

May 11, 2016

Brett Riser  
Calhoun Conservation District  
13464 Preston Drive  
Marshall, MI 49068

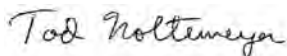
RE: Project: MARSHALL DAM SEDIMENT ANALYSIS  
Pace Project No.: 40131717

Dear Brett Riser:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Tod Noltemeyer  
tod.noltemeyer@pacelabs.com  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

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### Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302  
Florida/NELAP Certification #: E87948  
Illinois Certification #: 200050  
Kentucky Certification #: 82  
Louisiana Certification #: 04168  
Minnesota Certification #: 055-999-334  
Virginia VELAP ID: 460263  
North Dakota Certification #: R-150

South Carolina Certification #: 83006001  
Texas Certification #: T104704529-14-1  
US Dept of Agriculture #: S-76505  
Virginia VELAP Certification ID: 460263  
Virginia VELAP ID: 460263  
Wisconsin Certification #: 405132750  
Wisconsin DATCP Certification #: 105-444

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40131717001	#1 KAZOO-MARSHALL	Solid	04/26/16 11:24	05/03/16 10:40
40131717002	#2 KAZOO-MARSHALL	Solid	04/26/16 12:32	05/03/16 10:40
40131717003	#3 KAZOO-MARSHALL	Solid	04/26/16 13:08	05/03/16 10:40
40131717004	#4 KAZOO-MARSHALL	Solid	04/26/16 13:45	05/03/16 10:40
40131717005	#5 KAZOO-MARSHALL	Solid	04/26/16 14:28	05/03/16 10:40
40131717006	#6 KAZOO-MARSHALL	Solid	04/26/16 15:04	05/03/16 10:40

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## SAMPLE ANALYTE COUNT

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40131717001	#1 KAZOO-MARSHALL	EPA 8082	BDS	10
		EPA 6010	DLB	9
		EPA 7471	AJT	1
		EPA 8270 by SIM	ARO	12
		ASTM D2974-87	SKW	1
		Walkley Black	TJJ	1
40131717002	#2 KAZOO-MARSHALL	EPA 8082	BDS	10
		EPA 6010	DLB	9
		EPA 7471	AJT	1
		EPA 8270 by SIM	RJN	12
		ASTM D2974-87	SKW	1
		Walkley Black	TJJ	1
40131717003	#3 KAZOO-MARSHALL	EPA 8082	BDS	10
		EPA 6010	DLB	9
		EPA 7471	AJT	1
		EPA 8270 by SIM	ARO	12
		ASTM D2974-87	SKW	1
		Walkley Black	TJJ	1
40131717004	#4 KAZOO-MARSHALL	EPA 8082	BDS	10
		EPA 6010	DLB	9
		EPA 7471	AJT	1
		EPA 8270 by SIM	ARO	12
		ASTM D2974-87	SKW	1
		Walkley Black	TJJ	1
40131717005	#5 KAZOO-MARSHALL	EPA 8082	BDS	10
		EPA 6010	DLB	9
		EPA 7471	AJT	1
		EPA 8270 by SIM	ARO	12
		ASTM D2974-87	SKW	1
		Walkley Black	TJJ	1
40131717006	#6 KAZOO-MARSHALL	EPA 8082	BDS	10
		EPA 6010	DLB	9
		EPA 7471	AJT	1
		EPA 8270 by SIM	RJN	12
		ASTM D2974-87	SKW	1
		Walkley Black	TJJ	1

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## PROJECT NARRATIVE

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

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**Method:** EPA 8082

**Description:** 8082 GCS PCB

**Client:** Calhoun Conservation District MI

**Date:** May 11, 2016

### General Information:

6 samples were analyzed for EPA 8082. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3541 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

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**Method:** EPA 6010

**Description:** 6010 MET ICP

**Client:** Calhoun Conservation District MI

**Date:** May 11, 2016

### General Information:

6 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/13698

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 40131691001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 1329612)
- Barium

R1: RPD value was outside control limits.

- MS (Lab ID: 1329612)
- Lead
- MSD (Lab ID: 1329613)
- Lead

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

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**Method:** EPA 7471

**Description:** 7471 Mercury

**Client:** Calhoun Conservation District MI

**Date:** May 11, 2016

**General Information:**

6 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

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**Method:** EPA 8270 by SIM

**Description:** 8270 MSSV PAH by SIM

**Client:** Calhoun Conservation District MI

**Date:** May 11, 2016

### General Information:

6 samples were analyzed for EPA 8270 by SIM. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

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**Method:** Walkley Black

**Description:** Organic Carbon Walkley Black

**Client:** Calhoun Conservation District MI

**Date:** May 11, 2016

**General Information:**

6 samples were analyzed for Walkley Black. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with Walkley Black with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #1 KAZOO-MARSHALL**    **Lab ID: 40131717001**    Collected: 04/26/16 11:24    Received: 05/03/16 10:40    Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB</b> Analytical Method: EPA 8082    Preparation Method: EPA 3541									
PCB-1016 (Aroclor 1016)	<71.5	ug/kg	143	71.5	1	05/05/16 10:51	05/06/16 02:24	12674-11-2	
PCB-1221 (Aroclor 1221)	<71.5	ug/kg	143	71.5	1	05/05/16 10:51	05/06/16 02:24	11104-28-2	
PCB-1232 (Aroclor 1232)	<71.5	ug/kg	143	71.5	1	05/05/16 10:51	05/06/16 02:24	11141-16-5	
PCB-1242 (Aroclor 1242)	<71.5	ug/kg	143	71.5	1	05/05/16 10:51	05/06/16 02:24	53469-21-9	
PCB-1248 (Aroclor 1248)	<71.5	ug/kg	143	71.5	1	05/05/16 10:51	05/06/16 02:24	12672-29-6	
PCB-1254 (Aroclor 1254)	<71.5	ug/kg	143	71.5	1	05/05/16 10:51	05/06/16 02:24	11097-69-1	
PCB-1260 (Aroclor 1260)	<71.5	ug/kg	143	71.5	1	05/05/16 10:51	05/06/16 02:24	11096-82-5	
PCB, Total	<71.5	ug/kg	143	71.5	1	05/05/16 10:51	05/06/16 02:24	1336-36-3	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	76	%	63-130		1	05/05/16 10:51	05/06/16 02:24	877-09-8	
Decachlorobiphenyl (S)	66	%	48-130		1	05/05/16 10:51	05/06/16 02:24	2051-24-3	
<b>6010 MET ICP</b> Analytical Method: EPA 6010    Preparation Method: EPA 3050									
Arsenic	9.6	mg/kg	5.1	1.6	1	05/03/16 17:11	05/04/16 21:30	7440-38-2	
Barium	74.9	mg/kg	1.3	0.31	1	05/03/16 17:11	05/04/16 21:30	7440-39-3	
Cadmium	2.1	mg/kg	1.3	0.17	1	05/03/16 17:11	05/04/16 21:30	7440-43-9	
Chromium	23.4	mg/kg	2.6	0.50	1	05/03/16 17:11	05/04/16 21:30	7440-47-3	
Copper	14.7	mg/kg	2.6	0.40	1	05/03/16 17:11	05/04/16 21:30	7440-50-8	
Lead	43.1	mg/kg	3.1	1.1	1	05/03/16 17:11	05/04/16 21:30	7439-92-1	
Selenium	<2.0	mg/kg	5.1	2.0	1	05/03/16 17:11	05/04/16 21:30	7782-49-2	
Silver	<0.72	mg/kg	2.6	0.72	1	05/03/16 17:11	05/04/16 21:30	7440-22-4	
Zinc	259	mg/kg	10.3	0.99	1	05/03/16 17:11	05/04/16 21:30	7440-66-6	
<b>7471 Mercury</b> Analytical Method: EPA 7471    Preparation Method: EPA 7471									
Mercury	0.73	mg/kg	0.35	0.10	1	05/10/16 07:39	05/10/16 11:50	7439-97-6	
<b>8270 MSSV PAH by SIM</b> Analytical Method: EPA 8270 by SIM    Preparation Method: EPA 3546									
Anthracene	561	ug/kg	95.3	49.4	1	05/05/16 09:23	05/05/16 17:29	120-12-7	
Benzo(a)anthracene	1680	ug/kg	95.3	33.0	1	05/05/16 09:23	05/05/16 17:29	56-55-3	
Benzo(a)pyrene	1550	ug/kg	95.3	34.1	1	05/05/16 09:23	05/05/16 17:29	50-32-8	
Chrysene	1450	ug/kg	95.3	44.1	1	05/05/16 09:23	05/05/16 17:29	218-01-9	
Dibenz(a,h)anthracene	224	ug/kg	95.3	34.9	1	05/05/16 09:23	05/05/16 17:29	53-70-3	
Fluoranthene	3010	ug/kg	95.3	47.6	1	05/05/16 09:23	05/05/16 17:29	206-44-0	
Fluorene	121	ug/kg	95.3	47.6	1	05/05/16 09:23	05/05/16 17:29	86-73-7	
Naphthalene	88.5J	ug/kg	95.3	47.6	1	05/05/16 09:23	05/05/16 17:29	91-20-3	
Phenanthrene	1240	ug/kg	95.3	47.6	1	05/05/16 09:23	05/05/16 17:29	85-01-8	
Pyrene	2100	ug/kg	95.3	47.6	1	05/05/16 09:23	05/05/16 17:29	129-00-0	
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	48	%	26-130		1	05/05/16 09:23	05/05/16 17:29	321-60-8	
Terphenyl-d14 (S)	55	%	10-130		1	05/05/16 09:23	05/05/16 17:29	1718-51-0	
<b>Percent Moisture</b> Analytical Method: ASTM D2974-87									
Percent Moisture	65.0	%	0.10	0.10	1		05/05/16 15:12		

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #1 KAZOO-MARSHALL**      **Lab ID: 40131717001**      Collected: 04/26/16 11:24      Received: 05/03/16 10:40      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Organic Carbon Walkley Black</b>									
Analytical Method: Walkley Black    Preparation Method: Walkley Black									
Total Organic Carbon	<b>87800</b>	mg/kg	4540	1360	1	05/06/16 08:23	05/06/16 11:35	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #2 KAZOO-MARSHALL**    **Lab ID: 40131717002**    Collected: 04/26/16 12:32    Received: 05/03/16 10:40    Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB</b> Analytical Method: EPA 8082    Preparation Method: EPA 3541									
PCB-1016 (Aroclor 1016)	<110	ug/kg	219	110	1	05/05/16 10:51	05/06/16 02:42	12674-11-2	
PCB-1221 (Aroclor 1221)	<110	ug/kg	219	110	1	05/05/16 10:51	05/06/16 02:42	11104-28-2	
PCB-1232 (Aroclor 1232)	<110	ug/kg	219	110	1	05/05/16 10:51	05/06/16 02:42	11141-16-5	
PCB-1242 (Aroclor 1242)	<110	ug/kg	219	110	1	05/05/16 10:51	05/06/16 02:42	53469-21-9	
PCB-1248 (Aroclor 1248)	<110	ug/kg	219	110	1	05/05/16 10:51	05/06/16 02:42	12672-29-6	
PCB-1254 (Aroclor 1254)	<110	ug/kg	219	110	1	05/05/16 10:51	05/06/16 02:42	11097-69-1	
PCB-1260 (Aroclor 1260)	<110	ug/kg	219	110	1	05/05/16 10:51	05/06/16 02:42	11096-82-5	
PCB, Total	<110	ug/kg	219	110	1	05/05/16 10:51	05/06/16 02:42	1336-36-3	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	74	%	63-130		1	05/05/16 10:51	05/06/16 02:42	877-09-8	
Decachlorobiphenyl (S)	59	%	48-130		1	05/05/16 10:51	05/06/16 02:42	2051-24-3	
<b>6010 MET ICP</b> Analytical Method: EPA 6010    Preparation Method: EPA 3050									
Arsenic	19.7	mg/kg	7.6	2.4	1	05/03/16 17:11	05/04/16 21:32	7440-38-2	
Barium	197	mg/kg	1.9	0.45	1	05/03/16 17:11	05/04/16 21:32	7440-39-3	
Cadmium	75.3	mg/kg	1.9	0.25	1	05/03/16 17:11	05/04/16 21:32	7440-43-9	
Chromium	546	mg/kg	3.8	0.73	1	05/03/16 17:11	05/04/16 21:32	7440-47-3	
Copper	82.5	mg/kg	3.8	0.59	1	05/03/16 17:11	05/04/16 21:32	7440-50-8	
Lead	142	mg/kg	4.5	1.6	1	05/03/16 17:11	05/04/16 21:32	7439-92-1	
Selenium	3.3J	mg/kg	7.6	2.9	1	05/03/16 17:11	05/04/16 21:32	7782-49-2	
Silver	2.0J	mg/kg	3.8	1.1	1	05/03/16 17:11	05/04/16 21:32	7440-22-4	
Zinc	1400	mg/kg	15.1	1.5	1	05/03/16 17:11	05/04/16 21:32	7440-66-6	
<b>7471 Mercury</b> Analytical Method: EPA 7471    Preparation Method: EPA 7471									
Mercury	1.3	mg/kg	0.53	0.16	1	05/10/16 07:39	05/10/16 11:52	7439-97-6	
<b>8270 MSSV PAH by SIM</b> Analytical Method: EPA 8270 by SIM    Preparation Method: EPA 3546									
Anthracene	107J	ug/kg	146	75.7	1	05/05/16 09:23	05/06/16 19:53	120-12-7	
Benzo(a)anthracene	401	ug/kg	146	50.6	1	05/05/16 09:23	05/06/16 19:53	56-55-3	
Benzo(a)pyrene	444	ug/kg	146	52.2	1	05/05/16 09:23	05/06/16 19:53	50-32-8	
Chrysene	423	ug/kg	146	67.5	1	05/05/16 09:23	05/06/16 19:53	218-01-9	
Dibenz(a,h)anthracene	64.0J	ug/kg	146	53.6	1	05/05/16 09:23	05/06/16 19:53	53-70-3	
Fluoranthene	694	ug/kg	146	73.0	1	05/05/16 09:23	05/06/16 19:53	206-44-0	
Fluorene	<73.0	ug/kg	146	73.0	1	05/05/16 09:23	05/06/16 19:53	86-73-7	
Naphthalene	84.2J	ug/kg	146	73.0	1	05/05/16 09:23	05/06/16 19:53	91-20-3	
Phenanthrene	277	ug/kg	146	73.0	1	05/05/16 09:23	05/06/16 19:53	85-01-8	
Pyrene	516	ug/kg	146	73.0	1	05/05/16 09:23	05/06/16 19:53	129-00-0	
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	56	%	26-130		1	05/05/16 09:23	05/06/16 19:53	321-60-8	
Terphenyl-d14 (S)	65	%	10-130		1	05/05/16 09:23	05/06/16 19:53	1718-51-0	
<b>Percent Moisture</b> Analytical Method: ASTM D2974-87									
Percent Moisture	77.2	%	0.10	0.10	1		05/05/16 15:12		

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #2 KAZOO-MARSHALL**      **Lab ID: 40131717002**      Collected: 04/26/16 12:32      Received: 05/03/16 10:40      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Organic Carbon Walkley Black</b>									
Analytical Method: Walkley Black    Preparation Method: Walkley Black									
Total Organic Carbon	<b>130000</b>	mg/kg	4960	1490	1	05/06/16 08:23	05/06/16 11:35	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #3 KAZOO-MARSHALL**    **Lab ID: 40131717003**    Collected: 04/26/16 13:08    Received: 05/03/16 10:40    Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB</b> Analytical Method: EPA 8082    Preparation Method: EPA 3541									
PCB-1016 (Aroclor 1016)	<102	ug/kg	205	102	1	05/05/16 10:51	05/06/16 03:00	12674-11-2	
PCB-1221 (Aroclor 1221)	<102	ug/kg	205	102	1	05/05/16 10:51	05/06/16 03:00	11104-28-2	
PCB-1232 (Aroclor 1232)	<102	ug/kg	205	102	1	05/05/16 10:51	05/06/16 03:00	11141-16-5	
PCB-1242 (Aroclor 1242)	<102	ug/kg	205	102	1	05/05/16 10:51	05/06/16 03:00	53469-21-9	
PCB-1248 (Aroclor 1248)	<102	ug/kg	205	102	1	05/05/16 10:51	05/06/16 03:00	12672-29-6	
PCB-1254 (Aroclor 1254)	<102	ug/kg	205	102	1	05/05/16 10:51	05/06/16 03:00	11097-69-1	
PCB-1260 (Aroclor 1260)	<102	ug/kg	205	102	1	05/05/16 10:51	05/06/16 03:00	11096-82-5	
PCB, Total	<102	ug/kg	205	102	1	05/05/16 10:51	05/06/16 03:00	1336-36-3	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	73	%	63-130		1	05/05/16 10:51	05/06/16 03:00	877-09-8	
Decachlorobiphenyl (S)	61	%	48-130		1	05/05/16 10:51	05/06/16 03:00	2051-24-3	
<b>6010 MET ICP</b> Analytical Method: EPA 6010    Preparation Method: EPA 3050									
Arsenic	16.9	mg/kg	7.0	2.2	1	05/03/16 17:11	05/04/16 21:35	7440-38-2	
Barium	227	mg/kg	1.7	0.42	1	05/03/16 17:11	05/04/16 21:35	7440-39-3	
Cadmium	23.1	mg/kg	1.7	0.23	1	05/03/16 17:11	05/04/16 21:35	7440-43-9	
Chromium	1210	mg/kg	3.5	0.68	1	05/03/16 17:11	05/04/16 21:35	7440-47-3	
Copper	55.8	mg/kg	3.5	0.54	1	05/03/16 17:11	05/04/16 21:35	7440-50-8	
Lead	119	mg/kg	4.2	1.5	1	05/03/16 17:11	05/04/16 21:35	7439-92-1	
Selenium	<2.7	mg/kg	7.0	2.7	1	05/03/16 17:11	05/04/16 21:35	7782-49-2	
Silver	1.3J	mg/kg	3.5	0.97	1	05/03/16 17:11	05/04/16 21:35	7440-22-4	
Zinc	1690	mg/kg	14.0	1.3	1	05/03/16 17:11	05/04/16 21:35	7440-66-6	
<b>7471 Mercury</b> Analytical Method: EPA 7471    Preparation Method: EPA 7471									
Mercury	0.49	mg/kg	0.47	0.14	1	05/10/16 07:39	05/10/16 11:54	7439-97-6	
<b>8270 MSSV PAH by SIM</b> Analytical Method: EPA 8270 by SIM    Preparation Method: EPA 3546									
Anthracene	<70.8	ug/kg	136	70.8	1	05/05/16 09:23	05/05/16 17:47	120-12-7	
Benzo(a)anthracene	97.4J	ug/kg	136	47.3	1	05/05/16 09:23	05/05/16 17:47	56-55-3	
Benzo(a)pyrene	112J	ug/kg	136	48.8	1	05/05/16 09:23	05/05/16 17:47	50-32-8	
Chrysene	114J	ug/kg	136	63.1	1	05/05/16 09:23	05/05/16 17:47	218-01-9	
Dibenz(a,h)anthracene	<50.1	ug/kg	136	50.1	1	05/05/16 09:23	05/05/16 17:47	53-70-3	
Fluoranthene	179	ug/kg	136	68.2	1	05/05/16 09:23	05/05/16 17:47	206-44-0	
Fluorene	<68.2	ug/kg	136	68.2	1	05/05/16 09:23	05/05/16 17:47	86-73-7	
Naphthalene	<68.2	ug/kg	136	68.2	1	05/05/16 09:23	05/05/16 17:47	91-20-3	
Phenanthrene	81.4J	ug/kg	136	68.2	1	05/05/16 09:23	05/05/16 17:47	85-01-8	
Pyrene	138	ug/kg	136	68.2	1	05/05/16 09:23	05/05/16 17:47	129-00-0	
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	45	%	26-130		1	05/05/16 09:23	05/05/16 17:47	321-60-8	
Terphenyl-d14 (S)	58	%	10-130		1	05/05/16 09:23	05/05/16 17:47	1718-51-0	
<b>Percent Moisture</b> Analytical Method: ASTM D2974-87									
Percent Moisture	75.6	%	0.10	0.10	1		05/05/16 15:12		

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #3 KAZOO-MARSHALL**      **Lab ID: 40131717003**      Collected: 04/26/16 13:08      Received: 05/03/16 10:40      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Organic Carbon Walkley Black</b>									
Analytical Method: Walkley Black    Preparation Method: Walkley Black									
Total Organic Carbon	<b>112000</b>	mg/kg	3070	920	1	05/06/16 08:23	05/06/16 11:35	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #4 KAZOO-MARSHALL**    **Lab ID: 40131717004**    Collected: 04/26/16 13:45    Received: 05/03/16 10:40    Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB</b> Analytical Method: EPA 8082    Preparation Method: EPA 3541									
PCB-1016 (Aroclor 1016)	<101	ug/kg	201	101	1	05/05/16 10:51	05/06/16 03:18	12674-11-2	
PCB-1221 (Aroclor 1221)	<101	ug/kg	201	101	1	05/05/16 10:51	05/06/16 03:18	11104-28-2	
PCB-1232 (Aroclor 1232)	<101	ug/kg	201	101	1	05/05/16 10:51	05/06/16 03:18	11141-16-5	
PCB-1242 (Aroclor 1242)	<101	ug/kg	201	101	1	05/05/16 10:51	05/06/16 03:18	53469-21-9	
PCB-1248 (Aroclor 1248)	<101	ug/kg	201	101	1	05/05/16 10:51	05/06/16 03:18	12672-29-6	
PCB-1254 (Aroclor 1254)	<101	ug/kg	201	101	1	05/05/16 10:51	05/06/16 03:18	11097-69-1	
PCB-1260 (Aroclor 1260)	<101	ug/kg	201	101	1	05/05/16 10:51	05/06/16 03:18	11096-82-5	
PCB, Total	<101	ug/kg	201	101	1	05/05/16 10:51	05/06/16 03:18	1336-36-3	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	76	%	63-130		1	05/05/16 10:51	05/06/16 03:18	877-09-8	
Decachlorobiphenyl (S)	63	%	48-130		1	05/05/16 10:51	05/06/16 03:18	2051-24-3	
<b>6010 MET ICP</b> Analytical Method: EPA 6010    Preparation Method: EPA 3050									
Arsenic	12.4	mg/kg	6.9	2.2	1	05/03/16 17:11	05/04/16 21:37	7440-38-2	
Barium	146	mg/kg	1.7	0.41	1	05/03/16 17:11	05/04/16 21:37	7440-39-3	
Cadmium	8.1	mg/kg	1.7	0.23	1	05/03/16 17:11	05/04/16 21:37	7440-43-9	
Chromium	176	mg/kg	3.5	0.67	1	05/03/16 17:11	05/04/16 21:37	7440-47-3	
Copper	23.9	mg/kg	3.5	0.54	1	05/03/16 17:11	05/04/16 21:37	7440-50-8	
Lead	54.6	mg/kg	4.1	1.5	1	05/03/16 17:11	05/04/16 21:37	7439-92-1	
Selenium	<2.7	mg/kg	6.9	2.7	1	05/03/16 17:11	05/04/16 21:37	7782-49-2	
Silver	<0.96	mg/kg	3.5	0.96	1	05/03/16 17:11	05/04/16 21:37	7440-22-4	
Zinc	425	mg/kg	13.8	1.3	1	05/03/16 17:11	05/04/16 21:37	7440-66-6	
<b>7471 Mercury</b> Analytical Method: EPA 7471    Preparation Method: EPA 7471									
Mercury	0.34J	mg/kg	0.46	0.14	1	05/10/16 07:39	05/10/16 11:56	7439-97-6	
<b>8270 MSSV PAH by SIM</b> Analytical Method: EPA 8270 by SIM    Preparation Method: EPA 3546									
Anthracene	<69.6	ug/kg	134	69.6	1	05/05/16 09:23	05/05/16 18:04	120-12-7	
Benzo(a)anthracene	60.2J	ug/kg	134	46.5	1	05/05/16 09:23	05/05/16 18:04	56-55-3	
Benzo(a)pyrene	61.0J	ug/kg	134	48.0	1	05/05/16 09:23	05/05/16 18:04	50-32-8	
Chrysene	<62.0	ug/kg	134	62.0	1	05/05/16 09:23	05/05/16 18:04	218-01-9	
Dibenz(a,h)anthracene	<49.2	ug/kg	134	49.2	1	05/05/16 09:23	05/05/16 18:04	53-70-3	
Fluoranthene	102J	ug/kg	134	67.1	1	05/05/16 09:23	05/05/16 18:04	206-44-0	
Fluorene	<67.1	ug/kg	134	67.1	1	05/05/16 09:23	05/05/16 18:04	86-73-7	
Naphthalene	92.9J	ug/kg	134	67.1	1	05/05/16 09:23	05/05/16 18:04	91-20-3	
Phenanthrene	80.8J	ug/kg	134	67.1	1	05/05/16 09:23	05/05/16 18:04	85-01-8	
Pyrene	85.8J	ug/kg	134	67.1	1	05/05/16 09:23	05/05/16 18:04	129-00-0	
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	26	%	26-130		1	05/05/16 09:23	05/05/16 18:04	321-60-8	
Terphenyl-d14 (S)	42	%	10-130		1	05/05/16 09:23	05/05/16 18:04	1718-51-0	
<b>Percent Moisture</b> Analytical Method: ASTM D2974-87									
Percent Moisture	75.2	%	0.10	0.10	1		05/05/16 15:12		

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #4 KAZOO-MARSHALL**      **Lab ID: 40131717004**      Collected: 04/26/16 13:45      Received: 05/03/16 10:40      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Organic Carbon Walkley Black      Analytical Method: Walkley Black      Preparation Method: Walkley Black									
Total Organic Carbon	<b>102000</b>	mg/kg	3580	1070	1	05/06/16 08:23	05/06/16 11:35	7440-44-0	

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #5 KAZOO-MARSHALL Lab ID: 40131717005** Collected: 04/26/16 14:28 Received: 05/03/16 10:40 Matrix: Solid

**Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.**

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB</b> Analytical Method: EPA 8082 Preparation Method: EPA 3541									
PCB-1016 (Aroclor 1016)	<113	ug/kg	226	113	1	05/05/16 10:51	05/06/16 03:35	12674-11-2	
PCB-1221 (Aroclor 1221)	<113	ug/kg	226	113	1	05/05/16 10:51	05/06/16 03:35	11104-28-2	
PCB-1232 (Aroclor 1232)	<113	ug/kg	226	113	1	05/05/16 10:51	05/06/16 03:35	11141-16-5	
PCB-1242 (Aroclor 1242)	<113	ug/kg	226	113	1	05/05/16 10:51	05/06/16 03:35	53469-21-9	
PCB-1248 (Aroclor 1248)	<113	ug/kg	226	113	1	05/05/16 10:51	05/06/16 03:35	12672-29-6	
PCB-1254 (Aroclor 1254)	<113	ug/kg	226	113	1	05/05/16 10:51	05/06/16 03:35	11097-69-1	
PCB-1260 (Aroclor 1260)	<113	ug/kg	226	113	1	05/05/16 10:51	05/06/16 03:35	11096-82-5	
PCB, Total	<113	ug/kg	226	113	1	05/05/16 10:51	05/06/16 03:35	1336-36-3	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	74	%	63-130		1	05/05/16 10:51	05/06/16 03:35	877-09-8	
Decachlorobiphenyl (S)	54	%	48-130		1	05/05/16 10:51	05/06/16 03:35	2051-24-3	
<b>6010 MET ICP</b> Analytical Method: EPA 6010 Preparation Method: EPA 3050									
Arsenic	14.8	mg/kg	7.7	2.4	1	05/03/16 17:11	05/04/16 21:40	7440-38-2	
Barium	128	mg/kg	1.9	0.46	1	05/03/16 17:11	05/04/16 21:40	7440-39-3	
Cadmium	11.0	mg/kg	1.9	0.25	1	05/03/16 17:11	05/04/16 21:40	7440-43-9	
Chromium	209	mg/kg	3.8	0.74	1	05/03/16 17:11	05/04/16 21:40	7440-47-3	
Copper	33.6	mg/kg	3.8	0.60	1	05/03/16 17:11	05/04/16 21:40	7440-50-8	
Lead	73.7	mg/kg	4.6	1.6	1	05/03/16 17:11	05/04/16 21:40	7439-92-1	
Selenium	3.0J	mg/kg	7.7	3.0	1	05/03/16 17:11	05/04/16 21:40	7782-49-2	
Silver	<1.1	mg/kg	3.8	1.1	1	05/03/16 17:11	05/04/16 21:40	7440-22-4	
Zinc	578	mg/kg	15.3	1.5	1	05/03/16 17:11	05/04/16 21:40	7440-66-6	
<b>7471 Mercury</b> Analytical Method: EPA 7471 Preparation Method: EPA 7471									
Mercury	0.34J	mg/kg	0.54	0.16	1	05/10/16 07:39	05/10/16 11:59	7439-97-6	
<b>8270 MSSV PAH by SIM</b> Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546									
Anthracene	4480	ug/kg	753	390	5	05/05/16 09:23	05/06/16 12:10	120-12-7	
Benzo(a)anthracene	8520	ug/kg	753	261	5	05/05/16 09:23	05/06/16 12:10	56-55-3	
Benzo(a)pyrene	7650	ug/kg	753	269	5	05/05/16 09:23	05/06/16 12:10	50-32-8	
Chrysene	7260	ug/kg	753	348	5	05/05/16 09:23	05/06/16 12:10	218-01-9	
Dibenz(a,h)anthracene	1070	ug/kg	753	276	5	05/05/16 09:23	05/06/16 12:10	53-70-3	
Fluoranthene	19700	ug/kg	753	377	5	05/05/16 09:23	05/06/16 12:10	206-44-0	
Fluorene	1890	ug/kg	753	377	5	05/05/16 09:23	05/06/16 12:10	86-73-7	
Naphthalene	660J	ug/kg	753	377	5	05/05/16 09:23	05/06/16 12:10	91-20-3	
Phenanthrene	16700	ug/kg	753	377	5	05/05/16 09:23	05/06/16 12:10	85-01-8	
Pyrene	13000	ug/kg	753	377	5	05/05/16 09:23	05/06/16 12:10	129-00-0	
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	27	%	26-130		5	05/05/16 09:23	05/06/16 12:10	321-60-8	
Terphenyl-d14 (S)	46	%	10-130		5	05/05/16 09:23	05/06/16 12:10	1718-51-0	
<b>Percent Moisture</b> Analytical Method: ASTM D2974-87									
Percent Moisture	77.9	%	0.10	0.10	1		05/05/16 15:13		

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #5 KAZOO-MARSHALL**      **Lab ID: 40131717005**      Collected: 04/26/16 14:28      Received: 05/03/16 10:40      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Organic Carbon Walkley Black</b>									
Analytical Method: Walkley Black    Preparation Method: Walkley Black									
Total Organic Carbon	<b>133000</b>	mg/kg	3830	1150	1	05/06/16 08:23	05/06/16 11:35	7440-44-0	

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #6 KAZOO-MARSHALL**    **Lab ID: 40131717006**    Collected: 04/26/16 15:04    Received: 05/03/16 10:40    Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB</b> Analytical Method: EPA 8082    Preparation Method: EPA 3541									
PCB-1016 (Aroclor 1016)	<106	ug/kg	212	106	1	05/05/16 10:51	05/06/16 01:31	12674-11-2	
PCB-1221 (Aroclor 1221)	<106	ug/kg	212	106	1	05/05/16 10:51	05/06/16 01:31	11104-28-2	
PCB-1232 (Aroclor 1232)	<106	ug/kg	212	106	1	05/05/16 10:51	05/06/16 01:31	11141-16-5	
PCB-1242 (Aroclor 1242)	<106	ug/kg	212	106	1	05/05/16 10:51	05/06/16 01:31	53469-21-9	
PCB-1248 (Aroclor 1248)	<106	ug/kg	212	106	1	05/05/16 10:51	05/06/16 01:31	12672-29-6	
PCB-1254 (Aroclor 1254)	<106	ug/kg	212	106	1	05/05/16 10:51	05/06/16 01:31	11097-69-1	
PCB-1260 (Aroclor 1260)	<106	ug/kg	212	106	1	05/05/16 10:51	05/06/16 01:31	11096-82-5	
PCB, Total	<106	ug/kg	212	106	1	05/05/16 10:51	05/06/16 01:31	1336-36-3	
<b>Surrogates</b>									
Tetrachloro-m-xylene (S)	76	%	63-130		1	05/05/16 10:51	05/06/16 01:31	877-09-8	
Decachlorobiphenyl (S)	64	%	48-130		1	05/05/16 10:51	05/06/16 01:31	2051-24-3	
<b>6010 MET ICP</b> Analytical Method: EPA 6010    Preparation Method: EPA 3050									
Arsenic	10.4	mg/kg	7.9	2.5	1	05/03/16 17:11	05/04/16 21:42	7440-38-2	
Barium	112	mg/kg	2.0	0.47	1	05/03/16 17:11	05/04/16 21:42	7440-39-3	
Cadmium	6.4	mg/kg	2.0	0.26	1	05/03/16 17:11	05/04/16 21:42	7440-43-9	
Chromium	109	mg/kg	3.9	0.76	1	05/03/16 17:11	05/04/16 21:42	7440-47-3	
Copper	26.7	mg/kg	3.9	0.61	1	05/03/16 17:11	05/04/16 21:42	7440-50-8	
Lead	60.1	mg/kg	4.7	1.7	1	05/03/16 17:11	05/04/16 21:42	7439-92-1	
Selenium	<3.0	mg/kg	7.9	3.0	1	05/03/16 17:11	05/04/16 21:42	7782-49-2	
Silver	<1.1	mg/kg	3.9	1.1	1	05/03/16 17:11	05/04/16 21:42	7440-22-4	
Zinc	352	mg/kg	15.7	1.5	1	05/03/16 17:11	05/04/16 21:42	7440-66-6	
<b>7471 Mercury</b> Analytical Method: EPA 7471    Preparation Method: EPA 7471									
Mercury	0.21J	mg/kg	0.50	0.15	1	05/10/16 07:39	05/10/16 12:01	7439-97-6	
<b>8270 MSSV PAH by SIM</b> Analytical Method: EPA 8270 by SIM    Preparation Method: EPA 3546									
Anthracene	899	ug/kg	141	73.1	1	05/09/16 09:23	05/09/16 13:35	120-12-7	
Benzo(a)anthracene	1930	ug/kg	141	48.9	1	05/09/16 09:23	05/09/16 13:35	56-55-3	
Benzo(a)pyrene	2060	ug/kg	141	50.4	1	05/09/16 09:23	05/09/16 13:35	50-32-8	
Chrysene	2290	ug/kg	141	65.2	1	05/09/16 09:23	05/09/16 13:35	218-01-9	
Dibenz(a,h)anthracene	406	ug/kg	141	51.7	1	05/09/16 09:23	05/09/16 13:35	53-70-3	
Fluoranthene	4680	ug/kg	141	70.5	1	05/09/16 09:23	05/09/16 13:35	206-44-0	
Fluorene	180	ug/kg	141	70.5	1	05/09/16 09:23	05/09/16 13:35	86-73-7	
Naphthalene	73.7J	ug/kg	141	70.5	1	05/09/16 09:23	05/09/16 13:35	91-20-3	
Phenanthrene	2420	ug/kg	141	70.5	1	05/09/16 09:23	05/09/16 13:35	85-01-8	
Pyrene	3430	ug/kg	141	70.5	1	05/09/16 09:23	05/09/16 13:35	129-00-0	
<b>Surrogates</b>									
2-Fluorobiphenyl (S)	36	%	26-130		1	05/09/16 09:23	05/09/16 13:35	321-60-8	
Terphenyl-d14 (S)	44	%	10-130		1	05/09/16 09:23	05/09/16 13:35	1718-51-0	
<b>Percent Moisture</b> Analytical Method: ASTM D2974-87									
Percent Moisture	76.4	%	0.10	0.10	1		05/05/16 15:13		

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## ANALYTICAL RESULTS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

**Sample: #6 KAZOO-MARSHALL**      **Lab ID: 40131717006**      Collected: 04/26/16 15:04      Received: 05/03/16 10:40      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Organic Carbon Walkley Black</b>									
Analytical Method: Walkley Black    Preparation Method: Walkley Black									
Total Organic Carbon	<b>113000</b>	mg/kg	3930	1180	1	05/06/16 08:23	05/06/16 11:35	7440-44-0	

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

QC Batch: MERP/5731

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 40131717001, 40131717002, 40131717003, 40131717004, 40131717005, 40131717006

METHOD BLANK: 1330579

Matrix: Solid

Associated Lab Samples: 40131717001, 40131717002, 40131717003, 40131717004, 40131717005, 40131717006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.037	0.12	0.037	05/10/16 11:13	

LABORATORY CONTROL SAMPLE: 1330580

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.83	0.87	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1330581 1330582

Parameter	Units	40131686001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	<0.038	.87	.87	0.93	0.91	107	104	85-115	2	20	

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

QC Batch: MPRP/13698

Analysis Method: EPA 6010

QC Batch Method: EPA 3050

Analysis Description: 6010 MET

Associated Lab Samples: 40131717001, 40131717002, 40131717003, 40131717004, 40131717005, 40131717006

METHOD BLANK: 1329610

Matrix: Solid

Associated Lab Samples: 40131717001, 40131717002, 40131717003, 40131717004, 40131717005, 40131717006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.64	2.0	0.64	05/04/16 20:47	
Barium	mg/kg	<0.12	0.50	0.12	05/04/16 20:47	
Cadmium	mg/kg	<0.066	0.50	0.066	05/04/16 20:47	
Chromium	mg/kg	<0.19	1.0	0.19	05/04/16 20:47	
Copper	mg/kg	<0.16	1.0	0.16	05/04/16 20:47	
Lead	mg/kg	<0.43	1.2	0.43	05/04/16 20:47	
Selenium	mg/kg	<0.77	2.0	0.77	05/04/16 20:47	
Silver	mg/kg	<0.28	1.0	0.28	05/04/16 20:47	
Zinc	mg/kg	<0.39	4.0	0.39	05/04/16 20:47	

LABORATORY CONTROL SAMPLE: 1329611

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	50.4	101	80-120	
Barium	mg/kg	50	50.1	100	80-120	
Cadmium	mg/kg	50	51.3	103	80-120	
Chromium	mg/kg	50	51.0	102	80-120	
Copper	mg/kg	50	52.2	104	80-120	
Lead	mg/kg	50	52.0	104	80-120	
Selenium	mg/kg	50	51.3	103	80-120	
Silver	mg/kg	25	25.6	102	80-120	
Zinc	mg/kg	50	52.7	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1329612 1329613

Parameter	Units	40131691001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	7.5	63.6	64	65.6	63.5	91	87	75-125	3	20	
Barium	mg/kg	165	63.6	64	253	231	138	103	75-125	9	20 M0	
Cadmium	mg/kg	<0.084	63.6	64	60.5	60.4	95	94	75-125	0	20	
Chromium	mg/kg	28.1	63.6	64	89.5	87.3	97	92	75-125	3	20	
Copper	mg/kg	16.1	63.6	64	79.1	75.8	99	93	75-125	4	20	
Lead	mg/kg	19.1	63.6	64	98.4	79.5	125	94	75-125	21	20 R1	
Selenium	mg/kg	1.1J	63.6	64	58.8	58.7	91	90	75-125	0	20	
Silver	mg/kg	<0.35	31.9	32	30.2	29.9	95	93	75-125	1	20	
Zinc	mg/kg	60.7	63.6	64	140	119	124	92	75-125	16	20	

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

QC Batch:	OEXT/30325	Analysis Method:	EPA 8082
QC Batch Method:	EPA 3541	Analysis Description:	8082 GCS PCB
Associated Lab Samples:	40131717001, 40131717002, 40131717003, 40131717004, 40131717005, 40131717006		

METHOD BLANK: 1330640

Matrix: Solid

Associated Lab Samples: 40131717001, 40131717002, 40131717003, 40131717004, 40131717005, 40131717006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	<25.0	50.0	25.0	05/05/16 23:09	
PCB-1221 (Aroclor 1221)	ug/kg	<25.0	50.0	25.0	05/05/16 23:09	
PCB-1232 (Aroclor 1232)	ug/kg	<25.0	50.0	25.0	05/05/16 23:09	
PCB-1242 (Aroclor 1242)	ug/kg	<25.0	50.0	25.0	05/05/16 23:09	
PCB-1248 (Aroclor 1248)	ug/kg	<25.0	50.0	25.0	05/05/16 23:09	
PCB-1254 (Aroclor 1254)	ug/kg	<25.0	50.0	25.0	05/05/16 23:09	
PCB-1260 (Aroclor 1260)	ug/kg	<25.0	50.0	25.0	05/05/16 23:09	
Decachlorobiphenyl (S)	%	84	48-130		05/05/16 23:09	
Tetrachloro-m-xylene (S)	%	77	63-130		05/05/16 23:09	

LABORATORY CONTROL SAMPLE: 1330641

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg		<25.0			
PCB-1221 (Aroclor 1221)	ug/kg		<25.0			
PCB-1232 (Aroclor 1232)	ug/kg		<25.0			
PCB-1242 (Aroclor 1242)	ug/kg		<25.0			
PCB-1248 (Aroclor 1248)	ug/kg		<25.0			
PCB-1254 (Aroclor 1254)	ug/kg		<25.0			
PCB-1260 (Aroclor 1260)	ug/kg	500	446	89	55-130	
Decachlorobiphenyl (S)	%			83	48-130	
Tetrachloro-m-xylene (S)	%			75	63-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1330642 1330643

Parameter	Units	40131819001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
PCB-1016 (Aroclor 1016)	ug/kg	<5.2			<25.9	<25.9					20	
		mg/kg										
PCB-1221 (Aroclor 1221)	ug/kg	<5.2			<25.9	<25.9					20	
		mg/kg										
PCB-1232 (Aroclor 1232)	ug/kg	<5.2			<25.9	<25.9					20	
		mg/kg										
PCB-1242 (Aroclor 1242)	ug/kg	<5.2			<25.9	<25.9					20	
		mg/kg										
PCB-1248 (Aroclor 1248)	ug/kg	<5.2			<25.9	<25.9					20	
		mg/kg										
PCB-1254 (Aroclor 1254)	ug/kg	<5.2			<25.9	<25.9					20	
		mg/kg										

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1330642 1330643												
Parameter	Units	40131819001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
PCB-1260 (Aroclor 1260)	ug/kg	<5.2 mg/kg	517	517	413	394	80	76	40-130	5	20	
Decachlorobiphenyl (S)	%						76	74	48-130			
Tetrachloro-m-xylene (S)	%						78	76	63-130			

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

QC Batch: OEXT/30324 Analysis Method: EPA 8270 by SIM  
QC Batch Method: EPA 3546 Analysis Description: 8270/3546 MSSV PAH by SIM  
Associated Lab Samples: 40131717001, 40131717002, 40131717003, 40131717004, 40131717005

METHOD BLANK: 1330474 Matrix: Solid  
Associated Lab Samples: 40131717001, 40131717002, 40131717003, 40131717004, 40131717005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Anthracene	ug/kg	<8.6	16.7	8.6	05/05/16 13:46	
Benzo(a)anthracene	ug/kg	<5.8	16.7	5.8	05/05/16 13:46	
Benzo(a)pyrene	ug/kg	<6.0	16.7	6.0	05/05/16 13:46	
Chrysene	ug/kg	<7.7	16.7	7.7	05/05/16 13:46	
Dibenz(a,h)anthracene	ug/kg	<6.1	16.7	6.1	05/05/16 13:46	
Fluoranthene	ug/kg	<8.3	16.7	8.3	05/05/16 13:46	
Fluorene	ug/kg	<8.3	16.7	8.3	05/05/16 13:46	
Naphthalene	ug/kg	<8.3	16.7	8.3	05/05/16 13:46	
Phenanthrene	ug/kg	<8.3	16.7	8.3	05/05/16 13:46	
Pyrene	ug/kg	<8.3	16.7	8.3	05/05/16 13:46	
2-Fluorobiphenyl (S)	%	70	26-130		05/05/16 13:46	
Terphenyl-d14 (S)	%	84	10-130		05/05/16 13:46	

LABORATORY CONTROL SAMPLE: 1330475

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Anthracene	ug/kg	333	270	81	70-130	
Benzo(a)anthracene	ug/kg	333	253	76	58-130	
Benzo(a)pyrene	ug/kg	333	272	82	58-130	
Chrysene	ug/kg	333	268	80	64-130	
Dibenz(a,h)anthracene	ug/kg	333	273	82	44-130	
Fluoranthene	ug/kg	333	266	80	59-130	
Fluorene	ug/kg	333	233	70	56-130	
Naphthalene	ug/kg	333	247	74	46-130	
Phenanthrene	ug/kg	333	262	79	56-130	
Pyrene	ug/kg	333	233	70	59-130	
2-Fluorobiphenyl (S)	%			71	26-130	
Terphenyl-d14 (S)	%			80	10-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1330476 1330477

Parameter	Units	40131605007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Anthracene	ug/kg	<9.2	354	354	249	242	70	68	61-130	3	29	
Benzo(a)anthracene	ug/kg	<6.1	354	354	231	222	65	63	45-130	4	28	
Benzo(a)pyrene	ug/kg	<6.3	354	354	249	239	70	68	39-130	4	34	
Chrysene	ug/kg	<8.2	354	354	248	239	70	68	46-130	4	37	
Dibenz(a,h)anthracene	ug/kg	<6.5	354	354	248	236	70	67	33-130	5	34	

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1330476 1330477											
Parameter	Units	40131605007 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max	
			Spike Conc.	Spike Conc.						RPD	RPD
Fluoranthene	ug/kg	<8.8	354	354	245	235	69	66	41-130	4	25
Fluorene	ug/kg	<8.8	354	354	214	207	60	59	49-130	3	30
Naphthalene	ug/kg	<8.8	354	354	230	222	65	63	39-130	4	26
Phenanthrene	ug/kg	<8.8	354	354	243	232	69	65	47-130	5	26
Pyrene	ug/kg	<8.8	354	354	233	207	66	59	37-130	12	30
2-Fluorobiphenyl (S)	%						61	59	26-130		
Terphenyl-d14 (S)	%						68	66	10-130		

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS  
Pace Project No.: 40131717

QC Batch:	OEXT/30334	Analysis Method:	EPA 8270 by SIM
QC Batch Method:	EPA 3546	Analysis Description:	8270/3546 MSSV PAH by SIM
Associated Lab Samples:	40131717006		

METHOD BLANK: 1331956 Matrix: Solid  
Associated Lab Samples: 40131717006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Anthracene	ug/kg	<8.6	16.7	8.6	05/09/16 11:34	
Benzo(a)anthracene	ug/kg	<5.8	16.7	5.8	05/09/16 11:34	
Benzo(a)pyrene	ug/kg	<6.0	16.7	6.0	05/09/16 11:34	
Chrysene	ug/kg	<7.7	16.7	7.7	05/09/16 11:34	
Dibenz(a,h)anthracene	ug/kg	<6.1	16.7	6.1	05/09/16 11:34	
Fluoranthene	ug/kg	<8.3	16.7	8.3	05/09/16 11:34	
Fluorene	ug/kg	<8.3	16.7	8.3	05/09/16 11:34	
Naphthalene	ug/kg	<8.3	16.7	8.3	05/09/16 11:34	
Phenanthrene	ug/kg	<8.3	16.7	8.3	05/09/16 11:34	
Pyrene	ug/kg	<8.3	16.7	8.3	05/09/16 11:34	
2-Fluorobiphenyl (S)	%	64	26-130		05/09/16 11:34	
Terphenyl-d14 (S)	%	73	10-130		05/09/16 11:34	

LABORATORY CONTROL SAMPLE: 1331957

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Anthracene	ug/kg	333	283	85	70-130	
Benzo(a)anthracene	ug/kg	333	228	68	58-130	
Benzo(a)pyrene	ug/kg	333	265	80	58-130	
Chrysene	ug/kg	333	271	81	64-130	
Dibenz(a,h)anthracene	ug/kg	333	273	82	44-130	
Fluoranthene	ug/kg	333	268	81	59-130	
Fluorene	ug/kg	333	227	68	56-130	
Naphthalene	ug/kg	333	245	74	46-130	
Phenanthrene	ug/kg	333	264	79	56-130	
Pyrene	ug/kg	333	234	70	59-130	
2-Fluorobiphenyl (S)	%			68	26-130	
Terphenyl-d14 (S)	%			78	10-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1331958 1331959

Parameter	Units	40131841009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Anthracene	ug/kg	<10.8	418	418	335	333	80	80	61-130	1	29	
Benzo(a)anthracene	ug/kg	<7.2	418	418	266	266	63	64	45-130	0	28	
Benzo(a)pyrene	ug/kg	<7.5	418	418	335	331	80	79	39-130	1	34	
Chrysene	ug/kg	<9.7	418	418	320	320	76	76	46-130	0	37	
Dibenz(a,h)anthracene	ug/kg	<7.7	418	418	337	335	81	80	33-130	1	34	

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1331958 1331959											
Parameter	Units	40131841009 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max	
			Spike Conc.	Spike Conc.						RPD	RPD
Fluoranthene	ug/kg	<10.5	418	418	316	316	75	76	41-130	0	25
Fluorene	ug/kg	<10.5	418	418	266	263	64	63	49-130	1	30
Naphthalene	ug/kg	<10.5	418	418	288	281	69	67	39-130	3	26
Phenanthrene	ug/kg	<10.5	418	418	306	306	73	73	47-130	0	26
Pyrene	ug/kg	<10.5	418	418	275	274	66	65	37-130	0	30
2-Fluorobiphenyl (S)	%						59	56	26-130		
Terphenyl-d14 (S)	%						68	66	10-130		

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

QC Batch:	PMST/12692	Analysis Method:	ASTM D2974-87
QC Batch Method:	ASTM D2974-87	Analysis Description:	Dry Weight/Percent Moisture
Associated Lab Samples:	40131717001, 40131717002, 40131717003, 40131717004, 40131717005, 40131717006		

SAMPLE DUPLICATE: 1330886

Parameter	Units	40131778001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	2.3	2.4	5	10	

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## QUALITY CONTROL DATA

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

QC Batch: WETA/33511 Analysis Method: Walkley Black  
QC Batch Method: Walkley Black Analysis Description: Organic Carbon  
Associated Lab Samples: 40131717001, 40131717002, 40131717003, 40131717004, 40131717005, 40131717006

METHOD BLANK: 1330420 Matrix: Solid  
Associated Lab Samples: 40131717001, 40131717002, 40131717003, 40131717004, 40131717005, 40131717006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/kg	<193	644	193	05/06/16 11:34	

LABORATORY CONTROL SAMPLE: 1330421

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/kg	16000	14900	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1330422 1330423

Parameter	Units	40131572001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/kg	7830	42100	42100	47000	47800	93	95	80-120	2	20	

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## QUALIFIERS

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### BATCH QUALIFIERS

Batch: WETA/33529

[WB] Results reported on dry weight basis per cited method.

### ANALYTE QUALIFIERS

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: MARSHALL DAM SEDIMENT ANALYSIS

Pace Project No.: 40131717

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40131717001	#1 KAZOO-MARSHALL	EPA 3541	OEXT/30325	EPA 8082	GCSV/14359
40131717002	#2 KAZOO-MARSHALL	EPA 3541	OEXT/30325	EPA 8082	GCSV/14359
40131717003	#3 KAZOO-MARSHALL	EPA 3541	OEXT/30325	EPA 8082	GCSV/14359
40131717004	#4 KAZOO-MARSHALL	EPA 3541	OEXT/30325	EPA 8082	GCSV/14359
40131717005	#5 KAZOO-MARSHALL	EPA 3541	OEXT/30325	EPA 8082	GCSV/14359
40131717006	#6 KAZOO-MARSHALL	EPA 3541	OEXT/30325	EPA 8082	GCSV/14359
40131717001	#1 KAZOO-MARSHALL	EPA 3050	MPRP/13698	EPA 6010	ICP/12186
40131717002	#2 KAZOO-MARSHALL	EPA 3050	MPRP/13698	EPA 6010	ICP/12186
40131717003	#3 KAZOO-MARSHALL	EPA 3050	MPRP/13698	EPA 6010	ICP/12186
40131717004	#4 KAZOO-MARSHALL	EPA 3050	MPRP/13698	EPA 6010	ICP/12186
40131717005	#5 KAZOO-MARSHALL	EPA 3050	MPRP/13698	EPA 6010	ICP/12186
40131717006	#6 KAZOO-MARSHALL	EPA 3050	MPRP/13698	EPA 6010	ICP/12186
40131717001	#1 KAZOO-MARSHALL	EPA 7471	MERP/5731	EPA 7471	MERC/8094
40131717002	#2 KAZOO-MARSHALL	EPA 7471	MERP/5731	EPA 7471	MERC/8094
40131717003	#3 KAZOO-MARSHALL	EPA 7471	MERP/5731	EPA 7471	MERC/8094
40131717004	#4 KAZOO-MARSHALL	EPA 7471	MERP/5731	EPA 7471	MERC/8094
40131717005	#5 KAZOO-MARSHALL	EPA 7471	MERP/5731	EPA 7471	MERC/8094
40131717006	#6 KAZOO-MARSHALL	EPA 7471	MERP/5731	EPA 7471	MERC/8094
40131717001	#1 KAZOO-MARSHALL	EPA 3546	OEXT/30324	EPA 8270 by SIM	MSSV/9005
40131717002	#2 KAZOO-MARSHALL	EPA 3546	OEXT/30324	EPA 8270 by SIM	MSSV/9005
40131717003	#3 KAZOO-MARSHALL	EPA 3546	OEXT/30324	EPA 8270 by SIM	MSSV/9005
40131717004	#4 KAZOO-MARSHALL	EPA 3546	OEXT/30324	EPA 8270 by SIM	MSSV/9005
40131717005	#5 KAZOO-MARSHALL	EPA 3546	OEXT/30324	EPA 8270 by SIM	MSSV/9005
40131717006	#6 KAZOO-MARSHALL	EPA 3546	OEXT/30334	EPA 8270 by SIM	MSSV/9010
40131717001	#1 KAZOO-MARSHALL	ASTM D2974-87	PMST/12692		
40131717002	#2 KAZOO-MARSHALL	ASTM D2974-87	PMST/12692		
40131717003	#3 KAZOO-MARSHALL	ASTM D2974-87	PMST/12692		
40131717004	#4 KAZOO-MARSHALL	ASTM D2974-87	PMST/12692		
40131717005	#5 KAZOO-MARSHALL	ASTM D2974-87	PMST/12692		
40131717006	#6 KAZOO-MARSHALL	ASTM D2974-87	PMST/12692		
40131717001	#1 KAZOO-MARSHALL	Walkley Black	WETA/33511	Walkley Black	WETA/33529
40131717002	#2 KAZOO-MARSHALL	Walkley Black	WETA/33511	Walkley Black	WETA/33529
40131717003	#3 KAZOO-MARSHALL	Walkley Black	WETA/33511	Walkley Black	WETA/33529
40131717004	#4 KAZOO-MARSHALL	Walkley Black	WETA/33511	Walkley Black	WETA/33529
40131717005	#5 KAZOO-MARSHALL	Walkley Black	WETA/33511	Walkley Black	WETA/33529
40131717006	#6 KAZOO-MARSHALL	Walkley Black	WETA/33511	Walkley Black	WETA/33529

## REPORT OF LABORATORY ANALYSIS

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(Please Print Clearly)

UPPER MIDWEST REGION

MN: 612-607-1700 WI: 920-469-2436

Page 1 of

**Pace Analytical**  
www.paceanals.com

M.M.

40131717

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# CHAIN OF CUSTODY

Preservation Codes  
A=None B=HCL C=H2SO4 D=HNO3 E=D Water F=Methanol G=NaOH  
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

Dist.  
Analytical  
FILTRED?  
(YES/NO)  
PRESERVATION  
(CODE)

V / N  
Pick  
Letter

Quote #:  
Mail To Contact: Brett Riser  
Mail To Company: Calhoun Conservation Dist.  
Mail To Address: 13464 Preston Dr.  
Marshall, MN 56068  
Invoice To Contact:  
Invoice To Company:  
Invoice To Address:

Company Name: Calhoun Conservation  
Branch/Location: Marshall, MN  
Project Contact: Brett Riser  
Phone: 269.781.4867 x133  
Project Number:  
Project Name: Marshall Dam Sediment  
Project State: Michigan  
Sampled By (Print): Brett Riser  
Sampled By (Sign): Brett R. Riser  
PO #:

Regulatory  
Program:

Data Package Options  
(billable)  
☐ EPA Level III  
☐ EPA Level IV

MS/MSD  
(billable)  
☐ On your sample  
☐ NOT needed on  
your sample

Matrix Codes  
A = Air  
B = Bids  
C = Charcoal  
O = Oil  
S = Soil  
SI = Sludge  
W = Water  
DW = Drinking Water  
GW = Ground Water  
SW = Surface Water  
WP = Waste Water

PAGE LAB # CLIENT FIELD ID DATE TIME MATRIX

Analyses Requested

TOC  
Metals  
PAHs  
PCBs

Invoice To Phone:  
CLIENT  
COMMENTS

LAB COMMENTS  
(Lab Use Only)  
Profile #

269.781.4867 x133  
1-402ag A

001 1600224613 #1 Kayser - Marshall 4/26 11:24 S  
002 1600224622 #2 Kayser - Marshall 12/32 S  
003 1600224636 #3 Kayser - Marshall 13/08 S  
004 1600224647 #4 Kayser - Marshall 13/45 S  
005 1600224634 #5 Kayser - Marshall 14/28 S  
006 1501078720 #6 Kayser - Marshall 15/04 S

Rush Turnaround Time Requested - Prelims  
(Rush TAT subject to approval/surcharge)  
Date Needed:

Transmit Prelim Rush Results by (complete what you want):

Email #1:

Email #2:

Telephone:

Fax:

Samples on HOLD are subject to  
special pricing and release of liability

Relinquished By:

Received By:

PAGE Project No.

Relinquished By: UPS

Received By: J. Riser

403717

Relinquished By:

Received By:

Sample Receipt pH

Relinquished By:

Received By:

OK / Adjusted

Relinquished By:

Received By:

Cooler Custody Seal

Relinquished By:

Received By:

Present / Not Present

# Sample Condition Upon Receipt

Pace Analytical Services, Inc.  
1241 Bellevue Street, Suite 9  
Green Bay, WI 54302

**Pace Analytical**

Project

Client Name: Calhoun Conservation

WO#: **40131717**

Courier: ☐ Fed Ex ☒ UPS ☐ Client ☐ Pace Other:

Tracking #: 1Z78E8A71300274017



Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other

Thermometer Used: SR32 Type of Ice: ☒ Wet ☐ Blue ☐ Dry ☐ None

☒ Samples on ice, cooling process has begun

Cooler Temperature: Uncorr: 5.5 / Corr: 5.5 Biological Tissue is Frozen: ☐ yes

Temp Blank Present: ☒ yes ☐ no ☐ no

Temp should be above freezing to 6°C for all sample except Biota.

Frozen Biota Samples should be received ≤ 0°C.

Person examining contents:

Date: 5-3-16

Initials: STW

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix:	<u>S</u>	
All containers needing preservation have been checked. (Non-Compliance noted in 13.)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation. (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> ≤2; NaOH+ZnAct ≥9, NaOH ≥12)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
exceptions: VOA, coliform, TOC, TOX, TOH, O&G, WIDROW, Phenolics, OTHER:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Initial when completed	Lab Std #ID of preservative	Date/Time:
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

If checked, see attached form for additional comments ☐

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: Original and copy of COC in shipment 5-3-16 STW

Project Manager Review:

AMH for TN

Date: 5/3/16



## Appendix B:

Additional data was also gathered on April 26<sup>th</sup>, 2016, fisheries biologists from the Calhoun Conservation District and Michigan Department of Natural Resources inventoried the Marshall Impoundment formed by Perrin Dam in Marshall, MI. Cross-sections were sampled at locations throughout the impoundment. Measurements were taken for water depth, sediment depth, substrate composition and locations were documented by GPS coordinates and photographs of each cross-section looking upstream, downstream, river left and river right.

Biologists used morphological, biological, and hydraulic parameters to determine the area that has sediment accumulation as a result of the dam. Once that was determined, cross-section locations were taken throughout the impoundment. These measurement were intended to provide a site-specific look at potential sediment load upstream from the dam.

Appendix B: Prepared by Brett Riser, Aquatic Biologist, Calhoun Conservation District

Figure 1. Approximate surface area of the Marshall impoundment.

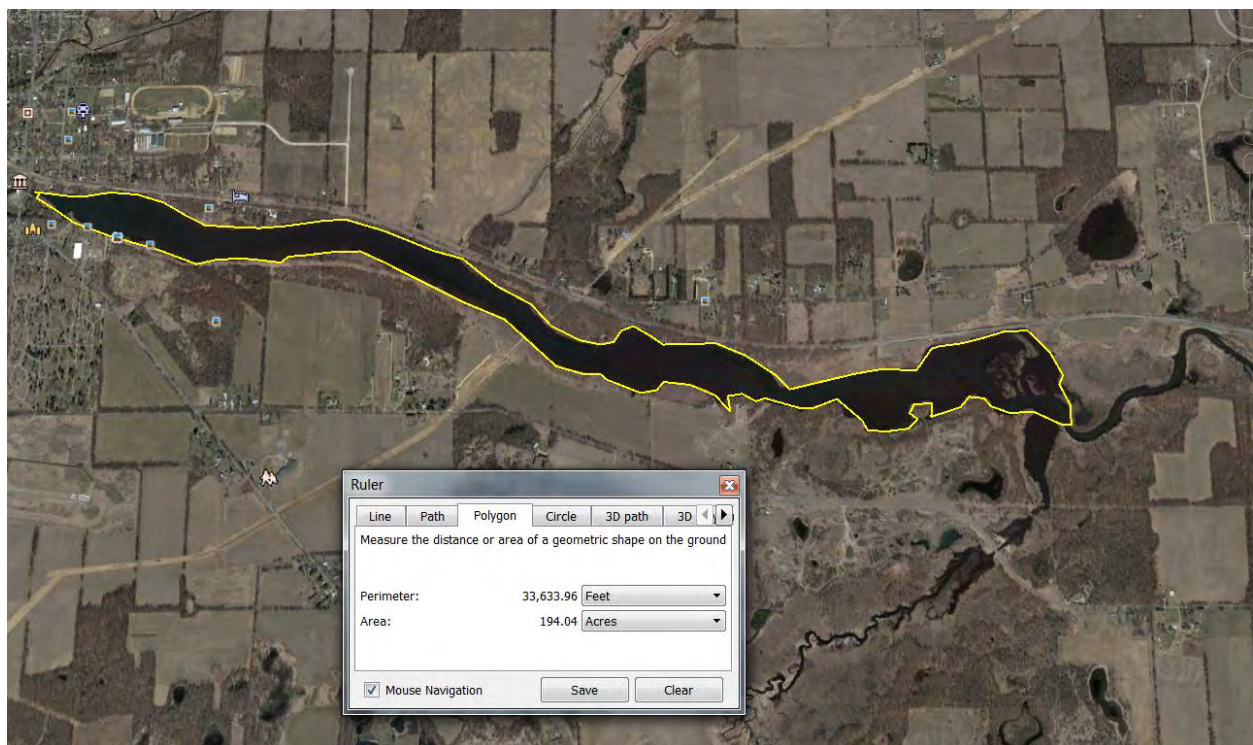




Figure 2. Marshall Impoundment Cross-section 1.

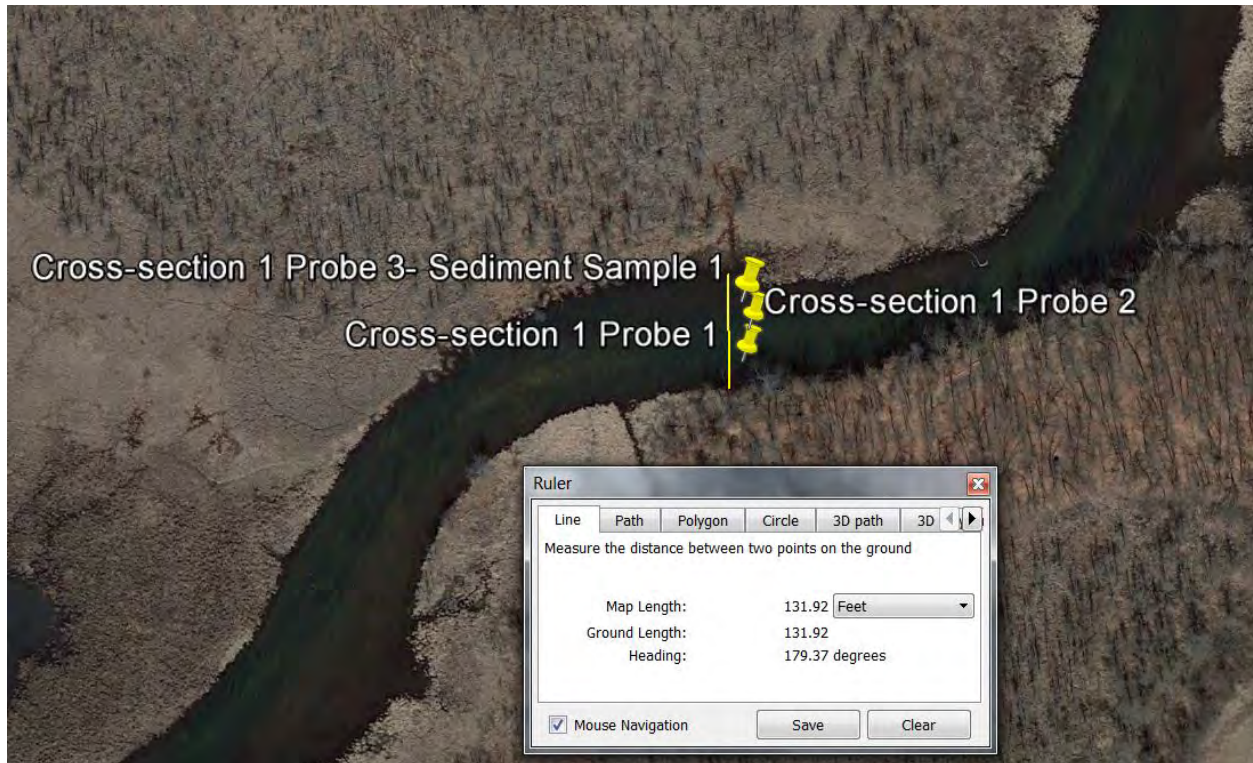


Figure 3. Marshall Impoundment Cross-section 2.

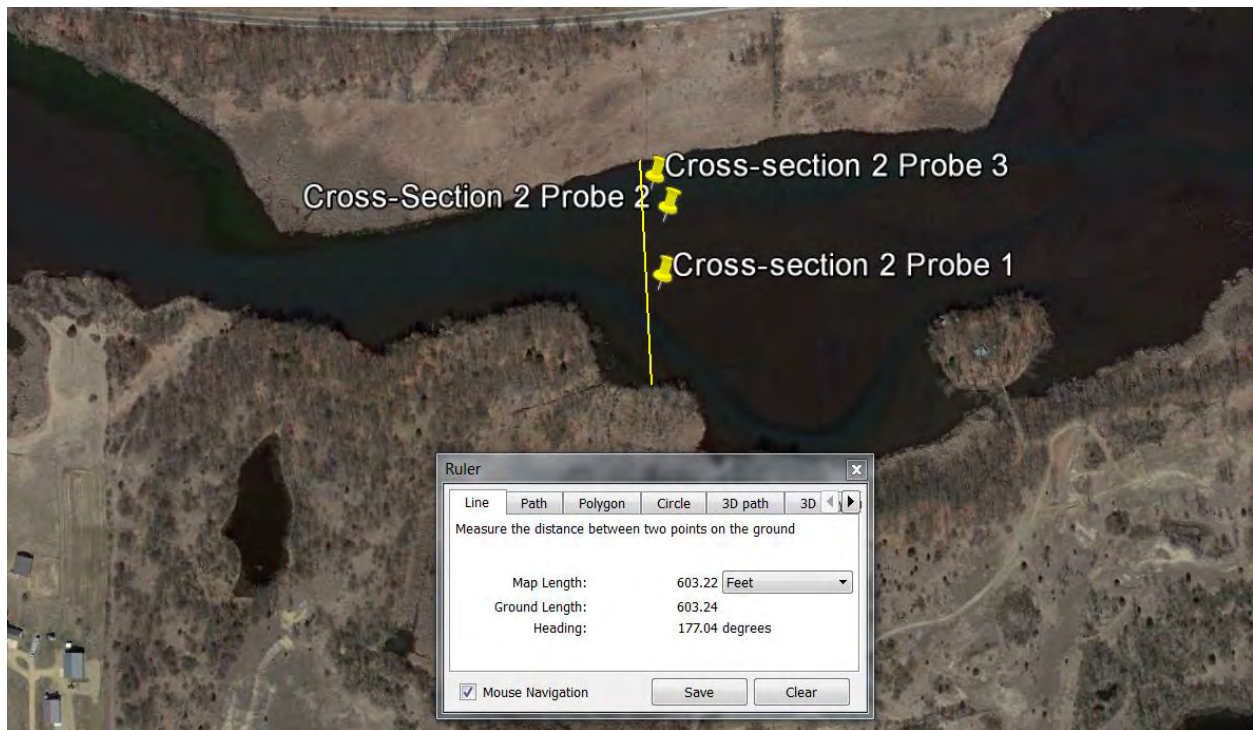


Figure 4. Marshall Impoundment Cross-section 3.

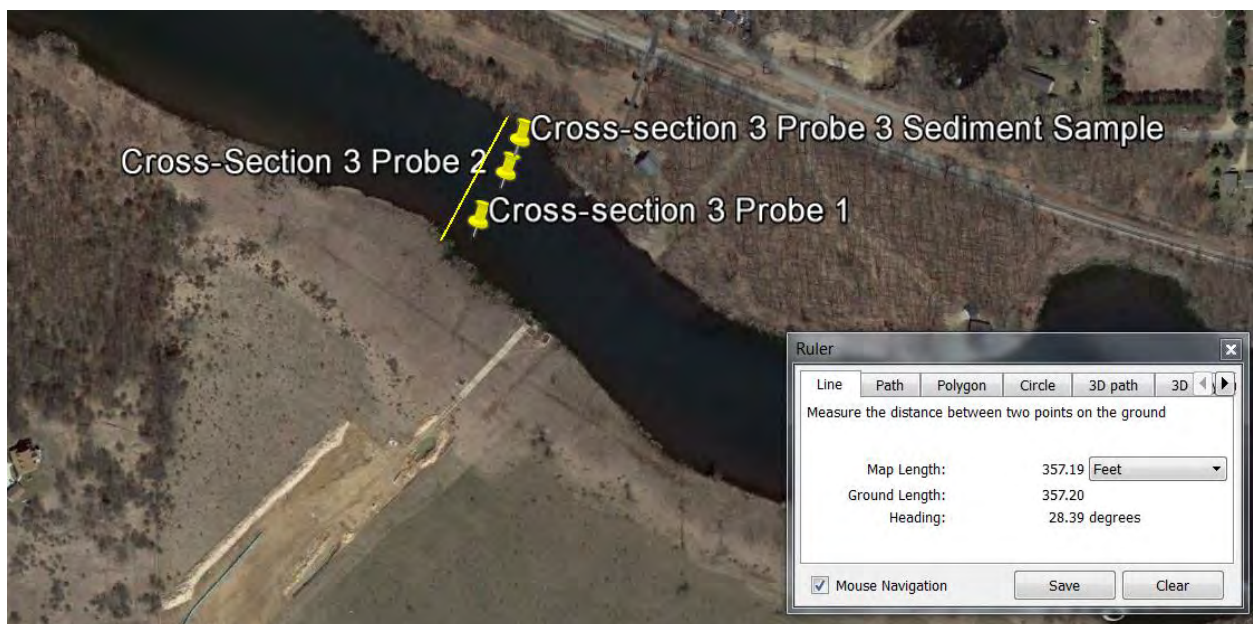




Figure 5. Marshall Impoundment Cross-section 4.

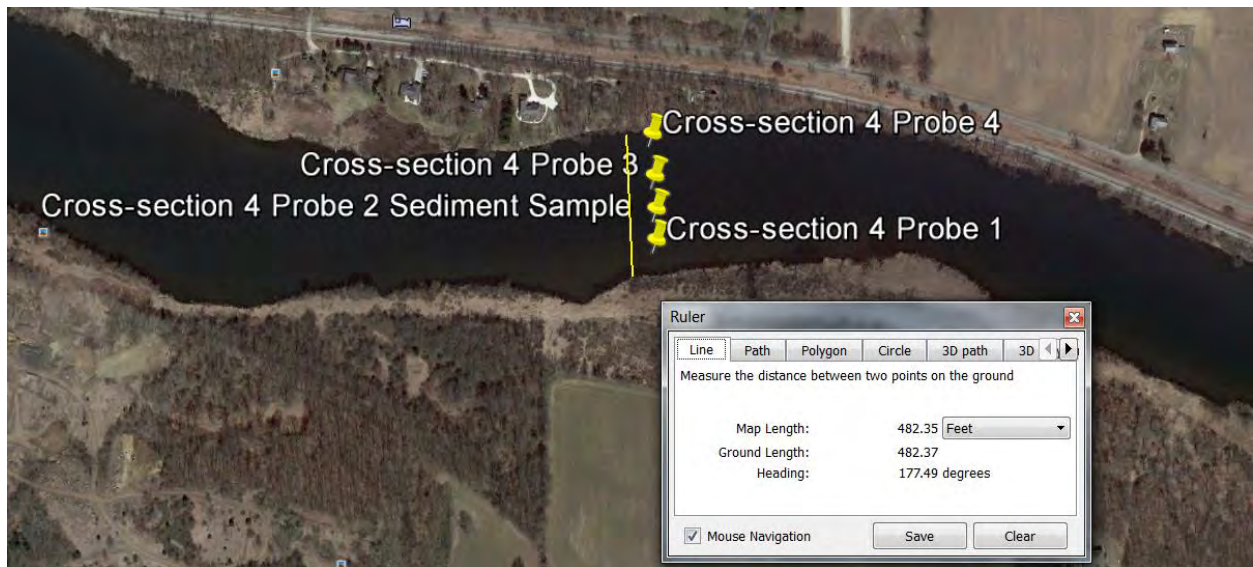


Figure 6. Marshall Impoundment Cross-section 5.

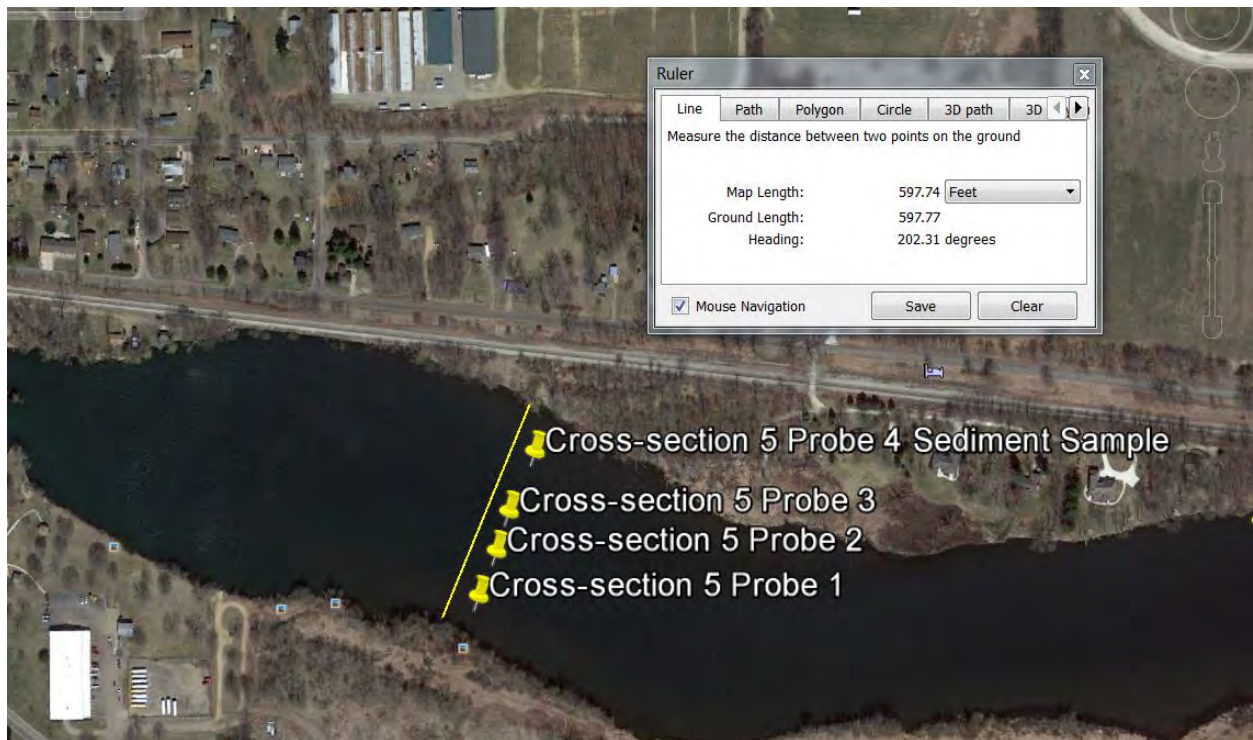




Figure 7. Marshall Impoundment Cross-section 6.

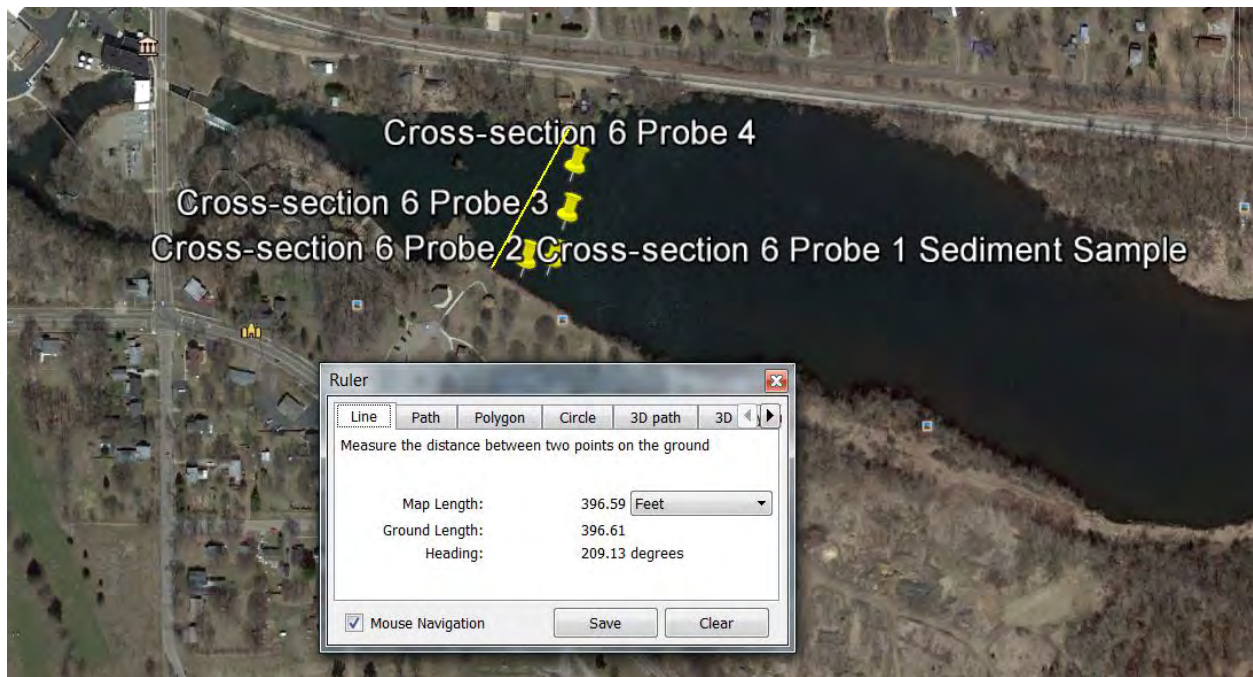


Figure 8. Spillway probes of sediment depth between cross-section 6 and the dam.



Table 1. Locations of cross-sections and probing sites.

Cross-Section	Probe Number	Latitude	Longitude
1	1	42°15'16.41"N	84°53'45.67"W
1	2	42°15'16.78"N	84°53'45.57"W
1	3	42°15'17.08"N	84°53'45.68"W
2	1	42°15'15.75"N	84°54'39.00"W
2	2	42°15'17.55"N	84°54'38.81"W
2	3	42°15'18.38"N	84°54'39.28"W
3	1	42°15'26.51"N	84°55'41.38"W
3	2	42°15'27.72"N	84°55'40.44"W
3	3	42°15'28.56"N	84°55'39.97"W
4	1	42°15'36.58"N	84°56'22.24"W
4	2	42°15'37.62"N	84°56'22.24"W
4	3	42°15'38.73"N	84°56'22.31"W
4	4	42°15'40.14"N	84°56'22.42"W
5	1	42°15'38.23"N	84°56'49.42"W
5	2	42°15'39.38"N	84°56'48.80"W
5	3	42°15'40.39"N	84°56'48.37"W
5	4	42°15'41.92"N	84°56'47.48"W
6	1	42°15'40.91"N	84°57'3.21"W
6	2	42°15'40.95"N	84°57'2.34"W
6	3	42°15'42.06"N	84°57'1.84"W
6	4	42°15'43.24"N	84°57'1.58"W

Table 2. Spillway samples between cross-section 6 and the dam.

Spillway Sample	Latitude	Longitude
1	42°15'43.29"N	84°57'3.25"W
2	42°15'43.26"N	84°57'5.80"W
3	42°15'44.56"N	84°57'9.44"W
4	42°15'45.26"N	84°57'12.54"W

Table 3. Cross-section sediment and water depth.

Cross-section	Probe Number	Sediment Depth (ft.)	Water Depth	Substrate Type
1	1	2.5'	N/A	Silt
1	2	1.8'	4.6'	Fine Sand/Silt
1	3	4.8'	1.7'	Silt
2	1	5' 9"	N/A	Silt
2	2	5' 3"	1' 4"	Silt
2	3	1' 1"	N/A	Silt
3	1	5' 2"	1' 5"	Silt
3	2	6'	5' 2"	Silt
3	3	3' 10"	3' 6"	Silt
4	1	0'	N/A	Gravel
4	2	6' 7"	3' 1"	Silt
4	3	9'	N/A	Silt
4	4	6' 7"	5' 2"	Silt
5	1	1' 9"	5'	Silt
5	2	4' 4"	4' 9"	Silt
5	3	11'	5'	Silt
5	4	8' 5"	4' 2"	Silt
6	1	1' 6"	4' 10"	Silt
6	2	5' 10"	6' 6"	Silt
6	3	6' 11"	7' 7"	Silt
6	4	5' 7"	8' 2"	Silt

Table 4. Spillway sample sediment and water depth.

Spillway Sample	Sediment Depth (ft.)	Water Depth	Substrate Type
1	3' 6"	8' 6"	Silt
2	4' 4"	13' 8"	Silt
3	0'	10'	gravel
4	0'	5' 3"	gravel

Figure 9. Discharge at immediate downstream gage location (Old 27).

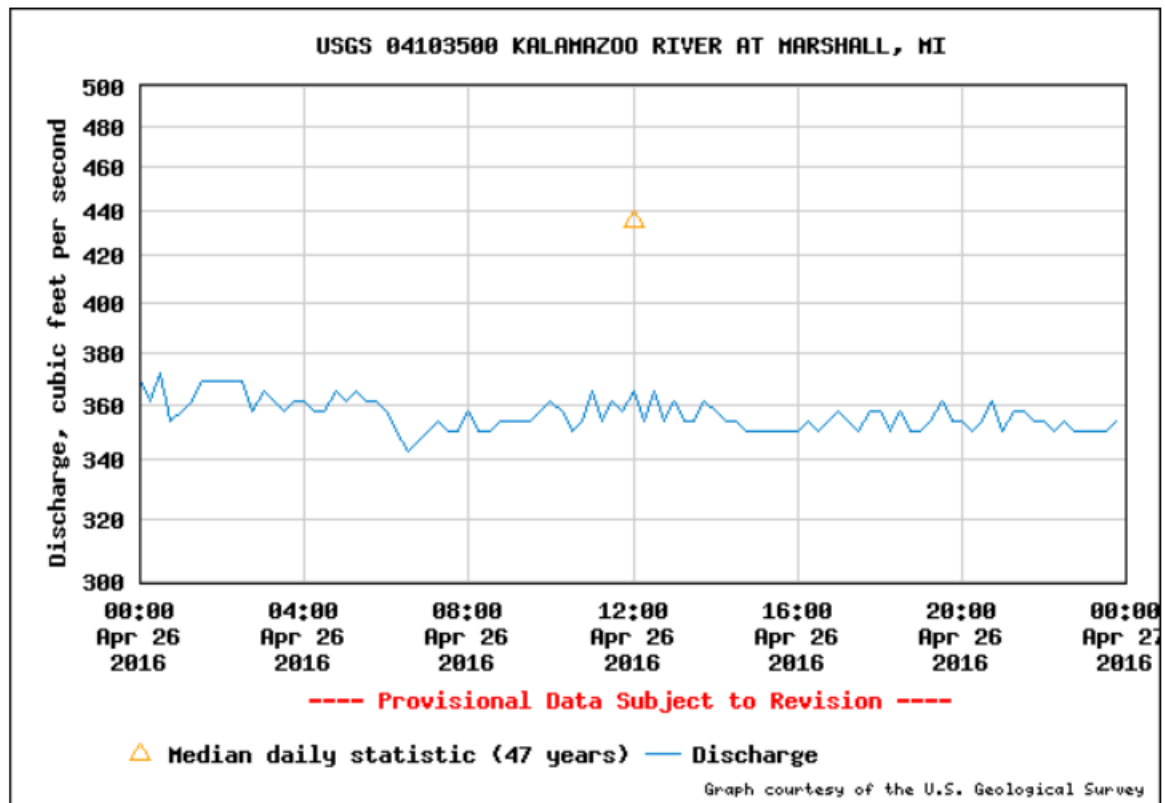


Figure 10. Gage height at immediate downstream gage location (Old 27).

