habitat under John Lynch Bridge-tailrace reach

Lower impoundment shoreline habitat

Interisland impoundment habitat

Water-willow margin below Reusens Dam

Eastern Elliptio located at Impoundment Site 7

Appendix I

Phase II Architectural Survey of Water Works Dam and Canal

Phase II Architectural Survey of the Water Works Dam and Canal (118-0209-0002), James River Dam (118-0209-0003), and Scott's Mill Ruin (118-5497) City of Lynchburg, Virginia.

Project Number 20150824-650

February 5, 2017

Submitted to:
Luminaire Technologies, Inc.
Mr. Mark Fendig, President

Submitted by:
Sarah M. Clarke
Senior Architectural Historian

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Figures

EXECUTIVE SUMMARY

This report presents the results of a Phase II Architectural Survey of the Water Works Dam and Canal (VDHR No. 118-0209-0002), James River Dam (VDHR No. 118-0209-0003), and Scott's Mill Ruin (VDHR No.118-5497) in the City of Lynchburg and Amherst County, Virginia. The survey was completed by Hurt & Proffitt (H&P) on behalf of Luminaire Technologies, Inc. (Luminaire). The fieldwork for this project was conducted on October 8, 2016.

The Water Works Dam and Canal and the James River Dam are all included within the National Register boundaries of the James River and Kanawha Canal Sites in Lynchburg, Virginia. The James River and Kanawha Canal Sites in Lynchburg was listed on the Virginia Landmarks Register (VLR) and the National Register of Historic Places (NRHP) in 1984 and has a period of significance of 1836-1882. The Water Works Dam and Canal and the James River Dam are identified with tertiary numbers because these properties are within the boundaries of the James River and Kanawha Canal Sites in Lynchburg. The Scott's Mill Ruin was issued a separate number and is not considered a contributing resource to the James River and Kanawha Canal Sites in Lynchburg, Virginia NRHP property.

Luminaire intends to rehabilitate the James River and Water Works Dams, currently referred to collectively as the Scott's Mill Dam, for the purposes of the Scott's Mill Hydropower Project. The proposed project will require a FERC permit which necessitates compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Through coordination with consulting parties, including the Virginia Department of Historic Resources (VDHR), it was determined that an intensive architectural survey was needed for those resources that may be potentially affected by the proposed project. The Area of Potential Effects (APE) for architecture is the project footprint as well as the vicinity to the project where alterations to feeling and setting may occur. It was determined that the Water Works Dam and Canal, the James River Dam, and the Scott's Mill Ruin all fall within the project APE for architecture.

The intensive-level survey included background research at the Library of Virginia and the Virginia Historical Society, as well as local libraries and historical societies. The fieldwork for the project entailed photographing and drawing site plans for each resource.

Based on the results of the survey, H&P recommends the Water Works Dam and Canal (VDHR No.118-0209-0002) are eligible for the NRHP. These resources were previously identified as contributing resources to the James River and Kanawha Canal Sites in Lynchburg (VDHR No.118-0209) and H&P concurs with this previous finding. The James River Dam (VDHR No.118-0209-0003) was also included as a contributing resource to the James River and Kanawha Canal Sites in Lynchburg nomination; however, research indicates that the James River Dam is a separate resource from that property. The James River Dam is recommended eligible for the NRHP but it is not a contributing resource to the James River and Kanawha Canal Sites in Lynchburg, Virginia property. H&P recommends that the Scott's Mill Ruin (VDHR No.118-5497) is not individually eligible for the NRHP nor is it a contributing resource to the James River and Kanawha Canal Sites in Lynchburg, Virginia property.

1. INTRODUCTION

This report presents the result of a Phase II-Intensive Architectural Survey of the Water Works Dam and Canal (VDHR No.118-0209-0002), the James River Dam (VDHR No.118-0209-0003), and the Scott's Mill Ruin (VDHR No.118-5497) in the City of Lynchburg and Amherst County, Virginia (Figure 1). The survey for this project was conducted by Hurt & Proffitt (H&P) on behalf of Luminaire Technologies, Inc. (Luminaire). The fieldwork for the project was conducted on October 8, 2016.

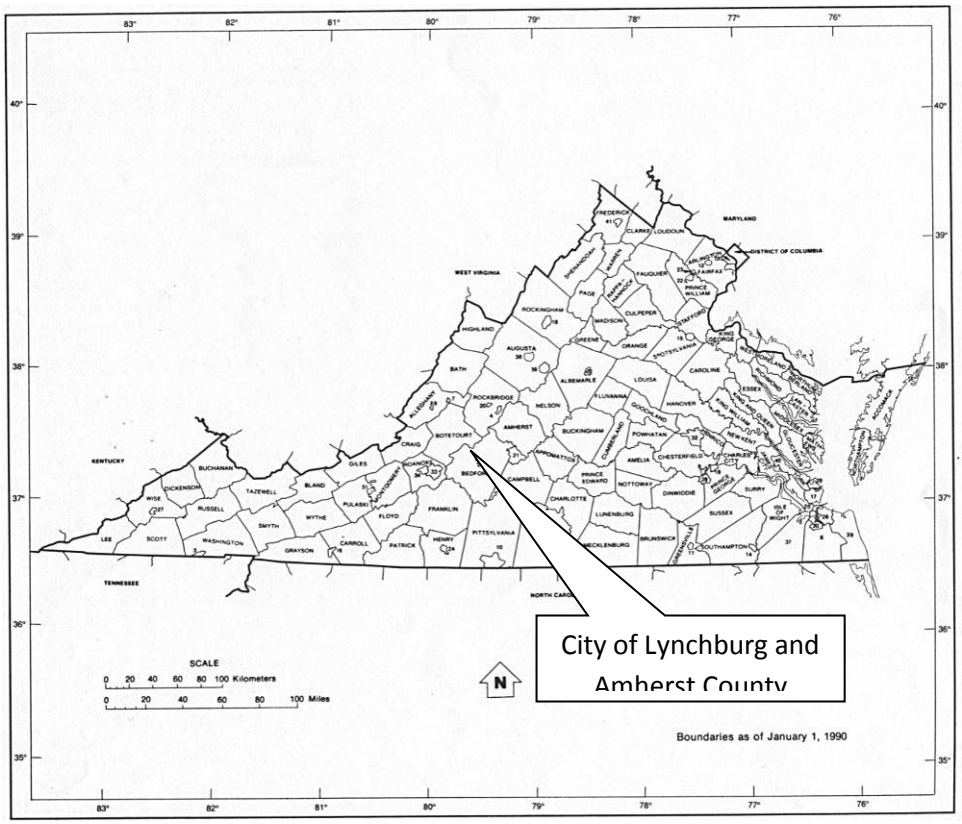

Figure 1. Project location.

Initially, the Water Works Dam and Canal, and the James River Dam were identified as contributing resources to the James River and Kanawha Canal Sites in Lynchburg, Virginia National Register property that has a period of significance of 1836-1882. The Scott's Mill Ruin is a separate resource located on the north bank of the James River in Amherst County. The Ruin consists of a stone foundation.

Luminaire intends to rehabilitate the James River and Water Works Dams, currently referred to collectively as the Scott's Mill Dam, in order to install a hydropower plant on the banks of the James River. The project requires a FERC permit; therefore an architectural survey was required to comply with Section 106 of the NHPA of 1966, as amended. The architecture APE for the project is the project footprint as well as the vicinity where alterations to feeling and setting may occur.

Prior to beginning the fieldwork for the project, H&P completed background and historic research at the Library of Virginia and the Virginia Historical Society, as well as local libraries and historical societies in the City of Lynchburg and Amherst County. H&P also completed a site file review of previously recorded architectural resources in the VDHR's Virginia Cultural Resources Information System (V-CRIS).

The fieldwork for this project was completed by Sarah M. Clarke, H&P Senior Architectural Historian and Randy Lichtenberger, H&P's Director of Cultural Resources. The field investigations and technical report meet the requirements specified in the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (Federal Register 48:190:44716-44742) and the Virginia Department of Historic Resources (VDHR) *Guidelines for Conducting Cultural Resource Survey In Virginia* (2011). The Principal Investigator performing the cultural resource investigations meets or exceeds the qualifications described in the Secretary of the Interior's *Professional Qualifications Standards* (48 FR 44738-9).

2. SETTING

The Water Works Dam and Canal, and the James River Dam, are located in the City of Lynchburg, Virginia; while the Scott's Mill Ruin sits across the river in Amherst County, Virginia (Figure 2). The south side of the James River lies in the City of Lynchburg in a heavy industrial area. The water works dam and canal adjoin the south or river right bank of the James River, adjacent to the Griffin Pipe Works, a large industrial facility. The only way to access those sites is through the Griffin Pipe Works property. Scott's Mill Ruin is to the north of the James River in a more rural setting that is heavily wooded with rolling hills. River Road (Rt. 685) runs immediately to the north of Scott's Mill Ruin.

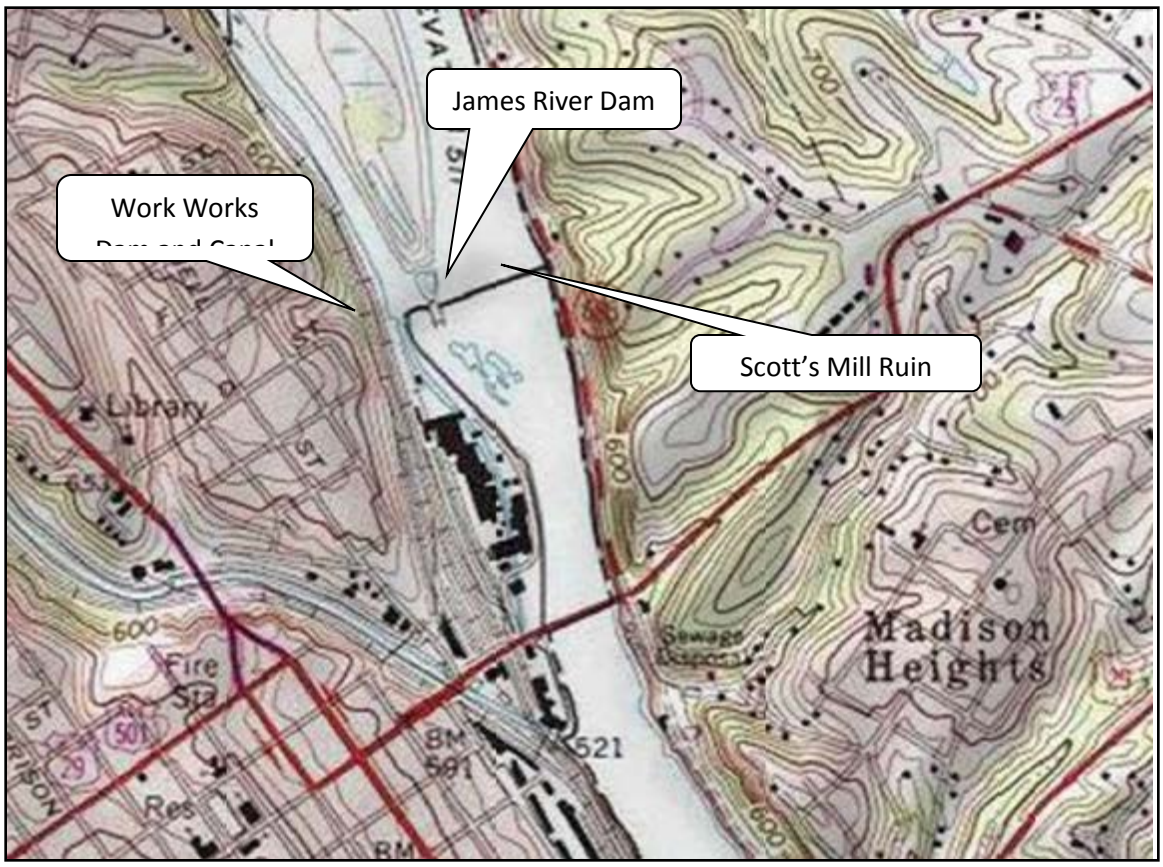

Figure 2. Water Works Dam and Canal, James River Dam, and Scott's Mill Ruin Depicted on 7.5 Lynchburg USGS Quad.

3. SITE HISTORY

Water Works Dam and Canal (VDHR No. 118-0209-0002)

The importance of a clean water supply is not a new concern for most cities and towns. Poor or unsanitary water supplies were often responsible for outbreaks of disease and sickness and that encouraged many municipalities to explore options for clean water. In fact, water works facilities began appearing in the United States as early as the mid-eighteenth century in Pennsylvania, Rhode Island, and New York (National Research Council 2002, 30).

A consistent and clean water supply was also a concern for the City of Lynchburg. So John Victor, Lynchburg's mayor at the time, began exploring options for an improved water works system for the city (Elson 2004, 61). Victor brought Albert Stein of Philadelphia to Lynchburg to assist the City in developing a water works system. Stein's proposal was to dam part of the James River, channel the water through a canal to a pump on the river bank at 7th Street, and then pump the water up cast iron pipes to a reservoir at 7th and Clay Streets (Elson 2004, 70). The dam was 10 feet high and constructed of stone, a forcing pump driven by a breast wheel moved the water through the pipe 2,000 feet to a reservoir 235 feet above the river (Scruggs 1972, 63).

Gravity would then bring the water down to the City. The total cost for the project was $40,000 and the ordinance to approve it was passed on June 29, 1827 (Elson 2004, 70). A few years later, the James River and Kanawha Canal utilized the Water Works Dam to channel water into the Canal (VDHR Survey File).

The Water Works Dam is still a prominent feature along the James River in the City of Lynchburg. Constructed of stone and designed in a curved shape, the dam runs between the shore of the river and Daniel's Island (Figure 3). The NRHP nomination form states that the dam has been heightened over the years and there is a ledge present that indicates that may be the case. It is possible that when the Glamorgan Pipe Factory (VDHR No. 118-0109) was established in 1882 and acquired the property from the City of Lynchburg, the dam was raised (VDHR Survey File).

Figure 3. Water Works Dam, view to the North.

The Water Works Canal is still present on the Griffin, formerly Glamorgan, Pipe Works property, though the canal has been filled in and is currently used as storage for the company (Figure 4). The gate at the head of the canal is also still present, though changes to the resource are visible. For example, the hand operated wheels which regulate water flow are dated 1884 (Figures 5 and 6).

Figure 4. Water Works Canal, view to the East.

Figure 5. Water Works Gate and Locks, view to the East.

Figure 6. Gate Wheels at the Water Works Dam and Canal.

James River Dam (VDHR No. 118-0209-0003)

The James River Dam is a 200 foot dam that spans the James River from Daniel's Island to the north shore of the James River in Amherst County. Like the Water Works Dam to the south, the James River Dam is also constructed of massive stones and stands 20 feet above the riverbed of the James River (Figures 7, 8, and 9).

Figure 7. Water Works Dam in the forefront, James River Dam in the distance, view to the north.

Figure 8. James River Dam, view to the north.

Figure 9. James River Dam, view to the south.

Construction on the James River Dam was completed in 1883 by John J. Scott, Jr. He was an heir of Charles Scott of Lynchburg, who acquired the Lynchburg Milling Company from the Langhorne family in 1858. The James River Dam was to provide the power necessary to run Scott's Mill on the north shore of the James River in Amherst County (Lynchburg, Virginia Bicentennial Commission 1985, 70-71).

Shortly after construction, the dam became the property of the Richmond and Alleghany Railroad Company. Eventually, the Richmond and Alleghany Railroad Company was dissolved and the assets sold at public auction in April 1880 (Richmond and Alleghany Railroad Business Records). The dam was later sold to the Appalachian Power Company. In 1999, the Appalachian Power Company sold the property to Luminaire Technologies, the current owner (Amherst County Deeds).

Construction of the James River Dam does occur during what is considered the first period (1880-1895) of the evolution of hydroelectric plant design and construction in Virginia. Dams of this time are typically constructed of local stone instead of concrete, which becomes the building material of choice in the early-twentieth century. During this early phase of hydroelectric power it was financially expedient to use existing dams. However, there is no evidence to date that the James River Dam ever functioned in this capacity (Louis Berger & Associates 1990, 7).

Scott's Mill Ruin (VDHR No. 118-5497)

The Scott's Mill Ruin is located on the north shore of the James River in Amherst County, across the James River from the Water Works Dam and Canal (Figure 10). The mill ruin consists of two walls; the south wall and west wall. The walls are of masonry construction and consist of dry-laid stone; however, there is some evidence that concrete was also used. The concrete may be the result of repairs that were done after the initial construction of the mill. The west wall measures approximately 33 feet long and 6.8 feet wide. The height of the west wall varies from less than 3 feet to 7 feet. The south wall is approximately 80.6 feet long and the width varies from 4.6 feet to 3 feet. The south wall stands 12.4 feet tall and consists of three distinct sections. The top section measures 3.4 feet, the middle section 7 feet, and the bottom section or footing measures 2 feet (Figure 11).

Figure 10. Scott's Mill, 1936 view to the west (Horner and Winfree eds.).

Figure 11. Scott's Mill Ruin, view to the southwest.

In 1883, John J. Scott, Jr. built Scott's Mill on the north bank of the James River. Scott came from a family of mill owners who purchased the Lynchburg Milling Company from the Langhorne family in 1858 (Lynchburg Bicentennial Commission 1985, 70-71). However, it appears that the Smith family did not own the property where the future Scott's Mill would be built. This property was actually owned by the Richmond and Alleghany Railroad. The property was initially owned by the James River and Kanawha Canal Company but when that company failed "all works, property, and franchises [went] to Richmond and Alleghany Railroad Company" (Richmond and Alleghany Railroad Business Records).

John J. Scott, Jr. leased the property from the Richmond and Alleghany Railroad with the right to construct a mill on the end of the stone dam. The Richmond and Alleghany Railroad Company was dissolved and the assets sold at public auction in April 1880. The mill was later sold to the Appalachian Power Company, who in 1999 sold the property to Luminaire Technologies (Richmond and Alleghany Railroad Business Records and Amherst County Deeds). The mill functioned as a grist mill and remained in operation until it was destroyed by fire on May 27, 1944 (Amherst County Heritage Book Commission 1997, 24).

Guard Locks (VDHR No. 44CP0069)

The Guard Locks are an archaeological resource that was included in the NRHP nomination for the James River and Kanawha Canal Sites in Lynchburg. The Guard Locks were built as part of the James River and Kanawha Canal in Lynchburg to protect the canal from flooding as it wound

its way through the young city. The current mapping available through V-CRIS places the Guard Locks at the same location as the gate for the Water Works Dam and Canal (Figure 12). However, historic mapping indicates that the Guard Locks associated with the Canal, and the gate for the Water Works Dam and Canal are two completely different resources (Figure 13). Currently, the Guard Locks are buried under or were destroyed by the construction of the railroad and lie outside of the potential project footprint.

Figure 12. Current mapping available for Guard Locks.

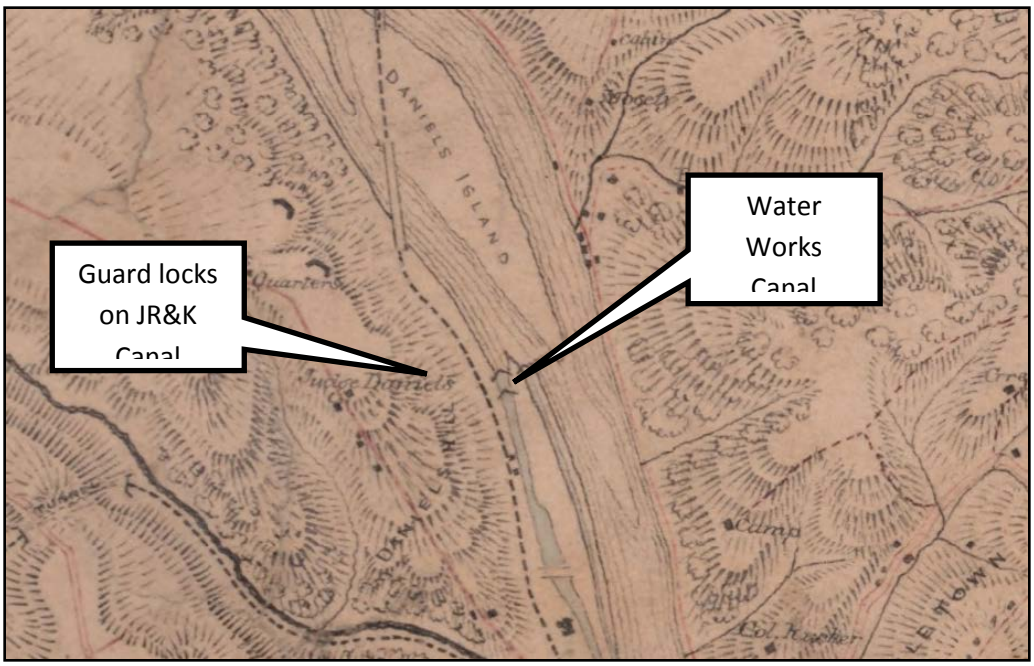

Figure 13. Civil War map depicting location of Guard Locks and Water Works Canal (Gilmer 1864).

4. FIELD METHODS

The purpose of the architectural survey was to survey and evaluate three properties located within the APE of the project; the Water Works Dam and Canal (VDHR No. 118-0209-0002), the James River Dam (VDHR No. 118-0209-0003), and the Scott's Mill Ruin (VDHR No. 118-5497). The APE for this project was established with input from the Virginia Department of Historic Resources (VDHR). Through consultation with the VDHR it was determined that these resources required survey at the Phase II/Intensive level. To accomplish this, background research was completed at the Library of Virginia and the Virginia Historical Society, as well as local libraries and historical societies. Next, H&P staff conducted a site visit to photograph and survey the architectural resources. The resources were photographed and site plans were drawn depicting the relationship of the resources to the landscape and each other.

5. RESULTS

H&P completed Phase II/Intensive surveys of three properties: the Water Works Dam and Canal (VDHR No. 118-0209-0002), the James River Dam (VDHR No. 118-0209-0003), and the Scott's Mill Ruin (VDHR No. 118-5497). The Water Works Dam and Canal and the James River Dam are considered contributing resources to the James River and Kanawha Canal Sites in Lynchburg (VDHR No. 118-5497) which was listed on the NRHP in 1984. The Scott's Mill Ruin is considered an individual site not associated with the James River and Kanawha Canal Sites in Lynchburg.

Water Works Dam and Canal (VDHR No. 118-0209-0002)

The stone Water Works Dam is a curved structure composed of massive stones that runs between the shore of the James River and Daniel's Island. Constructed between 1827 and 1829, the Water Works Dam is approximately 20 feet in height; however, the height of the Dam was raised slightly over the years. The Water Works Dam possesses integrity of location, association, design, workmanship, and materials.

Also constructed between 1827 and 1829, the Water Works Canal does not retain as much integrity as the Dam and lacks integrity of setting, design, feeling, association, workmanship, and materials. While evidence of the resource is present in the form of the stone gate, a majority of the canal has been filled in and is currently used by the Griffin Pipe Company for storage. However, the portion of the Canal that is visible demonstrates the Canal and gate were constructed of the same stone used for the Dam.

The proposed boundaries for the Water Works Dam and Canal are the same as those previously used when the resources were identified as part of the James River and Kanawha Canal Sites in Lynchburg (Figure 14). The Water Works Dam and Canal has integrity of association, design, location, workmanship, and materials; therefore the property is recommended eligible for the NRHP under Criteria A and C. The Water Works Dam and Canal is eligible under Criterion A for trends in history related to the establishment of water facilities in the United States and under Criterion C for architecture. In addition, because the dam and canal gate were integral to the later construction of the James River and Kanawha Canal, the Water Works Dam and Canal remain contributing resources to the James River and Kanawha Canal Sites NRHP nomination.

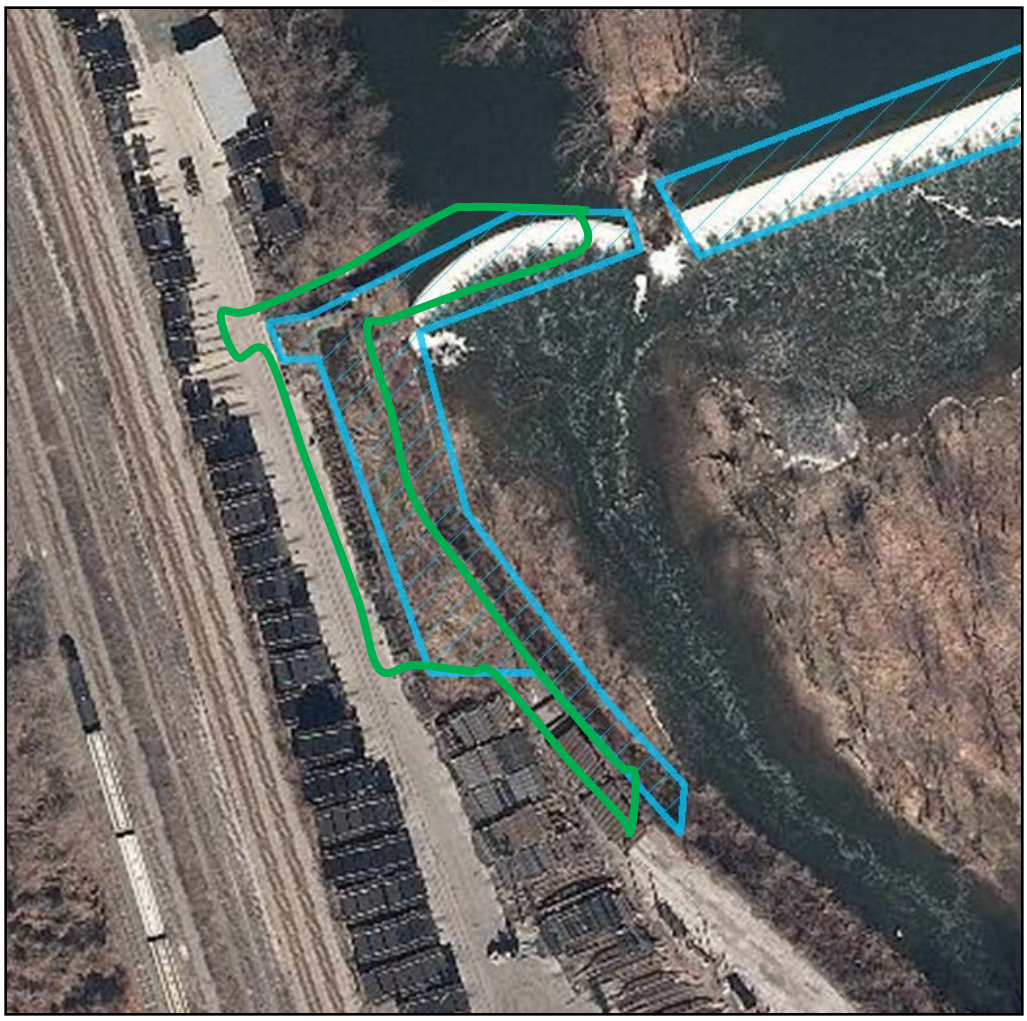

Figure 14. Proposed Boundaries for the Water Works Canal and Dam.

James River Dam (VDHR No. 118-0209-0003)

Constructed in 1883, the James River Dam is an impressive 200 foot-long structure that spans from Daniels Island to the north (river left) bank of the James River. Like the Water Works Dam, the James River Dam is composed of massive stones and stands 20 feet above the riverbed of the James River. The James River Dam possesses integrity of location, setting, design, feeling, association, workmanship, and materials. The James River Dam is recommended individually eligible for the NRHP under Criteria A and C for trends in history and architecture. It is recommended that the James River Dam be removed as a contributing resource to the James River and Kanawha Canal Sites in Lynchburg National Register nomination. The James River Dam postdates the period of significance for the James River and Kanawha Canal and its construction was independent of the Canal. The proposed boundaries for the resource remain unchanged (Figure 15).

Figure 15. Proposed Boundaries for the James River Dam.

Scott's Mill Ruin (VDHR No. 118-5497)

The Scott's Mill Ruin is located on the north shore of the James River in Amherst County. The ruin consists of two walls; the south wall and west wall. The walls are of masonry construction and consist of dry-laid stone; however, there is some evidence that concrete was also used. The concrete may be the result of repairs that were done after the initial construction of the mill. The west wall measures approximately 33 feet long and 6.8 feet wide. The height of the west wall varies from less than 3 feet to 7 feet. The south wall is approximately 80.6 feet long and the width varies from 4.6 feet to 3 feet. The south wall stands 12.4 feet tall and consists of three distinct sections. The top section measures 3.4 feet, the middle section 7 feet, and the bottom section or footing measures 2 feet.

The Scott's Mill Ruin lacks the integrity necessary to be considered eligible for the NRHP. Very little of the historic fabric of the building is left; as stated above all that is extant are the south and west walls. The ruin no longer possesses integrity of design, association, feeling,

workmanship, or materials. In addition, the Scott's Mill Ruin is not recommended eligible under Criteria A, B, C, or D. There is no known association with important people or events, the resource lacks the integrity needed to be eligible under C, and there is no research potential. The Scott's Mill Ruin is not considered a contributing resource to the James River and Kanawha Canal Sites in Lynchburg because the construction of Scott's Mill postdates the period of significance for the resource. The proposed boundaries of the Scott's Mill Ruin consist of the footprint of the resource (Figure 16).

Figure 16. Proposed Boundaries of Scott's Mill Ruin.

Guard Locks (VDHR No. 44CP0069)

The Guard Locks for the James River and Kanawha Canal are incorrectly mapped in the VDHR's V-CRIS database. Currently, the Guard Locks are mapped directly on top of the gate for the Water Works Dam and Canal. Historic maps indicate that these are two different resources and that the remnants of the Guard Locks were either buried or destroyed during the construction of the railroad. However, no archaeological fieldwork was completed to verify the location of the Guard Locks and the resource actually falls outside of the APE of the project. Therefore, H&P cannot comment on the integrity and eligibility of the Guard Locks.

6. CONCLUSIONS AND RECOMMENDATIONS

As a result of the survey, H&P recommends that the Water Works Dam and Canal (VDHR No. 118-0209-0002) remain contributing resources to the James River and Kanawha Canal Sites in Lynchburg National Register property (VDHR no. 118-0209). These resources were listed in 1984 as part of the National Register nomination. The James River Dam is recommended individually eligible for the NRHP under Criteria A and C for trends in history and architecture. H&P recommends that the James River Dam be removed as a contributing resource to the James River and Kanawha Canal Sites in Lynchburg property because the Dam postdates the period of significance of the Canal and was the result of a separate and distinct building campaign. Due to a lack of integrity, the Scott's Mill Ruin (VDHR No. 118-5497) is recommended not individually eligible for the NRHP under Criteria A, B, C, or D. There is no known association with important people or events, the resource lacks the integrity necessary to be eligible under Criterion C, and the resource does not have the potential to yield information through further study.

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EXHIBIT F

CONCEPTUAL DESIGN DRAWINGS

Scott's Mill Hydropower Project

FERC Project No. 14425

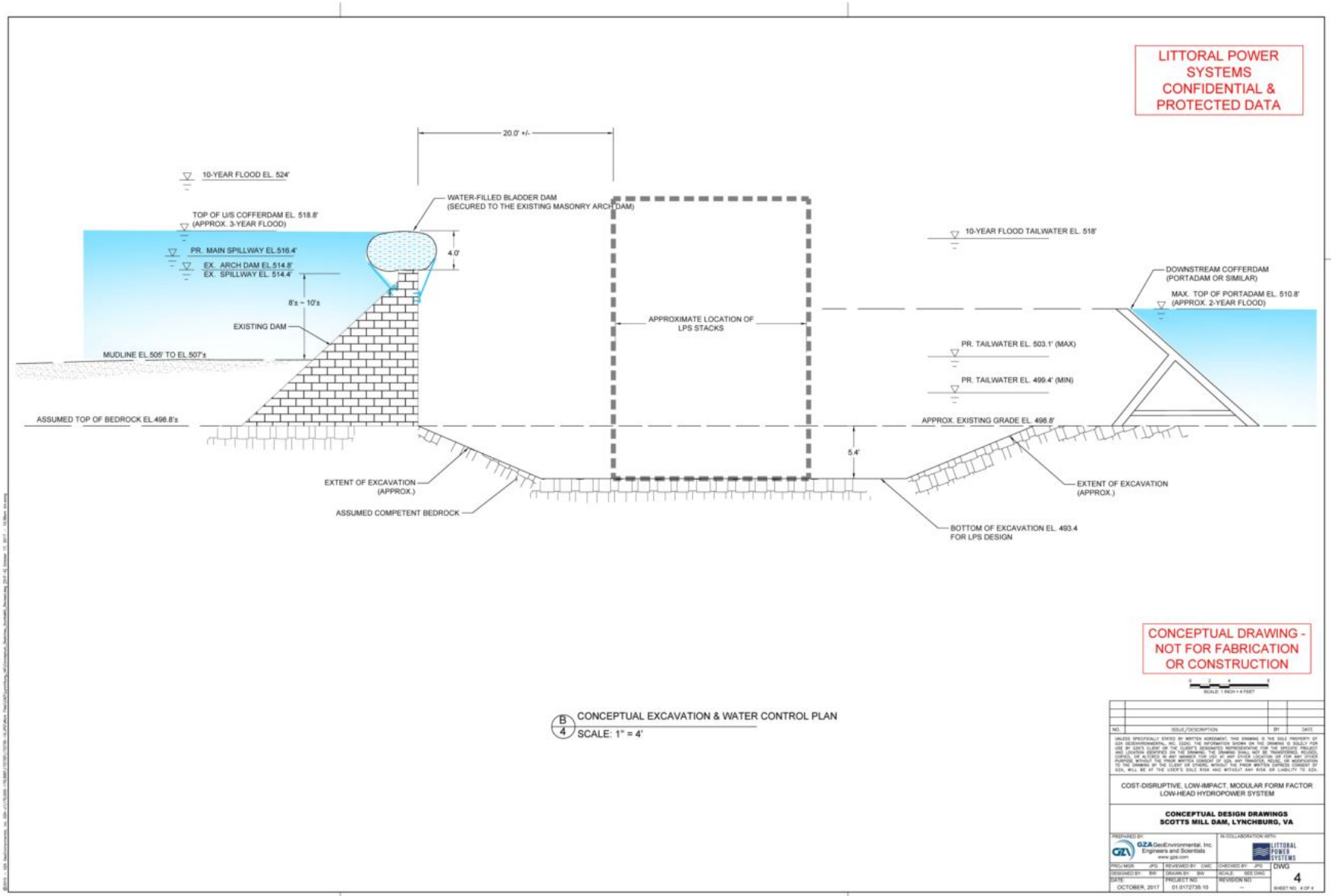


FIGURE F-1 CONCEPTUAL EVACUATION AND WATER CONTROL PLAN

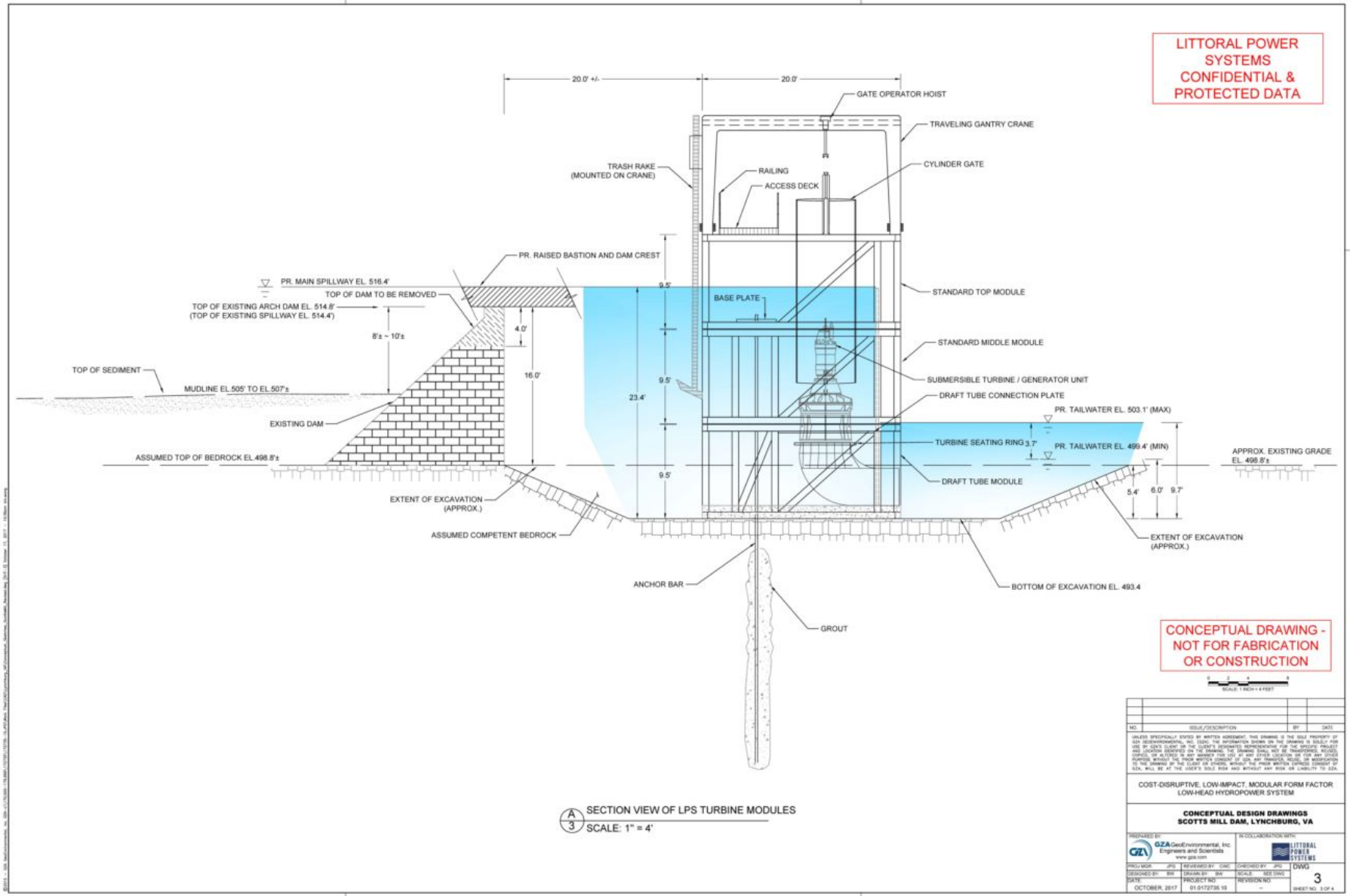
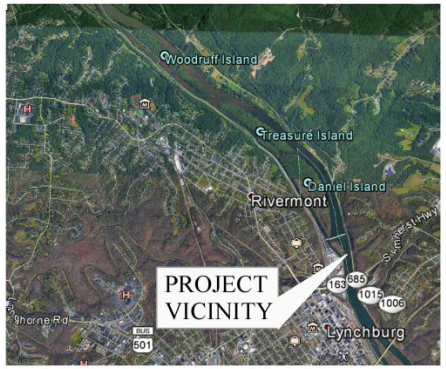


FIGURE F-2 SECTION VIEW OF LPS TURBINE MODULES

CONCEPTUAL LAMPREY AND EEL PASSAGE
SCOTT'S MILL DAM
JAMES RIVER LYNCHBURG, VA

PROJECT LOCATION MAP



PROJECT VICINITY MAP

FISHWAY NOTES & DESIGN INFORMATION

1. POWER HOUSE CAPACITY: 4500 CFS
2. HEAD POND ELEVATION (assumes hydropower operation)
   - Design high: 519.2 ft (5% exceedance)
   - Normal: 516.4 ft (50% exceedance)
   - Design low: 516.4 ft (95% exceedance)
   - Head pond range 2.8 ft
3. TAILWATER ELEVATION
   - Design high: 505.9 ft (5% exceedance)
   - Normal: 500.6 ft (50% exceedance)
   - Design low: 499.4 ft (95% exceedance)
   - Tailwater range: 6.5 ft
4. GROSS HEAD :12.5 TO 17 FT
5. RIVER FLOWS
   - Design high: 12,000 cfs (5% exceedance)
   - Average: 2,000 cfs (50% exceedance)
   - Design Low: 609 cfs (95% exceedance)
6. SEA LAMPREY/ AMERICAN EEL RAMP: 0.1 TO 0.3 CFS

GENERAL NOTES:

1. THIS CONCEPTUAL LEVEL DESIGN IS FOR REGULATORY & CLIENT REVIEW, NOT FOR CONSTRUCTION
2. THE FOLLOWING INFORMATION WAS USED IN PREPARATION OF THIS DESIGN:
   - GOOGLE EARTH AERIAL PHOTOGRAPHS
   - DRAWINGS OF THE PROPOSED POWERHOUSE DEVELOPED BY GZA GEOENVIRONMENTAL, INC., DATED OCTOBER 2017.

No.	Revision Description	Drawn	Chkd	Date
1	REVISED LOCATION & FOR REVIEW	BJM		11/8/2017
0	FOR REVIEW	BJM		10/9/2017

Drawn By: BJM
Design By: ___
Chkd By: BJM
Apvd By: ___
Date: 10/9/2017

ALDEN Solving Flow Problems Since 1894
Alden Research Laboratory, Inc.
30 SHREWSBURY ST., HOLDEN, MA (508) 829-6000

SCOTT'S MILL DAM
LYNCHBURG, VA

CONCEPTUAL LAMPREY/ EEL PASSAGE
TITLE SHEET

Job Number: 31735CTMLL

Drawing No: T-1

Sheet 1 of 3

FIGURE F-3

1 C1 PLAN

SCOTT'S MILL DAM
LYNCHBURG, VA

CONCEPTUAL LAMPREY/ EEL PASSAGE
GENERAL ARRANGEMENT

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Drwn By: BJM
Desg By: ___
Chkd By: BJM
Aprvd By: ___
Date: 10/30/17

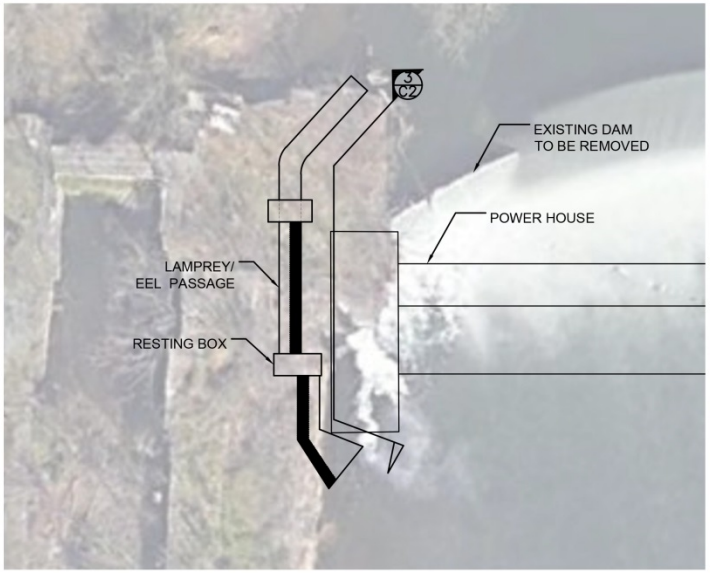
No.	Revision Description	Drwn	Chkd	Date
1	REVISED LOCATION + FOR REVIEW	BJM		11/8/2017
0	FOR REVIEW	BJM		10/30/17

Job Number:
31735CTMLL

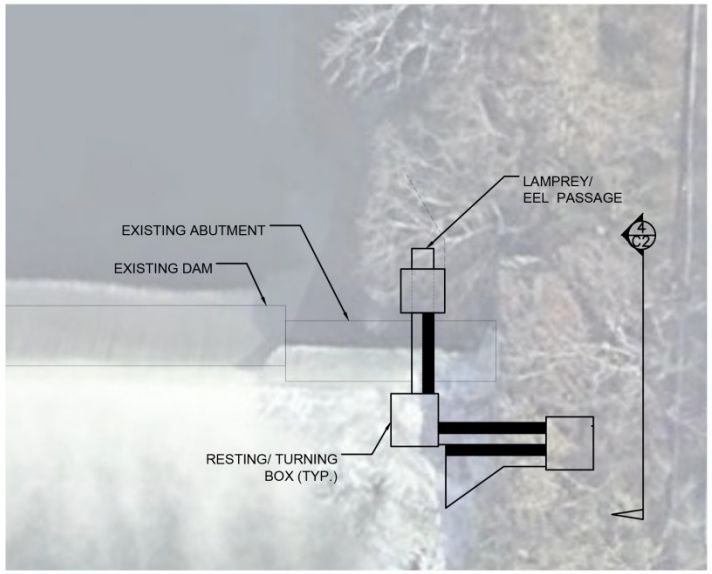
Drawing No:
C- 1

Sheet 2 of 3

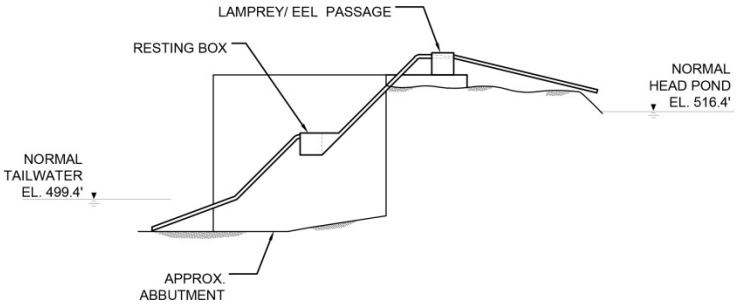
FIGURE F-4



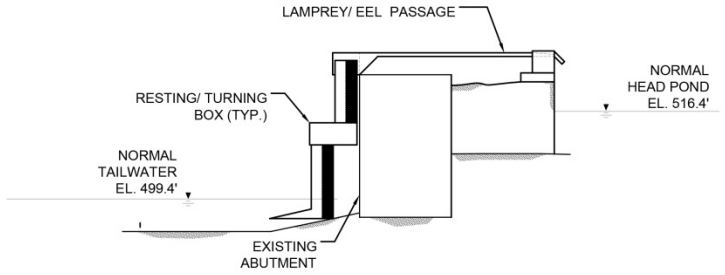
1 C2 LOCATION A DETAIL - PLAN



2 C2 LOCATION B DETAIL - PLAN



3 C2 LOCATION A DETAIL - SECTION



4 C2 LOCATION B DETAIL - SECTION

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Drwn By: RJM
Dsng By: -
Chkd By: CMM
Aprvd By: —
Date: 10/9/2017

No.	Revision Description	Drwn	Chkd	Date
1	REVISED LOCATION A FOR REVIEW	RJM		11/9/2017
0	FOR REVIEW	RJM		10/9/2017

SCOTTS MILL DAM
LYNCHBURG, VA
CONCEPTUAL LAMPREY EEL PASSAGE
DETAILS

Job Number:
31735CTMLL

Drawing No:
C-2

Sheet 3 of 3

FIGURE F-5

EXHIBIT G

PROJECT BOUNDARY

Scott's Mill Hydropower Project

FERC Project No. 14425

PROJECT BOUNDARY