DATA SUMMARY REPORT

2013 DATA SUMMARY REPORT
MISSISSIPPI RIVER – POOL 2 AND ADJACENT LOCATIONS

Prepared for

Brewer Attorneys and Counselors

Dallas, Texas

Prepared by

Anchor QEA, LLC

4300 Route 50, Suite 202

Saratoga Springs, New York 12866

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ACRONYMS AND ABBREVIATIONS

Anchor QEA	Anchor QEA, LLC
cfs	cubic feet per second
DSR	Data Summary Report
PFAS	perfluoroalkyl substance
PFBA	Perfluorobutanoate
PFBS	Perfluorobutanesulfonate
PFDA	Perfluorodecanoate
PFDoA	Perfluorododecanoate
PFHpA	Perfluoroheptanoate
PFHxA	Perfluorohexanoate
PFHxS	Perfluorohexanesulfonate
PFNA	Perfluorononanoate
PFOA	Perfluorooctanoate
PFOS	Perfluorooctanesulfonate
PFOSA	Perfluorooctane sulfonamide
PFPeA	Perfluoropentanoate
PFUnA	Perfluoroundecanoate
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
TDS	total dissolved solids
TOC	total organic carbon
TSS	total suspended solids
USEPA	United States Environmental Protection Agency

1 INTRODUCTION

This Data Summary Report (DSR) has been developed by Anchor QEA, LLC, on behalf of Brewer Attorneys and Counselors, to present the results of sampling and analysis activities performed to measure the concentrations of perfluoroalkyl substances (PFASs) in multiple media collected within Pool 2 of the Mississippi River in 2013 and nearby locations as documented in the 2013 *Sampling and Analysis Plan* (SAP; Anchor QEA 2013).

The objective of this DSR is to describe the methods, summarize the data, and present the results of the applicable data quality assessments associated with the 2013 sampling and analysis activities.

2 METHODS

2.1 Water Sampling

2.1.1 Locations

A total of six sampling locations were targeted in this study (Figure 1). One centroid location sited just below Lock and Dam No. 1. Cross-channel transects containing between three and seven sampling nodes were sited at the remaining locations. Three rounds of sampling were targeted to capture three low flow conditions of nominally 6,500 cubic feet per second (cfs), 5,000 cfs, and 3,500 cfs as measured at the Mississippi River gaging station located in Saint Paul, Minnesota. The actual flows varied based on field conditions and project schedule. A summary of the sampling locations is provided in Table 1.

The sampling schedule for each round was generally based on the time of travel from the confluence of the Mississippi and Minnesota Rivers to Lock and Dam No. 2, as estimated by a mathematical model developed for Pool 2. At river flows of 6,500 cfs, 5,000 cfs, and 3,500 cfs, the time-of-travel estimates are 120 hours, 160 hours, and 220 hours, respectively. Due to higher river flows than targeted in the fall of 2013, only two rounds of water sampling were conducted.

2.1.2 Water Sampling Procedures

Sampling was performed at all locations specified in Table 1 and shown in Figure 1. Each location was sampled three times to capture a range of flow conditions. The sampling methods are presented in detail in Standard Operating Procedure (SOP) for Water Sampling, included as Attachment 1 of the SAP (Anchor QEA 2013), and described below.

Water sampling was conducted using a stainless steel Kemmerer sampler. At locations where the water depth was greater than or equal to 10 feet, subsamples were collected at 20% and 80% of the water depth and combined to form a single sample. At locations where the water depth was less than 10 feet, the samples were collected at 60% of the water depth. Samples were transferred from the stainless steel sampler to sample bottles supplied by the laboratory. The samples were kept on ice prior to shipment to the analytical laboratories.

Water quality parameters, including temperature, pH, turbidity, and conductivity, were measured in the field at each sampling station using a YSI 6920 multiparameter probe. In addition, the actual field coordinates of the locations occupied during sample collection were recorded using a Trimble GeoXT GPS unit.

2.1.3 Laboratory Analyses

Water samples collected during the program were submitted to AXYS Analytical Laboratory for PFAS analysis which includes the following compounds:

- Perfluorobutanesulfonate (PFBS)
- Perfluorobutanoate (PFBA)
- Perfluorodecanoate (PFDA)
- Perfluorododecanoate (PFDoA)
- Perfluoroheptanoate (PFHpA)
- Perfluorohexanesulfonate (PFHxS)
- Perfluorohexanoate (PFHxA)
- Perfluorononanoate (PFNA)
- Perfluorooctane sulfonamide (PFOSA)
- Perfluorooctanesulfonate (PFOS)
- Perfluorooctanoate (PFOA)
- Perfluoropentanoate (PFPeA)
- Perfluoroundecanoate (PFUnA)

Samples were also submitted to Pace Analytical for total organic carbon (TOC), total dissolved solids (TDS), and total suspended solids (TSS) analysis in accordance with methodologies presented in a quality assurance project plan (QAPP) for an earlier study (2011 Cardno ENTRIX Quality Assurance Project Plan; [Cardno ENTRIX 2011]).

2.2 Fish Sampling

The fish sampling efforts were conducted under a Scientific Collector's Permit (Permit No. 19417) that was obtained from the Minnesota Department of Natural Resources on September 23, 2013 (Appendix A). As required in the permit, an e-mail was sent to Mr. T.J. Debates, with the Minnesota Department of Natural Resources Division of Fish and Wildlife,

and Captain Gregory Salo, with the Minnesota Department of Natural Resources Division of Enforcement, on September 23, 2013, indicating the initiation of sampling activities (Appendix A).

2.2.1 Locations

The fish sampling program targeted Bluegill (*Lepomis macrochirus*), White Bass (*Morone chrysops*), Freshwater Drum (*Aplodinotus grunniens*), and Common Carp (*Cyprinus carpio*), species previously collected by the Minnesota Pollution Control Agency. The fish were collected from four sections of Pool 2 previously defined by the Minnesota Pollution Control Agency in earlier fish studies (Table 2, Figure 2). In Sections 1 and 3, 15 individuals of each species were targeted for collection. Sections 2 and 4 were split longitudinally, and 15 individuals of each species were targeted on either side of the Mississippi River to allow for examination of how proximity to potential sources of PFOS in Pool 2 influences concentration. Approximately 360 fish specimens were collected as part of this effort. The exact number of fish varied based on field conditions, weather, and amount of suitable habitat.

2.2.2 Fish Sampling Procedures

Fish were collected using electrofishing sampling techniques. A detailed SOP for electrofishing is included in Attachment 2 of the 2013 SAP (Anchor QEA 2013). Electrofishing was accomplished with a 16-foot boat equipped with a variable output, gas-powered, direct current generator. Operating amperage was adjusted according to water conductivity to minimize injury; stunned fish were immediately removed from the electrical field using dip nets to minimize the duration of the shock. Fish were held in livewells with frequent water changes.

Fish sampling efforts targeted size ranges for each species to maintain consistency with prior sampling efforts (Table 3). Fish were handled according to standard procedures and documented in the SOP for Fish Sampling (Attachment 2, Anchor QEA 2013). For each specimen, the date of collection, a unique identification number or code, the station identification, genus and species, total length in millimeters (to nearest millimeter), weight in grams (to nearest gram), sex (if possible), and method of collection were recorded on a

Fish Collection Field Log. Any observed external abnormalities also were noted on the Field Log. Fish samples were wrapped in aluminum foil, labeled appropriately, and placed in a resealable plastic bag. Chain-of-custody forms were maintained and processed samples kept cool (below 4 °C) and shipped overnight to the analytical laboratory.

The specimens and size of targeted fish were generally consistent with prior sampling efforts and are summarized in Table 3.

The field coordinates of the of the sampling runs from within each river section where fish were collected were recorded using a GPS unit.

2.2.3 Fish Processing and Laboratory Analyses

Fish specimens collected during the program were submitted to AXYS Analytical Laboratory in British Columbia, Canada for processing and PFAS analysis, in accordance with the methodologies presented in the aforementioned 2011 Cardno ENTRIX QAPP (Cardno ENTRIX 2011). Consistent with prior sampling efforts, fillets were removed from the fish by AXYS Analytical based on United States Environmental Protection (USEPA) Guidelines (USEPA 2000). Consistent with prior sampling efforts, the fillet type for all fish species was scaled with skin-on. The bones (i.e., rib cage) were removed from the fillets. The fillets from both sides of the fish were used for PFAS analysis. The fillet samples were homogenized and analyzed for PFASs.

2.3 Porewater and Sediment Sampling

2.3.1 Locations

Twenty locations were sampled for porewater and sediment within Pool 2 (Figure 3). Three sampling points were located downstream of the Metropolitan Council Environmental Services treatment plant and above the channel leading to Pigs Eye Lake, two locations were downstream of the Northern Tier Energy's Saint Paul Park Refinery, two locations were sampled in Spring Lake, and one location was sampled in Baldwin Lake. Along the 3M Cottage Grove facility, 12 locations were sampled: 1 location above and 1 below the plant site, and 10 locations co-located with previous sediment and/or porewater locations near the shoreline.

2.3.2 Sediment Sampling Procedures

To collect the sediment samples, a Petite Ponar sampler was lowered through the water column until it contacted the sediment surface. The line was allowed to go slack, and a short tug triggered the spring mechanism. The sampler was retrieved and the retained sediment was placed in an aluminum pan for sample processing. The targeted depth of the sediment samples was 2 inches. A detailed SOP for surface sediment sampling is included in Attachment 3 of the SAP (Anchor QEA 2013).

2.3.3 Porewater Sampling Procedures

Porewater sampling was conducted adjacent to all 20 of the sediment sampling locations. At each location, a porewater sampling probe consisting of a 6-inch, stainless steel, 0.01-inch slotted screen attached to an appropriate length of 1.25-inch, black steel riser pipe was driven into the sediment to a depth of 0.5 to 1 foot below the sediment surface. Once the probe was installed, a minimum of one volume of water was removed from the probe using a peristaltic pump, and water levels were measured to determine the recharge capacity of the screened interval. After purging, the probe was left in place for approximately 24 hours to allow the surrounding sediment to stabilize. The following day, a peristaltic pump was used to collect the porewater sample. The pumping rate was adjusted to prevent excessive drawdown within the probe. If the recharge rate was too low to limit drawdown at the slowest pumping rate, then a sample aliquot was collected and the location was resampled on subsequent days until sufficient volume was obtained. A detailed SOP for porewater sampling is included in Attachment 4 of the 2013 SAP (Anchor QEA 2013).

Water quality parameters, including temperature, pH, turbidity, and conductivity, were measured in the overlying water column above each porewater location using a YSI 6820 multiparameter probe. Water quality parameters were measured in water retrieved from the porewater probe and compared to parameters measured in the overlying river water to determine if the porewater peristaltic pump had captured river water; if so, the porewater sample was discarded, and another sample will be collected in close proximity and with a lower pumping rate.

In addition, the field coordinates of the locations where sediment and porewater were collected was recorded using a Trimble GeoXT GPS unit.

2.3.4 Laboratory Analysis

Porewater samples collected during the program were submitted to AXYS Analytical Laboratory for PFAS analysis and to Pace Analytical for TOC, TDS, and TSS analysis, in accordance with the methodologies presented in the 2011 Cardno ENTRIX QAPP (Cardno ENTRIX 2011).

Sediment samples were submitted to AXYS Analytical Laboratory for PFAS analysis and to Pace Analytical for TOC analysis, in accordance with the methodologies presented in the 2011 Cardno ENTRIX QAPP (Cardno ENTRIX 2011).

2.4 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) procedures presented in a QAPP for an earlier study (2011 Cardno ENTRIX Quality Assurance Project Plan; [Cardno ENTRIX 2011]) were adopted and followed for this sampling effort. Sampling and analytical activities were consistent with the methodologies presented in the QAPP, and included the collection of appropriate additional QA/QC samples, including equipment rinse blanks, matrix spike samples, and duplicate samples when appropriate for each sample matrix. A summary of field QA/QC samples collected is presented in the QAPP.

3 RESULTS

3.1 Water

The SAP identified three Mississippi River flow targets of 6500 cfs, 5000 cfs, and 3500 cfs for sampling. In fall of 2013, the river flows measured at the Mississippi River gaging station located in Saint Paul, Minnesota (United States Geological Survey gage 5331000) never reached the lowest targeted flow, therefore only two rounds of sampling were conducted. The first round of sampling occurred from September 8 through 12, 2013 while the river flows averaged 4,200 cfs (Figure 4). Sampling was conducted from upstream to downstream generally following time of travel estimates from the confluence with the Minnesota River down to Lock and Dam No. 2. The second round of sampling occurred on October 15 and 16, 2013, when the river flow averaged 7,000 cfs. Due to varying flow conditions, time of travel sampling was not attempted; however, the river was sampled from upstream to downstream.

A total of 48 environmental samples were submitted for analysis for PFASs, TOC, TDS, and TSS. In addition, four field blanks and four field duplicates were submitted as QA/QC samples. The results for the sampling are presented in Table 4.

3.2 Fish Results

The targeted species and sample counts were met in most sections. In Section 2B, Bluegill could not be located, so green sunfish were used as a substitute. In Section 4A, White Bass were difficult to locate and only 11 specimens were collected. In some sections, fish specimens slightly outside of targeted size ranges were kept to achieve sufficient sample numbers. Figures 5a through 5k show the location and count of the fish collected by run in each section. Table 5 summarizes counts, lengths, and weights of the fish collected from Pool 2.

A total of 361 tissue samples were submitted for analysis for PFASs. The results for the sampling are presented in Table 6.

3.3 Porewater and Sediment Sampling

The porewater and sediment sampling was conducted from September 20 through 29, 2013. A total of 20 porewater samples were submitted for PFAS analysis. Due to very slow recharge rates, only ten samples were submitted for TOC and nine samples were submitted for TDS and TSS. In addition, one field duplicate was submitted as a QA/QC sample. The sediment samples (20 environmental sample and 1 field duplicate) were submitted for PFAS analysis, moisture content, and TOC analysis. The results for the porewater and sediment sampling are presented in Tables 7 and 8, respectively.

3.4 Data Validation

A USEPA Stage 2A data validation review of the analytical results was conducted for each sampling matrix. The final validation reports for the samples are included as Appendix B.

3.5 Laboratory Data Reports

Due to the file size, the laboratory data reports are not included in this electronic data summary report. The laboratory data reports can be provided upon request.

4 REFERENCES

Anchor QEA, 2013. *Sampling and Analysis Plan – Mississippi Pool 2*. Prepared for Faegre, Baker and Daniels, LLP. September 2013.

Cardno ENTRIX, 2011. *Quality Assurance Project Plan*. Prepared by Cardno ENTRIX for the 3M Company. June 2011.

USEPA (United States Environmental Protection Agency), 2000. *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories.* November 2000.

TABLES

Table 1
Summary of Water Sampling Locations

River Mile	Type	Location
Mississippi River RM 846.5	Centroid	Upstream
Mississippi River RM 841	3 Node Transect	Downstream of the confluence of the Mississippi and Minnesota rivers
Mississippi River RM 836	3 Node Transect	Upstream of the Metropolitan Council Environmental Services Metro treatment plant
Mississippi River RM 826	5 Node Transect	Downstream of the Metropolitan Council Environmental Services Metro treatment plant; upstream of Spring Lake
Mississippi River RM 818.5	7 Node Transect	Downstream of Spring Lake; upstream of 3M Cottage Grove
Mississippi River RM 814	5 Node Transect	Downstream of Lock and Dam No. 2 (Pool 3)

Note:
RM = river mile

Table 2
Fish Sampling Sections

Section	Description
Section 1	Lock and Dam No. 1 to RM 843.3 below the confluence with the Minnesota River
Section 2a	RM 843.3 to Pigs Eye Lake (RM 833), excluding the section near Metropolitan Council Environmental Services Metro treatment plant outfall
Section 2b	The eastern shore of the Mississippi River near the Metropolitan Council Environmental Services Metro outfall from RM 836.9 to RM 834.1
Section 3	Below Pigs Eye Lake at RM 833 down to the bottom of Spring Lake at RM 819.8
Section 4a	RM 819.8 to Lock and Dam No. 2 opposite the 3M Cottage Grove facility (southern shoreline)
Section 4b	RM 819.8 to Lock and Dam No. 2 same bank as the 3M Cottage Grove facility (northern shoreline)

Note:
RM = river mile

Table 3
Summary of Fish Targeted from Pool 2

Common Name	Species	Size Classes (Total Length)	Sample Size (Entire Pool)
Bluegill/sunfishes	*Lepomis macrochirus/Lepomis spp.*	4 to 10 inches (102 to 254 mm)	90
White Bass	*Morone chrysops*	10 to 18 inches (254 to 457 mm)	90
Freshwater Drum	*Aplodinotus grunniens*	10 to 20 inches (254 to 508 mm)	90
Common Carp	*Cyprinus carpio*	10 to 24 inches (254 to 576 mm)	90

Note:
mm = millimeters

Table 4
2013 Surface Water Results

Sample Name	Sample Date	Sample Time	Parent Location	Sample Type	PFBA (ng/L)	PFBS (ng/L)	PFDA (ng/L)	PFDoA (ng/L)	PFHpA (ng/L)	PFHxA (ng/L)	PFHxS (ng/L)	PFNA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	PFOSA (ng/L)	PFPeA (ng/L)	PFUnA (ng/L)	TDS (mg/L)	TOC (mg/L)	TSS (mg/L)
MISS-RM814.3-1-201309120854	9/12/2013	8:54:00 AM	MISS-RM814.3-1	N	177 J	206	< 1	< 1	4.49	6.23	3.21	< 1	11.4	6.29	< 1	5.31	< 1	372	7	39.5
MISS-RM814.3-1-201309120854DUP	--	--	MISS-RM814.3-1	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	40.4
MISS-RM814.3-1-201310161258	10/16/2013	12:58:00 PM	MISS-RM814.3-1	N	36.1	< 2.15	< 1.08	< 1.08	2.41 J	4.56	< 2.15	< 1.08	8.95	2.76 J	< 1.08	4.3	< 1.08	330	6.4	42.1
MISS-RM814.3-1-201310161258DUP	10/16/2013	12:58:00 PM	MISS-RM814.3-1	LR	33.2	< 2.11	< 1.05	< 1.05	2.02	4.43	< 2.11	< 1.05	7.47	4.16	< 1.05	3.65	< 1.05	328	--	42.6
MISS-RM814.3-2-201309120906	9/12/2013	9:06:00 AM	MISS-RM814.3-2	N	182 J	274	< 1	< 1	4.57	6.82	< 2.01	< 1	12	6.59	< 1	5.27	< 1	368	6.8	35.6
MISS-RM814.3-2-201309120906DUP	--	--	MISS-RM814.3-2	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	359	--	--
MISS-RM814.3-2-201310161301	10/16/2013	1:01:00 PM	MISS-RM814.3-2	N	37.1	< 1.9	< 0.952	< 0.952	2.2	4.87	< 1.9	< 0.952	7.45	3.05	< 0.952	4.03	< 0.952	332	5.4	42.5
MISS-RM814.3-3-201309120915	9/12/2013	9:15:00 AM	MISS-RM814.3-3	N	179 J	252	< 0.944	< 0.944	5.22	6.2	3.64	< 0.944	11.7	8.01	< 0.944	4.12	< 0.944	370	6.7	40.2
MISS-RM814.3-3-201310161308	10/16/2013	1:08:00 PM	MISS-RM814.3-3	N	37.2	< 1.81	< 0.904	< 0.904	1.89	4.85	< 1.81	< 0.904	7.39	3.4	< 0.904	4.13	< 0.904	334 J	5.5	39.7
MISS-RM814.3-3-201310161308DUP	--	--	MISS-RM814.3-3	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	589	--	--
MISS-RM814.3-4-201309120921	9/12/2013	9:21:00 AM	MISS-RM814.3-4	N	232	290	< 0.961	< 0.961	4.73	5.96	4.27	< 0.961	11.6	5.59	< 0.961	4.04	< 0.961	357	6.8	41.9
MISS-RM814.3-4-201310161310	10/16/2013	1:10:00 PM	MISS-RM814.3-4	N	54.2	4.55	< 1.02	< 1.02	1.91	5.74	< 2.05	< 1.02	11.4	6.31	< 1.02	5.34	< 1.02	336 J	5.3	42.6
MISS-RM814.3-5-201309120930	9/12/2013	9:30:00 AM	MISS-RM814.3-5	N	201 J	260	< 0.969	< 0.969	3.79	6.26	2.22	1.06	13	6.91	< 0.969	6.39	< 0.969	382	6.7	37.1
MISS-RM814.3-5-201310161319	10/16/2013	1:19:00 PM	MISS-RM814.3-5	N	43.2 J	2.5 J	< 1 J	< 1 J	2.22 J	4.41 J	< 2.01 J	< 1 J	8.35 J	4.03 J	< 1 J	3.76 J	< 1 J	325 J	5.4	41.9
MISS-RM818.5-1-201309110952	9/11/2013	9:52:00 AM	MISS-RM818.5-1	N	35.3 J	419	< 0.965	< 0.965	3.75	4.45	2.43	< 0.965	6.71	3.13	< 0.965	3.43	< 0.965	378	6.6	26.9
MISS-RM818.5-1-201310161101	10/16/2013	11:01:00 AM	MISS-RM818.5-1	N	49.3 J	< 1.97 J	< 0.921 J	< 0.921 J	2.03 J	6.94 J	< 1.84 J	< 0.921 J	9.35 J	4.6 J	< 0.921 J	3.85 J	< 0.921 J	326 J	5.4	38.8
MISS-RM818.5-2-201309111000	9/11/2013	10:00:00 AM	MISS-RM818.5-2	N	28.9 J	271	< 0.934	< 0.934	5.02	5.74	< 4.13	1.18	6.8	4.13	< 0.934	3.5	< 0.934	399	6.6	33.8
MISS-RM818.5-2-201310161109	10/16/2013	11:09:00 AM	MISS-RM818.5-2	N	24.6	< 2.07	< 1.03	< 1.03	1.78	3.03	< 2.07	< 1.03	5.14	2.91	< 1.03	3.85	< 1.03	328 J	5.3	46.6
MISS-RM818.5-3-201309111010	9/11/2013	10:10:00 AM	MISS-RM818.5-3	N	25.1 J	46.7 J	< 0.965 J	< 0.965 J	4.66 J	4.89 J	2.01 J	< 0.965 J	6.8 J	4.36 J	< 0.965 J	3.69 J	< 0.965 J	392	6.5	25.3
MISS-RM818.5-3-201309111010DUP	9/11/2013	10:10:00 AM	MISS-RM818.5-3	LR	23.7	38.9	< 0.991	< 0.991	5.23	4.79	< 1.98	< 0.991	6.06	3.55	< 0.991	2.34	< 0.991	--	--	--
MISS-RM818.5-3-201310161116	10/16/2013	11:16:00 AM	MISS-RM818.5-3	N	21.1	< 1.9	< 0.952	< 0.952	1.1	3.64	< 1.9	< 0.952	4.61	3.7	< 0.952	2.23	< 0.952	316 J	5.7	26.8
MISS-RM818.5-4-201309111026	9/11/2013	10:26:00 AM	MISS-RM818.5-4	N	26.8 J	65.2	< 0.939	< 0.939	4.83	5.5	2.38	< 0.939	6.92	3.48	< 0.939	3.75	< 0.939	386	6.5	25
MISS-RM818.5-4-201310161128	10/16/2013	11:28:00 AM	MISS-RM818.5-4	N	18.9	< 1.86	< 0.931	< 0.931	2.41	3.2	< 1.86	< 0.931	3.82	2.31	< 0.931	1.42	< 0.931	314 J	6.7	24.1
MISS-RM818.5-4-201310161128DUP	10/16/2013	11:28:00 AM	MISS-RM818.5-4	LR	12.8	< 2.07	< 1.04	< 1.04	1.42	2.67	< 2.07	< 1.04	3.62	< 2.07 J	< 1.04	1.44	< 1.04	289	--	22.8
MISS-RM818.5-5-201309111041	9/11/2013	10:41:00 AM	MISS-RM818.5-5	N	34.5	46.8	< 0.97	< 0.97	4.22	4.94	< 1.94	1.48 J	8.12	5.29	< 0.97	3.61	< 0.97	413	6.4	38.1
MISS-RM818.5-5-201310161137	10/16/2013	11:37:00 AM	MISS-RM818.5-5	N	26.3	< 2.09	< 1.04	< 1.04	2.25	4.65	< 2.09	< 1.04	6.02	4.43	< 1.04	4.06	< 1.04	309 J	6.7	22.7
MISS-RM818.5-5-201310161137DUP	--	--	MISS-RM818.5-5	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24.4
MISS-RM818.5-6-201309111050	9/11/2013	10:50:00 AM	MISS-RM818.5-6	N	36	57.6	< 0.989	< 0.989	5.74	4.81	3.31	1.76 J	8.74	5.84	< 0.989	3.08	< 0.989	393	6.4	46.3
MISS-RM818.5-6-201309111050DUP	--	--	MISS-RM818.5-6	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	398	--	--
MISS-RM818.5-6-201310161144	10/16/2013	11:44:00 AM	MISS-RM818.5-6	N	28.5	< 2.08	< 1.04	< 1.04	1.93	4.3	< 2.08	< 1.04	4.18	2.75	< 1.04	1.04	< 1.04	329 J	6.4	24.2
MISS-RM818.5-7-201309111102	9/11/2013	11:02:00 AM	MISS-RM818.5-7	N	34.8	60.3	< 0.97	< 0.97	5.29	6.25	2.7	1.54 J	7.61	4.3	< 0.97	3.07	< 0.97	391	6.6	28.4
MISS-RM818.5-7-201310161153	10/16/2013	11:53:00 AM	MISS-RM818.5-7	N	18	< 1.85	< 0.926	< 0.926	1.95	3.74	< 1.85	< 0.926	4.17	2.52	< 0.926	1.93	< 0.926	314 J	5.7	30.9
MISS-RM826.0-1-201309100928	9/10/2013	9:28:00 AM	MISS-RM826.0-1	N	14.3	13	< 1.06	< 1.06	6.4	3.87	2.68	1.54 J	5.93	3.92	< 1.06	2.62	< 1.06	387	6.4	20.1
MISS-RM826.0-1-201310151530	10/15/2013	3:30:00 PM	MISS-RM826.0-1	N	13.8 J	< 1.81 J	< 0.905 J	< 0.905 J	1.81 J	3 J	< 1.81 J	< 0.905 J	2.97 J	1.756 J	< 0.905 J	1.46 J	< 0.905 J	290	6.4	12.3
MISS-RM826.0-2-201309100941	9/10/2013	9:41:00 AM	MISS-RM826.0-2	N	16.6	7.91	< 0.975	< 0.975	5.05	4.07	< 1.95	< 0.975	6.05	4.07	< 0.975	2.45	< 0.975	390	6.3	22
MISS-RM826.0-2-201310151535	10/15/2013	3:35:00 PM	MISS-RM826.0-2	N	--	< 1.83	< 0.914	< 0.914	1.15	2.87	< 1.83	< 0.914	2.88	3.65	< 0.914	< 1.03	< 0.914	295	4.1	18.3
MISS-RM826.0-3-201309100950	9/10/2013	9:50:00 AM	MISS-RM826.0-3	N	19.8	11.1	< 0.97	< 0.97	3.33	4.51	< 2.28	1.26 J	6.21	4.8	< 0.97	1.95	< 0.97	395	7.1	33.1
MISS-RM826.0-3-201310151543	10/15/2013	3:43:00 PM	MISS-RM826.0-3	N	14.5 J	< 2.09 J	< 1.04 J	< 1.04 J	2.19 J	2.86 J	< 2.09 J	< 1.04 J	3.14 J	2.13 J	< 1.04 J	1.39 J	< 1.04 J	306	6.4	19.5
MISS-RM826.0-4-201309101003	9/10/2013	10:03:00 AM	MISS-RM826.0-4	N	17.6	13.1	< 1.02	< 1.02	4.89 J	4.03 J	2.98 J	2.59 J	5.8	5.52	< 1.02	1.94	< 1.02	388	7.1	24.9
MISS-RM826.0-4-201309101003DUP	9/10/2013	10:03:00 AM	MISS-RM826.0-4	LR	16.8	11.8	< 1.02	< 1.02	3.38	5.88	< 2.03	1.62	5.64	4.09	< 1.02	2.17	< 1.02	--	--	--
MISS-RM826.0-4-201310151548	10/15/2013	3:48:00 PM	MISS-RM826.0-4	N	12.5	< 2.11	< 1.05	< 1.05	1.48	2.91	< 2.11	< 1.05	3.35	2.108 J	< 1.05	1.4	< 1.05	312	6	19.3
MISS-RM826.0-5-201309101016	9/10/2013	10:16:00 AM	MISS-RM826.0-5	N	19.8	10.4	< 0.976	< 0.976	3.98	3.25	< 1.95	1.3 J	4.86	3.88	< 0.976	2.39	< 0.976	384	7.7 J	24.9
MISS-RM826.0-5-201310151554	10/15/2013	3:54:00 PM	MISS-RM826.0-5	N	12.3	< 1.8	< 0.902	< 0.902	1.35	2.93	< 1.8	< 0.902	3.61	1.91	< 0.902	1.29	< 0.902	307	6.4	16.6
MISS-RM826.0-5-201310151554DUP	--	--	MISS-RM826.0-5	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.5
MISS-RM836.3-1-201309091112	9/9/2013	11:12:00 AM	MISS-RM836.3-1	N	13.5 J	2.54	< 0.979	< 0.979	3.07	1.82	< 1.96	< 0.979	2.85	1.38 J	< 0.979	< 2.08	< 0.979	323	7.3	23.2
MISS-RM836.3-1-201309091112DUP	--	--	MISS-RM836.3-1	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	336	--	19
MISS-RM836.3-1-201310151439	10/15/2013	2:39:00 PM	MISS-RM836.3-1	N	6.97	< 2.03	< 1.01	< 1.01	< 1.01	1.21	< 2.03	< 1.01	< 1.01	1.573 J	< 1.01	1.35	< 1.01	260	6.8	15
MISS-RM836.3-2-201309091123	9/9/2013	11:23:00 AM	MISS-RM836.3-2	N	9.76 J	< 2.86	< 1.05	< 1.05	5.04	1.52	< 3.37	< 1.05	2.9	< 2.1 J	< 1.05	1.36	< 1.05	350	7.1	23.7

Table 4
2013 Surface Water Results

Sample Name	Sample Date	Sample Time	Parent Location	Sample Type	PFBA (ng/L)	PFBS (ng/L)	PFDA (ng/L)	PFDoA (ng/L)	PFHpA (ng/L)	PFHxA (ng/L)	PFHxS (ng/L)	PFNA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	PFOSA (ng/L)	PFPeA (ng/L)	PFUnA (ng/L)	TDS (mg/L)	TOC (mg/L)	TSS (mg/L)
MISS-RM836.3-2-201309091123DUP	--	--	MISS-RM836.3-2	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22.6
MISS-RM836.3-2-201310151447	10/15/2013	2:47:00 PM	MISS-RM836.3-2	N	6.38	< 1.79	< 0.897	< 0.897	0.951	1.04	< 1.79	< 0.897	1.12	1.142 J	< 0.897	0.928	< 0.897	259	6.9	15.9
MISS-RM836.3-3-201309091134	9/9/2013	11:34:00 AM	MISS-RM836.3-3	N	10.9 J	< 1.94	< 0.968	< 0.968	4.83	2.2	< 1.94	< 0.968	3.8	1.098 J	< 0.968	< 1.38	< 0.968	322	7	16.1
MISS-RM836.3-3-201310151457	10/15/2013	2:57:00 PM	MISS-RM836.3-3	N	7.32	< 1.89	< 0.947	< 0.947	< 0.947	< 0.947	< 1.89	< 0.947	1.51	1.405 J	< 0.947	< 1.24	< 0.947	270	6.9	16.2
MISS-RM841.0-1-201309081342	9/8/2013	1:42:00 PM	MISS-RM841.0-1	N	10.7	< 2.04	< 1.02	< 1.02	1.54	1.82	< 2.04	< 1.02	2.14	1.843 J	< 1.02	< 2.54	< 1.02	378 J	7.4	24
MISS-RM841.0-1-201310151226	10/15/2013	12:26:00 PM	MISS-RM841.0-1	N	6.26	< 1.77	< 0.884	< 0.884	< 0.884	1.35	< 1.77	< 0.884	1.28	1.23 J	< 0.884	< 0.884	< 0.884	246	7	11.5
MISS-RM841.0-2-201309081355	9/8/2013	1:55:00 PM	MISS-RM841.0-2	N	9.45	2.67	< 1.02	< 1.02	2.65	1.76	< 2.04	< 1.02	1.92	1.24 J	< 1.02	< 2.3	< 1.02	382 J	7.3	< 10
MISS-RM841.0-2-201310151239	10/15/2013	12:39:00 PM	MISS-RM841.0-2	N	6.03	< 1.98	< 0.992	< 0.992	< 0.992	1.89	< 1.98	< 0.992	1.24	1.505 J	< 0.992	< 1.15	< 0.992	258	7	12.6
MISS-RM841.0-3-201309081403	9/8/2013	2:03:00 PM	MISS-RM841.0-3	N	10.9	< 2.26	< 0.994	< 0.994	2.84	2.11	< 1.99	< 0.994	2.01	1.331 J	< 0.994	< 1.65	< 0.994	338 J	7.5	16
MISS-RM841.0-3-201309081403DUP	--	--	MISS-RM841.0-3	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	21.8
MISS-RM841.0-3-201310151351	10/15/2013	1:51:00 PM	MISS-RM841.0-3	N	7.09	< 1.76	< 0.878	< 0.878	< 0.878	1.78	< 1.76	< 0.878	1.3	1.595 J	< 0.878	< 0.878	< 0.878	278	6.3	17.6
MISS-RM847.3-C-201309081307	9/8/2013	1:07:00 PM	MISS-RM847.3-C	N	10.4	< 2.02	< 1.01	< 1.01	4.36	1.32	< 2.02	< 1.01	2.35	< 2.02 J	< 1.01	< 2.29	< 1.01	252 J	8.4 J	< 10
MISS-RM847.3-C-201309081307DUP	--	--	MISS-RM847.3-C	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.9 J
MISS-RM847.3-C-201310151143	10/15/2013	11:43:00 AM	MISS-RM847.3-C	N	7.23	< 1.81	< 0.903	< 0.903	< 0.903	1.5	< 1.81	< 0.903	1.67	1.742 J	< 0.903	< 1.57	< 0.903	201	7.1	< 10
SW-FB-20130910	9/10/2013	2:44:00 PM	MISS-RM826.0-5	FB	< 0.949	< 1.9	< 0.949	< 0.949	< 0.949	< 0.949	< 1.9	< 0.949	< 0.949	< 1.9 J	< 0.949	< 0.949	< 0.949	--	--	--
SW-FB-20130912	9/12/2013	10:49:00 AM	MISS-RM814.3-5	FB	< 0.981	< 1.96	< 0.981	< 0.981	< 0.981	< 0.981	< 1.96	< 0.981	< 0.981	1.192 J	< 0.981	< 0.981	< 0.981	--	--	--
SW-FB-20131016	10/16/2013	11:53:00 AM	MISS-RM818.5-7	FB	< 0.926	< 1.85	< 0.926	< 0.926	< 0.926	< 0.926	< 1.85	< 0.926	< 0.926	< 1.85 J	< 0.926	< 0.926	< 0.926	--	--	--
SW-FB2-20131016	10/16/2013	1:24:00 PM	MISS-RM814.3-5	FB	< 0.981	< 1.96	< 0.981	< 0.981	< 0.981	< 0.981	< 1.96	< 0.981	< 0.981	< 1.96 J	< 0.981	< 0.981	< 0.981	--	--	--
SW-FD-20130911	9/11/2013	11:02:00 AM	MISS-RM818.5-7	FD	38.5	65.8	< 1.01	< 1.01	3.76	5.97	< 2.03	1.56 J	8.22	6.12	< 1.01	3.77	< 1.01	397	6.4	28.7
SW-FD-20130911DUP	--	--	MISS-RM818.5-7	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	29.8
SW-FD-20130912	9/12/2013	9:30:00 AM	MISS-RM814.3-5	FD	207 J	276	< 0.985	< 0.985	5.34	7.91	3.29	< 0.985	12.5	8.46	< 0.985	6.55	< 0.985	375	6.7	39.2
SW-FD-20131016	10/16/2013	11:16:00 AM	MISS-RM818.5-3	FD	26.2	< 2.16	< 0.868	< 0.868	< 1.3	6.16	< 1.74	< 0.868	5.6	2.93	< 0.868	< 5.34	< 0.868	317 J	5.7	27.8
SW-FD2-20131016	10/16/2013	1:08:00 PM	MISS-RM814.3-3	FD	36.3	< 2.03	< 1.01	< 1.01	1.95	5.12	< 2.03	< 1.01	7.09	3.89	< 1.01	4.44	< 1.01	481 J	5.5	41.5

Notes:
All non-detect results are reported at the reporting limit.
All perfluorochemicals were analyzed and reported in the dissolved fraction.

-- = results not reported or not applicable
< = compound analyzed, but not detected above reporting limit
FB = field blank
FD = field duplicate
J = estimated value
LR = lab replicate
mg/L = milligrams per liter
ng/L = nanogram per liter
N = environmental sample
PFBA = Perfluorobutanoate
PFBS = Perfluorobutanesulfonate
PFDA = Perfluorodecanoate
PFDoA = Perfluorododecanoate
PFHpA = Perfluoroheptanoate
PFHxA = Perfluorohexanoate
PFHxS = Perfluorohexanesulfonate
PFNA = Perfluorononanoate
PFOA = Perfluorooctanoate
PFOS = Perfluorooctanesulfonate
PFOSA = Perfluorooctane sulfonamide
PFPeA = Perfluoropentanoate
PFUnA = Perfluoroundecanoate
TDS = total dissolved solids
TOC = total organic carbon
TSS = total suspended solids
SW = Surface Water

Table 5
Summary of Fish Collected from Pool 2

Common Name	Species	Length (millimeters)			Weight (grams)			Sample Size (Entire Pool)
		Min.	Avg.	Max.	Min.	Avg.	Max.	
Bluegill/sunfishes	*Lepomis macrochirus/ Lepomis spp.*	99	127	185	19	49	167	90
White Bass	*Morone chrysops*	226	337	454	145	525	1115	87
Freshwater Drum	*Aplodinotus grunniens*	275	391	584	243	860	2502	91
Common Carp	*Cyprinus carpio*	353	508	692	644	1932	4122	93

Table 6
2013 Fish Results

Sample Name	Sample Date	Sample Time	Sample Type	River Section	Species	Length (mm)	Weight (g)	PFBA (ng/g)	PFBS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHpA (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOA (ng/g)	PFOS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFUnA (ng/g)
MISS-S1-R1-01	9/23/2013	1:32:00 PM	N	MISS-S1	Freshwater drum	390	714	< 0.818	< 0.976	1.37	1.15	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	36.9	< 0.585	< 0.488	1.21
MISS-S1-R1-01DUP	9/23/2013	1:32:00 PM	LR	--	--	--	--	< 0.476	< 0.952	1.39	1.37	< 0.476	< 0.476	< 0.952	< 0.476	< 0.476	39.8	< 0.571	< 0.476	1.3
MISS-S1-R1-02	9/23/2013	1:55:00 PM	N	MISS-S1	Freshwater drum	391	803	< 0.481	< 0.962	0.615	< 0.481	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	12.2	< 0.577	< 0.481	< 0.481
MISS-S1-R1-03	9/23/2013	1:58:00 PM	N	MISS-S1	Freshwater drum	390	595	< 0.481	< 0.962	< 0.481	< 0.481	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	3.95	< 0.577	< 0.481	< 0.481
MISS-S1-R1-04	9/23/2013	2:00:00 PM	N	MISS-S1	Freshwater drum	363	537	< 0.481	< 0.962	0.696	0.893	< 0.481	< 0.481	< 0.962	0.485	< 0.481	8.19	< 0.577	< 0.481	0.656
MISS-S1-R1-05	9/23/2013	2:02:00 PM	N	MISS-S1	Freshwater drum	409	812	< 0.505	< 1.01	0.585	1.27	< 0.505	< 0.505	< 1.01	< 0.505	< 0.505	3.29	< 0.606	< 0.505	0.597
MISS-S1-R1-06	9/23/2013	2:04:00 PM	N	MISS-S1	Freshwater drum	493	1335	< 0.49	< 0.98	0.822	1.24	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	4.92	< 0.588	< 0.49	0.606
MISS-S1-R1-07	9/23/2013	2:07:00 PM	N	MISS-S1	Freshwater drum	403	835	< 0.493	< 0.985	0.796	1.21	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	4.72	< 0.591	< 0.493	0.643
MISS-S1-R1-08	9/23/2013	2:09:00 PM	N	MISS-S1	Freshwater drum	369	679	< 0.488	< 0.976	< 0.488	< 0.488	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	10.7	< 0.585	< 0.488	< 0.488
MISS-S1-R1-09	9/23/2013	2:12:00 PM	N	MISS-S1	Freshwater drum	340	467	< 0.498	< 0.995	1.27	0.977	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	37.8	< 0.597	< 0.498	0.805
MISS-S1-R1-10	9/23/2013	2:14:00 PM	N	MISS-S1	Blue gill	137	59	< 0.795	< 0.995	1.21	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	11.5	< 0.597	< 0.498	< 0.498
MISS-S1-R1-11	9/23/2013	2:17:00 PM	N	MISS-S1	Blue gill	129	44	< 0.618	< 0.98	3.87	2.41	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	134	< 0.588	< 0.49	2.68
MISS-S1-R1-12	9/23/2013	2:20:00 PM	N	MISS-S1	Blue gill	142	64	< 0.786	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	12.1	< 0.597	< 0.498	< 0.498
MISS-S1-R1-13	9/23/2013	2:21:00 PM	N	MISS-S1	Blue gill	126	40	< 1	< 0.98	1.68	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	23.3	0.818	< 0.49	1.62
MISS-S1-R1-14	9/23/2013	2:24:00 PM	N	MISS-S1	Blue gill	140	65	< 0.49	< 0.98	0.787	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	14.2	< 0.588	< 0.49	0.903
MISS-S1-R1-15	9/23/2013	2:25:00 PM	N	MISS-S1	Blue gill	125	36	< 0.807	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	8.84	< 0.588	< 0.49	< 0.49
MISS-S1-R1-16	9/23/2013	2:27:00 PM	N	MISS-S1	Blue gill	152	79	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	10.4	< 0.6	< 0.5	< 0.5
MISS-S1-R1-17	9/23/2013	2:30:00 PM	N	MISS-S1	Blue gill	119	33	< 0.498	< 0.995	0.581	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	7.53	< 0.597	< 0.498	< 0.498
MISS-S1-R1-18	9/23/2013	2:32:00 PM	N	MISS-S1	Blue gill	133	48	< 1.33	< 1.02	0.519	< 0.508	< 0.508	< 0.508	< 1.02	< 0.508	< 0.508	12.3	< 0.609	< 0.508	< 0.508
MISS-S1-R1-19	9/23/2013	2:33:00 PM	N	MISS-S1	Blue gill	118	32	< 0.5	< 1	0.837	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	8.56	< 0.6	< 0.5	< 0.5
MISS-S1-R1-20	9/23/2013	2:36:00 PM	N	MISS-S1	Blue gill	133	50	< 0.686	< 1.01	0.68	0.528	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	23.9	< 0.603	< 0.503	< 0.503
MISS-S1-R1-21	9/23/2013	2:38:00 PM	N	MISS-S1	Carp	590	2099	< 0.493	< 0.985	< 0.493	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	5.39	< 0.591	< 0.493	< 0.493
MISS-S1-R1-22	9/23/2013	2:45:00 PM	N	MISS-S1	Carp	466	1259	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	3	< 0.588	< 0.49	< 0.49
MISS-S1-R1-23	9/23/2013	2:47:00 PM	N	MISS-S1	Carp	638	3531	< 0.49	< 0.98	1.87	0.661	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	13.6	< 0.588	< 0.49	0.654
MISS-S1-R2-01	9/23/2013	3:27:00 PM	N	MISS-S1	Blue gill	148	61	< 0.493	< 0.985	0.749	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	10.6	< 0.591	< 0.493	< 0.493
MISS-S1-R2-02	9/23/2013	3:29:00 PM	N	MISS-S1	Blue gill	145	67	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	8.59	< 0.588	< 0.49	< 0.49
MISS-S1-R2-03	9/23/2013	3:30:00 PM	N	MISS-S1	Blue gill	152	79	< 0.495	< 0.99	2.49	1.38	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	67.9	< 0.594	< 0.495	1.76
MISS-S1-R2-04	9/23/2013	3:33:00 PM	N	MISS-S1	Blue gill	135	41	< 0.503	< 1.01	< 0.503	< 0.503	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	7.96	< 0.603	< 0.503	< 0.503
MISS-S1-R2-05	9/23/2013	3:35:00 PM	N	MISS-S1	Carp	641	3123	< 0.485	< 0.971	< 0.485	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	4.07	< 0.583	< 0.485	< 0.485
MISS-S1-R2-06	9/23/2013	3:37:00 PM	N	MISS-S1	Carp	473	1409	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	5.65	< 0.597	< 0.498	< 0.498
MISS-S1-R2-07	9/23/2013	3:40:00 PM	N	MISS-S1	Carp	689	4057	< 0.488	< 0.976	1.11	0.802	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	8.27	< 0.585	< 0.488	0.782
MISS-S1-R2-07DUP	9/23/2013	3:40:00 PM	LR	--	--	--	--	< 0.493	< 0.985	1.06	0.93	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	7.98	< 0.591	< 0.493	0.789
MISS-S1-R2-08	9/23/2013	3:41:00 PM	N	MISS-S1	Carp	432	964	< 0.474	< 0.948	< 0.474	< 0.474	< 0.474	< 0.474	< 0.948	< 0.474	< 0.474	2.17	< 0.569	< 0.474	< 0.474
MISS-S1-R2-09	9/23/2013	3:45:00 PM	N	MISS-S1	Carp	353	1158	< 0.503	< 1.01	0.629	1.18	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	5.14	< 0.603	< 0.503	< 0.503
MISS-S1-R2-10	9/23/2013	3:47:00 PM	N	MISS-S1	Carp	548	1943	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	12.4	< 0.6	< 0.5	< 0.5
MISS-S1-R2-11	9/23/2013	3:49:00 PM	N	MISS-S1	Carp	536	1985	< 0.5	< 1	0.542	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	7.18	< 0.6	< 0.5	< 0.5
MISS-S1-R2-12	9/23/2013	3:52:00 PM	N	MISS-S1	Carp	451	1197	< 0.653	< 0.971	0.512	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	3.67	< 0.583	< 0.485	< 0.485
MISS-S1-R2-13	9/23/2013	3:55:00 PM	N	MISS-S1	Carp	438	906	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	2.37	< 0.588	< 0.49	< 0.49
MISS-S1-R2-14	9/23/2013	3:57:00 PM	N	MISS-S1	Carp	405	771	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	1.11	< 0.6	< 0.5	< 0.5
MISS-S1-R2-15	9/23/2013	4:00:00 PM	N	MISS-S1	Freshwater drum	275	243	< 0.485	< 0.971	< 0.485	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	6.1	< 0.583	< 0.485	< 0.485
MISS-S1-R3-01	9/23/2013	4:04:00 PM	N	MISS-S1	Freshwater drum	402	864	< 0.894	< 1.01	0.527	< 0.505	< 0.505	< 0.505	< 1.01	< 0.505	< 0.505	15.8	< 0.606	< 0.505	< 0.505
MISS-S1-R3-02	9/23/2013	4:07:00 PM	N	MISS-S1	Freshwater drum	375	627	< 0.776	< 0.98	0.678	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	32.4	< 0.588	< 0.49	< 0.49
MISS-S1-R3-03	9/23/2013	4:08:00 PM	N	MISS-S1	Freshwater drum	374	668	< 0.49	< 0.98	1.26	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	37.5	< 0.588	< 0.49	0.657
MISS-S1-R3-04	9/23/2013	4:11:00 PM	N	MISS-S1	Freshwater drum	398	753	< 0.506	< 0.985	0.779	1.05	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	8.73	< 0.591	< 0.493	< 0.493
MISS-S1-R3-05	9/23/2013	4:12:00 PM	N	MISS-S1	Freshwater drum	410	821	< 0.495	< 0.99	0.589	1.12	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	2.9	< 0.594	< 0.495	0.503
MISS-S1-R3-06	9/23/2013	4:14:00 PM	N	MISS-S1	Carp	570	2202	< 0.52	< 1	0.804	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	6.1	< 0.6	< 0.5	< 0.5
MISS-S1-R3-07	9/23/2013	4:17:00 PM	N	MISS-S1	Carp	618	3410	< 0.498	< 0.995	0.529	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	14.8	< 0.597	< 0.498	< 0.498
MISS-S1-R4-01	9/23/2013	5:04:00 PM	N	MISS-S1	White Bass	284	283	< 0.5	< 1	2.22	0.701	< 0.5	< 0.5	< 1	0.543	< 0.5	28.9	< 0.6	< 0.5	0.739
MISS-S1-R4-02	9/23/2013	5:58:00 PM	N	MISS-S1	Carp	411	853	< 0.485	< 0.971	< 0.485	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	< 0.971	< 0.583	< 0.485	< 0.485

Table 6
2013 Fish Results

Sample Name	Sample Date	Sample Time	Sample Type	River Section	Species	Length (mm)	Weight (g)	PFBA (ng/g)	PFBS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHpA (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOA (ng/g)	PFOS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFUnA (ng/g)
MISS-S1-R5-01	9/24/2013	1:42:00 PM	N	MISS-S1	White Bass	309	387	< 0.481	< 0.962	5.01	1.24	< 0.481	< 0.481	< 0.962	1.01	< 0.481	119	1.69	< 0.481	2.73
MISS-S1-R6-01	9/30/2013	6:05:00 PM	N	MISS-S1	White Bass	303	389	< 0.498	< 0.995	2.42	0.73	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	39.9	< 0.597	< 0.498	0.993
MISS-S1-R6-02	9/30/2013	6:07:00 PM	N	MISS-S1	White Bass	299	325	< 0.472	< 0.943	2.41	0.71	< 0.472	< 0.472	< 0.943	0.872	< 0.472	40.5	0.663	< 0.472	0.973
MISS-S1-R6-03	9/30/2013	6:09:00 PM	N	MISS-S1	White Bass	357	219	< 0.503	< 1.01	1.47	< 0.503	< 0.503	< 0.503	< 1.01	0.597	< 0.503	30.2	1.09	< 0.503	< 0.503
MISS-S1-R6-04	9/30/2013	6:10:00 PM	N	MISS-S1	White Bass	247	207	< 0.515	< 1.03	1.51	0.616	< 0.515	< 0.515	< 1.03	< 0.515	< 0.515	23	< 0.619	< 0.515	0.565
MISS-S1-R6-05	9/30/2013	6:12:00 PM	N	MISS-S1	White Bass	395	840	< 0.495	< 0.99	2.91	1.21	< 0.495	< 0.495	< 0.99	0.552	< 0.495	34.1	< 0.594	< 0.495	1.22
MISS-S1-R6-06	9/30/2013	6:13:00 PM	N	MISS-S1	White Bass	315	411	< 0.515	< 1.03	0.938	< 0.515	< 0.515	< 0.515	< 1.03	< 0.515	< 0.515	26.8	1.28	< 0.515	< 0.515
MISS-S1-R6-06DUP	9/30/2013	6:13:00 PM	LR	--	--	--	--	< 0.508	< 1.02	0.915	< 0.508	< 0.508	< 0.508	< 1.02	< 0.508	< 0.508	24.5	1.14	< 0.508	< 0.508
MISS-S1-R6-07	9/30/2013	6:14:00 PM	N	MISS-S1	White Bass	381	748	< 0.513	< 1.03	2.7	1.15	< 0.513	< 0.513	< 1.03	1.12	< 0.513	30.9	< 0.615	< 0.513	1.15
MISS-S1-R6-08	9/30/2013	6:16:00 PM	N	MISS-S1	White Bass	320	462	< 0.521	< 1.04	1.24	< 0.521	< 0.521	< 0.521	< 1.04	< 0.521	< 0.521	34.2	1.24	< 0.521	0.581
MISS-S1-R6-09	9/30/2013	6:17:00 PM	N	MISS-S1	White Bass	257	214	< 0.521	< 1.04	2.31	0.935	< 0.521	< 0.521	< 1.04	0.593	< 0.521	28.4	< 0.625	< 0.521	0.854
MISS-S1-R6-10	9/30/2013	6:18:00 PM	N	MISS-S1	White Bass	257	219	< 0.49	< 0.98	1.73	0.554	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	25.7	0.614	< 0.49	0.669
MISS-S1-R6-11	9/30/2013	6:20:00 PM	N	MISS-S1	White Bass	378	669	< 0.49	< 0.98	1.95	0.542	< 0.49	< 0.49	< 0.98	0.641	< 0.49	27.1	< 0.588	< 0.49	0.701
MISS-S1-R6-12	9/30/2013	6:21:00 PM	N	MISS-S1	White Bass	226	150	< 0.474	< 0.948	2.24	0.683	< 0.474	< 0.474	< 0.948	0.574	< 0.474	32.4	< 0.569	< 0.474	0.696
MISS-S1-R6-13	9/30/2013	6:23:00 PM	N	MISS-S1	White Bass	234	170	< 0.5	< 1	1.94	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	19.6	< 0.6	< 0.5	0.557
MISS-S1-R6-14	9/30/2013	6:24:00 PM	N	MISS-S1	White Bass	238	145	< 0.5	< 1	2.19	0.514	< 0.5	< 0.5	< 1	0.744	< 0.5	29	< 0.6	< 0.5	0.629
MISS-S2A-R1-01	9/23/2013	6:04:00 PM	N	MISS-S2A	Carp	527	2424	< 0.488	< 0.976	< 0.488	< 0.488	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	8.24	< 0.585	< 0.488	< 0.488
MISS-S2A-R1-02	9/23/2013	6:07:00 PM	N	MISS-S2A	Carp	565	3925	< 0.495	< 0.99	< 0.495	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	2.57	< 0.594	< 0.495	< 0.495
MISS-S2A-R1-03	9/23/2013	6:11:00 PM	N	MISS-S2A	Carp	552	3685	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	1.86	< 0.6	< 0.5	< 0.5
MISS-S2A-R1-04	9/23/2013	6:14:00 PM	N	MISS-S2A	Carp	521	2272	< 0.488	< 0.976	< 0.488	< 0.488	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	3.58	< 0.585	< 0.488	< 0.488
MISS-S2A-R1-05	9/23/2013	6:04:00 PM	N	MISS-S2A	Carp	547	3184	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	< 0.98	< 0.588	< 0.49	< 0.49
MISS-S2A-R1-05DUP	9/23/2013	6:04:00 PM	LR	--	--	--	--	< 0.488	< 0.976	< 0.488	< 0.488	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	< 0.976	< 0.585	< 0.488	< 0.488
MISS-S2A-R1-06	9/23/2013	6:21:00 PM	N	MISS-S2A	Carp	446	1137	< 0.493	< 0.985	< 0.493	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	3.48	< 0.591	< 0.493	< 0.493
MISS-S2A-R1-07	9/23/2013	6:04:00 PM	N	MISS-S2A	Carp	565	2927	< 0.828	< 0.971	< 0.485	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	7.92	< 0.583	< 0.485	< 0.485
MISS-S2A-R1-08	9/23/2013	6:04:00 PM	N	MISS-S2A	Carp	528	2771	< 0.508	< 0.995	0.621	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	31.9	< 0.597	< 0.498	< 0.498
MISS-S2A-R1-09	9/23/2013	6:27:00 PM	N	MISS-S2A	Carp	465	1248	< 0.488	< 0.976	< 0.488	< 0.488	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	11.3	< 0.585	< 0.488	< 0.488
MISS-S2A-R1-10	9/23/2013	6:04:00 PM	N	MISS-S2A	Carp	533	2665	< 0.495	< 0.99	< 0.495	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	4.65	< 0.594	< 0.495	< 0.495
MISS-S2A-R1-11	9/23/2013	6:32:00 PM	N	MISS-S2A	Carp	512	2299	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	4.95	< 0.6	< 0.5	< 0.5
MISS-S2A-R1-12	9/23/2013	6:34:00 PM	N	MISS-S2A	Carp	485	1636	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	3.23	< 0.588	< 0.49	< 0.49
MISS-S2A-R1-13	9/23/2013	6:37:00 PM	N	MISS-S2A	Carp	509	2197	< 0.493	< 0.985	0.523	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	4.81	< 0.591	< 0.493	< 0.493
MISS-S2A-R1-14	9/23/2013	6:39:00 PM	N	MISS-S2A	White Bass	308	404	< 0.5	< 1	1.04	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	31.7	1.4	< 0.5	< 0.5
MISS-S2A-R1-15	9/23/2013	6:04:00 PM	N	MISS-S2A	Carp	512	2338	< 0.5	< 1	2.75	1.08	< 0.5	< 0.5	< 1	0.969	< 0.5	40	< 0.6	< 0.5	1.08
MISS-S2A-R1-16	9/23/2013	6:04:00 PM	N	MISS-S2A	Carp	490	1819	< 0.498	< 0.995	0.625	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	10.6	< 0.597	< 0.498	< 0.498
MISS-S2A-R1-17	9/23/2013	6:45:00 PM	N	MISS-S2A	Blue gill	139	66	< 0.5	< 1	0.557	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	9.08	< 0.6	< 0.5	< 0.5
MISS-S2A-R1-18	9/23/2013	6:46:00 PM	N	MISS-S2A	Blue gill	151	72	< 0.498	< 0.995	0.668	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	6.43	< 0.597	< 0.498	< 0.498
MISS-S2A-R1-19	9/23/2013	6:47:00 PM	N	MISS-S2A	Blue gill	152	78	< 0.493	< 0.985	0.578	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	6.92	< 0.591	< 0.493	< 0.493
MISS-S2A-R1-20	9/23/2013	6:49:00 PM	N	MISS-S2A	Blue gill	144	64	< 0.503	< 1.01	0.681	< 0.503	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	21.6	< 0.603	< 0.503	< 0.503
MISS-S2A-R1-21	9/23/2013	6:51:00 PM	N	MISS-S2A	Blue gill	142	63	< 0.493	< 0.985	2.99	1.3	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	35.4	< 0.591	< 0.493	1.09
MISS-S2A-R1-22	9/23/2013	6:52:00 PM	N	MISS-S2A	Blue gill	111	30	< 0.488	< 0.976	2.33	2.35	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	37.8	< 0.585	< 0.488	1.8
MISS-S2A-R1-23	9/23/2013	6:53:00 PM	N	MISS-S2A	Blue gill	127	43	< 0.495	< 0.99	1.64	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	20.6	< 0.594	< 0.495	1.6
MISS-S2A-R1-24	9/23/2013	6:54:00 PM	N	MISS-S2A	Blue gill	124	44	< 0.495	< 0.99	1.08	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	64.7	< 0.594	< 0.495	< 0.495
MISS-S2A-R1-25	9/23/2013	6:55:00 PM	N	MISS-S2A	Blue gill	115	32	< 0.498	< 0.995	0.987	0.582	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	28.3	< 0.597	< 0.498	< 0.498
MISS-S2A-R2-01	9/24/2013	1:47:00 PM	N	MISS-S2A	White Bass	371	694	< 0.481	< 0.962	2.98	1.36	< 0.481	< 0.481	< 0.962	0.688	< 0.481	52.9	< 0.577	< 0.481	1.57
MISS-S2A-R2-01DUP	9/24/2013	1:47:00 PM	LR	--	--	--	--	< 0.488	< 0.976	2.92	1.39	< 0.488	< 0.488	< 0.976	0.57	< 0.488	52.2	< 0.585	< 0.488	1.4
MISS-S2A-R2-02	9/24/2013	1:49:00 PM	N	MISS-S2A	White Bass	323	450	< 0.485	< 0.971	2.12	0.662	< 0.485	< 0.485	< 0.971	0.786	< 0.485	37.1	< 0.583	< 0.485	0.795
MISS-S2A-R2-03	9/24/2013	1:50:00 PM	N	MISS-S2A	White Bass	320	413	< 0.485	< 0.971	1.44	0.598	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	27.5	0.848	< 0.485	0.606
MISS-S2A-R2-04	9/24/2013	1:52:00 PM	N	MISS-S2A	White Bass	317	411	< 0.493	< 0.985	1.7	0.572	< 0.493	< 0.493	< 0.985	0.676	< 0.493	32.2	< 0.591	< 0.493	0.704
MISS-S2A-R2-05	9/24/2013	1:54:00 PM	N	MISS-S2A	White Bass	267	238	< 0.49	< 0.98	1.2	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	32	1.74	< 0.49	0.529
MISS-S2A-R2-06	9/24/2013	1:55:00 PM	N	MISS-S2A	White Bass	312	394	< 0.5	< 1	1.77	0.556	< 0.5	< 0.5	< 1	0.613	< 0.5	28.7	1.23	< 0.5	0.599

Table 6
2013 Fish Results

Sample Name	Sample Date	Sample Time	Sample Type	River Section	Species	Length (mm)	Weight (g)	PFBA (ng/g)	PFBS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHpA (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOA (ng/g)	PFOS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFUnA (ng/g)
MISS-S2A-R2-07	9/24/2013	1:56:00 PM	N	MISS-S2A	Freshwater drum	332	454	< 0.495	< 0.99	0.963	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	12.8	< 0.594	< 0.495	< 0.495
MISS-S2A-R2-08	9/24/2013	1:57:00 PM	N	MISS-S2A	Freshwater drum	460	1368	< 0.478	< 0.957	1.36	1.77	< 0.478	< 0.478	< 0.957	< 0.478	< 0.478	19.1	< 0.574	< 0.478	1.05
MISS-S2A-R2-09	9/24/2013	1:59:00 PM	N	MISS-S2A	Freshwater drum	342	466	< 0.503	< 1.01	< 0.503	< 0.503	< 0.503	< 0.503	< 1.44	< 0.503	< 0.503	10.6	< 0.603	< 0.503	< 0.503
MISS-S2A-R2-10	9/24/2013	2:00:00 PM	N	MISS-S2A	Freshwater drum	375	694	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 1.42	< 0.498	< 0.498	6.44	< 0.597	< 0.498	< 0.498
MISS-S2A-R2-11	9/24/2013	2:01:00 PM	N	MISS-S2A	Freshwater drum	391	769	< 0.483	< 0.966	1.11	1.76	< 0.483	< 0.483	< 0.966	< 0.483	< 0.483	45.4	< 0.58	< 0.483	1.02
MISS-S2A-R2-12	9/24/2013	2:03:00 PM	N	MISS-S2A	Freshwater drum	306	362	< 0.503	< 1.01	1.32	0.736	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	38.6	< 0.603	< 0.503	< 0.503
MISS-S2A-R3-01	9/25/2013	2:34:00 PM	N	MISS-S2A	White Bass	360	582	< 0.493	< 0.985	2.33	0.834	< 0.493	< 0.493	< 0.985	0.696	< 0.493	62.5	0.963	< 0.493	1.38
MISS-S2A-R3-02	9/25/2013	2:36:00 PM	N	MISS-S2A	White Bass	310	407	< 0.49	< 0.98	1.32	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	38.6	1.92	< 0.49	0.571
MISS-S2A-R3-03	9/25/2013	2:37:00 PM	N	MISS-S2A	Freshwater drum	401	778	< 0.528	< 1	1.51	1.13	< 0.5	< 0.5	< 1	< 0.5	< 0.5	17.3	< 0.6	< 0.5	0.832
MISS-S2A-R3-04	9/25/2013	2:39:00 PM	N	MISS-S2A	Freshwater drum	306	328	< 0.493	< 0.985	0.636	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	12.4	< 0.591	< 0.493	< 0.493
MISS-S2A-R3-05	9/25/2013	2:41:00 PM	N	MISS-S2A	Freshwater drum	337	440	< 1.17	< 0.985	0.748	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	25.8	< 0.591	< 0.493	< 0.493
MISS-S2A-R3-06	9/25/2013	2:43:00 PM	N	MISS-S2A	Freshwater drum	319	389	< 0.495	< 0.99	0.575	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	13.7	< 0.594	< 0.495	< 0.495
MISS-S2A-R3-07	9/25/2013	2:44:00 PM	N	MISS-S2A	Freshwater drum	379	656	< 0.521	< 0.98	0.641	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	22.7	< 0.588	< 0.49	< 0.49
MISS-S2A-R3-08	9/25/2013	2:54:00 PM	N	MISS-S2A	Blue gill	131	56	< 0.776	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	7.39	< 0.597	< 0.498	< 0.498
MISS-S2A-R3-09	9/25/2013	2:55:00 PM	N	MISS-S2A	Blue gill	125	46	< 0.503	< 1.01	0.794	< 0.503	2.54	< 0.503	< 1.01	< 0.503	< 0.503	15.6	< 0.603	< 0.503	< 0.503
MISS-S2A-R3-10	9/25/2013	2:56:00 PM	N	MISS-S2A	Blue gill	118	39	< 0.498	< 0.995	1.11	< 0.498	1.11	< 0.498	< 0.995	< 0.498	< 0.498	21.2	< 0.597	< 0.498	< 0.498
MISS-S2A-R3-11	9/25/2013	2:58:00 PM	N	MISS-S2A	Blue gill	117	38	< 0.5	< 1	< 0.5	< 0.5	1.49	< 0.5	< 1	< 0.5	< 0.5	7.15	< 0.6	< 0.5	< 0.5
MISS-S2A-R3-12	9/25/2013	2:59:00 PM	N	MISS-S2A	Blue gill	118	44	< 0.505	< 1.01	0.708	0.543	0.718	< 0.505	< 1.01	< 0.505	< 0.505	18.9	< 0.606	< 0.505	< 0.505
MISS-S2A-R3-13	9/25/2013	3:00:00 PM	N	MISS-S2A	Blue gill	118	39	< 0.493	< 0.985	0.517	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	39.3	< 0.591	< 0.493	< 0.493
MISS-S2A-R4-01	9/25/2013	2:50:00 PM	N	MISS-S2A	White Bass	345	535	< 0.498	< 0.995	2.46	1.03	< 0.498	< 0.498	< 0.995	0.657	< 0.498	66.4	1.39	< 0.498	1.61
MISS-S2A-R4-02	9/25/2013	3:02:00 PM	N	MISS-S2A	White Bass	344	561	< 0.481	< 0.962	1.8	0.619	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	46.5	1.22	< 0.481	0.781
MISS-S2A-R4-03	9/25/2013	3:04:00 PM	N	MISS-S2A	Freshwater drum	343	548	< 0.49	< 0.98	0.686	0.545	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	11.7	< 0.588	< 0.49	< 0.49
MISS-S2A-R4-04	9/25/2013	3:06:00 PM	N	MISS-S2A	Freshwater drum	501	1587	< 0.5	< 1	0.886	0.584	< 0.5	< 0.5	< 1	< 0.5	< 0.5	14.1	< 0.6	< 0.5	0.509
MISS-S2A-R4-05	9/25/2013	3:12:00 PM	N	MISS-S2A	Freshwater drum	399	813	< 0.493	< 0.985	3.29	2.2	< 0.493	< 0.493	< 0.985	0.793	< 0.493	96.2	< 0.591	< 0.493	1.86
MISS-S2A-R4-06	9/25/2013	3:14:00 PM	N	MISS-S2A	Freshwater drum	377	832	< 0.503	< 1.01	1.77	0.941	< 0.503	< 0.503	< 1.01	0.778	< 0.503	44.5	< 0.603	< 0.503	1.05
MISS-S2A-R4-07	9/25/2013	3:16:00 PM	N	MISS-S2A	White Bass	362	614	< 0.495	< 0.99	2.66	2.09	< 0.495	< 0.495	< 0.99	0.809	< 0.495	71.7	1.27	< 0.495	1.61
MISS-S2A-R4-08	9/25/2013	3:19:00 PM	N	MISS-S2A	White Bass	382	770	< 0.5	< 1	2.9	1.29	< 0.5	< 0.5	< 1	0.512	< 0.5	44.3	0.731	< 0.5	1.76
MISS-S2A-R4-08DUP	9/25/2013	3:19:00 PM	LR	--	--	--	--	< 0.5	< 1	2.47	1.11	< 0.5	< 0.5	< 1	0.609	< 0.5	47.7	0.764	< 0.5	1.18
MISS-S2A-R4-09	9/25/2013	3:20:00 PM	N	MISS-S2A	White Bass	361	566	< 0.474	< 0.948	3.58	1.45	< 0.474	< 0.474	< 0.948	< 0.474	< 0.474	52.9	< 0.569	< 0.474	1.64
MISS-S2A-R4-10	9/25/2013	3:22:00 PM	N	MISS-S2A	White Bass	364	593	< 0.503	< 1.01	2.37	0.92	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	45.3	0.83	< 0.503	1.28
MISS-S2B-R1-01	9/24/2013	6:06:00 PM	N	MISS-S2B	Carp	558	2273	< 0.485	< 0.971	0.778	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	21.3	< 0.583	< 0.485	< 0.485
MISS-S2B-R1-02	9/24/2013	6:09:00 PM	N	MISS-S2B	Carp	528	2104	< 0.481	< 0.962	1.75	0.54	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	29.1	< 0.577	< 0.481	1.36
MISS-S2B-R1-03	9/24/2013	6:10:00 PM	N	MISS-S2B	Carp	527	1904	< 0.483	< 0.966	1.46	0.609	< 0.483	< 0.483	< 0.966	< 0.483	< 0.483	24.4	0.683	< 0.483	0.656
MISS-S2B-R1-04	9/24/2013	6:12:00 PM	N	MISS-S2B	Carp	564	2128	< 0.498	< 0.995	2.76	1.11	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	19.5	0.891	< 0.498	1.98
MISS-S2B-R1-05	9/24/2013	6:13:00 PM	N	MISS-S2B	Carp	482	1707	< 0.503	< 1.01	2.81	0.724	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	31.6	< 0.603	< 0.503	1.87
MISS-S2B-R1-06	9/24/2013	6:15:00 PM	N	MISS-S2B	Carp	496	1474	< 0.5	< 1	0.822	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	8.03	0.666	< 0.5	< 0.5
MISS-S2B-R1-08	9/24/2013	6:17:00 PM	N	MISS-S2B	Carp	368	644	< 0.467	< 0.935	0.7	< 0.467	< 0.467	< 0.467	< 0.935	< 0.467	< 0.467	17.9	< 0.561	< 0.467	< 0.467
MISS-S2B-R1-09	9/24/2013	6:18:00 PM	N	MISS-S2B	Carp	387	859	< 0.481	< 0.962	0.725	< 0.481	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	16.1	< 0.577	< 0.481	< 0.481
MISS-S2B-R1-09DUP	9/24/2013	6:18:00 PM	LR	--	--	--	--	< 0.549	< 0.957	0.743	< 0.478	< 0.478	< 0.478	< 0.957	< 0.478	< 0.478	16.3	0.83	< 0.478	< 0.478
MISS-S2B-R1-10	9/24/2013	6:06:00 PM	N	MISS-S2B	Carp	558	2273	< 0.485	< 0.971	1.34	0.637	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	28.4	< 0.583	< 0.485	0.626
MISS-S2B-R1-11	9/24/2013	6:22:00 PM	N	MISS-S2B	Carp	692	4122	< 0.495	< 0.99	1.23	0.808	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	7.94	0.67	< 0.495	1.08
MISS-S2B-R1-12	9/24/2013	6:24:00 PM	N	MISS-S2B	Carp	514	2638	< 0.49	< 0.98	1.03	0.853	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	29.4	< 0.588	< 0.49	0.875
MISS-S2B-R1-13	9/24/2013	6:26:00 PM	N	MISS-S2B	Carp	519	1930	< 0.571	< 0.93	0.959	< 0.465	< 0.465	< 0.465	< 0.93	< 0.465	< 0.465	15.6	< 0.558	< 0.465	0.533
MISS-S2B-R1-14	9/24/2013	6:29:00 PM	N	MISS-S2B	Carp	462	1382	< 0.495	< 0.99	1.94	0.625	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	24.7	< 0.594	< 0.495	0.844
MISS-S2B-R1-15	9/24/2013	6:31:00 PM	N	MISS-S2B	Carp	401	897	< 0.495	< 0.99	0.958	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	25.1	< 0.594	< 0.495	< 0.495
MISS-S2B-R2-01	9/24/2013	6:37:00 PM	N	MISS-S2B	White Bass	354	623	< 0.469	< 0.939	1.36	0.618	< 0.469	< 0.469	< 0.939	< 0.469	< 0.469	53.9	2.1	< 0.469	0.516
MISS-S2B-R2-02	9/24/2013	6:37:00 PM	N	MISS-S2B	White Bass	343	677	< 0.498	< 0.995	0.948	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	29.6	1.58	< 0.498	< 0.498
MISS-S2B-R2-03	9/24/2013	6:37:00 PM	N	MISS-S2B	White Bass	368	667	< 0.508	< 1.02	0.933	< 0.508	< 0.508	< 0.508	< 1.02	< 0.508	< 0.508	35.3	1.73	< 0.508	< 0.508
MISS-S2B-R2-04	9/24/2013	6:42:00 PM	N	MISS-S2B	White Bass	314	414	< 0.478	< 0.957	1.35	0.546	< 0.478	< 0.478	< 0.957	< 0.478	< 0.478	36.4	1.32	< 0.478	< 0.478

Table 6
2013 Fish Results

Sample Name	Sample Date	Sample Time	Sample Type	River Section	Species	Length (mm)	Weight (g)	PFBA (ng/g)	PFBS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHpA (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOA (ng/g)	PFOS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFUnA (ng/g)
MISS-S2B-R2-05	9/24/2013	6:37:00 PM	N	MISS-S2B	White Bass	304	550	< 0.481	< 0.962	1.45	< 0.481	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	42.8	1.46	< 0.481	0.519
MISS-S2B-R2-06	9/24/2013	6:46:00 PM	N	MISS-S2B	White Bass	333	480	< 0.461	< 0.922	1.4	0.598	< 0.461	< 0.461	< 0.922	0.601	< 0.461	29.5	1.89	< 0.461	< 0.461
MISS-S2B-R2-07	9/24/2013	6:47:00 PM	N	MISS-S2B	White Bass	378	789	< 0.448	< 0.897	1.85	0.531	< 0.448	< 0.448	< 0.897	0.54	< 0.448	53.7	1.4	< 0.448	0.583
MISS-S2B-R2-08	9/24/2013	6:49:00 PM	N	MISS-S2B	White Bass	390	801	< 0.5	< 1	1.69	0.738	< 0.5	< 0.5	< 1	0.503	< 0.5	53.2	1.82	< 0.5	0.567
MISS-S2B-R2-09	9/24/2013	6:50:00 PM	N	MISS-S2B	White Bass	315	355	< 0.613	< 0.995	1.08	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	44.8	1.96	< 0.498	< 0.498
MISS-S2B-R2-10	9/24/2013	6:52:00 PM	N	MISS-S2B	White Bass	403	888	< 0.485	< 0.971	2.02	0.766	< 0.485	< 0.485	< 0.971	0.502	< 0.485	57.7	1.32	< 0.485	0.98
MISS-S2B-R2-11	9/24/2013	6:53:00 PM	N	MISS-S2B	White Bass	402	909	< 0.488	< 0.976	2.71	0.649	< 0.488	< 0.488	< 0.976	0.783	< 0.488	57.9	0.952	< 0.488	1.01
MISS-S2B-R2-12	9/24/2013	6:55:00 PM	N	MISS-S2B	White Bass	376	706	< 0.493	< 0.985	2.74	1.3	< 0.493	< 0.493	< 0.985	0.589	< 0.493	73.8	1.25	< 0.493	1.51
MISS-S2B-R2-13	9/24/2013	6:56:00 PM	N	MISS-S2B	White Bass	303	307	< 0.498	< 0.995	2.63	0.879	< 0.498	< 0.498	< 0.995	0.937	< 0.498	45	1.12	< 0.498	0.762
MISS-S2B-R2-14	9/24/2013	6:58:00 PM	N	MISS-S2B	White Bass	312	432	< 0.5	< 1	1.15	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	19.8	0.83	< 0.5	< 0.5
MISS-S2B-R2-15	9/24/2013	6:59:00 PM	N	MISS-S2B	White Bass	358	668	< 0.472	< 0.943	2.68	1.13	< 0.472	< 0.472	< 0.943	0.663	< 0.472	66.2	1.38	< 0.472	1.07
MISS-S2B-R3-01	9/25/2013	2:03:00 PM	N	MISS-S2B	Freshwater drum	331	478	< 0.5	< 1	0.958	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	33.4	< 0.6	< 0.5	< 0.5
MISS-S2B-R4-01	9/25/2013	2:07:00 PM	N	MISS-S2B	Blue gill	118	36	< 0.503	< 1.01	1.43	0.966	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	19.6	1.55	< 0.503	1.41
MISS-S2B-R4-02	9/25/2013	2:09:00 PM	N	MISS-S2B	Blue gill	102	28	< 0.5	< 1	2.03	1.65	< 0.5	< 0.5	< 1.65	< 0.5	< 0.5	41.9	< 0.6	< 0.5	1.88
MISS-S2B-R4-03	9/25/2013	2:11:00 PM	N	MISS-S2B	Blue gill	105	26	< 0.536	< 0.985	1.61	1.93	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	38.9	< 0.591	< 0.493	2.14
MISS-S2B-R4-04	9/25/2013	2:12:00 PM	N	MISS-S2B	Blue gill	124	43	< 0.498	< 0.995	1.16	1.24	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	27.7	< 0.597	< 0.498	1.41
MISS-S2B-R4-05	9/25/2013	2:14:00 PM	N	MISS-S2B	Blue gill	119	36	< 0.737	< 1	1.36	1.64	< 0.5	< 0.5	< 1	< 0.5	< 0.5	43.4	< 0.6	< 0.5	1.24
MISS-S2B-R4-06	9/25/2013	2:15:00 PM	N	MISS-S2B	Blue gill	109	23	< 0.498	< 0.995	1.37	0.879	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	23	< 0.597	< 0.498	0.868
MISS-S2B-R4-07	9/25/2013	2:17:00 PM	N	MISS-S2B	Blue gill	112	31	< 0.775	< 1	2.25	2.73	< 0.5	< 0.5	< 1	< 0.5	< 0.5	34.1	0.876	< 0.5	2.59
MISS-S2B-R4-08	9/25/2013	2:18:00 PM	N	MISS-S2B	Blue gill	102	31	1.19	< 1.01	1.58	1.42	< 0.505	< 0.505	< 1.01	< 0.505	< 0.505	29.5	< 0.606	< 0.505	1.59
MISS-S2B-R4-09	9/25/2013	2:20:00 PM	N	MISS-S2B	Blue gill	102	19	< 0.503	< 1.01	2.05	1.48	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	33.3	0.657	< 0.503	1.67
MISS-S2B-R4-10	9/25/2013	2:22:00 PM	N	MISS-S2B	Blue gill	127	40	< 0.5	< 1	1.75	1.19	< 0.5	< 0.5	< 1	< 0.5	< 0.5	33.5	0.733	< 0.5	1.23
MISS-S2B-R4-11	9/25/2013	2:24:00 PM	N	MISS-S2B	Blue gill	116	32	< 0.605	< 1.01	1.8	2.2	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	43.7	< 0.603	< 0.503	1.84
MISS-S2B-R4-12	9/25/2013	2:25:00 PM	N	MISS-S2B	Blue gill	115	28	< 0.498	< 0.995	1.29	1.27	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	30.5	< 0.597	< 0.498	1.32
MISS-S2B-R4-13	9/25/2013	2:27:00 PM	N	MISS-S2B	Blue gill	106	21	< 0.526	< 1.01	0.881	1.17	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	23.3	< 0.603	< 0.503	0.796
MISS-S2B-R4-14	9/25/2013	2:28:00 PM	N	MISS-S2B	Blue gill	106	23	< 0.503	< 1.01	1.94	2.02	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	39.3	0.807	< 0.503	1.37
MISS-S2B-R4-15	9/25/2013	2:30:00 PM	N	MISS-S2B	Blue gill	105	23	< 0.505	< 1.01	1.8	1.52	< 0.505	< 0.505	< 1.01	< 0.505	< 0.505	30	0.652	< 0.505	1.89
MISS-S2B-R5-01	9/28/2013	11:27:00 AM	N	MISS-S2B	Freshwater drum	403	804	< 0.521	< 1.04	0.771	< 0.521	< 0.521	< 0.521	< 1.04	< 0.521	< 0.521	28.6	< 0.625	< 0.521	< 0.521
MISS-S2B-R5-02	9/28/2013	11:28:00 AM	N	MISS-S2B	Freshwater drum	382	663	< 0.478	< 0.957	1.23	< 0.478	< 0.478	< 0.478	< 0.957	< 0.478	< 0.478	40.7	< 0.574	< 0.478	0.645
MISS-S2B-R5-03	9/28/2013	11:30:00 AM	N	MISS-S2B	Freshwater drum	298	291	< 0.643	< 0.98	0.717	< 0.49	< 0.49	< 0.49	< 0.98	0.623	< 0.49	10.1	< 0.588	< 0.49	< 0.49
MISS-S2B-R5-04	9/28/2013	11:31:00 AM	N	MISS-S2B	Freshwater drum	584	2090	< 0.524	< 1.05	9.09	4.72	< 0.524	< 0.524	< 1.05	< 0.524	< 0.524	115	2.06	< 0.524	9.18
MISS-S2B-R5-05	9/28/2013	11:33:00 AM	N	MISS-S2B	Freshwater drum	334	449	< 0.513	< 1.03	0.941	< 0.513	< 0.513	< 0.513	< 1.03	< 0.513	< 0.513	15.2	< 0.615	< 0.513	< 0.513
MISS-S2B-R5-05DUP	9/28/2013	11:33:00 AM	LR	--	--	--	--	< 0.51	< 1.02	1.11	< 0.51	< 0.51	< 0.51	< 1.02	< 0.51	< 0.51	15.4	< 0.612	< 0.51	< 0.51
MISS-S2B-R5-06	9/28/2013	11:36:00 AM	N	MISS-S2B	Freshwater drum	384	270	< 0.503	< 1.01	0.822	< 0.503	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	16.9	< 0.603	< 0.503	< 0.503
MISS-S2B-R5-07	9/28/2013	11:37:00 AM	N	MISS-S2B	Freshwater drum	377	659	< 0.513	< 1.03	< 0.513	< 0.513	< 0.513	< 0.513	< 1.03	< 0.513	< 0.513	13	< 0.615	< 0.513	< 0.513
MISS-S2B-R5-08	9/28/2013	11:39:00 AM	N	MISS-S2B	Freshwater drum	327	432	< 0.488	< 0.976	0.796	0.549	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	24.7	< 0.585	< 0.488	0.601
MISS-S2B-R5-09	9/28/2013	11:41:00 AM	N	MISS-S2B	Freshwater drum	344	453	< 0.503	< 1.01	0.92	< 0.503	< 0.503	< 0.503	< 1.01	0.531	< 0.503	30.1	< 0.603	< 0.503	< 0.503
MISS-S2B-R5-10	9/28/2013	11:43:00 AM	N	MISS-S2B	Freshwater drum	315	376	< 0.515	< 1.03	< 0.515	< 0.515	< 0.515	< 0.515	< 1.03	< 0.515	< 0.515	9.01	< 0.619	< 0.515	< 0.515
MISS-S2B-R5-11	9/28/2013	11:44:00 AM	N	MISS-S2B	Freshwater drum	313	370	< 0.474	< 0.948	0.972	0.828	< 0.474	< 0.474	< 0.948	< 0.474	< 0.474	43.3	< 0.569	< 0.474	0.604
MISS-S2B-R5-12	9/28/2013	11:45:00 AM	N	MISS-S2B	Freshwater drum	305	325	< 0.478	< 0.957	0.504	< 0.478	< 0.478	< 0.478	< 0.957	< 0.478	< 0.478	8.58	< 0.574	< 0.478	< 0.478
MISS-S2B-R5-13	9/28/2013	11:47:00 AM	N	MISS-S2B	Freshwater drum	302	336	< 0.485	< 0.971	< 0.485	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	13.2	< 0.583	< 0.485	< 0.485
MISS-S2B-R5-14	9/28/2013	11:49:00 AM	N	MISS-S2B	Freshwater drum	280	278	< 0.521	< 1.04	< 0.521	< 0.521	< 0.521	< 0.521	< 1.04	< 0.521	< 0.521	7.95	< 0.625	< 0.521	< 0.521
MISS-S3-R1-01	9/25/2013	4:59:00 PM	N	MISS-S3	White Bass	266	221	< 0.5	< 1	1.49	< 0.5	< 0.5	< 0.5	< 1	0.579	< 0.5	29.3	0.797	< 0.5	0.526
MISS-S3-R1-02	9/25/2013	5:02:00 PM	N	MISS-S3	White Bass	324	403	< 0.478	< 0.957	1.78	0.611	< 0.478	< 0.478	< 0.957	0.694	< 0.478	40.4	0.735	< 0.478	0.812
MISS-S3-R1-03	9/25/2013	5:03:00 PM	N	MISS-S3	White Bass	363	585	< 0.483	< 0.966	1.64	0.673	< 0.483	< 0.483	< 0.966	< 0.483	< 0.483	57.7	1.12	< 0.483	0.797
MISS-S3-R1-03DUP	9/25/2013	5:03:00 PM	LR	--	--	--	--	< 0.5	< 1	1.72	0.585	< 0.5	< 0.5	< 1	< 0.5	< 0.5	54	1.35	< 0.5	0.889
MISS-S3-R1-04	9/25/2013	5:05:00 PM	N	MISS-S3	White Bass	308	335	< 0.498	< 0.995	1.54	< 0.498	< 0.498	< 0.498	< 0.995	0.61	< 0.498	30.7	1.18	< 0.498	< 0.498
MISS-S3-R1-05	9/25/2013	5:07:00 PM	N	MISS-S3	White Bass	337	496	< 0.49	< 0.98	1.68	0.5	< 0.49	< 0.49	< 0.98	0.991	< 0.49	31.4	< 0.588	< 0.49	0.579
MISS-S3-R1-06	9/25/2013	5:08:00 PM	N	MISS-S3	White Bass	300	343	< 0.483	< 0.966	1.58	0.822	< 0.483	< 0.483	< 0.966	< 0.483	< 0.483	21.8	0.835	< 0.483	0.729

Table 6
2013 Fish Results

Sample Name	Sample Date	Sample Time	Sample Type	River Section	Species	Length (mm)	Weight (g)	PFBA (ng/g)	PFBS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHpA (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOA (ng/g)	PFOS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFUnA (ng/g)
MISS-S3-R1-07	9/25/2013	5:10:00 PM	N	MISS-S3	White Bass	353	623	< 0.493	< 0.985	2.63	1.09	< 0.493	< 0.493	< 0.985	0.928	< 0.493	48.4	0.971	< 0.493	1.24
MISS-S3-R1-08	9/25/2013	5:11:00 PM	N	MISS-S3	White Bass	306	334	< 0.495	< 0.99	1.87	< 0.495	< 0.495	< 0.495	< 0.99	0.782	< 0.495	37.6	< 0.594	< 0.495	0.597
MISS-S3-R1-09	9/25/2013	5:12:00 PM	N	MISS-S3	White Bass	329	406	< 0.483	< 0.966	1.46	0.485	< 0.483	< 0.483	< 0.966	0.934	< 0.483	52.8	0.654	< 0.483	0.672
MISS-S3-R1-10	9/25/2013	5:13:00 PM	N	MISS-S3	White Bass	311	342	< 0.498	< 0.995	2.37	0.592	< 0.498	< 0.498	< 0.995	0.555	< 0.498	50.1	1.02	< 0.498	0.735
MISS-S3-R1-11	9/25/2013	5:15:00 PM	N	MISS-S3	Freshwater drum	545	2136	< 0.495	< 0.99	2.02	1.11	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	30.8	< 0.594	< 0.495	1.4
MISS-S3-R1-12	9/25/2013	5:18:00 PM	N	MISS-S3	Freshwater drum	465	1485	< 0.474	< 0.948	2.41	1.59	< 0.474	< 0.474	< 0.948	0.66	< 0.474	5.9	< 0.569	< 0.474	1.74
MISS-S3-R1-13	9/25/2013	5:19:00 PM	N	MISS-S3	Freshwater drum	355	568	< 0.493	< 0.985	1.41	0.555	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	31.7	< 0.591	< 0.493	0.755
MISS-S3-R1-14	9/25/2013	5:21:00 PM	N	MISS-S3	Carp	519	1896	< 0.485	< 0.971	0.845	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	17.5	< 0.583	< 0.485	< 0.485
MISS-S3-R1-15	9/25/2013	5:22:00 PM	N	MISS-S3	Carp	576	2701	< 0.498	< 0.995	0.758	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	27.3	< 0.597	< 0.498	< 0.498
MISS-S3-R1-16	9/25/2013	5:24:00 PM	N	MISS-S3	Carp	501	1702	< 0.495	< 0.99	< 0.495	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	17.6	< 0.594	< 0.495	< 0.495
MISS-S3-R1-17	9/25/2013	5:27:00 PM	N	MISS-S3	Carp	567	2824	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	6.72	< 0.597	< 0.498	< 0.498
MISS-S3-R1-18	9/25/2013	5:29:00 PM	N	MISS-S3	Carp	527	1964	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	10.7	< 0.6	< 0.5	< 0.5
MISS-S3-R1-19	9/25/2013	5:32:00 PM	N	MISS-S3	Carp	478	1562	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	18.2	< 0.597	< 0.498	< 0.498
MISS-S3-R1-20	9/25/2013	5:40:00 PM	N	MISS-S3	Carp	526	2137	< 0.495	< 0.99	1.46	0.738	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	37.3	< 0.594	< 0.495	0.807
MISS-S3-R1-21	9/25/2013	5:42:00 PM	N	MISS-S3	Carp	608	3001	< 0.485	< 0.971	0.75	0.544	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	19.5	< 0.583	< 0.485	< 0.485
MISS-S3-R1-22	9/25/2013	5:46:00 PM	N	MISS-S3	Carp	484	1744	< 0.493	< 0.985	0.655	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	5.9	< 0.591	< 0.493	< 0.493
MISS-S3-R1-23	9/25/2013	5:49:00 PM	N	MISS-S3	Carp	437	1135	< 0.495	< 0.99	< 0.495	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	19.7	< 0.594	< 0.495	< 0.495
MISS-S3-R1-24	9/25/2013	5:51:00 PM	N	MISS-S3	Blue gill	138	59	< 0.495	< 0.99	0.852	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	19.1	< 0.594	< 0.495	< 0.495
MISS-S3-R1-25	9/25/2013	5:52:00 PM	N	MISS-S3	Blue gill	141	63	< 0.495	< 0.99	0.747	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	17.2	< 0.594	< 0.495	0.509
MISS-S3-R2-01	9/25/2013	5:57:00 PM	N	MISS-S3	Freshwater drum	343	531	< 0.5	< 1	0.738	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	17.3	< 0.6	< 0.5	< 0.5
MISS-S3-R2-02	9/25/2013	5:59:00 PM	N	MISS-S3	Freshwater drum	314	381	< 0.481	< 0.962	0.648	< 0.481	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	25.8	< 0.577	< 0.481	1.03
MISS-S3-R2-03	9/25/2013	6:01:00 PM	N	MISS-S3	Freshwater drum	344	1218	< 0.493	< 0.985	1.66	1.26	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	8.3	< 0.591	< 0.493	1.45
MISS-S3-R2-04	9/25/2013	6:02:00 PM	N	MISS-S3	Freshwater drum	295	284	< 0.495	< 0.99	0.597	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	14.3	< 0.594	< 0.495	< 0.495
MISS-S3-R2-05	9/25/2013	6:04:00 PM	N	MISS-S3	Freshwater drum	377	706	< 0.488	< 0.976	1.32	1.18	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	28.4	< 0.585	< 0.488	1.15
MISS-S3-R2-06	9/25/2013	6:05:00 PM	N	MISS-S3	Freshwater drum	331	411	< 0.498	< 0.995	1.01	0.519	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	27.5	< 0.597	< 0.498	0.59
MISS-S3-R2-07	9/25/2013	6:07:00 PM	N	MISS-S3	Freshwater drum	380	734	< 0.49	< 0.98	1.66	1.23	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	13.8	< 0.588	< 0.49	1.22
MISS-S3-R2-07DUP	9/25/2013	6:07:00 PM	LR	--	--	--	--	< 0.493	< 0.985	1.37	1.17	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	13.6	< 0.591	< 0.493	1.12
MISS-S3-R2-08	9/25/2013	6:09:00 PM	N	MISS-S3	Blue gill	185	167	< 0.481	< 0.962	0.759	0.568	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	17.4	< 0.577	< 0.481	0.814
MISS-S3-R2-09	9/25/2013	6:10:00 PM	N	MISS-S3	Blue gill	142	63	< 0.488	< 0.976	0.685	< 0.488	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	15.9	< 0.585	< 0.488	< 0.488
MISS-S3-R2-10	9/25/2013	6:12:00 PM	N	MISS-S3	Blue gill	135	57	< 0.498	< 0.995	0.585	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	16.1	< 0.597	< 0.498	< 0.498
MISS-S3-R2-11	9/25/2013	6:13:00 PM	N	MISS-S3	Blue gill	113	33	< 0.798	< 0.985	0.698	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	27.2	< 0.591	< 0.493	0.598
MISS-S3-R2-12	9/25/2013	6:14:00 PM	N	MISS-S3	Blue gill	120	41	< 0.495	< 0.99	0.547	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	11.4	< 0.594	< 0.495	< 0.495
MISS-S3-R2-13	9/25/2013	6:15:00 PM	N	MISS-S3	Blue gill	135	50	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	84.5	< 0.6	< 0.5	0.677
MISS-S3-R2-14	9/25/2013	6:17:00 PM	N	MISS-S3	Blue gill	114	31	< 0.485	< 0.971	0.957	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	28.6	< 0.583	< 0.485	< 0.485
MISS-S3-R2-15	9/25/2013	6:18:00 PM	N	MISS-S3	Blue gill	118	36	< 0.481	< 0.962	0.572	< 0.481	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	16.1	< 0.577	< 0.481	< 0.481
MISS-S3-R3-01	9/26/2013	10:52:00 AM	N	MISS-S3	Carp	560	2700	< 0.485	< 0.971	1.44	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	11.7	< 0.583	< 0.485	0.512
MISS-S3-R3-02	9/26/2013	10:58:00 AM	N	MISS-S3	Carp	585	2868	< 0.495	< 0.99	0.667	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	11.3	< 0.594	< 0.495	< 0.495
MISS-S3-R3-03	9/26/2013	11:02:00 AM	N	MISS-S3	Carp	590	3135	< 0.498	< 0.995	0.75	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	13	< 0.597	< 0.498	< 0.498
MISS-S3-R3-03DUP	9/26/2013	11:02:00 AM	LR	--	--	--	--	< 0.683	< 0.985	0.911	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	13	< 0.591	< 0.493	< 0.493
MISS-S3-R3-04	9/26/2013	11:11:00 AM	N	MISS-S3	Carp	372	785	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 2.2	< 0.498	< 0.498	7.89	< 0.597	< 0.498	< 0.498
MISS-S3-R3-05	9/26/2013	11:16:00 AM	N	MISS-S3	Carp	462	1293	< 0.483	< 0.966	< 0.483	< 0.483	< 0.483	< 0.483	< 0.966	< 0.483	< 0.483	8.6	< 0.58	< 0.483	< 0.483
MISS-S3-R3-06	9/26/2013	11:22:00 AM	N	MISS-S3	Freshwater drum	428	1046	< 0.5	< 1	0.709	0.551	< 0.5	< 0.5	< 1.41	< 0.5	< 0.5	6.42	< 0.6	< 0.5	< 0.5
MISS-S3-R3-07	9/26/2013	11:24:00 AM	N	MISS-S3	Freshwater drum	320	424	< 0.495	< 0.99	1.4	0.614	< 0.495	< 0.495	2.69	< 0.495	0.676	21.7	< 0.594	< 0.495	0.635
MISS-S3-R3-08	9/26/2013	11:28:00 AM	N	MISS-S3	Freshwater drum	412	1023	< 0.495	< 0.99	0.681	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	8.08	< 0.594	< 0.495	< 0.495
MISS-S3-R3-08DUP	9/26/2013	11:28:00 AM	LR	--	--	--	--	< 0.498	< 0.995	0.647	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	8.68	< 0.597	< 0.498	< 0.498
MISS-S3-R3-09	9/26/2013	11:33:00 AM	N	MISS-S3	Freshwater drum	558	2502	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	11.7	< 0.588	< 0.49	< 0.49
MISS-S3-R3-10	9/26/2013	11:35:00 AM	N	MISS-S3	Freshwater drum	311	382	< 0.498	< 0.995	2	< 0.498	< 0.498	< 0.498	< 0.995	0.755	< 0.498	27.6	< 0.597	< 0.498	0.566
MISS-S3-R3-11	9/26/2013	11:40:00 AM	N	MISS-S3	White Bass	454	575	< 0.49	< 0.98	1.59	0.761	< 0.49	< 0.49	< 0.98	0.675	< 0.49	41	< 0.588	< 0.49	0.81
MISS-S3-R3-12	9/26/2013	11:42:00 AM	N	MISS-S3	White Bass	315	384	< 0.493	< 0.985	2.02	0.495	< 0.493	< 0.493	< 0.985	0.703	< 0.493	32	< 0.591	< 0.493	0.796

Table 6
2013 Fish Results

Sample Name	Sample Date	Sample Time	Sample Type	River Section	Species	Length (mm)	Weight (g)	PFBA (ng/g)	PFBS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHpA (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOA (ng/g)	PFOS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFUnA (ng/g)
MISS-S3-R3-13	9/26/2013	11:54:00 AM	N	MISS-S3	White Bass	394	884	< 0.495	< 0.99	1.43	0.652	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	23.4	0.645	< 0.495	0.728
MISS-S3-R3-14	9/26/2013	11:56:00 AM	N	MISS-S3	White Bass	380	848	< 0.49	< 0.98	1.5	0.886	< 0.49	< 0.49	< 0.98	0.744	< 0.49	29.2	0.679	< 0.49	0.771
MISS-S3-R3-15	9/26/2013	11:57:00 AM	N	MISS-S3	White Bass	375	694	< 0.488	< 0.976	3.27	1.15	< 0.488	< 0.488	< 0.976	0.763	< 0.488	36.8	0.63	< 0.488	0.757
MISS-S3-R3-16	9/26/2013	10:52:00 AM	N	MISS-S3	Carp	560	2700	< 0.495	< 0.99	1.02	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	19.1	< 0.594	< 0.495	< 0.495
MISS-S3-R3-17	9/26/2013	12:00:00 PM	N	MISS-S3	Blue gill	172	138	< 0.495	< 0.99	0.606	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	10.9	< 0.594	< 0.495	< 0.495
MISS-S3-R3-18	9/26/2013	12:02:00 PM	N	MISS-S3	Blue gill	141	73	< 0.493	< 0.985	0.577	< 0.493	< 0.493	< 0.493	< 1.38	< 0.493	< 0.493	8.59	< 0.591	< 0.493	< 0.493
MISS-S3-R3-19	9/26/2013	12:04:00 PM	N	MISS-S3	Blue gill	133	61	< 0.488	< 0.976	0.648	< 0.488	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	8.45	< 0.585	< 0.488	< 0.488
MISS-S3-R3-20	9/26/2013	12:06:00 PM	N	MISS-S3	Blue gill	126	36	< 0.495	< 0.99	< 0.495	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	10.7	< 0.594	< 0.495	< 0.495
MISS-S3-R4-01	9/28/2013	11:55:00 AM	N	MISS-S3	Blue gill	134	48	< 0.439	< 0.877	0.5	< 0.439	< 0.439	< 0.439	< 0.877	< 0.439	< 0.439	12.5	< 0.526	< 0.439	< 0.439
MISS-S3-R5-01	10/1/2013	5:41:00 PM	N	MISS-S2B	Carp	468	1275	< 0.469	< 0.939	0.622	< 0.469	< 0.469	< 0.469	< 0.939	< 0.469	< 0.469	24.8	< 0.563	< 0.469	< 0.469
MISS-S4A-R1-01	9/26/2013	5:50:00 PM	N	MISS-S4A	Carp	474	1341	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	11.5	< 0.6	0.605	< 0.5
MISS-S4A-R1-02	9/26/2013	5:51:00 PM	N	MISS-S4A	Carp	519	1984	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	9.21	< 0.597	< 0.498	< 0.498
MISS-S4A-R1-03	9/26/2013	5:52:00 PM	N	MISS-S4A	Carp	574	2729	< 0.498	< 0.995	0.636	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	7.1	< 0.597	< 0.498	< 0.498
MISS-S4A-R1-04	9/26/2013	5:54:00 PM	N	MISS-S4A	Carp	474	1338	< 0.493	< 0.985	< 0.493	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	6.39	< 0.591	< 0.493	< 0.493
MISS-S4A-R1-05	9/26/2013	5:56:00 PM	N	MISS-S4A	Carp	500	1726	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	2.93	< 0.588	< 0.49	< 0.49
MISS-S4A-R1-06	9/26/2013	5:57:00 PM	N	MISS-S4A	Carp	445	1088	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	7.31	< 0.597	< 0.498	< 0.498
MISS-S4A-R1-07	9/26/2013	6:00:00 PM	N	MISS-S4A	Carp	437	994	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 1.13	< 0.49	< 0.49	1.46	< 0.588	< 0.49	< 0.49
MISS-S4A-R1-08	9/26/2013	6:00:00 PM	N	MISS-S4A	Carp	499	1540	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	9.08	< 0.6	< 0.5	< 0.5
MISS-S4A-R1-09	9/26/2013	6:01:00 PM	N	MISS-S4A	Carp	466	1199	< 0.483	< 0.966	< 0.483	< 0.483	< 0.483	< 0.483	< 0.966	< 0.483	< 0.483	5.35	< 0.58	< 0.483	< 0.483
MISS-S4A-R1-10	9/26/2013	6:03:00 PM	N	MISS-S4A	Carp	444	1160	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	6.41	< 0.597	< 0.498	< 0.498
MISS-S4A-R1-11	9/26/2013	6:04:00 PM	N	MISS-S4A	Carp	472	1574	< 0.488	< 0.976	< 0.488	< 0.488	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	30.4	< 0.585	< 0.488	< 0.488
MISS-S4A-R1-12	9/26/2013	6:05:00 PM	N	MISS-S4A	Carp	446	1185	< 0.493	< 0.985	< 0.493	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	5.26	< 0.591	< 0.493	< 0.493
MISS-S4A-R1-13	9/26/2013	6:06:00 PM	N	MISS-S4A	Carp	467	1337	0.521	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	4.14	< 0.588	< 0.49	< 0.49
MISS-S4A-R1-14	9/26/2013	6:07:00 PM	N	MISS-S4A	Carp	603	2960	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	3.41	< 0.6	< 0.5	< 0.5
MISS-S4A-R1-15	9/26/2013	6:09:00 PM	N	MISS-S4A	Carp	481	1697	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	16.2	< 0.597	< 0.498	< 0.498
MISS-S4A-R1-16	9/26/2013	6:11:00 PM	N	MISS-S4A	Freshwater drum	525	2184	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 1.81	< 0.49	< 0.49	5.17 J	< 0.588	< 0.49	< 0.49
MISS-S4A-R1-16DUP	9/26/2013	6:11:00 PM	LR	--	--	--	--	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	6.34	< 0.597	< 0.498	< 0.498
MISS-S4A-R1-17	9/26/2013	6:13:00 PM	N	MISS-S4A	Freshwater drum	397	788	< 0.493	< 0.985	< 0.493	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	4.91	< 0.591	< 0.493	< 0.493
MISS-S4A-R1-18	9/26/2013	6:15:00 PM	N	MISS-S4A	Freshwater drum	424	1108	< 0.503	< 1.01	< 0.503	< 0.503	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	4.68	< 0.603	< 0.503	< 0.503
MISS-S4A-R1-19	9/26/2013	6:16:00 PM	N	MISS-S4A	Freshwater drum	418	1164	< 0.495	< 0.99	< 0.495	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	6.9	< 0.594	< 0.495	< 0.495
MISS-S4A-R1-20	9/26/2013	6:17:00 PM	N	MISS-S4A	Freshwater drum	426	1070	< 0.485	< 0.971	< 0.485	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	13.6	< 0.603	< 0.485	< 0.485
MISS-S4A-R1-21	9/26/2013	6:21:00 PM	N	MISS-S4A	Freshwater drum	484	1786	< 0.485	< 0.971	< 0.485	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	4.52	< 0.583	< 0.485	< 0.485
MISS-S4A-R1-22	9/26/2013	6:22:00 PM	N	MISS-S4A	Freshwater drum	432	1022	< 0.503	< 1.01	< 0.503	< 0.503	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	8.16	< 0.603	< 0.503	< 0.503
MISS-S4A-R1-23	9/26/2013	6:23:00 PM	N	MISS-S4A	Freshwater drum	419	1022	< 0.483	< 0.966	< 0.483	< 0.483	< 0.483	< 0.483	< 0.966	< 0.483	< 0.483	3.75	< 0.58	< 0.483	< 0.483
MISS-S4A-R1-24	9/26/2013	6:24:00 PM	N	MISS-S4A	Freshwater drum	414	983	< 0.49	< 0.98	< 0.49	< 0.49	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	16.7	< 0.588	< 0.49	< 0.49
MISS-S4A-R1-25	9/26/2013	6:25:00 PM	N	MISS-S4A	Freshwater drum	503	1909	< 0.483	< 0.966	< 0.483	< 0.483	< 0.483	< 0.483	< 0.966	< 0.483	< 0.483	3.68	< 0.58	< 0.483	< 0.483
MISS-S4A-R1-26	9/26/2013	6:27:00 PM	N	MISS-S4A	Freshwater drum	420	960	< 0.503	< 1.01	< 0.503	< 0.503	< 0.503	< 0.503	< 1.01	< 0.503	< 0.503	20.3	0.605	< 0.503	< 0.503
MISS-S4A-R1-27	9/26/2013	6:28:00 PM	N	MISS-S4A	Freshwater drum	390	624	< 0.467	< 0.935	< 0.467	< 0.467	< 0.467	< 0.467	< 0.935	< 0.467	< 0.467	10.7	< 0.561	< 0.467	< 0.467
MISS-S4A-R1-28	9/26/2013	6:30:00 PM	N	MISS-S4A	Freshwater drum	454	1101	< 0.459	< 0.917	< 0.459	0.472	< 0.459	< 0.459	< 0.917	< 0.459	< 0.459	2.53	< 0.55	< 0.459	< 0.459
MISS-S4A-R1-29	9/26/2013	6:32:00 PM	N	MISS-S4A	Freshwater drum	500	1775	< 0.478	< 0.957	< 0.478	< 0.478	< 0.478	< 0.478	< 0.957	< 0.478	< 0.478	5.49	< 0.574	< 0.478	< 0.478
MISS-S4A-R1-30	9/26/2013	6:33:00 PM	N	MISS-S4A	Freshwater drum	334	467	< 0.508	< 1.02	< 0.508	< 0.508	< 0.508	< 0.508	< 1.02	< 0.508	< 0.508	14.4	< 0.609	< 0.508	< 0.508
MISS-S4A-R1-31	9/26/2013	6:34:00 PM	N	MISS-S4A	White Bass	309	337	< 0.483	< 0.966	2.04	0.56	< 0.483	< 0.483	< 0.966	0.806	< 0.483	35.9	1.17	< 0.483	0.547
MISS-S4A-R1-32	9/26/2013	6:35:00 PM	N	MISS-S4A	Blue gill	156	100	< 0.493	< 0.985	1.62	0.831	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	24.8	< 0.591	< 0.493	1.02
MISS-S4A-R1-33	9/26/2013	6:36:00 PM	N	MISS-S4A	Blue gill	115	37	< 0.442	< 0.885	1.29	0.466	< 0.442	< 0.442	< 0.885	< 0.442	< 0.442	16.9	< 0.531	< 0.442	0.449
MISS-S4A-R1-34	9/26/2013	6:37:00 PM	N	MISS-S4A	Blue gill	109	27	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	4.44	< 0.597	< 0.498	< 0.498
MISS-S4A-R1-35	9/26/2013	6:38:00 PM	N	MISS-S4A	Blue gill	113	31	< 0.457	< 0.913	< 0.457	< 0.457	< 0.457	< 0.457	< 0.913	< 0.457	< 0.457	7.81	< 0.548	< 0.457	< 0.457
MISS-S4A-R2-01	9/27/2013	12:32:00 PM	N	MISS-S4A	White Bass	380	816	< 0.498	< 0.995	3.34	1.2	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	73.7	< 0.597	< 0.498	1.36
MISS-S4A-R2-02	9/27/2013	12:34:00 PM	N	MISS-S4A	White Bass	308	399	< 0.5	< 1	2.49	0.766	< 0.5	< 0.5	< 1	0.691	< 0.5	47.9	1.32	< 0.5	0.737
MISS-S4A-R2-03	9/27/2013	12:37:00 PM	N	MISS-S4A	Blue gill	141	60	< 0.518	< 1.04	0.802	< 0.518	< 0.518	< 0.518	< 1.04	< 0.518	< 0.518	8.76	< 0.622	< 0.518	< 0.518

Table 6
2013 Fish Results

Sample Name	Sample Date	Sample Time	Sample Type	River Section	Species	Length (mm)	Weight (g)	PFBA (ng/g)	PFBS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHpA (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOA (ng/g)	PFOS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFUnA (ng/g)
MISS-S4A-R2-04	9/27/2013	12:39:00 PM	N	MISS-S4A	Blue gill	177	140	< 0.498	< 0.995	1.2	0.512	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	11.3	< 0.597	< 0.498	0.654
MISS-S4A-R2-05	9/27/2013	12:40:00 PM	N	MISS-S4A	Blue gill	146	79	< 0.521	< 1.04	1.47	2.17	< 0.521	< 0.521	< 1.04	< 0.521	< 0.521	108	1.34	< 0.521	0.975
MISS-S4A-R2-06	9/27/2013	12:44:00 PM	N	MISS-S4A	Blue gill	112	30	< 0.51	< 1.02	0.812	< 0.51	< 0.51	< 0.51	< 1.02	< 0.51	< 0.51	10.8	< 0.612	< 0.51	< 0.51
MISS-S4A-R2-07	9/27/2013	12:45:00 PM	N	MISS-S4A	Blue gill	134	66	< 0.474	< 0.948	0.569	< 0.474	< 0.474	< 0.474	< 0.948	< 0.474	< 0.474	7.71	< 0.569	< 0.474	< 0.474
MISS-S4A-R2-08	9/27/2013	12:46:00 PM	N	MISS-S4A	Blue gill	142	61	< 0.498	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	24.1	< 0.597	< 0.498	< 0.498
MISS-S4A-R2-09	9/27/2013	12:49:00 PM	N	MISS-S4A	Blue gill	123	42	< 0.5	< 1	0.652	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	4.18	< 0.6	< 0.5	< 0.5
MISS-S4A-R2-10	9/27/2013	12:51:00 PM	N	MISS-S4A	Blue gill	106	26	< 0.5	< 1	0.867	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	7.67	< 0.6	< 0.5	< 0.5
MISS-S4A-R2-11	9/27/2013	12:52:00 PM	N	MISS-S4A	Blue gill	111	31	< 0.498	< 0.995	0.984	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	9.28	< 0.597	< 0.498	< 0.498
MISS-S4A-R2-12	9/27/2013	12:53:00 PM	N	MISS-S4A	Blue gill	121	41	< 0.5	< 1	1.1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	12.4	< 0.6	< 0.5	< 0.5
MISS-S4A-R3-01	9/27/2013	5:32:00 PM	N	MISS-S4A	White Bass	444	1112	< 0.472	< 0.943	1.78	< 0.472	< 0.472	< 0.472	< 0.943	0.548	< 0.472	28.3	< 0.566	< 0.472	0.678
MISS-S4A-R3-02	9/27/2013	5:34:00 PM	N	MISS-S4A	White Bass	244	175	< 0.597	< 0.952	2.58	0.532	< 0.476	< 0.476	< 0.952	0.918	< 0.476	39.1	0.782	< 0.476	0.76
MISS-S4A-R3-03	9/27/2013	5:36:00 PM	N	MISS-S4A	Blue gill	149	72	< 0.51	< 1.02	< 0.51	< 0.51	< 0.51	< 0.51	< 1.02	< 0.51	< 0.51	6.33	< 0.612	< 0.51	< 0.51
MISS-S4A-R4-01	9/29/2013	6:27:00 PM	N	MISS-S4A	White Bass	364	628	< 0.405	< 0.81	2.58	0.96	< 0.405	< 0.405	< 0.81	1.54	< 0.405	58.5	0.709	< 0.405	1.16
MISS-S4A-R4-01DUP	9/29/2013	6:27:00 PM	LR	--	--	--	--	< 0.478	< 0.957	2.5	0.869	< 0.478	< 0.478	< 0.957	1.3	< 0.478	53.3	0.85	< 0.478	1.14
MISS-S4A-R4-02	9/30/2013	6:29:00 PM	N	MISS-S4A	White Bass	421	956	< 0.467	< 0.935	1.98	0.867	< 0.467	< 0.467	< 0.935	1.04	< 0.467	35.5	< 0.561	< 0.467	1.02
MISS-S4A-R4-03	9/30/2013	6:30:00 PM	N	MISS-S4A	White Bass	237	164	< 0.461	< 0.922	2.03	< 0.461	< 0.461	< 0.461	< 0.922	0.828	< 0.461	28.9	0.999	< 0.461	0.476
MISS-S4A-R5-01	10/1/2013	5:48:00 PM	N	MISS-S4A	White Bass	405	866	< 0.481	< 0.962	1.98	0.581	< 0.481	< 0.481	< 0.962	0.704	< 0.481	51.4	0.73	< 0.481	0.996
MISS-S4A-R5-02	10/1/2013	5:49:00 PM	N	MISS-S4A	White Bass	407	922	< 0.469	< 0.939	3.23	1.61	< 0.469	< 0.469	< 0.939	0.528	< 0.469	59.7	0.736	< 0.469	2.06
MISS-S4A-R5-03	10/1/2013	5:51:00 PM	N	MISS-S4A	White Bass	437	1115	< 0.49	< 0.98	2.09	0.548	< 0.49	< 0.49	< 0.98	0.845	< 0.49	29.7	< 0.588	< 0.49	0.935
MISS-S4B-R1-01	9/26/2013	3:59:00 PM	N	MISS-S4B	Carp	444	1242	< 0.5	< 1	0.666	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	23.1	< 0.6	< 0.5	< 0.5
MISS-S4B-R1-02	9/26/2013	4:12:00 PM	N	MISS-S4B	Carp	651	3290	< 0.474	< 0.948	0.685	< 0.474	< 0.474	< 0.474	< 0.948	< 0.474	< 0.474	19.5	< 0.569	< 0.474	< 0.474
MISS-S4B-R1-03	9/26/2013	4:16:00 PM	N	MISS-S4B	Carp	626	2774	0.564	< 0.995	0.503	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	22.3	< 0.597	< 0.498	< 0.498
MISS-S4B-R1-04	9/26/2013	4:18:00 PM	N	MISS-S4B	Carp	581	2188	< 0.435	< 0.87	0.746	< 0.435	< 0.435	< 0.435	< 0.87	< 0.435	< 0.435	9.33	< 0.522	< 0.435	< 0.435
MISS-S4B-R1-04DUP	9/26/2013	4:18:00 PM	LR	--	--	--	--	< 0.493	< 0.985	0.627	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	9.93	< 0.591	< 0.493	< 0.493
MISS-S4B-R1-05	9/26/2013	4:19:00 PM	N	MISS-S4B	Carp	466	1290	< 0.577	< 0.99	< 0.495	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	14.3	< 0.594	< 0.495	< 0.495
MISS-S4B-R1-06	9/26/2013	4:23:00 PM	N	MISS-S4B	Carp	564	2254	< 0.481	< 0.962	0.57	< 0.481	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	12.3	< 0.577	< 0.481	< 0.481
MISS-S4B-R1-07	9/26/2013	4:25:00 PM	N	MISS-S4B	Carp	481	1508	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	13.6	< 0.6	< 0.5	< 0.5
MISS-S4B-R1-08	9/26/2013	4:27:00 PM	N	MISS-S4B	Carp	463	1372	< 0.459	< 0.917	1.43	< 0.459	< 0.459	< 0.459	< 0.917	< 0.459	< 0.459	16.1	< 0.55	< 0.459	0.533
MISS-S4B-R1-09	9/26/2013	4:28:00 PM	N	MISS-S4B	Freshwater drum	395	870	< 0.513	< 1.03	1.04	0.998	< 0.513	< 0.513	< 1.03	< 0.513	< 0.513	27	0.759	< 0.513	0.944
MISS-S4B-R1-10	9/26/2013	4:30:00 PM	N	MISS-S4B	Freshwater drum	474	1507	< 0.488	< 0.976	1.34	1.28	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	6.71	< 0.585	< 0.488	0.967
MISS-S4B-R1-11	9/26/2013	4:32:00 PM	N	MISS-S4B	Freshwater drum	434	1117	< 0.465	< 0.93	1.33	1.39	< 0.465	< 0.465	< 0.93	< 0.465	< 0.465	23.2	0.896	< 0.465	1.33
MISS-S4B-R1-12	9/26/2013	4:33:00 PM	N	MISS-S4B	Freshwater drum	428	981	< 0.459	< 0.917	2.63	2.9	< 0.459	< 0.459	< 0.917	< 0.459	< 0.459	9.01	0.606	< 0.459 J	2.64
MISS-S4B-R1-13	9/26/2013	4:35:00 PM	N	MISS-S4B	Freshwater drum	425	1108	< 0.485	< 0.971	1.58	1.11	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	37.3	0.821	< 0.485 J	1.14
MISS-S4B-R1-14	9/26/2013	4:37:00 PM	N	MISS-S4B	Freshwater drum	406	977	< 0.472	< 0.943	1.46	2.19	< 0.472	< 0.472	< 0.943	< 0.472	< 0.472	10.7	< 0.566	< 0.472 J	2.01
MISS-S4B-R1-15	9/26/2013	4:38:00 PM	N	MISS-S4B	Blue gill	151	77	< 0.488	< 0.976	< 0.488	< 0.488	< 0.488	< 0.488	< 0.976	< 0.488	< 0.488	14.2	< 0.585	< 0.488 J	< 0.488
MISS-S4B-R1-16	9/26/2013	4:40:00 PM	N	MISS-S4B	Blue gill	148	74	< 0.476	< 0.952	0.955	< 0.476	< 0.476	< 0.476	< 0.952	< 0.476	< 0.476	18.5	< 0.571	< 0.476 J	< 0.476
MISS-S4B-R1-17	9/26/2013	4:41:00 PM	N	MISS-S4B	Blue gill	117	37	< 0.485	< 0.971	1.16	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	137	4.52	< 0.485 J	< 0.485
MISS-S4B-R1-18	9/26/2013	4:43:00 PM	N	MISS-S4B	Blue gill	123	47	< 0.455	< 0.909	1.08	< 0.455	< 0.455	< 0.455	< 0.909	< 0.455	< 0.455	12.9	< 0.545	< 0.455 J	0.458
MISS-S4B-R1-19	9/26/2013	4:44:00 PM	N	MISS-S4B	Blue gill	118	37	< 0.469	< 0.939	0.697	< 0.469	< 0.469	< 0.469	< 0.939	< 0.469	< 0.469	11.5	< 0.563	< 0.469 J	0.507
MISS-S4B-R1-20	9/26/2013	4:46:00 PM	N	MISS-S4B	Blue gill	118	41	< 0.508	< 1.02	0.765	< 0.508	< 0.508	< 0.508	< 1.02	< 0.508	< 0.508	7.8	< 0.609	< 0.508 J	< 0.508
MISS-S4B-R1-21	9/26/2013	4:48:00 PM	N	MISS-S4B	Blue gill	109	28	< 0.508	< 0.966	1.17	0.805	< 0.483	< 0.483	< 0.966	< 0.483	< 0.483	24.9	0.829	< 0.483 J	0.866
MISS-S4B-R1-22	9/26/2013	4:49:00 PM	N	MISS-S4B	Blue gill	107	40	< 0.485	< 0.971	0.983	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	11.3	< 0.583	< 0.485 J	< 0.485
MISS-S4B-R1-23	9/26/2013	4:50:00 PM	N	MISS-S4B	Blue gill	118	43	< 0.495	< 0.99	2.18	1.52	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	96.7	2.05	< 0.495 J	1.11
MISS-S4B-R2-01	9/26/2013	5:06:00 PM	N	MISS-S4B	Carp	465	1153	7.64	< 0.98	< 0.49	0.626	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	24.6	5.66	< 0.49 J	< 0.49
MISS-S4B-R2-01DUP	9/26/2013	5:06:00 PM	LR	--	--	--	--	7.48	< 0.962	< 0.481	0.637	< 0.481	< 0.481	< 0.962	< 0.481	< 0.481	23.6	5.76	< 0.481	< 0.481
MISS-S4B-R2-02	9/26/2013	5:08:00 PM	N	MISS-S4B	Carp	439	1075	1.93	< 0.98	< 0.49	1	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	73.4	4.82	< 0.49 J	< 0.49
MISS-S4B-R2-03	9/26/2013	5:09:00 PM	N	MISS-S4B	Carp	460	1025	5.91	< 1.02	0.742	0.715	< 0.51	< 0.51	< 1.02	< 0.51	0.86	93	14.2	< 0.51 J	< 0.51
MISS-S4B-R2-04	9/26/2013	5:10:00 PM	N	MISS-S4B	Carp	584	1839	11.6	< 1	1.1	5.65	< 0.5	< 0.5	< 1	< 0.5	0.559	227	22.4	< 0.5 J	1.29
MISS-S4B-R2-05	9/26/2013	5:12:00 PM	N	MISS-S4B	Carp	455	1070	0.704	< 1	0.957	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 0.5	52.8	< 0.6	< 0.5 J	< 0.5

Table 6
2013 Fish Results

Sample Name	Sample Date	Sample Time	Sample Type	River Section	Species	Length (mm)	Weight (g)	PFBA (ng/g)	PFBS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHpA (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOA (ng/g)	PFOS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFUnA (ng/g)
MISS-S4B-R2-06	9/26/2013	5:14:00 PM	N	MISS-S4B	Carp	462	1104	3.63	< 0.995	< 0.498	0.763	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	70.6	10.5	< 0.498 J	< 0.498
MISS-S4B-R2-07	9/26/2013	5:08:00 PM	N	MISS-S4B	Carp	585	2416	1.41	< 0.99	0.901	< 0.495	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	74.3	2.84	< 0.495 J	< 0.495
MISS-S4B-R2-08	9/26/2013	5:20:00 PM	N	MISS-S4B	Freshwater drum	379	865	< 0.5	< 1	0.875	1.43	< 0.5	< 0.5	< 1	< 0.5	< 0.5	106	4.58	< 0.5 J	0.516
MISS-S4B-R2-09	9/26/2013	5:23:00 PM	N	MISS-S4B	Freshwater drum	359	684	< 0.505	< 1.01	1.51	3.85	< 0.505	< 0.505	< 1.01	< 0.505	< 0.505	126	5.12	< 0.505	1.28
MISS-S4B-R2-10	9/26/2013	5:25:00 PM	N	MISS-S4B	Freshwater drum	428	1279	< 0.788	< 0.995	< 0.498	< 0.498	< 0.498	< 0.498	< 0.995	< 0.498	< 0.498	8.17	< 0.597	< 0.498	< 0.498
MISS-S4B-R2-11	9/26/2013	5:27:00 PM	N	MISS-S4B	Freshwater drum	427	1688	< 0.495	< 0.99	3.04	7.9	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	98.4	10.1	< 0.495	2.41
MISS-S4B-R2-12	9/26/2013	5:29:00 PM	N	MISS-S4B	Freshwater drum	397	907	< 1.39	< 1	4.55	1.29	< 0.5	< 0.5	< 1	< 0.5	< 0.5	368	13.8	< 0.5	2.91
MISS-S4B-R2-13	9/26/2013	5:30:00 PM	N	MISS-S4B	Freshwater drum	429	1104	< 0.519	< 0.98	2.67	6.9	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	130	5.71	< 0.49	2.31
MISS-S4B-R2-14	9/26/2013	5:31:00 PM	N	MISS-S4B	Freshwater drum	428	1095	< 0.51	< 1.02	3.98	7.2	< 0.51	< 0.51	< 1.02	< 0.51	< 0.51	243	5.59	< 0.51	2.58
MISS-S4B-R2-15	9/26/2013	5:32:00 PM	N	MISS-S4B	Freshwater drum	457	1474	< 0.508	< 1.02	< 0.508	< 0.508	< 0.508	< 0.508	< 1.02	< 0.508	< 0.508	11	< 0.609	< 0.508	< 0.508
MISS-S4B-R2-16	9/26/2013	5:34:00 PM	N	MISS-S4B	Freshwater drum	326	380	< 0.498	< 0.995	3.88	1.31	< 0.498	< 0.498	< 0.995	1.31	< 0.498	176	2.35	< 0.498	1.34
MISS-S4B-R2-17	9/26/2013	5:35:00 PM	N	MISS-S4B	Freshwater drum	416	969	< 0.495	< 0.99	2.67	7.55	< 0.495	< 0.495	< 0.99	< 0.495	< 0.495	133	6.44	< 0.495	2.32
MISS-S4B-R2-18	9/26/2013	5:08:00 PM	N	MISS-S4B	Carp	493	2324	< 0.493	< 0.985	2.29	0.793	< 0.493	< 0.493	< 0.985	0.752	< 0.493	29.5	0.714	< 0.493	0.878
MISS-S4B-R2-19	9/26/2013	5:38:00 PM	N	MISS-S4B	White Bass	343	578	< 0.49	< 0.98	2.53	1.25	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	37.5	0.884	< 0.49	1.07
MISS-S4B-R2-20	9/26/2013	5:39:00 PM	N	MISS-S4B	White Bass	372	652	< 0.51	< 1.02	3.08	1.22	< 0.51	< 0.51	< 1.02	1.04	< 0.51	115	1.04	< 0.51	1.16
MISS-S4B-R2-20DUP	9/26/2013	5:39:00 PM	LR	--	--	--	--	< 0.49	< 0.98	3.34	1.09	< 0.49	< 0.49	< 0.98	1.18	< 0.49	114	1.16	< 0.49	1.16
MISS-S4B-R2-21	9/26/2013	5:40:00 PM	N	MISS-S4B	Blue gill	128	47	< 0.513	< 1.03	1.04	< 0.513	< 0.513	< 0.513	< 1.03	< 0.513	< 0.513	16.2	< 0.615	< 0.513	< 0.513
MISS-S4B-R2-22	9/26/2013	5:42:00 PM	N	MISS-S4B	Blue gill	125	51	< 0.478	< 0.957	1.15	< 0.478	< 0.478	< 0.478	< 0.957	< 0.478	< 0.478	24.6	< 0.574	< 0.478	< 0.478
MISS-S4B-R2-23	9/26/2013	5:44:00 PM	N	MISS-S4B	Blue gill	112	31	< 0.508	< 1.02	1.6	0.835	< 0.508	< 0.508	< 1.02	< 0.508	< 0.508	87.5	3.59	< 0.508	< 0.508
MISS-S4B-R2-24	9/26/2013	5:44:00 PM	N	MISS-S4B	Blue gill	106	25	< 0.485	< 0.971	0.578	< 0.485	< 0.485	< 0.485	< 0.971	< 0.485	< 0.485	16	< 0.583	< 0.485	< 0.485
MISS-S4B-R3-01	9/27/2013	5:39:00 PM	N	MISS-S4B	White Bass	333	456	< 0.478	< 0.957	2.35	0.562	< 0.478	< 0.478	< 0.957	0.867	< 0.478	39.8	0.896	< 0.478	0.617
MISS-S4B-R4-01	9/29/2013	12:20:00 PM	N	MISS-S4B	White Bass	319	422	< 0.441	< 0.881	3.18	1.25	< 0.441	< 0.441	< 0.881	1.08	< 0.441	83	2.01	< 0.441	1.57
MISS-S4B-R4-02	9/29/2013	12:27:00 PM	N	MISS-S4B	White Bass	391	590	< 0.467	< 0.935	2.56	0.867	< 0.467	< 0.467	< 0.935	0.959	< 0.467	52	1.19	< 0.467	1.08
MISS-S4B-R4-04	9/29/2013	12:33:00 PM	N	MISS-S4B	White Bass	312	369	< 0.469	< 0.939	2.23	0.708	< 0.469	< 0.469	< 0.939	< 0.469	< 0.469	38.5	1.1	< 0.469	0.89
MISS-S4B-R5-01	9/29/2013	1:45:00 PM	N	MISS-S4B	White Bass	314	360	< 0.488	< 0.976	2.98	0.94	< 0.488	< 0.488	< 0.976	0.619	< 0.488	49.2	0.918	< 0.488	1.61
MISS-S4B-R5-02	9/29/2013	1:46:00 PM	N	MISS-S4B	White Bass	365	680	< 0.467	< 0.935	2.41	0.854	< 0.467	< 0.467	< 0.935	0.672	< 0.467	60.8	1.24	< 0.467	1.35
MISS-S4B-R5-03	9/29/2013	1:47:00 PM	N	MISS-S4B	White Bass	431	831	< 0.49	< 0.98	2.44	1.68	< 0.49	< 0.49	< 0.98	< 0.49	< 0.49	35.6	< 0.588	< 0.49	1.44
MISS-S4B-R5-04	9/29/2013	1:49:00 PM	N	MISS-S4B	White Bass	333	483	< 0.474	< 0.948	2.21	0.83	< 0.474	< 0.474	< 0.948	0.721	< 0.474	31.2	0.692	< 0.474	1.12
MISS-S4B-R5-05	9/29/2013	1:51:00 PM	N	MISS-S4B	White Bass	383	779	< 0.478	< 0.957	3.87	1.61	< 0.478	< 0.478	< 0.957	< 0.478	< 0.478	68.6	0.636	< 0.478	2.08
MISS-S4B-R5-06	9/29/2013	1:52:00 PM	N	MISS-S4B	White Bass	316	378	< 0.485	< 0.971	1.86	< 0.485	< 0.485	< 0.485	< 0.971	0.594	< 0.485	49.5	1.85	< 0.485	0.625
MISS-S4B-R5-07	9/29/2013	1:53:00 PM	N	MISS-S4B	White Bass	355	592	< 0.5	< 1	2.77	0.726	< 0.5	< 0.5	< 1	1.22	< 0.5	67.1	1.2	< 0.5	0.963
MISS-S4B-R5-08	9/29/2013	1:55:00 PM	N	MISS-S4B	White Bass	317	446	< 0.392	< 0.784	5.81	3.28	< 0.392	< 0.392	< 0.784	0.722	< 0.392	177	4.52	< 0.392	3.34
MISS-S4B-R5-09	9/29/2013	1:56:00 PM	N	MISS-S4B	White Bass	307	367	< 0.476	< 0.952	1.54	< 0.476	< 0.476	< 0.476	< 0.952	0.604	< 0.476	31.7	0.727	< 0.476	0.674
MISS-S4B-R6-01	10/1/2013	5:43:00 PM	N	MISS-S4B	Blue gill	99	23	< 0.493	< 0.985	< 0.493	< 0.493	< 0.493	< 0.493	< 0.985	< 0.493	< 0.493	5.22	< 0.591	< 0.493	< 0.493
MISS-S4B-R6-01DUP	10/1/2013	5:43:00 PM	LR	--	--	--	--	< 0.478	< 0.957	0.497	< 0.478	< 0.478	< 0.478	< 0.957	< 0.478	< 0.478	6.1	< 0.574	< 0.478	< 0.478
MISS-S4B-R6-02	10/1/2013	5:45:00 PM	N	MISS-S4B	Blue gill	101	25	< 0.412	< 0.823	1.04	< 0.412	< 0.412	< 0.412	< 1.89	< 0.412	< 0.412	7.68	< 0.494	< 0.412	< 0.412

Notes:
All non-detect results are reported at the reporting limit.

-- = results not reported or not applicable
< = compound analyzed, but not detected above reporting limit
J = estimated value
LR = lab replicate
MS = matrix spike
ng/g = nanogram per gram
N = environmental sample

PFBA = Perfluorobutanoate
PFBS = Perfluorobutanesulfonate
PFDA = Perfluorodecanoate
PFDoA = Perfluorododecanoate
PFHpA = Perfluoroheptanoate
PFHxA = Perfluorohexanoate
PFHxS = Perfluorohexanesulfonate

PFNA = Perfluorononanoate
PFOA = Perfluorooctanoate
PFOS = Perfluorooctanesulfonate
PFOSA = Perfluorooctane sulfonamide
PFPeA = Perfluoropentanoate
PFUnA = Perfluoroundecanoate

Table 7
2013 Porewater Results

Sample Name	Sample Date	Sample Time	Parent Location	Sample Type	PFBA (ng/L)	PFBS (ng/L)	PFDA (ng/L)	PFDoA (ng/L)	PFHpA (ng/L)	PFHxA (ng/L)	PFHxS (ng/L)	PFNA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	PFOSA (ng/L)	PFPeA (ng/L)	PFUnA (ng/L)	TDS (mg/L)	TOC (mg/L)	TSS (mg/L)
BALDWIN_LAKE-PW-201309211418	9/21/2013	2:18:00 PM	BALDWIN_LAKE	N	22.7 J	< 2.5	< 1.19	< 1.19	< 2.29	8.88	< 3.9	2.73	13.4	7.94	< 1.19	< 1.87	< 1.19	--	20.9	--
MISS-RM816.7-PW-201309291345	9/29/2013	1:45:00 PM	MISS-RM816.7	N	382	25.3	< 6.49	< 6.49	16.3	52.1	< 13	< 6.49	69.9	175	< 6.49	38.1	< 6.49	--	--	--
MISS-RM817.0-PW-201309290831	9/29/2013	8:31:00 AM	MISS-RM817.0	N	2270	32.7	6.14	< 5.01	37.6	70.1	24.4	< 5.01	269	821	14.3	50.6	< 5.01	--	--	--
MISS-RM817.1-1-PW-201309291008	9/29/2013	10:08:00 AM	MISS-RM817.1-1	N	40200	1730	72.9	< 4.67	1770	5540	908	54.3	6880	20100	122	5130	< 4.67	--	--	--
MISS-RM817.1-2-PW-201309291331	9/29/2013	1:31:00 PM	MISS-RM817.1-2	N	5820	< 190	1620	< 95	5920	10500	682	313	17500	1250000	460	1870	< 95	--	--	--
MISS-RM817.4-1-PW-201309290936	9/29/2013	9:36:00 AM	MISS-RM817.4-1	N	83300	30400	< 7.91	< 7.91	4820	12700	7630	100	116000	251	< 7.91	12300	< 7.91	330	--	244 J
MISS-RM817.4-2-PW-201309270916	9/27/2013	9:16:00 AM	MISS-RM817.4-2	N	15500	1350	47.6	< 9.85	1040 J	7580 J	819	60.8	3510 J	68500	36.5	7290	< 9.85	--	--	--
MISS-RM817.7-1-PW-201309221251	9/22/2013	12:51:00 PM	MISS-RM817.7-1	N	19300 J	186	< 0.966	< 0.966	10.8	654	< 3.24	2.99	12.9	3.86	< 0.966	1730	< 0.966	513 J	13.6	888 J
MISS-RM817.7-2-PW-201309261210	9/26/2013	12:10:00 PM	MISS-RM817.7-2	N	27600	43600	93.1	< 7.37	2730	4110	3760	823	177000	27100	< 7.37	4950	< 7.37	511 J	8.3	17.2 J
MISS-RM817.7-2-PW-201309261210DUP	--	--	MISS-RM817.7-2	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18.3
MISS-RM818.0-1-PW-201309220958	9/22/2013	9:58:00 AM	MISS-RM818.0-1	N	31.1 J	5.48	0.896	< 0.858	< 2.13	9.85	2.24	4.74	13.7	6.05	< 0.858	< 4.25	< 0.858	1270 J	44	515 J
MISS-RM818.0-2-PW-201309260815	9/26/2013	8:15:00 AM	MISS-RM818.0-2	N	1830	23.2 J	< 3.96	< 3.96	117	274	16.8	< 3.96	382 J	75.7 J	< 3.96	149 J	< 3.96	--	--	--
MISS-RM818.2-PW-201309211313	9/21/2013	1:13:00 PM	MISS-RM818.2	N	67.6 J	556	< 1.09	< 1.09	< 1.36	9.1	< 7.51	2.39	18.5	5	< 1.09	5.82	< 1.09	337 J	13	668 J
MISS-RM819.0-PW-201309220854	9/22/2013	8:54:00 AM	MISS-RM819.0	N	25.9 J	< 7.13	< 1.03	< 1.03	< 1.17	8.44	< 4.15	3.14	14.3	3.54	< 1.03	< 2.83	1.14	--	--	--
MISS-RM828.5-PW-201309201319	9/20/2013	1:19:00 PM	MISS-RM828.5	N	19.1 J	< 2.06	< 1.03	< 1.03	2.15	3.06	< 2.06	< 1.03	5.76	2.31	< 1.03	4.17	< 1.03	425 J	11.4	< 10 J
MISS-RM829.6-PW-201309201245	9/20/2013	12:45:00 PM	MISS-RM829.6	N	972 J	4.44	< 1.03	1.75	6.21 J	23.7	6.79	< 1.03	30.7	2.043 J	< 1.03	25.4	< 1.03	494 J	4.4	10.8 J
MISS-RM829.6-PW-201309201245DUP	9/20/2013	12:45:00 PM	MISS-RM829.6	LR	856	5.59	< 1.01	< 1.01	6.23	24.5	5.38	< 1.01	33.2	< 2.03	< 1.01	27.9	< 1.01	--	--	--
MISS-RM829.8-PW-201309201245DUP	--	--	--	LR	--	--	--	--	--	--	--	--	--	--	--	--	--	474	--	6.1 J
MISS-RM833.6-PW-201309201049	9/20/2013	10:49:00 AM	MISS-RM833.6	N	23 J	31.6	2.78	< 0.992	< 2.16	16.9	2.89	10.9	25.9	25.4	< 0.992	< 3.61	< 0.992	1370 J	41.9	114 J
MISS-RM834.2-PW-201309201159	9/20/2013	11:59:00 AM	MISS-RM834.2	N	413 J	8.73	< 1.01	< 1.01	2.86	10.8	< 2.02	< 1.01	18.9	2.33	< 1.01	12.8	< 1.01	540 J	1.8	79.6 J
PIGSEYE_OF-PW-201309201115	9/20/2013	11:15:00 AM	PIGSEYE_OF	N	40.9 J	84.1	< 1.01	< 1.01	< 3.53	15.9	< 2.74	< 1.01	21.7	14.7	< 1.01	< 3.41	< 1.01	--	--	--
PW-FD-20130926	9/26/2013	12:10:00 PM	MISS-RM817.7-2	FD	29900	26600	82.5	< 7.81	2540	3910	4310	759	142000	34800	< 7.81	4820	< 7.81	522 J	8.2	16 J
SPRING_LAKE_N-PW-201309211445	9/21/2013	2:45:00 PM	SPRING_LAKE_N	N	10.2 J	199	< 1.09	< 1.09	< 2.07	< 1.19	< 2.51	< 1.09	7.4	3.47	1.2	< 2.76	< 1.09	--	--	--
SPRING_LAKE_S-PW-201309221158	9/22/2013	11:58:00 AM	SPRING_LAKE_S	N	22.5 J	487	1.1	< 1.07	< 1.49	8.69	< 4.5	7.05	7.47	5.79	< 1.07	< 2.89	< 1.07	--	22.1	--

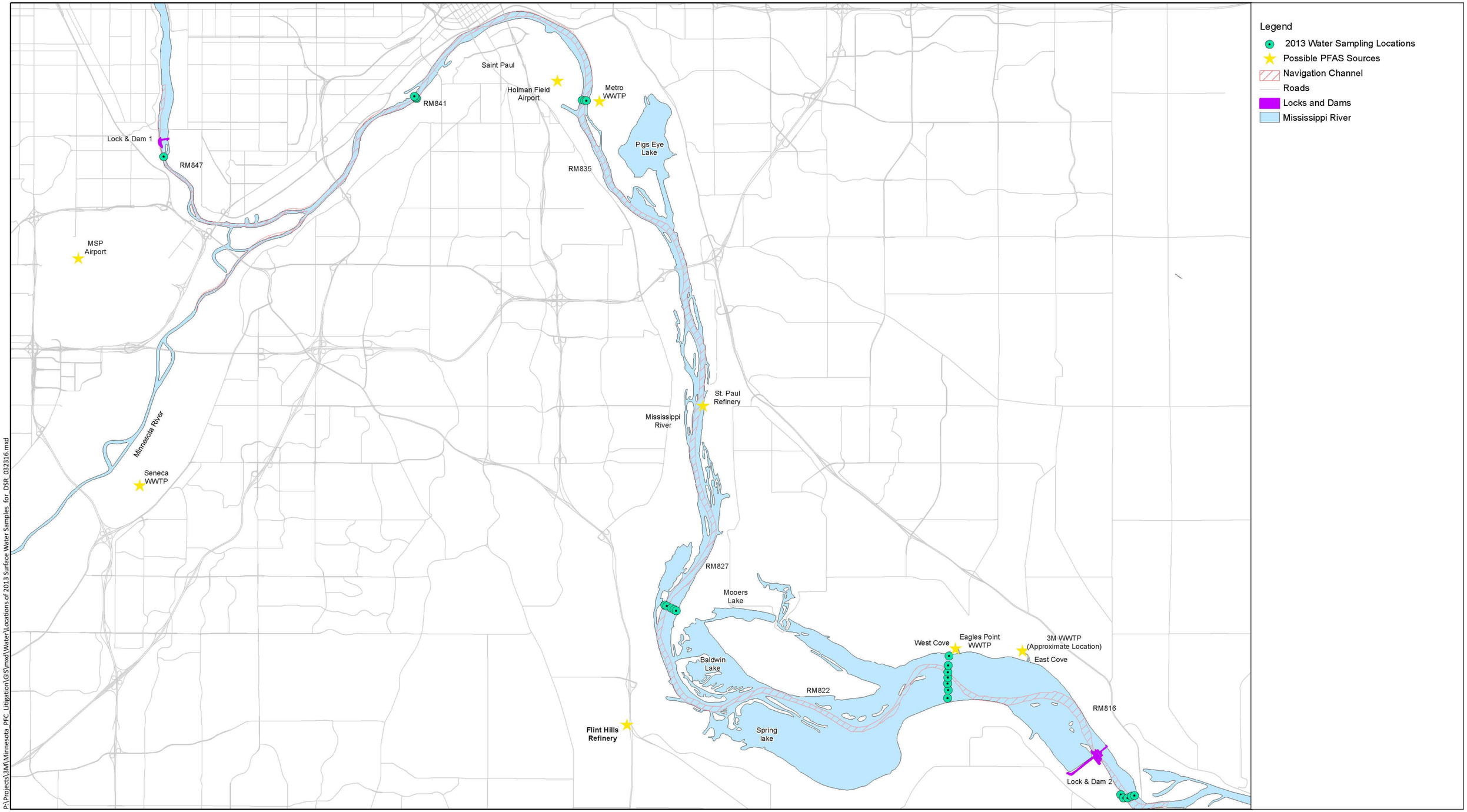
Notes:
All non-detect results are reported at the reporting limit.
All perfluorochemicals were analyzed and reported in the dissolved fraction.
-- = results not reported or not applicable
< = compound analyzed, but not detected above reporting limit
FB = field blank
FD = field duplicate
J = estimated value
LR = lab replicate
mg/L = milligrams per liter
ng/L = nanogram per liter
N = environmental sample
PFBA = Perfluorobutanoate
PFBS = Perfluorobutanesulfonate
PFDA = Perfluorodecanoate
PFDoA = Perfluorododecanoate
PFHpA = Perfluoroheptanoate
PFHxA = Perfluorohexanoate
PFHxS = Perfluorohexanesulfonate
PFNA = Perfluorononanoate
PFOA = Perfluorooctanoate
PFOS = Perfluorooctanesulfonate
PFOSA = Perfluorooctane sulfonamide
PFPeA = Perfluoropentanoate
PFUnA = Perfluoroundecanoate
TDS = total dissolved solids
TOC = total organic carbon
TSS = total suspended solids

Table 8
2013 Sediment Results

Sample Name	Sample Date	Sample Time	Parent Location	Sample Type	PFBA (ng/g)	PFBS (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFHpA (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFOA (ng/g)	PFOS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFUnA (ng/g)	TOC (mg/kg)	Moisture (%)
BALDWIN_LAKE-SED-201309231314	9/23/2013	1:14:00 PM	BALDWIN_LAKE	N	< 0.0955	< 0.191	< 0.0955	< 0.0955	< 0.0955	< 0.0955	< 0.191	< 0.0955	< 0.0955	0.131 J	< 0.0955	< 0.0955	< 0.0955	4820	30
MISS-RM816.7-SED-201309291543	9/29/2013	8:20:00 AM	MISS-RM816.7	N	0.092	< 0.176	< 0.0878	< 0.0878	< 0.0878	< 0.0878	< 0.176	< 0.0878	< 0.0878	0.553	< 0.0878	< 0.0878	< 0.0878	13100	33
MISS-RM817.0-SED-201309291542	9/29/2013	3:42:00 PM	MISS-RM817.0	N	0.436	< 0.193	< 0.0965	< 0.0965	< 0.0965	< 0.0965	< 0.193	< 0.0965	0.348	2.45	0.399	< 0.0965	< 0.0965	19800	39
MISS-RM817.1-1-SED-201309291541	9/29/2013	3:41:00 PM	MISS-RM817.1-1	N	1.44	< 0.191	< 0.0953	< 0.0953	< 0.0953	< 0.0953	< 0.191	< 0.0953	0.395	2.28	0.126	< 0.0953	< 0.0953	6930	30.8
MISS-RM817.1-2-SED-201309291542	9/29/2013	3:42:00 PM	MISS-RM817.1-2	N	3.77	0.406	0.531	0.634	0.199	0.358	0.298	0.13	6.32	47.9	5.27	0.307	0.129	20000	50.6
MISS-RM817.4-1-SED-201309291539	9/29/2013	3:39:00 PM	MISS-RM817.4-1	N	2.02	0.526	< 0.0689	< 0.0689	0.121	0.35	0.179	< 0.0689	3.74	1.58	< 0.0689	0.257	< 0.0689	7650	31.3
MISS-RM817.4-2-SED-201309280924	9/28/2013	9:24:00 AM	MISS-RM817.4-2	N	0.601	< 0.193	0.123	< 0.0966	< 0.0966	< 0.0966	< 0.193	< 0.0966	0.742	7.99	0.227	< 0.0966	< 0.0966	15800	46
MISS-RM817.4-2-SED-201309280924DUP	9/28/2013	9:24:00 AM	MISS-RM817.4-2	LR	0.721	< 0.195	0.111	< 0.0975	< 0.0975	< 0.0975	< 0.195	< 0.0975	0.741	9.16	0.235	< 0.0975	< 0.0975	--	46.2
MISS-RM817.4-2-SED-201309280924MS	9/28/2013	9:24:00 AM	--	MS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	46.1
MISS-RM817.7-1-SED-201309231314	9/23/2013	1:14:00 PM	MISS-RM817.7-1	N	0.707	< 0.192	< 0.0962	< 0.0962	< 0.0962	0.121	< 0.192	< 0.0962	0.116	0.384	< 0.0962	0.167	< 0.0962	9820	33.8
MISS-RM817.7-2-SED-201309280938	9/28/2013	9:38:00 AM	MISS-RM817.7-2	N	0.769	0.638	< 0.134	< 0.134	< 0.134	< 0.134	0.299	< 0.134	8.98	11.5	< 0.134	< 0.134	< 0.134	13800	49.8
MISS-RM818.0-1-SED-201309231315	9/23/2013	1:15:00 PM	MISS-RM818.0-1	N	< 0.101	< 0.201	< 0.101	< 0.101	< 0.101	< 0.101	< 0.201	< 0.101	< 0.101	0.212	< 0.101	< 0.101	< 0.101	20100	40.9
MISS-RM818.0-2-SED-201309231329	9/23/2013	1:29:00 PM	MISS-RM818.0-2	N	0.11	< 0.203	< 0.101	< 0.101	< 0.101	< 0.101	< 0.203	< 0.101	0.492	5.58	0.343	< 0.101	< 0.101	20000	45.1
MISS-RM818.2-SED-201309231316	9/23/2013	1:16:00 PM	MISS-RM818.2	N	< 0.0994	< 0.199	< 0.0994	< 0.0994	< 0.0994	< 0.0994	< 0.199	< 0.0994	< 0.0994	0.392	< 0.0994	< 0.0994	< 0.0994	11900	38.2
MISS-RM819.0-SED-201309231316	9/23/2013	1:16:00 PM	MISS-RM819.0	N	< 0.103	< 0.205	< 0.103	< 0.103	< 0.103	< 0.103	< 0.205	< 0.103	< 0.103	0.196 J	< 0.103	< 0.103	< 0.103	5480	26.7
MISS-RM828.5-SED-201309201939	9/20/2013	7:39:00 PM	MISS-RM828.5	N	< 0.0975	< 0.195	< 0.0975	< 0.0975	< 0.0975	< 0.0975	< 0.195	< 0.0975	< 0.0975	< 0.195 J	< 0.0975	< 0.0975	< 0.0975	1080	18.7
MISS-RM829.6-SED-201309201939	9/20/2013	7:39:00 PM	MISS-RM829.6	N	< 0.101	< 0.201	< 0.101	< 0.101	< 0.101	< 0.101	< 0.201	< 0.101	< 0.101	0.194 J	< 0.101	< 0.101	< 0.101	2030	20.2
MISS-RM829.6-SED-201309201939DUP	9/20/2013	7:39:00 PM	MISS-RM829.6	LR	< 0.101	< 0.202	< 0.101	< 0.101	< 0.101	< 0.101	< 0.202	< 0.101	< 0.101	< 0.202	< 0.101	< 0.101	< 0.101	--	17.6
MISS-RM829.6-SED-201309201939MS	9/20/2013	7:39:00 PM	--	MS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.2
MISS-RM833.6-SED-201309231259	9/23/2013	12:59:00 PM	MISS-RM833.6	N	< 0.0991	< 0.198	< 0.0991	< 0.0991	< 0.0991	< 0.0991	< 0.198	< 0.0991	< 0.0991	0.098 J	< 0.0991	< 0.0991	< 0.0991	2960	24.6
MISS-RM834.2-SED-201309201938	9/20/2013	7:38:00 PM	MISS-RM834.2	N	< 0.0604	< 0.0604	< 0.0604	< 0.0604	< 0.0604	< 0.0604	< 0.0604	< 0.0604	< 0.0604	< 0.0604 J	< 0.0604	< 0.0604	< 0.0604	5810	22.8
PIGSEYE_OF-SED-201309201936	9/20/2013	7:36:00 PM	PIGSEYE_OF	N	< 0.128	< 0.256	< 0.128	< 0.128	< 0.128	< 0.128	< 0.256	< 0.128	< 0.128	< 0.256 J	< 0.128	< 0.128	< 0.128	25500	51.2
SED-FD-20130928	9/28/2013	9:38:00 AM	MISS-RM817.7-2	FD	0.798	0.762	< 0.14	< 0.14	< 0.14	< 0.14	< 0.28	< 0.14	8.61	9.66	< 0.14	< 0.14	< 0.14	14300	49.5
SPRING_LAKE_N-SED-201309231324	9/23/2013	1:24:00 PM	SPRING_LAKE_N	N	< 0.0981	< 0.196	< 0.0981	< 0.0981	< 0.0981	< 0.0981	< 0.196	< 0.0981	< 0.0981	0.118 J	< 0.0981	< 0.0981	< 0.0981	7510	32.4
SPRING_LAKE_S-SED-201309231323	9/23/2013	1:23:00 PM	SPRING_LAKE_S	N	< 0.101	< 0.202	< 0.101	< 0.101	< 0.101	< 0.101	< 0.202	< 0.101	< 0.101	0.116 J	< 0.101	< 0.101	< 0.101	15200	37.6

Notes:
All non-detect results are reported at the reporting limit.
-- = results not reported or not applicable
< = compound analyzed, but not detected above reporting limit
FD = field duplicate
J = estimated value
LR = lab replicate
MS = matrix spike
mg/g = milligrams per gram
ng/g = nanogram per gram
N = environmental sample
PFBA = Perfluorobutanoate
PFBS = Perfluorobutanesulfonate
PFDA = Perfluorodecanoate
PFDoA = Perfluorododecanoate
PFHpA = Perfluoroheptanoate
PFHxA = Perfluorohexanoate
PFHxS = Perfluorohexanesulfonate
PFNA = Perfluorononanoate
PFOA = Perfluorooctanoate
PFOS = Perfluorooctanesulfonate
PFOSA = Perfluorooctane sulfonamide
PFPeA = Perfluoropentanoate
PFUnA = Perfluoroundecanoate
TOC = total organic carbon

FIGURES

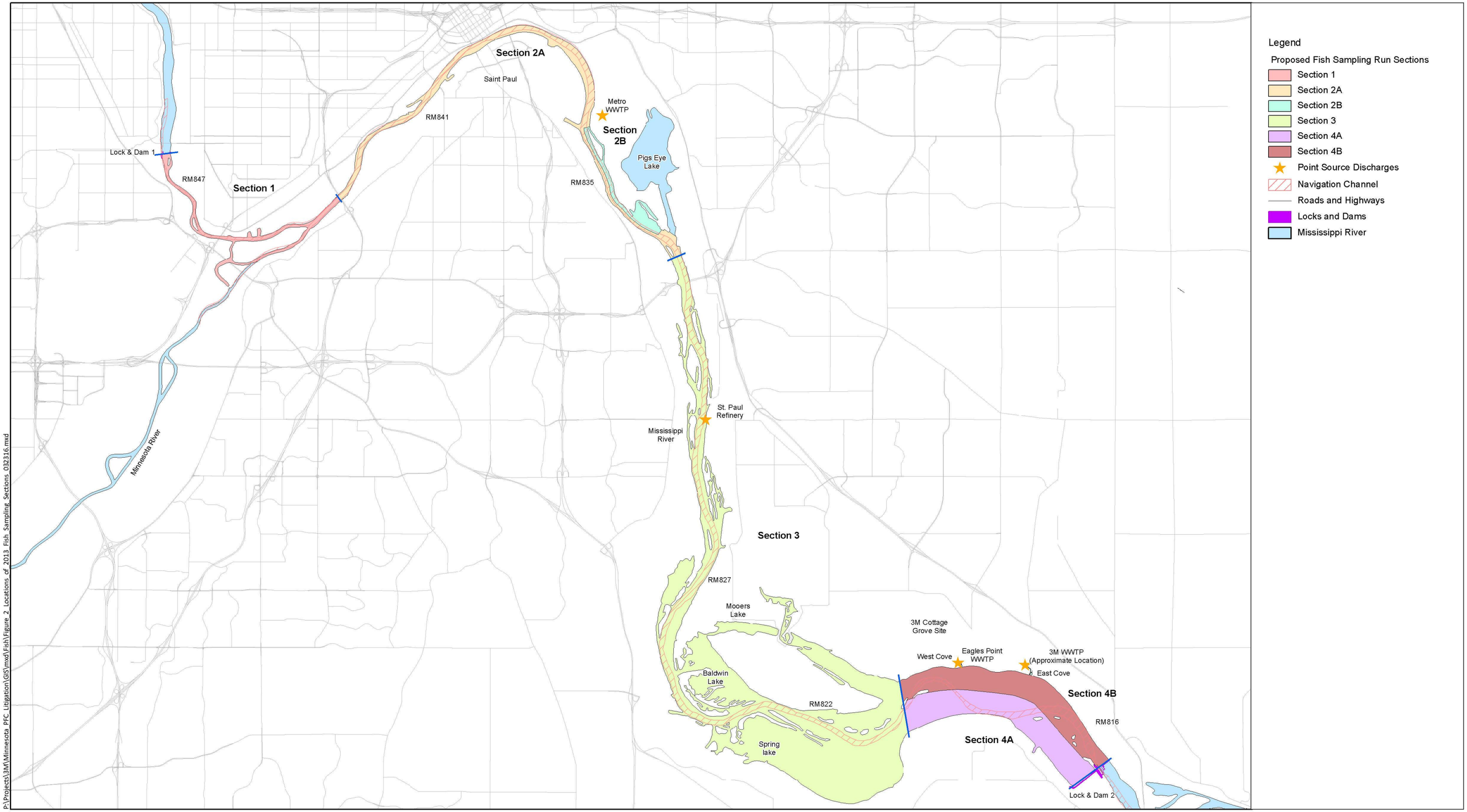


ANCHOR QEA

Miles
0 2 4

2431.0034

Figure 1
Locations of 2013 Surface Water Samples
2013 Data Summary Report Mississippi River - Pool 2

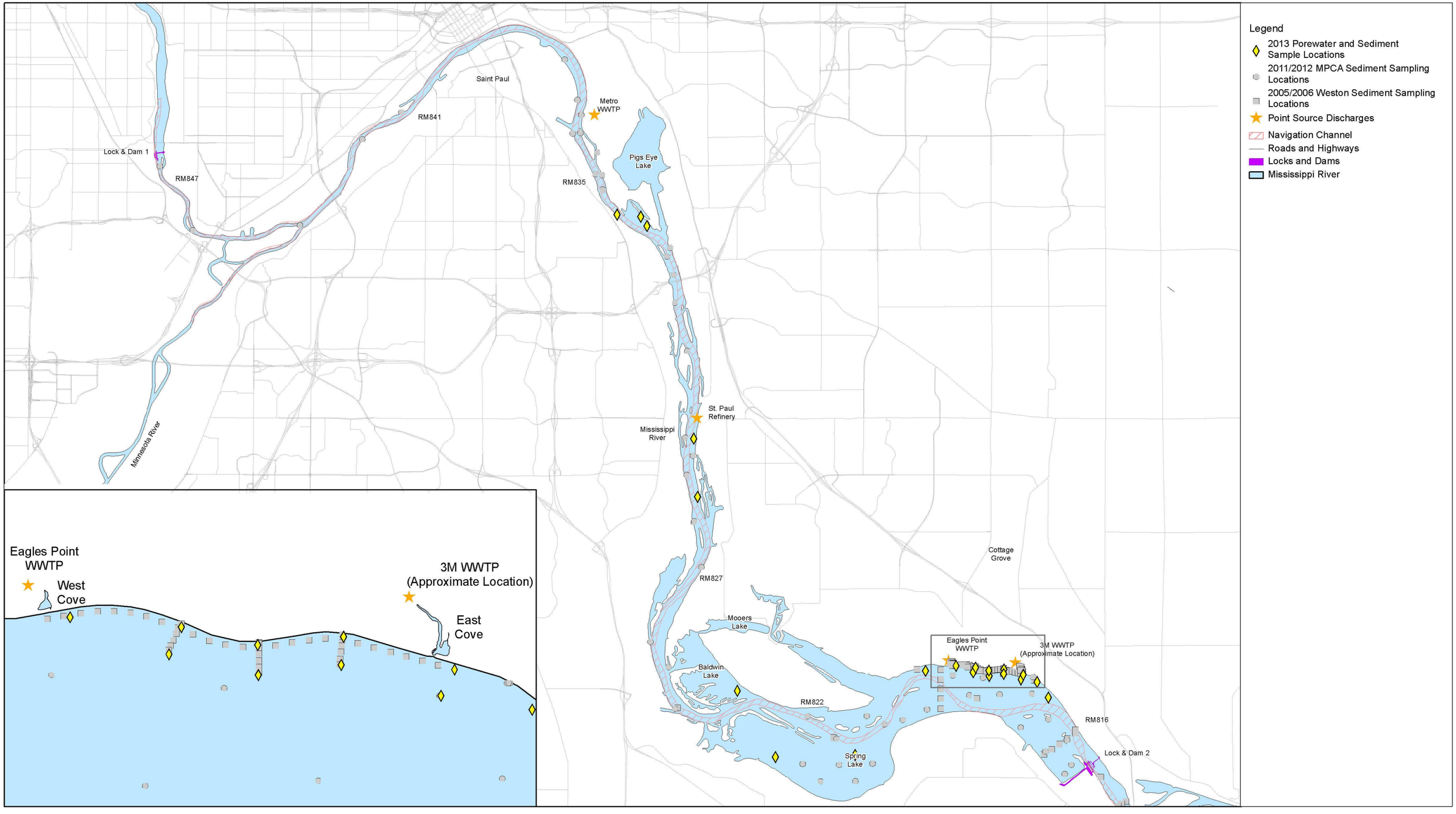


ANCHOR QEA

Miles
0 2 4

2431.0035

Figure 2
Locations of 2013 Fish Sampling Sections
2013 Data Summary Report Mississippi River - Pool 2



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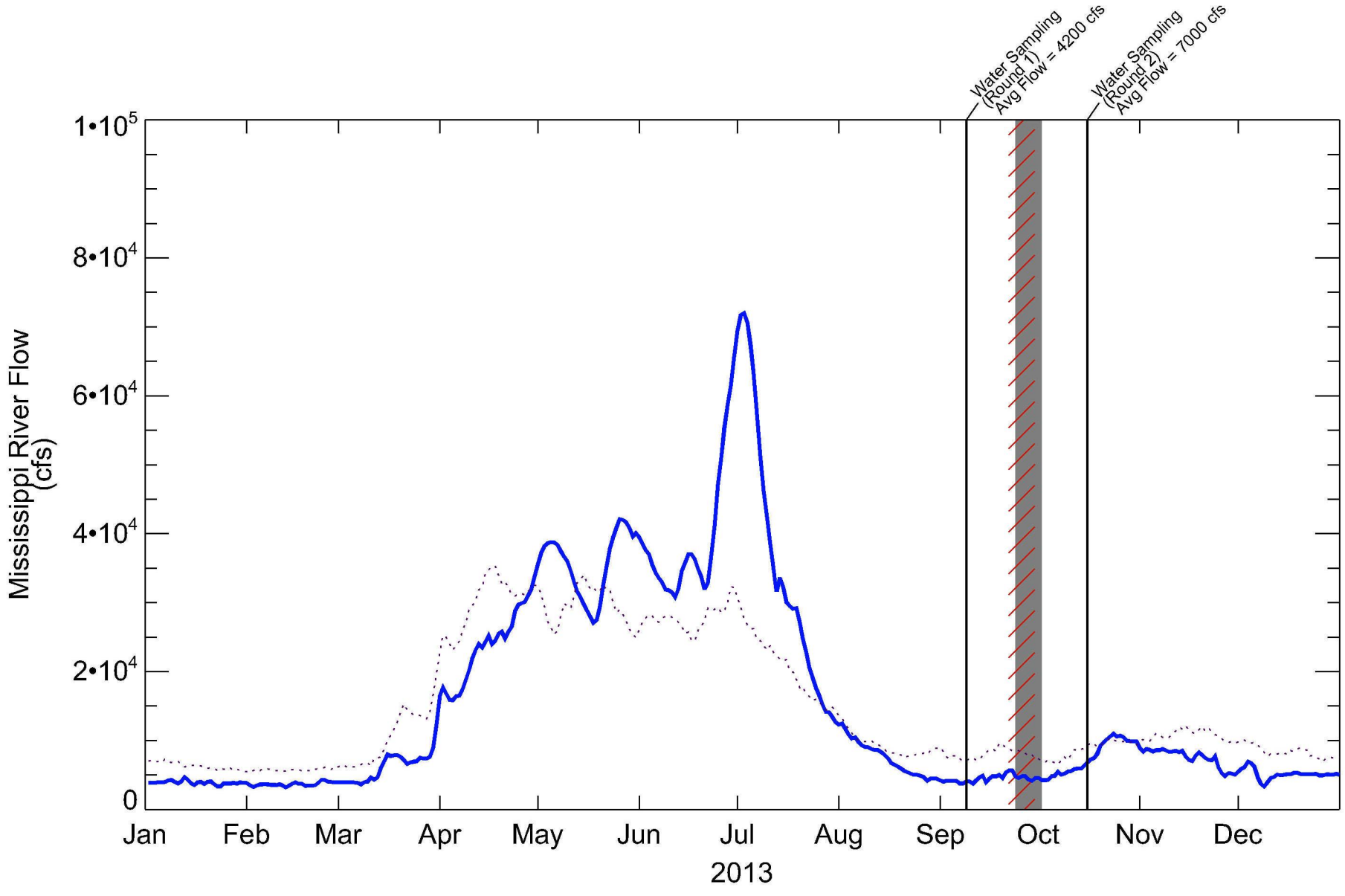
ANCHOR QEA

Miles
0 2 4

2431.0036

Figure 3
Locations of 2013 Porewater and Sediment Samples
2013 Data Summary Report Mississippi River - Pool 2



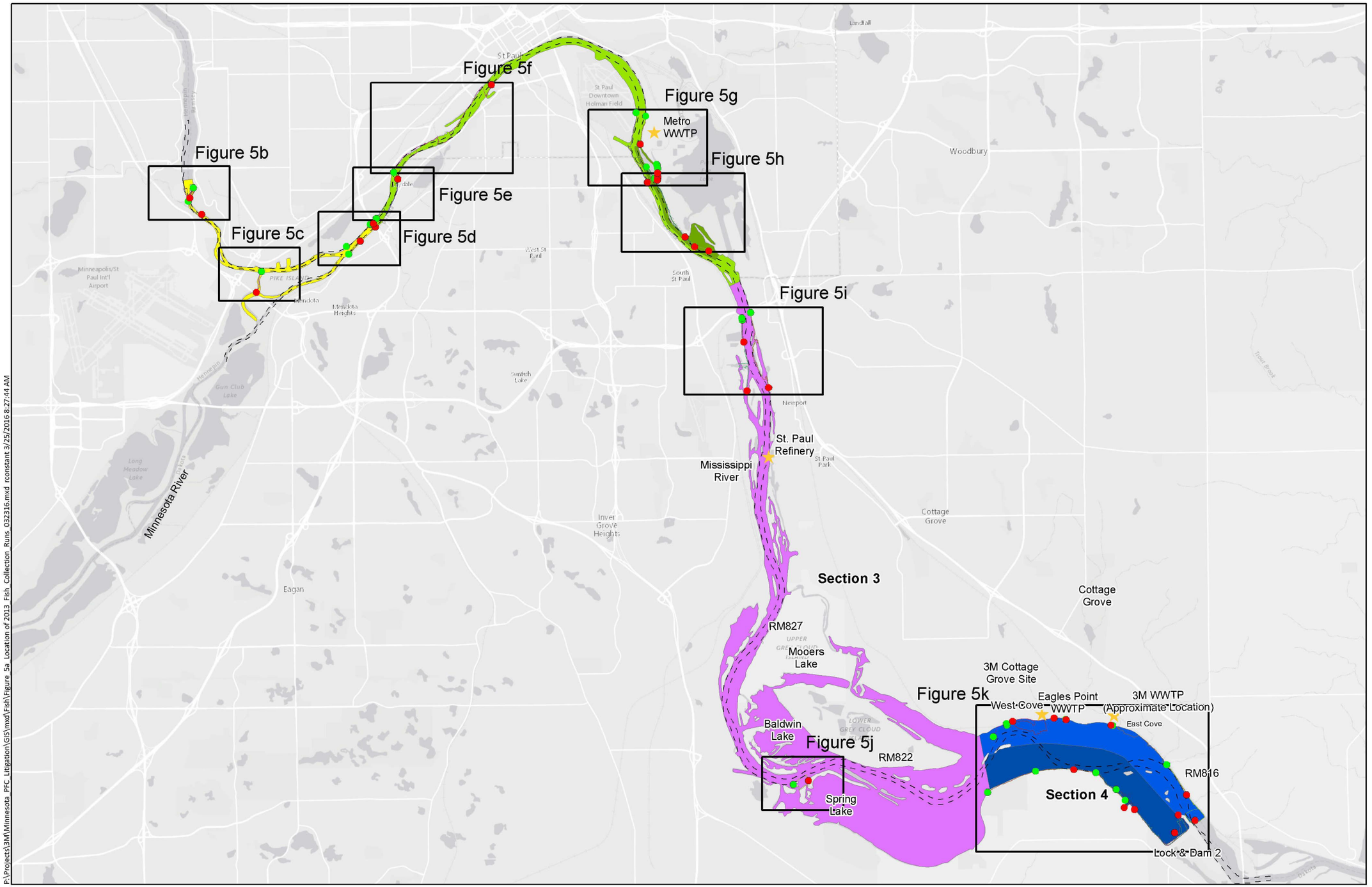
Fish Sampling Event
Pore Water/Sediment Sampling Event
2013 Flow
Median Flow 1990-2016
Water Sampling Event

Figure 4

Mississippi River Hydrograph with Sampling Events
2013 Data Summary Report Mississippi River - Pool 2

Flow from USGS gage 5331000 - Mississippi River at St. Paul, MN.

SLL - \\Saratoga1\Saratoga\Projects\3M\Minnesota_PFC_Litigation\Analysis\PFOS_water_analyses\Hydrographs\IDL\Plot_MR_Flow_2013_AQsampling.pro
Wed Mar 23 16:46:01 2016



Legend

- Fish Run Start
- Fish Run End
- Point Sources Discharge
- Navigation Channel
- Map Sheets

2013 AQ Fish Runs

- MISS-S1-R1
- MISS-S1-R2
- MISS-S1-R3
- MISS-S1-R4
- MISS-S1-R5
- MISS-S1-R6
- MISS-S2A-R1
- MISS-S2A-R2
- MISS-S2A-R3
- MISS-S2A-R4
- MISS-S2B-R1
- MISS-S2B-R2
- MISS-S2B-R3
- MISS-S2B-R4
- MISS-S2B-R5
- MISS-S2B-R6
- MISS-S3-R1
- MISS-S3-R2
- MISS-S3-R3
- MISS-S3-R4
- MISS-S4A-R1
- MISS-S4A-R2
- MISS-S4A-R3
- MISS-S4A-R4
- MISS-S4A-R5
- MISS-S4B-R1
- MISS-S4B-R2
- MISS-S4B-R3
- MISS-S4B-R4
- MISS-S4B-R5
- MISS-S4B-R6

River Sections

- Section 1
- Section 2A
- Section 2B
- Section 3
- Section 4A
- Section 4B

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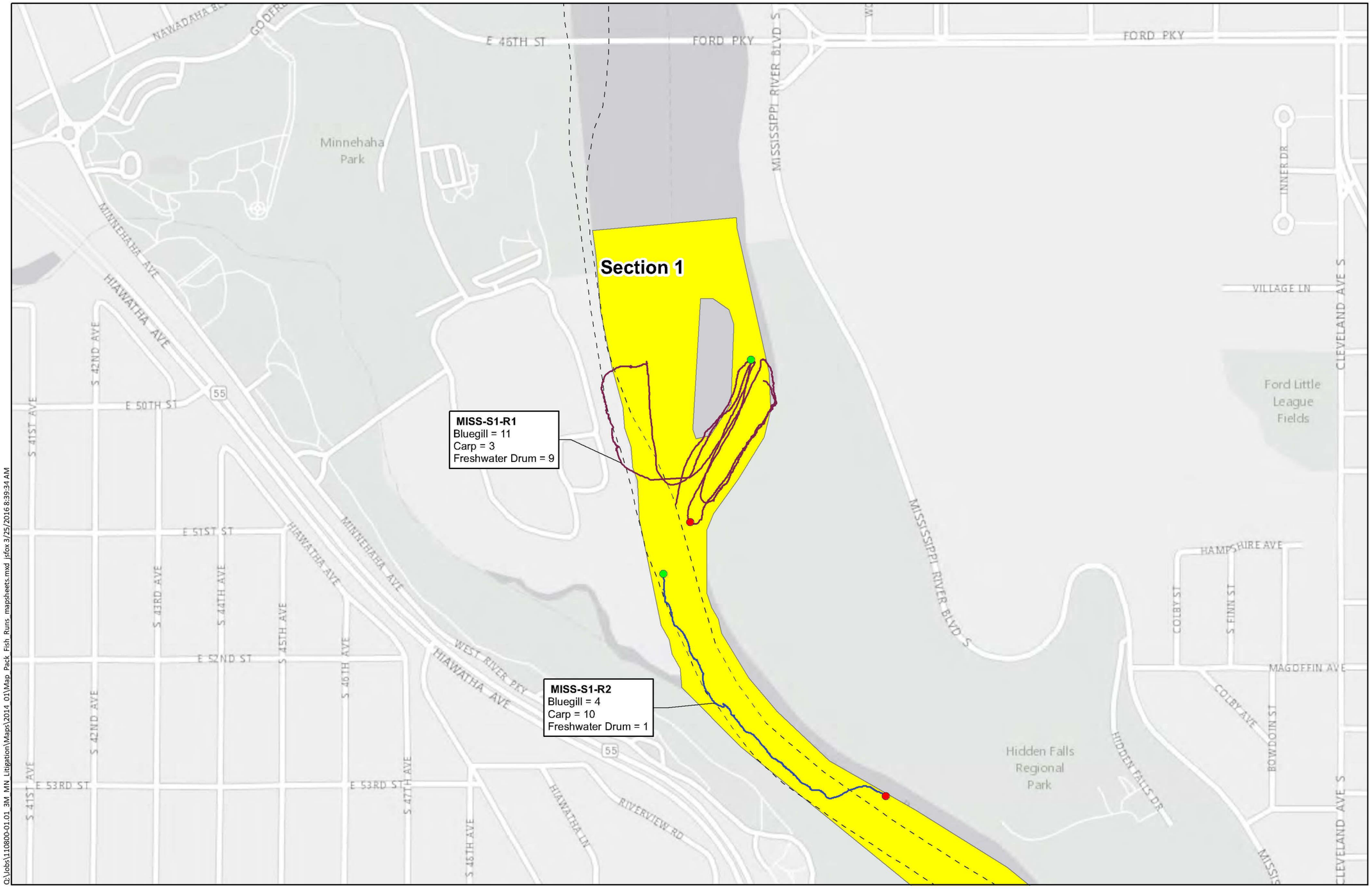
ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 2 4

2431.0038

Figure 5a
Locations of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2



Legend

- Fish Run Start
- Fish Run End
- Point Sources Discharge

2013 AQ Fish Runs

- MISS-S1-R1
- MISS-S1-R2
- MISS-S1-R3
- MISS-S1-R4
- MISS-S1-R5
- MISS-S1-R6
- MISS-S2A-R1
- MISS-S2A-R2
- MISS-S2A-R3
- MISS-S2A-R4
- MISS-S2B-R1
- MISS-S2B-R2
- MISS-S2B-R3
- MISS-S2B-R4
- MISS-S2B-R5
- MISS-S2B-R6
- MISS-S3-R1
- MISS-S3-R2
- MISS-S3-R3
- MISS-S3-R4
- MISS-S4A-R1
- MISS-S4A-R2
- MISS-S4A-R3
- MISS-S4A-R4
- MISS-S4A-R5
- MISS-S4B-R1
- MISS-S4B-R2
- MISS-S4B-R3
- MISS-S4B-R4
- MISS-S4B-R5
- MISS-S4B-R6
- Navigation Channel

River Sections

- Section 1
- Section 2A
- Section 2B
- Section 3
- Section 4A
- Section 4B

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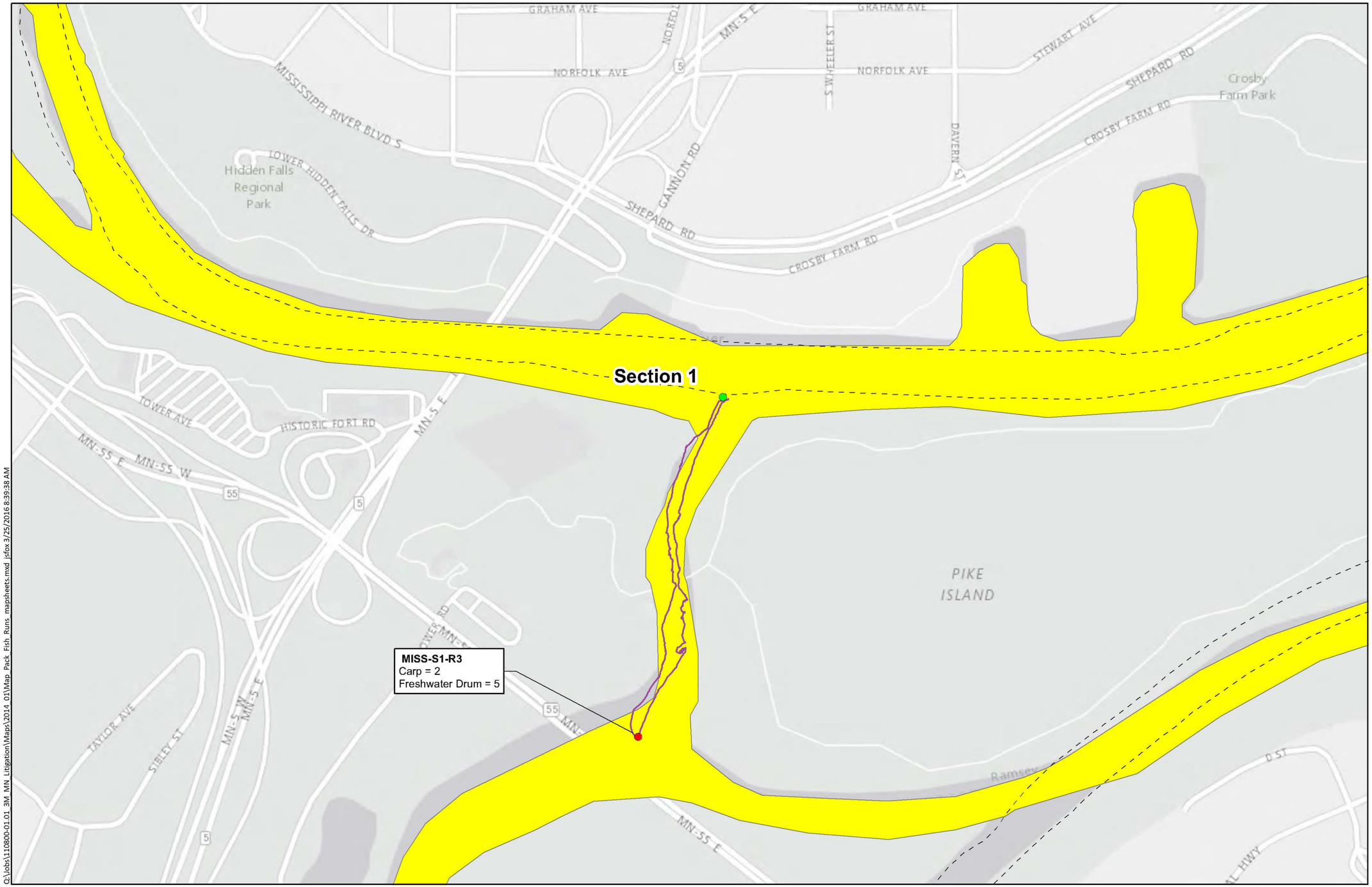
ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.15 0.3

2431.0039

Figure 5b
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2



Legend

- Fish Run Start
- Fish Run End
- Point Sources Discharge

2013 AQ Fish Runs

- MISS-S1-R1
- MISS-S1-R2
- MISS-S1-R3
- MISS-S1-R4
- MISS-S1-R5
- MISS-S1-R6
- MISS-S2A-R1
- MISS-S2A-R2
- MISS-S2A-R3
- MISS-S2A-R4
- MISS-S2B-R1
- MISS-S2B-R2
- MISS-S2B-R3
- MISS-S2B-R4
- MISS-S2B-R5
- MISS-S2B-R6
- MISS-S3-R1
- MISS-S3-R2
- MISS-S3-R3
- MISS-S3-R4
- MISS-S4A-R1
- MISS-S4A-R2
- MISS-S4A-R3
- MISS-S4A-R4
- MISS-S4A-R5
- MISS-S4B-R1
- MISS-S4B-R2
- MISS-S4B-R3
- MISS-S4B-R4
- MISS-S4B-R5
- MISS-S4B-R6
- Navigation Channel

River Sections

- Section 1
- Section 2A
- Section 2B
- Section 3
- Section 4A
- Section 4B

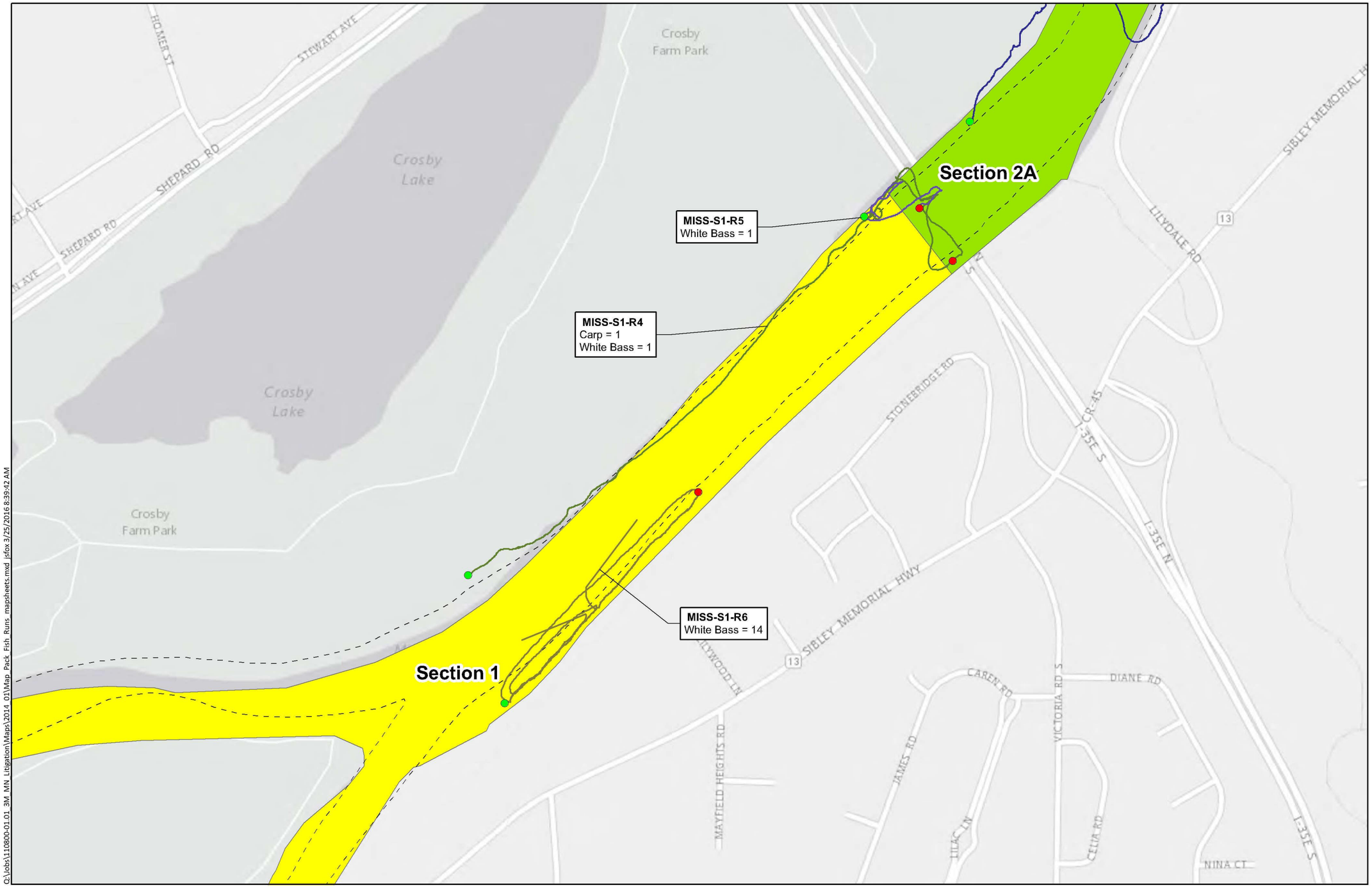
ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.15 0.3

2431.0040

Figure 5c
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2



Legend

- Fish Run Start
- Fish Run End
- Point Sources Discharge

2013 AQ Fish Runs

- MISS-S1-R1
- MISS-S1-R2
- MISS-S1-R3
- MISS-S1-R4
- MISS-S1-R5
- MISS-S1-R6
- MISS-S2A-R1
- MISS-S2A-R2
- MISS-S2A-R3
- MISS-S2A-R4
- MISS-S2B-R1
- MISS-S2B-R2
- MISS-S2B-R3
- MISS-S2B-R4
- MISS-S2B-R5
- MISS-S2B-R6
- MISS-S3-R1
- MISS-S3-R2
- MISS-S3-R3
- MISS-S3-R4
- MISS-S4A-R1
- MISS-S4A-R2
- MISS-S4A-R3
- MISS-S4A-R4
- MISS-S4A-R5
- MISS-S4B-R1
- MISS-S4B-R2
- MISS-S4B-R3
- MISS-S4B-R4
- MISS-S4B-R5
- MISS-S4B-R6
- Navigation Channel

River Sections

- Section 1
- Section 2A
- Section 2B
- Section 3
- Section 4A
- Section 4B

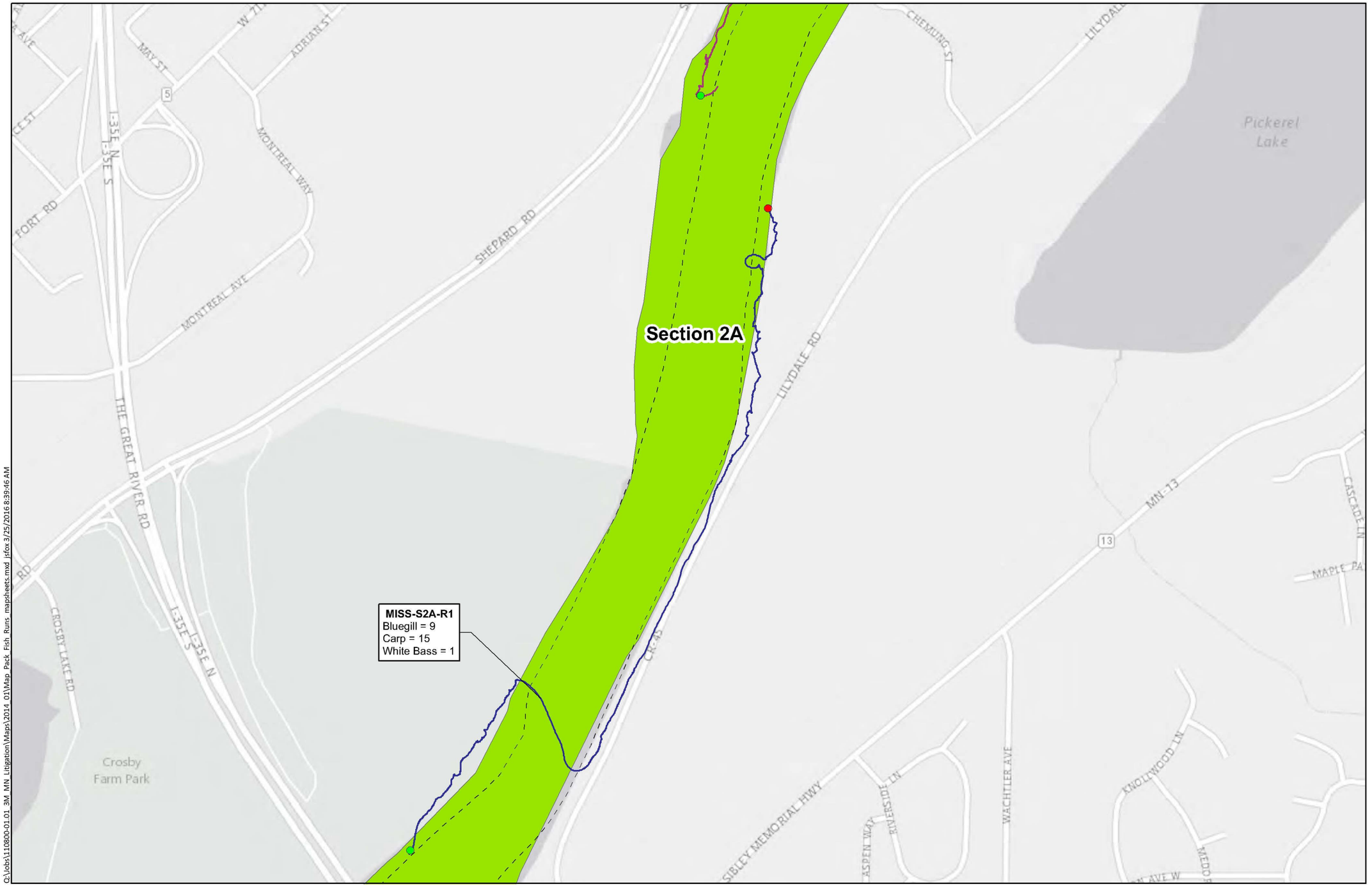
ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.15 0.3

2431.0041

Figure 5d
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2



Legend

- Fish Run Start
- Fish Run End
- Point Sources Discharge

2013 AQ Fish Runs

- MISS-S1-R1
- MISS-S1-R2
- MISS-S1-R3
- MISS-S1-R4
- MISS-S1-R5
- MISS-S1-R6
- MISS-S2A-R1
- MISS-S2A-R2
- MISS-S2A-R3
- MISS-S2A-R4
- MISS-S2B-R1
- MISS-S2B-R2
- MISS-S2B-R3
- MISS-S2B-R4
- MISS-S2B-R5
- MISS-S2B-R6
- MISS-S3-R1
- MISS-S3-R2
- MISS-S3-R3
- MISS-S3-R4
- MISS-S4A-R1
- MISS-S4A-R2
- MISS-S4A-R3
- MISS-S4A-R4
- MISS-S4A-R5
- MISS-S4B-R1
- MISS-S4B-R2
- MISS-S4B-R3
- MISS-S4B-R4
- MISS-S4B-R5
- MISS-S4B-R6
- Navigation Channel

River Sections

- Section 1
- Section 2A
- Section 2B
- Section 3
- Section 4A
- Section 4B

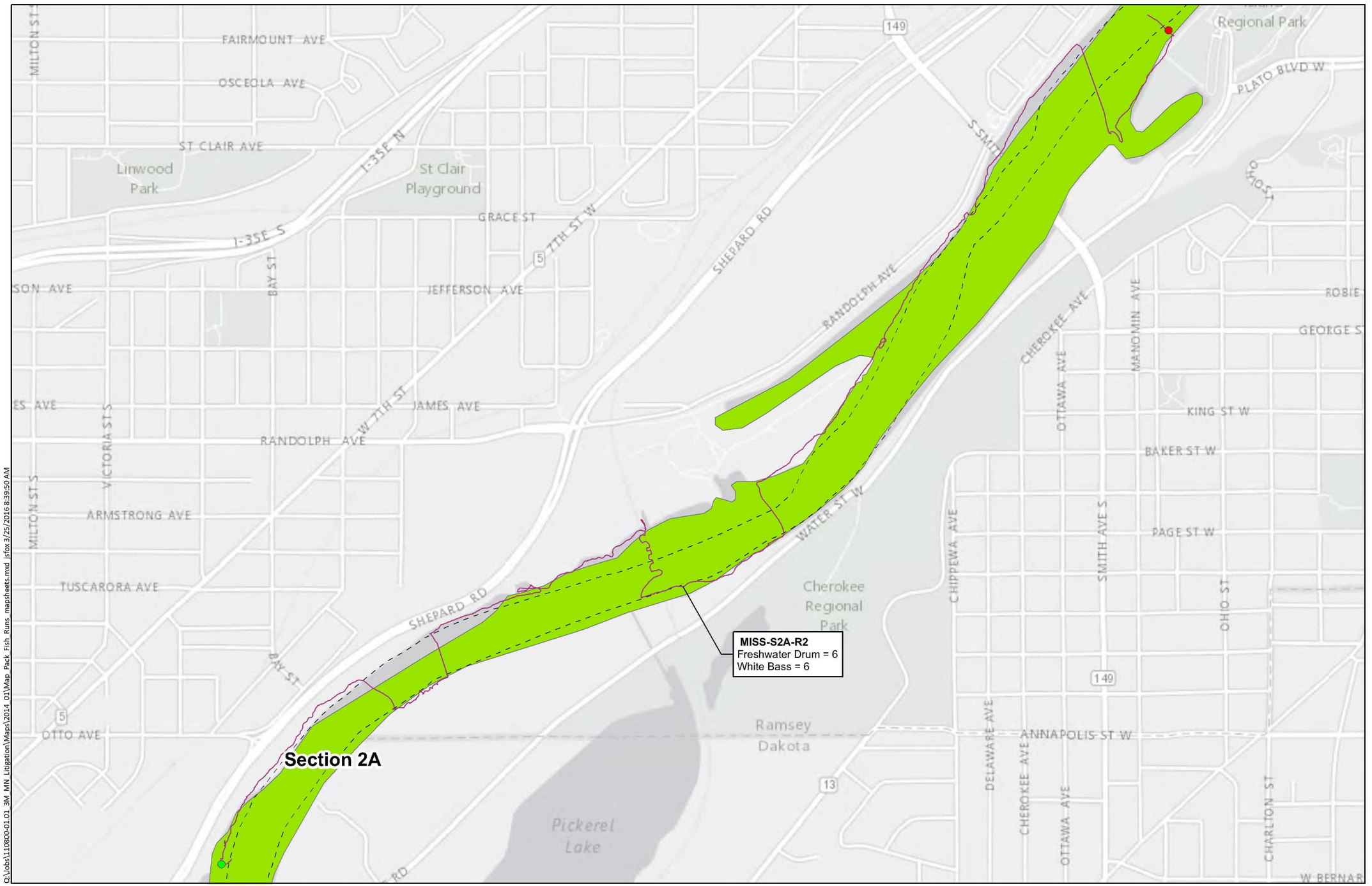
ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.15 0.3

2431.0042

Figure 5e
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2



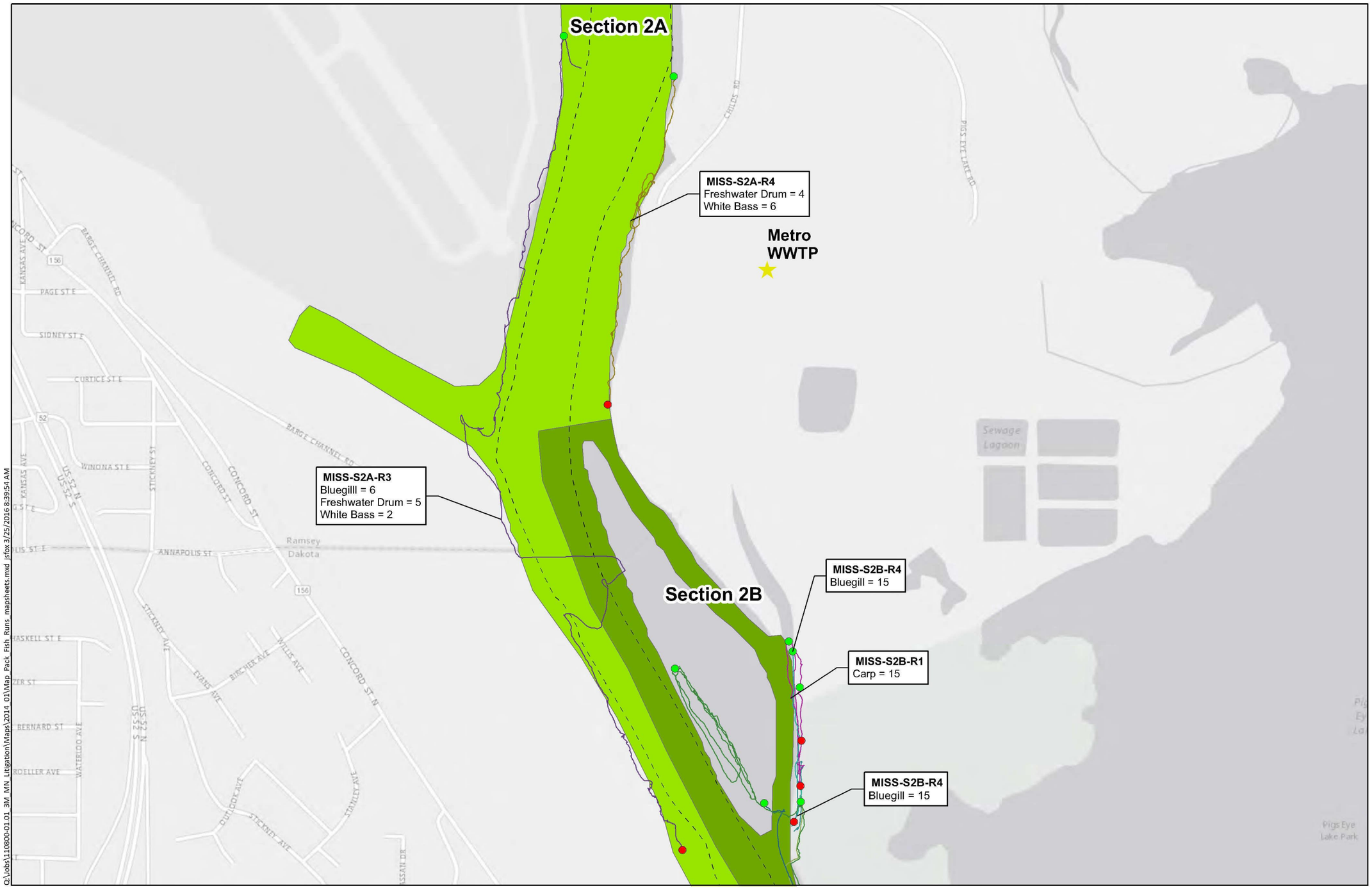
ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.25 0.5

2431.0043

Figure 5f
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2



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Legend

- Fish Run Start
- Fish Run End
- Point Sources Discharge

2013 AQ Fish Runs

- MISS-S1-R1
- MISS-S1-R2
- MISS-S1-R3
- MISS-S1-R4
- MISS-S1-R5
- MISS-S1-R6
- MISS-S2A-R1
- MISS-S2A-R2
- MISS-S2A-R3
- MISS-S2A-R4
- MISS-S2B-R1
- MISS-S2B-R2
- MISS-S2B-R3
- MISS-S2B-R4
- MISS-S2B-R5
- MISS-S2B-R6
- MISS-S3-R1
- MISS-S3-R2
- MISS-S3-R3
- MISS-S3-R4
- MISS-S4A-R1
- MISS-S4A-R2
- MISS-S4A-R3
- MISS-S4A-R4
- MISS-S4A-R5
- MISS-S4B-R1
- MISS-S4B-R2
- MISS-S4B-R3
- MISS-S4B-R4
- MISS-S4B-R5
- MISS-S4B-R6
- Navigation Channel

River Sections

- Section 1
- Section 2A
- Section 2B
- Section 3
- Section 4A
- Section 4B

ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.2 0.4

2431.0044

Figure 5g
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2

Legend

- Fish Run Start
- Fish Run End
- Point Sources Discharge

2013 AQ Fish Runs

- MISS-S1-R1
- MISS-S1-R2
- MISS-S1-R3
- MISS-S1-R4
- MISS-S1-R5
- MISS-S1-R6
- MISS-S2A-R1
- MISS-S2A-R2
- MISS-S2A-R3
- MISS-S2A-R4
- MISS-S2B-R1
- MISS-S2B-R2
- MISS-S2B-R3
- MISS-S2B-R4
- MISS-S2B-R5
- MISS-S2B-R6
- MISS-S3-R1
- MISS-S3-R2
- MISS-S3-R3
- MISS-S3-R4
- MISS-S4A-R1
- MISS-S4A-R2
- MISS-S4A-R3
- MISS-S4A-R4
- MISS-S4A-R5
- MISS-S4B-R1
- MISS-S4B-R2
- MISS-S4B-R3
- MISS-S4B-R4
- MISS-S4B-R5
- MISS-S4B-R6
- Navigation Channel

River Sections

- Section 1
- Section 2A
- Section 2B
- Section 3
- Section 4A
- Section 4B

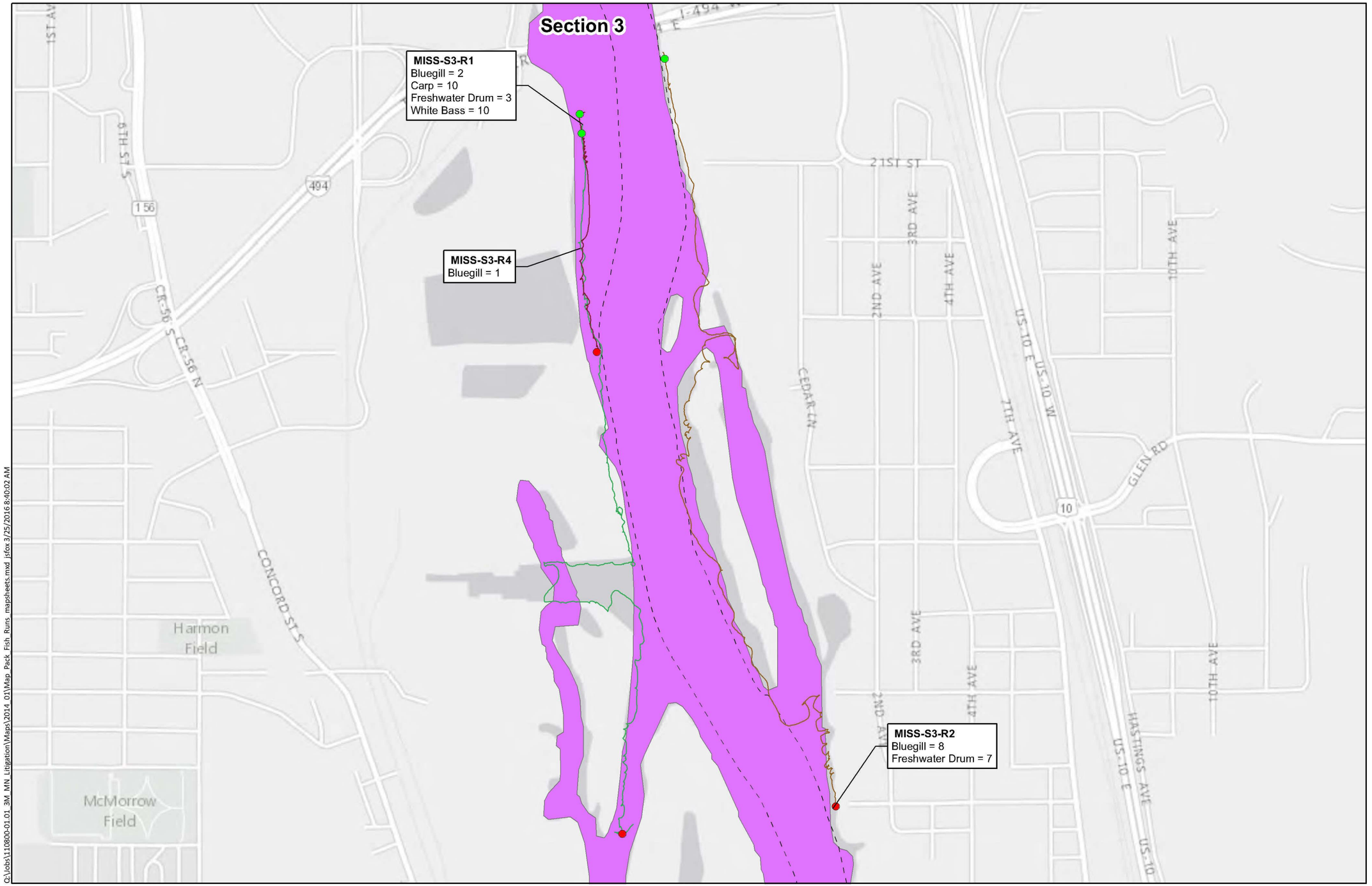
ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.25 0.5

2431.0045

Figure 5h
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2



Legend

- Fish Run Start
- Fish Run End
- Point Sources Discharge

2013 AQ Fish Runs

- MISS-S1-R1
- MISS-S1-R2
- MISS-S1-R3
- MISS-S1-R4
- MISS-S1-R5
- MISS-S1-R6
- MISS-S2A-R1
- MISS-S2A-R2
- MISS-S2A-R3
- MISS-S2A-R4
- MISS-S2B-R1
- MISS-S2B-R2
- MISS-S2B-R3
- MISS-S2B-R4
- MISS-S2B-R5
- MISS-S2B-R6
- MISS-S3-R1
- MISS-S3-R2
- MISS-S3-R3
- MISS-S3-R4
- MISS-S4A-R1
- MISS-S4A-R2
- MISS-S4A-R3
- MISS-S4A-R4
- MISS-S4A-R5
- MISS-S4B-R1
- MISS-S4B-R2
- MISS-S4B-R3
- MISS-S4B-R4
- MISS-S4B-R5
- MISS-S4B-R6
- Navigation Channel

River Sections

- Section 1
- Section 2A
- Section 2B
- Section 3
- Section 4A
- Section 4B

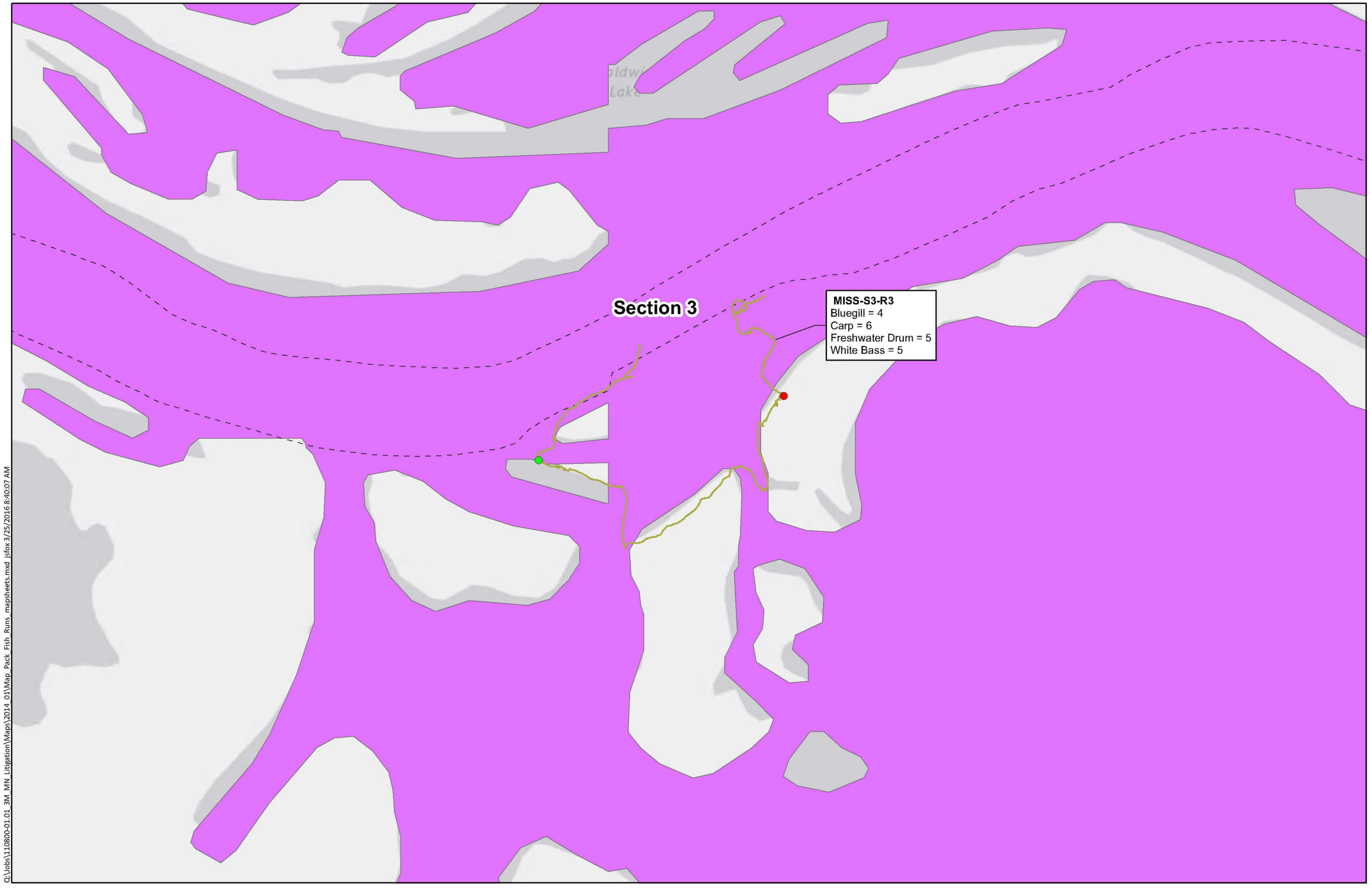
ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.25 0.5

2431.0046

Figure 5i
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2



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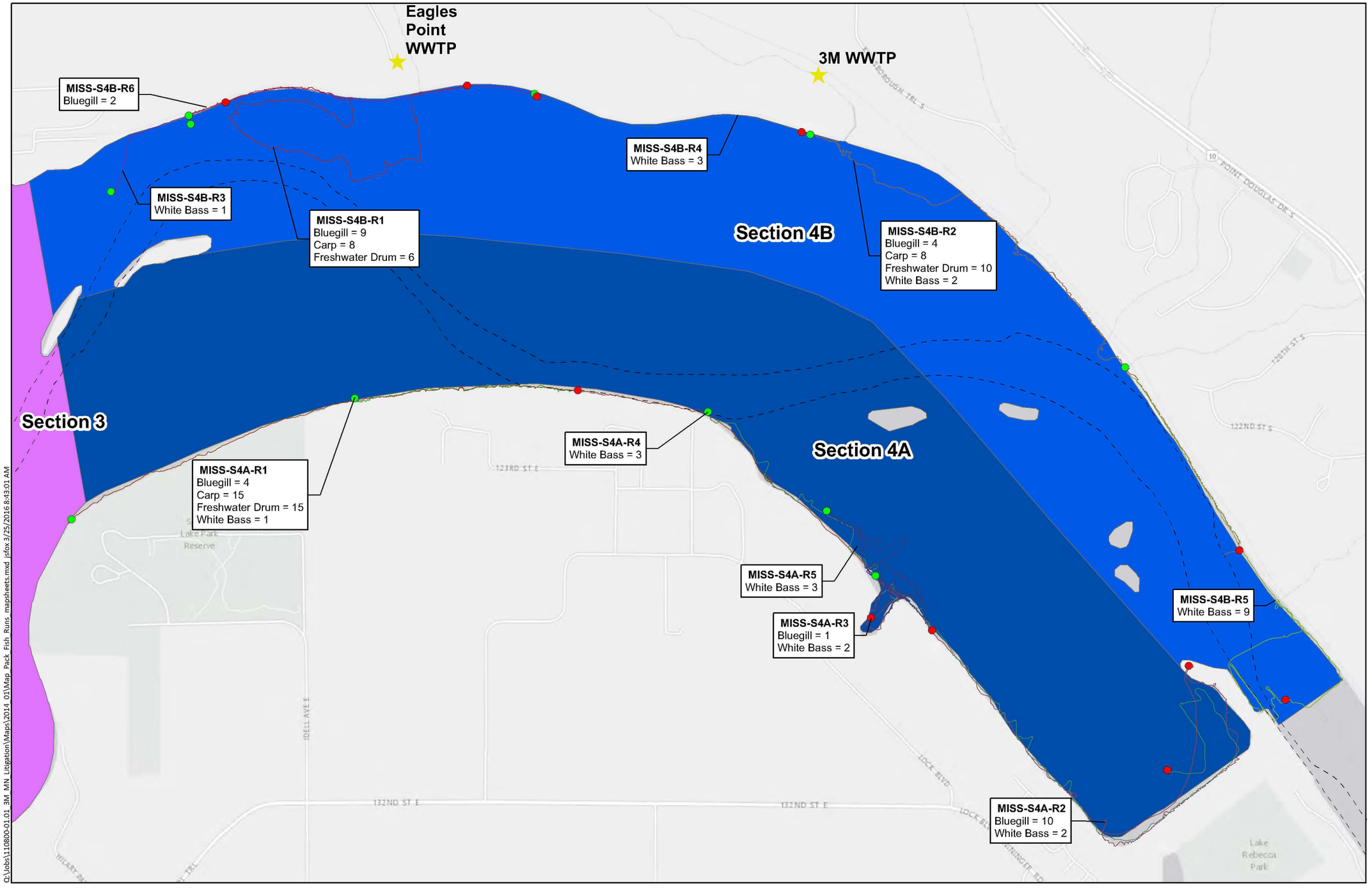
ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.15 0.3

2431.0047

Figure 5j
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2



Legend

- Fish Run Start
- Fish Run End
- Point Sources Discharge

2013 AQ Fish Runs

- MISS-S1-R1
- MISS-S1-R2
- MISS-S1-R3
- MISS-S1-R4
- MISS-S1-R5
- MISS-S1-R6
- MISS-S2A-R1
- MISS-S2A-R2
- MISS-S2A-R3
- MISS-S2A-R4
- MISS-S2B-R1
- MISS-S2B-R2
- MISS-S2B-R3
- MISS-S2B-R4
- MISS-S2B-R5
- MISS-S2B-R6
- MISS-S3-R1
- MISS-S3-R2
- MISS-S3-R3
- MISS-S3-R4
- MISS-S4A-R1
- MISS-S4A-R2
- MISS-S4A-R3
- MISS-S4A-R4
- MISS-S4A-R5
- MISS-S4B-R1
- MISS-S4B-R2
- MISS-S4B-R3
- MISS-S4B-R4
- MISS-S4B-R5
- MISS-S4B-R6
- Navigation Channel

River Sections

- Section 1
- Section 2A
- Section 2B
- Section 3
- Section 4A
- Section 4B

ANCHOR QEA

Note:
The section boundaries shown are an approximation of the Mississippi shoreline. The actual shoreline varies and fish runs may appear to be on land.

Miles
0 0.45 0.9

2431.0048

Figure 5k
Location of 2013 Fish Collection Runs
2013 Data Summary Report Mississippi River - Pool 2

APPENDIX A
MINNESOTA DEPARTMENT OF NATURAL RESOURCES SCIENTIFIC COLLECTORS PERMIT

STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES
Fish Management Section, Division of Fish and Wildlife
500 Lafayette Road
St. Paul, MN 55155-4020
PH: (651) 259-5236
e-mail: fisheries.permits@state.mn.us

SPECIAL PERMIT NO. 19417
(General and Miscellaneous)
Date: 23 September 2013

TO WHOM IT MAY CONCERN:
Permission is hereby granted to: Christopher Yates
Anchor QEA, LLC
80 Glen Street, Suite 2
Glen Falls, NY 12801

to collect fish by electrofishing or angling from Pool 2 of the Mississippi River between Lock and Dam #1 and #2. All collected fish will be released except those permitted for sampling and transport to the laboratory: 90 bluegill (Lepomis spp) or other representative sunfishes, 90 white bass (Morone chrysops), 90 freshwater drum (Aplodinotus grunniens), and 90 common carp (Cyprinus carpio) to be analyzed for PFCs. No threatened or endangered species may be collected.

Condition #1. Permits for Work in All State Waters *(Applies to all permits)*
- Before conducting work under this permit in state waters, permittees must decontaminate all equipment that has been used for other activities in infested waters in Minnesota or other locations.
- Permittees must do the following when leaving all waters:
  - **Clean** off all aquatic plants and animals (e.g., snails, zooplankton) from equipment; and
  - **Drain** water from watercraft and all equipment used to collect specimens.

Condition #2. General Invasive Species Related Conditions *(Applies to all permits)*
- If your permit allows for live transport, bring uninfested surface water or ground water to the collection site for specimen transportation.
- Obtain a *Prohibited Invasive Species Permit* if you collect any prohibited invasive species (see attachment for list and permit application information).

Condition #3. Permits for Work in Infested Waters *(Applies to permits in infested waters only)*
- Permittees using waders, hip boots, or other footwear in infested waters shall decontaminate the footwear before reuse in other waters.
- When collecting or conducting other research activities in designated infested waters, permittees should be aware that state regulations prohibit transport of water from designated infested waters and special precautions are required as conditions of this permit (download list of waters at http://files.dnr.state.mn.us/eco/invasives/infested_waters.pdf).

- Obtain an *Infested Waters Appropriation Permit* if it is critical to transport aquatic species in infested water (see attachment for permit application information).
- Traps, nets, and gear used in designated infested waters shall be tagged with orange *Infested Waters Only* tags supplied by DNR and not used in other waters. Hook and line (angling), and backpack electrofishing equipment is excluded. Tags must be attached in a manner that prohibits their removal without cutting the tag, though see Condition #5 below if you have a situation that requires a second permit during the calendar year. Decontamination procedures must still be followed for tagged gear after completion of your field work. Watercraft do not need to be tagged, but must be fully decontaminated after work is completed in infested waters, and should not be left in infested waters overnight.
- The permittee must decontaminate equipment specific to the aquatic invasive species present in the waterbody. The following procedures are required before the tagged equipment may be used in uninfested waters or other types of infested waters:
  - **zebra mussel** – rinse with 140 degree F water at the point of contact for at least 10 seconds, or 120 degrees F for at least 2 minutes;
  - **faucet snail** – rinse with 140 degree F hot water for at least one minute;
  - **spiny water flea** – equipment must be thoroughly dry for at least 24 hours; and
  - **Eurasian watermilfoil, flowering rush** – all plant parts must be removed

This permit is only for sampling on State property, unless the permittee has explicit permission from the land owners; including the National Park Service, or County. A separate permit is needed from the Division of Parks and Recreation to collect within a State Park. A copy of this permit shall be carried while sampling.

The Area Fisheries Supervisor and the Regional Enforcement Manager must be notified by e-mail in advance of sampling. A hard copy of the notifications shall be attached to the year-end activity report. Your letter of application does not constitute advance notification of your intent to sample.

A report detailing collection activities (species, numbers, and collection sites) will be submitted to the Division of Fish and Wildlife by 31 January of each year. A copy of any report or publication resulting from this research will be provided to the Division of Fish and Wildlife upon its completion.

This permit is valid from date of issuance through 31 December 2013, but may be revoked at any time.

DONALD L. PEREIRA
FISHERIES RESEARCH AND POLICY MANAGER

I hereby certify that I have read and understand the provisions of this permit and understand that this permit is not valid unless it is signed by me.

Permittee Signature	Title	Date
Christopher Yates	Managing Scientist	9/23/13

cc: **Division of Fish and Wildlife**
TJ Debates, East Metro Area Fisheries Supervisor, St. Paul
(e-mail timothy.debates@state.mn.us, phone 651-259-5770)
Joel Stiras, East Metro Fisheries Specialist, St. Paul
Brad Parsons, Regional Fisheries Manager, St. Paul

Division of Enforcement
Capt. Gregory Salo, Regional Enforcement Manager, St. Paul
(e-mail gregory.salo@state.mn.us, phone 651-259-5882)

From: Christopher Yates
To: "gregory.salo@state.mn.us"; "timothy.debates@state.mn.us"
Cc: "Telander, Colleen L (DNR)"
Subject: RE: MN DNR Fisheries Research Permit 19415 - ISSUED
Date: Monday, September 23, 2013 8:43:00 PM

Greg/TJ,

We have started fish collection via electroshocking methods today in accordance with Fisheries Research Permit 19415. We expect to the sampling to continue all of this week and into next week if necessary. If you have an questions, please feel free to contact me at any time at (518)-522-7037.

Thanks,
Chris

Christopher Yates
ANCHOR QEA, LLC
cyates@anchorqea.com
80 Glen Street, Suite 2
Glens Falls, NY 12801
T 518.792.3709
F 518.792.3719
C 518.522.7037

ANCHOR QEA, LLC
www.anchorqea.com

From: Telander, Colleen L (DNR) [mailto:colleen.telander@state.mn.us]
Sent: Monday, September 23, 2013 4:19 PM
To: Christopher Yates
Subject: MN DNR Fisheries Research Permit 19415 - ISSUED

Chris –

The attached Fisheries Research Permit 19417 has been issued to collect fish by electrofishing or angling from Pool 2 of the Mississippi River between Lock and Dam #1 and #2. Also included are attachments detailing aquatic invasive species transfer risk, and the prior notification and reporting requirements associated with this permit. As stated in your permit, the Area Fisheries Supervisor and the Regional Enforcement Manager must be notified by e-mail in advance of sampling, with e-mail addresses located at the end of your permit.

If you require your permit to be sent by U.S. mail in addition to this electronic distribution, please let us know. Thanks!

Colleen Telander
MN DNR – Fisheries Research
500 Lafayette Road, Box 20
St. Paul, MN 55112-4020
Phone: 651-259-5236
Fax: 651-297-4961
colleen.telander@state.mn.us

APPENDIX B
DATA VALIDATION REPORTS

ANCHOR QEA

720 Olive Way, Suite 1900
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131
www.anchorqea.com

DATA VALIDATION REVIEW REPORT – USEPA STAGE 2A

Project:	Mississippi River Pool 2
Project Number:	110800-01.01
Date:	March 14, 2014

This report summarizes the review of analytical results for one porewater and 48 surface water samples, four field blanks, and four field duplicates collected September 8 – 12 and 27 and October 15-16, 2013. The samples were collected by Anchor QEA, LLC, and submitted to Pace Analytical Services, Inc. (Pace) in Minneapolis, Minnesota and Axys Analytical Services, Ltd. (Axys) in Sidney, British Columbia. The samples were analyzed for the following parameters:

- Total dissolved solids (TDS) by Standard Method (SM) 2540C
- Total suspended solids (TSS) by SM 2540D
- Total organic carbon (TOC) by U.S. Environmental Protection Agency (USEPA) method 9060
- Perfluorinated organic compounds (PFCs) by Axys method MLA-060, Revision 10

Pace sample data group (SDG) numbers 10241685 and 10246309 and Axys SDG numbers WG44838, WG44849 and WG45148 (L20281), and WG45326 and WG45307 (L20535) were reviewed in this report. Samples reviewed in this report are presented in Table 1.

Table 1
Samples Reviewed

Sample ID	Pace Lab ID	Axys Lab ID	Axys Lab SDG	Matrix	Analyses Requested
MISS-RM814.3-1-201309120854	10241685001	L20281-2	WG44838	Water	TDS, TSS, TOC, PFCs
MISS-RM814.3-2-201309120906	10241685002	L20281-3		Water	TDS, TSS, TOC, PFCs
MISS-RM814.3-3-201309120915	10241685003	L20281-4		Water	TDS, TSS, TOC, PFCs
MISS-RM814.3-5-201309120930	10241685005	L20281-6		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-1-201309110952	10246309007	L20281-8		Water	TDS, TSS, TOC,

Sample ID	Pace Lab ID	Axys Lab ID	Axys Lab SDG	Matrix	Analyses Requested
					PFCs
MISS-RM818.5-2-201309111000	10246309008	L20281-9		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-3-201309111010	10246309009	L20281-10		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-4-201309111026	10246309011	L20281-11		Water	TDS, TSS, TOC, PFCs
MISS-RM836.3-1-201309091112	10246309020	L20281-13		Water	TDS, TSS, TOC, PFCs
MISS-RM836.3-2-201309091123	10246309021	L20281-14		Water	TDS, TSS, TOC, PFCs
MISS-RM836.3-3-201309091134	10246309022	L20281-15		Water	TDS, TSS, TOC, PFCs
SW-FB-20130910	--	L20281-12		Water	PFCs
SW-FB-20130912	--	L20281-1		Water	PFCs
SW-FD-20130912	10241685006	L20281-7		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-5-201309111041	10246309012	L20281-21		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-6-201309111050	10246309013	L20281-22		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-7-201309111102	10246309014	L20281-23		Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-1-201309100928	10246309015	L20281-25		Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-2-201309100941	10246309016	L20281-26		Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-3-201309100950	10246309017	L20281-27		Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-4-201309101003	10246309018	L20281-28	WG44849	Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-5-201309101016	10246309019	L20281-29		Water	TDS, TSS, TOC, PFCs
MISS-RM841.0-1-201309081342	10246309023	L20281-16		Water	TDS, TSS, TOC, PFCs
MISS-RM841.0-2-201309081355	10246309024	L20281-17		Water	TDS, TSS, TOC, PFCs
MISS-RM841.0-3-201309081403	10246309025	L20281-18		Water	TDS, TSS, TOC, PFCs
MISS-RM847.3-C-201309081307	10246309026	L20281-19		Water	TDS, TSS, TOC, PFCs
SW-FD-20130911	10241685014	L20281-24		Water	TDS, TSS, TOC, PFCs
MISS-RM814.3-4-201309120921	10241685004	L20281-5	WG45148	Water	TDS, TSS, TOC, PFCs
MISS-RM817.4-2-PW-201309270916	--	L20418-6		Water	PFCs
MISS-RM814.3-1-201310161258	10246309001	L20535-1	WG45307	Water	TDS, TSS, TOC,

Sample ID	Pace Lab ID	Axys Lab ID	Axys Lab SDG	Matrix	Analyses Requested
					PFCs
MISS-RM814.3-2-201310161301	10246309002	L20535-2		Water	TDS, TSS, TOC, PFCs
MISS-RM814.3-3-201310161308	10246309003	L20535-3		Water	TDS, TSS, TOC, PFCs
MISS-RM814.3-4-201310161310	10246309005	L20535-5		Water	TDS, TSS, TOC, PFCs
MISS-RM814.3-5-201310161319	10246309006	L20535-6		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-1-201310161101	10241685008	L20535-8		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-2-201310161109	10241685009	L20535-9		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-3-201310161116	10241685010	L20535-10		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-5-201310161137	10241685012	L20535-13		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-6-201310161144	10241685013	L20535-14		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-7-201310161153	10241685015	L20535-15		Water	TDS, TSS, TOC, PFCs
SW-FB2-20131016	--	L20535-7		Water	PFC
SW-FD-20131016	10246309010	L20535-11		Water	TDS, TSS, TOC, PFCs
SW-FD2-20131016	10246309004	L20535-4		Water	TDS, TSS, TOC, PFCs
MISS-RM818.5-4-201310161128	10241685011	L20535-12	WG45326	Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-1-201310151530	10241685016	L20535-17		Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-2-201310151535	10241685017	L20535-18		Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-3-201310151543	10241685018	L20535-19		Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-4-201310151548	10241685019	L20535-20		Water	TDS, TSS, TOC, PFCs
MISS-RM826.0-5-201310151554	10241685020	L20535-21		Water	TDS, TSS, TOC, PFCs
MISS-RM836.3-1-201310151439	10241685021	L20535-22		Water	TDS, TSS, TOC, PFCs
MISS-RM836.3-2-201310151447	10241685022	L20535-23		Water	TDS, TSS, TOC, PFCs
MISS-RM836.3-3-201310151457	10241685023	L20535-24		Water	TDS, TSS, TOC, PFCs
MISS-RM841.0-1-201310151226	10241685024	L20535-25		Water	TDS, TSS, TOC, PFCs
MISS-RM841.0-2-201310151239	10241685025	L20535-26		Water	TDS, TSS, TOC, PFCs

Sample ID	Pace Lab ID	Axys Lab ID	Axys Lab SDG	Matrix	Analyses Requested
MISS-RM841.0-3-201310151351	10241685026	L20535-27		Water	TDS, TSS, TOC, PFCs
MISS-RM847.3-C-201310151143	10241685014	L20535-28		Water	TDS, TSS, TOC, PFCs
SW-FB-20131016	--	L20535-16		Water	PFCs

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control (QA/QC) guidelines outlined in the analytical procedures and data quality objective sections of the Quality Assurance Project Plan (QAPP; Cardno ENTRIX, 2011) and in the Sampling and Analysis Plan (SAP; Anchor QEA, 2013). Laboratory results were reviewed using the following guidelines:

- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA 1999)
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA 2008)

Laboratory and method QC criteria were also used as stated in USEPA 1986 (SW-846, Third Edition), *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, update 1, August 1993; update II, January 1995; update IIA, February 1994; update IIB, August 1995; update III, June 1997; update IIIA, May 1999; update IIIB, June 2008; update IVA and IVB, January 2008. Unless noted in this report, laboratory results for the samples listed above were within QC criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by Pace and Axys at the time of sample receipt and the samples were received in good condition. Some samples were received at Pace above the recommended temperature range of 4° ± 2° C; however, cooler temperatures were less than 10°C so no data were qualified. Four coolers received at Axys were above the recommended temperature range, but less than or equal to 10°C. The laboratory indicated that this does not significantly

impact data accuracy, so no data were qualified. Samples received above 10°C have been qualified "J" or "UJ" to indicate a potentially low bias.

Holding Times, Sample Containers and Sample Preservation

Samples were appropriately preserved and analyzed within holding times, with the following exceptions:

- SDG 10241685
    - TDS: Four samples were analyzed one day past the 7-day hold time. Results have been qualified "J" to indicate a potentially low bias.
    - TOC: Two pre-preserved glass sample containers broke during transport. TOC was analyzed on an aliquot taken from an unpreserved, HDPE sample bottle submitted for TDS/TSS analysis. Because samples were not preserved in the field, results have been qualified "J" to indicate a potentially low bias.

See Table 3 for qualified data.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes, with the exception of the blank in SDG WG45148. PFOA and PFOS were detected above the method reporting limit (MRL); however sample results were greater than five times the concentration of the blank so no data were qualified.

Field Quality Control

Field Blanks

Four field blanks were collected in association with this sample set for PFCs. All field blanks were free of target analytes at the reporting limit.

Field Duplicates

Four field duplicates were collected in association with these sample sets. Detected results are summarized in Table 2.

Table 2
Field Duplicate Summary

Analyte	MISS-RM818.5-7-201309111102	SW-FD-20130911	RPD
Perfluorobutanesulfonate (PFBS)	60.3 ng/L	65.8 ng/L	9%

Analyte	MISS-RM818.5-7-201309111102	SW-FD-20130911	RPD
Perfluorobutanoate (PFBA)	34.8 ng/L	38.5 ng/L	10%
Perfluoroheptanoate (PFHpA)	5.29 ng/L	3.76 ng/L	34%
Perfluorohexanesulfonate (PFHxS)	2.7 ng/L	2.03U ng/L	200%
Perfluorohexanoate (PFHxA)	6.25 ng/L	5.97 ng/L	5%
Perfluorononanoate (PFNA)	1.54 ng/L	1.56 ng/L	1%
Perfluorooctanesulfonate (PFOS)	4.3 ng/L	6.12 ng/L	35%
Perfluorooctanoate (PFOA)	7.61 ng/L	8.22 ng/L	8%
Perfluoropentanoate (PFPeA)	3.07 ng/L	3.77 ng/L	20%
TDS	391 mg/L	397 mg/L	2%
TSS	28.4 mg/L	28.7 mg/L	1%
TOC	6.6 mg/L	6.4 mg/L	3%

Analyte	MISS-RM814.3-5-201309120930	SW-FD-20130912	RPD
PFBS	260 ng/L	276 ng/L	6%
PFBA	201 ng/L	207 ng/L	3%
PFHpA	3.79 ng/L	5.34 ng/L	34%
PFHxS	2.22 ng/L	3.29 ng/L	39%
PFHxA	6.26 ng/L	7.91 ng/L	23%
PFNA	1.06 ng/L	0.985U ng/L	200%
PFOS	6.91 ng/L	8.46 ng/L	20%
PFOA	13 ng/L	12.5 ng/L	4%
PFPeA	6.39 ng/L	6.55 ng/L	2%
TDS	382 mg/L	375 mg/L	2%
TSS	37.1 mg/L	39.2 mg/L	6%
TOC	6.7 mg/L	6.7 mg/L	0%

Analyte	MISS-RM818.5-3-201310161116	SW-FD-20131016	RPD
PFBA	21.1 ng/L	26.2 ng/L	22%
PFHpA	1.1 ng/L	1.3U ng/L	200%
PFHxA	3.64 ng/L	6.16 ng/L	51%
PFOS	3.7 ng/L	2.93 ng/L	23%
PFOA	4.61 ng/L	5.6 ng/L	19%
PFPeA	2.23 ng/L	5.34U ng/L	200%
TDS	316 mg/L	317 mg/L	0%
TSS	26.8 mg/L	27.8 mg/L	4%
TOC	5.7 mg/L	5.7 mg/L	0%

Analyte	MISS-RM814.3-3-201310161308	SW-FD2-20131016	RPD
PFBA	37.2 ng/L	36.3 ng/L	2%
PFHpA	1.89 ng/L	1.95 ng/L	3%
PFHxA	4.85 ng/L	5.12 ng/L	5%
PFOS	3.4 ng/L	3.89 ng/L	13%
PFOA	7.39 ng/L	7.09 ng/L	4%
PFPeA	4.13 ng/L	4.44 ng/L	7%
TDS	334 mg/L	481 mg/L	36%

Analyte	MISS-RM814.3-3-201310161308	SW-FD2-20131016	RPD
TSS	39.7 mg/L	41.5 mg/L	4%
TOC	5.5 mg/L	5.5 mg/L	0%

Results at or near the reporting limit (RL) may have exaggerated relative percent difference (RPD) values. The PFHxA RPD value for sample MISS-RM814.3-5-201309120930, and the PFBA and PFHxA RPD values for sample MISS-RM818.5-3-201310161116 exceeded the QAPP's 20% advisory limit for field duplicates with concentrations greater than five times the reporting limit. No data were qualified based on field duplicate results.

Labeled Compound Recoveries

Labeled compounds were added to all field and QC samples and recoveries were within laboratory control limits with some exceptions. However, since results are corrected for labeled compound recoveries, no data were qualified.

Laboratory Control Sample and Laboratory Control Sample Duplicate

Laboratory control samples (LCS) were analyzed at the required frequencies. All LCS analyses yielded percent recovery (%R) values within laboratory control limits, with the following exceptions:

- SDG WG44838 PFCs: The LCS %R for PFBA was above the project control limit. Associated detected results were qualified "J" to indicate a potentially high bias.
- SDG WG44849 PFCs: The LCS %R for PFNA was above the control limit. Associated detected results were qualified "J" to indicate a potentially high bias.
- SDG WG45148 PFCs: The LCS %R for PFHxA, PFHpA and PFOA were above the control limit. Associated detected results were qualified "J" to indicate a potentially high bias.
- SDG WG45326 PFCs: The LCS %R for Perfluorododecanoate (PFDoA) as above the project control limit. This compound was not detected in any samples so no data were qualified.

Matrix Spike and Matrix Spike Duplicate

Matrix spike (MS) and matrix spike duplicate (MSD) samples were analyzed at required frequencies. All MS/MSD analyses yielded %R and/or RPD values within laboratory control limits with the following exceptions:

- SDG WG44838 PFCs: The %R values for the MS performed on sample MISS-RM818.5-3-201309111010 were within the project control limit for all compounds except PFHpA, which recovered above the control limit. The parent sample result was qualified "J" to indicate a potentially low bias.
- SDG WG44849 PFCs: The %R values for the MS performed on sample MISS-RM826.0-4-201309101003 were above the project control limit for PFHpA and PFHxS. Parent sample results were qualified "J" to indicate a potentially high bias.
- SDG WG45307 PFCs: The %R values for the MS performed on sample MISS-RM814.3-1-201310161258 were above the project control limit for PFHpA and PFOS. Parent sample results were qualified "J" to indicate a potentially high bias.

See Table 3 for qualified data.

Laboratory Duplicates

Laboratory duplicates were analyzed for PFCs, TDS and TSS. Precision was assessed for TOC using the MSD RPD values. All duplicate RPDs were within the project control limit with the following exceptions:

- SDG 10241685 TSS: The RPD values were above the control limit for the duplicates analyzed on samples MISS-RM841.0-3-201309081403 and MISS-RM836.3-1-201309091112. Results were within five times the MRL, and the difference between the two values was less than the MRL, so no data were qualified.
- SDG 10246309 TDS: The RPD value was above the control limit for the duplicate analysis of sample MISS-RM814.3-3-201310161308. Twelve associated results have been qualified "J" to indicate that they are estimated.
- SDG WG44838 PFCs: The RPD values were above the control limit for PFPeA and PFOS in the duplicate analysis of sample MISS-RM818.5-3-201309111010. However, results were less than five times the MRL, and the difference between the two values was less than the MRL, so no data were qualified.
- SDG WG44849 PFCs: The RPD values for 4 PFC compounds were above the control limit in the duplicate analysis of sample MISS-RM826.0-4-201309101003. Parent sample results for PFHpA and PFHxA were qualified "J" because the difference between the two results was greater than the MRL.

- SDG WG45307 PFCs: The RPD value for PFOS was above the control limit in the duplicate analysis of sample MISS-RM814.3-1-201310161258. However, results were less than five times the MRL, and the difference between the two values was less than the MRL, so no data were qualified.
- SDG WG45326 PFCs: The RPD value for PFBA and PFHpA were above the control limit in the duplicate analysis of sample MISS-RM818.5-4-201310161128. However, result was less than five times the MRL, and the difference between the two values was less than the MRL, so no data were qualified.

Sample Analyses

PFBA was not quantifiable in sample MISS-RM826.0-2-201310151535, due to no %R for the associated labeled compound. Sample results were rejected and are not usable for any purpose.

See Table 3 for qualified data.

Method Reporting Limits and Method Detection Limits

Most reporting limits were deemed acceptable as reported. Non-detected values for PFOS were reported to the method detection limit (MDL) provided by the laboratory. Results detected above the MDL and below the method reporting limit (MRL) were qualified with a "J" to indicate that the results are estimated. [1] Results (detects and non-detects) for other compounds were reported to the MRL.

Overall Assessment

This evaluation determined that the laboratory followed the specified analytical methods and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the labeled compound, LCS and MS/MSD %R values, with the exceptions noted above.

[1] A S/N ratio of 3 was referenced in the 2012 data validation report. However, all sample results with a S/N ratio less than 3 were below the MDL, so no data were affected. Upon further review of the laboratory analytical procedure, it was determined that results between the MDL and MRL can be used with an estimated qualifier.

Precision was also acceptable as demonstrated by the laboratory duplicates and MS/MSD RPD values, with the exceptions noted above. Most data were deemed acceptable as reported; other data are acceptable as qualified. One PFBA result was rejected due to no labeled compound recovery. Table 3 summarizes the qualifiers applied to samples reviewed in this report.

Data Qualifier Definitions

U Indicates the compound or analyte was analyzed for but not detected at or above the specified limit.

J Indicates an estimated value.

UJ Indicates the compound or analyte was analyzed for but not detected and the specified limit reported is estimated

R Indicates data is rejected and unusable

Table 3
Qualifier Summary

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
MISS-RM814.3-1-201309120854	PFCs	PFBA	177 ng/L	177J ng/L	High LCS %R
MISS-RM814.3-1-201310161258	PFCs	PFHpA	2.41 ng/L	2.41J ng/L	High MS %R
		PFOS	2.76 ng/L	2.76J ng/L	
MISS-RM814.3-2-201309120906	PFCs	PFBA	182 ng/L	182J ng/L	High LCS %R
MISS-RM814.3-3-201309120915	PFCs	PFBA	179 ng/L	179J ng/L	High LCS %R
MISS-RM814.3-3-201310161308	Conventionals	TDS	334 mg/L	334J mg/L	High duplicate RPD
MISS-RM814.3-4-201309120921	PFCs	PFHpA	4.75 ng/L	4.75J ng/L	High LCS %R
		PFHxA	6.35 ng/L	6.35J ng/L	
		PFOA	23.1B ng/L	23.1J ng/L	
MISS-RM814.3-4-	Conventionals	TDS	336 mg/L	336J mg/L	High duplicate RPD

201310161310					
MISS-RM814.3-5-201309120930	PFCs	PFBA	201 ng/L	201J ng/L	High LCS %R
MISS-RM814.3-5-201310161319	PFCs	All PFCs	Varies	J or UJ	Cooler temperature > 10°C
	Conventionals	TDS	325 mg/L	325J mg/L	High duplicate RPD
MISS-RM817.4-2-PW-201309270916	PFCs	PFHpA	1040D ng/L	1040J ng/L	High LCS %R
		PFHxA	7580D ng/L	7580J ng/L	
		PFOA	3510B D ng/L	3510J ng/L	
MISS-RM818.5-1-201309110952	PFCs	PFBA	35.3 ng/L	35.3J ng/L	High LCS %R
MISS-RM818.5-1-201310161101	PFCs	All PFCs	Varies	J or UJ	Cooler temperature > 10°C
	Conventionals	TDS	326 mg/L	326J mg/L	High duplicate RPD
MISS-RM818.5-2-201309111000	PFCs	PFBA	28.9 ng/L	28.9J ng/L	High LCS %R
MISS-RM818.5-2-201310161109	Conventionals	TDS	328 mg/L	328J mg/L	High duplicate RPD
MISS-RM818.5-3-201309111010	PFCs	All PFCs	Varies	J or UJ	Cooler temperature > 10°C
		PFBA	25.1 ng/L	25.1J ng/L	High LCS %R
		PFHpA	4.66 ng/L	4.66J ng/L	High MS %R
MISS-RM818.5-3-201310161116	Conventionals	TDS	316 mg/L	316J mg/L	High duplicate RPD
MISS-RM818.5-4-201309111026	PFCs	PFBA	26.8 ng/L	26.8J ng/L	High LCS %R
MISS-RM818.5-4-201310161128	Conventionals	TDS	314 mg/L	314J mg/L	High duplicate RPD
MISS-RM818.5-5-201309111041	PFCs	PFNA	1.48 ng/L	1.48J ng/L	High LCS %R
MISS-RM818.5-5-201310161137	Conventionals	TDS	309 mg/L	309J mg/L	High duplicate RPD
MISS-RM818.5-6-	PFCs	PFNA	1.76 ng/L	1.76J ng/L	High LCS %R

201309111050					
MISS-RM818.5-6-201310161144	Conventionals	TDS	329 mg/L	329J mg/L	High duplicate RPD
MISS-RM818.5-7-201309111102	PFCs	PFNA	1.54 ng/L	1.54J ng/L	High LCS %R
MISS-RM818.5-7-201310161153	Conventionals	TDS	314 mg/L	314J mg/L	High duplicate RPD
MISS-RM826.0-1-201309100928	PFCs	PFNA	1.54 ng/L	1.54J ng/L	High LCS %R
MISS-RM826.0-1-201310151530	PFCs	PFOS	1.81U ng/L	1.756J ng/L	Detected between MDL and MRL
MISS-RM826.0-1-201310151530	PFCs	All PFCs	Varies	J or UJ	Cooler temperature > 10°C
MISS-RM826.0-2-201310151535	PFCs	PFBA	NQ ng/L	R ng/L	No labelled compound recovery
MISS-RM826.0-3-201309100950	PFCs	PFNA	1.26 ng/L	1.26J ng/L	High LCS %R
MISS-RM826.0-3-201310151543	PFCs	All PFCs	Varies	J or UJ	Cooler temperature > 10°C
MISS-RM826.0-4-201309101003	PFCs	PFHpA	4.89 ng/L	4.89J ng/L	High MS %R, high duplicate RPD
		PFHxS	2.98 ng/L	2.98J ng/L	High MS %R
		PFHxA	4.03 ng/L	4.03J ng/L	High duplicate RPD
		PFNA	2.59 ng/L	2.59J ng/L	High LCS %R
MISS-RM826.0-4-201310151548	PFCs	PFOS	2.11U ng/L	2.11J ng/L	Detected between MDL and MRL
MISS-RM826.0-5-201309101016	PFCs	PFNA	1.3 ng/L	1.3J ng/L	High LCS %R
	Conventionals	TOC	7.7 mg/L	7.7J mg/L	No field preservation
MISS-RM836.3-1-201309091112	PFCs	PFOS	1.96U ng/L	1.38J ng/L	Detected between MDL and MRL
		PFBA	13.5 ng/L	13.5J ng/L	High LCS %R
MISS-RM836.3-1-201310151439	PFCs	PFOS	2.03U ng/L	1.573J ng/L	Detected between MDL and MRL
MISS-RM836.3-	PFCs	PFOS	2.1U ng/L	0.946UJ	Not detected at

2-201309091123				ng/L	MDL
		PFBA	9.76 ng/L	9.76J ng/L	High LCS %R
MISS-RM836.3-2-201310151447	PFCs	PFOS	1.79U ng/L	1.142J ng/L	Detected between MDL and MRL
MISS-RM836.3-3-201309091134	PFCs	PFOS	1.94U ng/L	1.098J ng/L	Detected between MDL and MRL
		PFBA	10.9 ng/L	10.9J ng/L	High LCS %R
MISS-RM836.3-3-201310151457	PFCs	PFOS	1.89U ng/L	1.405J ng/L	Detected between MDL and MRL
MISS-RM841.0-1-201309081342	PFCs	PFOS	2.04U ng/L	1.843J ng/L	Detected between MDL and MRL
	Conventionals	TDS	378 mg/L	378J mg/L	Hold time exceeded
MISS-RM841.0-1-201310151226	PFCs	PFOS	1.77U ng/L	1.23J ng/L	Detected between MDL and MRL
MISS-RM841.0-2-201309081355	PFCs	PFOS	2.04U ng/L	1.24J ng/L	Detected between MDL and MRL
	Conventionals	TDS	382 mg/L	382J mg/L	Hold time exceeded
MISS-RM841.0-2-201310151239	PFCs	PFOS	1.98U ng/L	1.505J ng/L	Detected between MDL and MRL
MISS-RM841.0-3-201309081403	PFCs	PFOS	1.99U ng/L	1.331J ng/L	Detected between MDL and MRL
	Conventionals	TDS	338 mg/L	338J mg/L	Hold time exceeded
MISS-RM841.0-3-201310151351	PFCs	PFOS	1.76U ng/L	1.595J ng/L	Detected between MDL and MRL
MISS-RM847.3-C-201309081307	PFCs	PFOS	2.02U ng/L	0.909UJ ng/L	Not detected at MDL
	Conventionals	TDS	252 mg/L	252J mg/L	Hold time exceeded
		TOC	8.4 mg/L	8.4J mg/L	No field preservation
MISS-RM847.3-C-201310151143	PFCs	PFOS	1.81U ng/L	1.742J ng/L	Detected between MDL and MRL
SW-FB-20130910	PFCs	PFOS	1.9U ng/L	0.854UJ ng/L	Not detected at MDL
SW-FB-20130912	PFCs	PFOS	1.96U ng/L	1.192J ng/	Detected between MDL and MRL
SW-FB-20131016	PFCs	PFOS	1.85U ng/L	0.833UJ ng/L	Not detected at MDL
SW-FB2-	PFCs	PFOS	1.96U	0.882UJ	Not detected at

20131016			ng/L		MDL
SW-FD-20130911	PFCs	PFNA	1.56 ng/L	1.56J ng/L	High LCS %R
SW-FD-20130912	PFCs	PFBA	207 ng/L	207J ng/L	High LCS %R
SW-FD-20131016	Conventionals	TDS	317 mg/L	317J mg/L	High duplicate RPD
SW-FD2-20131016	Conventionals	TDS	481 mg/L	481J mg/L	High duplicate RPD

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DATA VALIDATION REVIEW REPORT – USEPA STAGE 2A

Project:	Mississippi River Pool 2 Surface Water Sampling
Project Number:	110800-01.01
Date:	December 3, 2013

This report summarizes the review of analytical results for 120 tissue samples collected September 23 and 25, 2013. The samples were collected by Anchor QEA, LLC, and submitted to Axys Analytical Services, Ltd. (Axys) in Sidney, British Columbia. The samples were analyzed for perfluorinated organic compounds (PFCs) by Axys method MLA-060, Revision 10. Sample IDs, lab sample IDs, and sample data group (SDG) numbers of the data reviewed in this report are presented in Table 1.

Table 1
Samples IDs

Sample ID	Lab Sample ID	Lab SDG
MISS-S1-R1-01	L20367-1	WG45077
MISS-S1-R1-02	L20367-2	
MISS-S1-R1-03	L20367-3	
MISS-S1-R1-04	L20367-4	
MISS-S1-R1-05	L20367-5	
MISS-S1-R1-06	L20367-6	
MISS-S1-R1-07	L20367-7	
MISS-S1-R1-08	L20367-8	
MISS-S1-R1-09	L20367-9	
MISS-S1-R1-10	L20367-10	
MISS-S1-R1-11	L20367-11	
MISS-S1-R1-12	L20367-12	
MISS-S1-R1-13	L20367-13	
MISS-S1-R1-14	L20367-14	
MISS-S1-R1-15	L20367-15	
MISS-S1-R1-16	L20367-16	
MISS-S1-R1-17	L20367-17	
MISS-S1-R1-18	L20367-18	
MISS-S1-R1-19	L20367-19	
MISS-S1-R1-20	L20367-20	
MISS-S1-R1-21	L20367-21	WG45078
MISS-S1-R1-22	L20367-22	
MISS-S1-R1-23	L20367-23	

Sample ID	Lab Sample ID	Lab SDG
MISS-S1-R2-01	L20367-24	
MISS-S1-R2-02	L20367-25	
MISS-S1-R2-03	L20367-26	
MISS-S1-R2-04	L20367-27	
MISS-S1-R2-05	L20367-28	
MISS-S1-R2-06	L20367-29	
MISS-S1-R2-07	L20367-30	
MISS-S1-R2-08	L20367-31	
MISS-S1-R2-09	L20367-32	
MISS-S1-R2-10	L20367-33	
MISS-S1-R2-11	L20367-34	
MISS-S1-R2-12	L20367-35	
MISS-S1-R2-13	L20367-36	
MISS-S1-R2-14	L20367-37	
MISS-S1-R2-15	L20367-38	
MISS-S1-R3-01	L20367-39	
MISS-S1-R3-02	L20367-40	
MISS-S1-R3-03	L20367-41	
MISS-S1-R3-04	L20367-42	
MISS-S1-R3-05	L20367-43	
MISS-S1-R3-06	L20367-44	
MISS-S1-R3-07	L20367-45	
MISS-S1-R4-01	L20367-46	
MISS-S2A-R3-01	L20384-1	
MISS-S2A-R3-02	L20384-2	
MISS-S2A-R3-03	L20384-3	
MISS-S2A-R3-04	L20384-4	WG45106
MISS-S2A-R3-05	L20384-5	
MISS-S2A-R3-06	L20384-6	
MISS-S2A-R3-07	L20384-7	
MISS-S2A-R3-08	L20384-8	
MISS-S2A-R3-09	L20384-9	
MISS-S2A-R3-10	L20384-10	
MISS-S2A-R3-11	L20384-11	
MISS-S2A-R3-12	L20384-12	
MISS-S2A-R3-13	L20384-13	
MISS-S2A-R4-01	L20384-14	
MISS-S2A-R4-02	L20384-15	
MISS-S2A-R4-03	L20384-16	
MISS-S2A-R4-04	L20384-17	WG45159
MISS-S2A-R4-05	L20384-18	
MISS-S2A-R4-06	L20384-19	

Sample ID	Lab Sample ID	Lab SDG
MISS-S2A-R4-07	L20384-20	
MISS-S2A-R4-08	L20384-21	
MISS-S2A-R4-09	L20384-22	
MISS-S2A-R4-10	L20384-23	
MISS-S2B-R3-01	L20384-24	
MISS-S2B-R4-01	L20384-25	
MISS-S2B-R4-02	L20384-26	
MISS-S2B-R4-03	L20384-27	
MISS-S2B-R4-04	L20384-28	
MISS-S2B-R4-05	L20384-29	
MISS-S2B-R4-06	L20384-30	
MISS-S2B-R4-07	L20384-31	
MISS-S2B-R4-08	L20384-32	
MISS-S2B-R4-09	L20384-33	
MISS-S2B-R4-10	L20384-34	
MISS-S2B-R4-11	L20384-35	
MISS-S2B-R4-12	L20384-36	
MISS-S2B-R4-13	L20384-37	
MISS-S2B-R4-14	L20384-38	
MISS-S2B-R4-15	L20384-39	
MISS-S3-R1-01	L20384-40	
MISS-S3-R1-02	L20384-41	
MISS-S3-R1-03	L20384-42	
MISS-S3-R1-04	L20384-43	
MISS-S3-R1-05	L20384-44	
MISS-S3-R1-06	L20384-45	WG45160
MISS-S3-R1-07	L20384-46	
MISS-S3-R1-08	L20384-47	
MISS-S3-R1-09	L20384-48	
MISS-S3-R1-10	L20384-49	
MISS-S3-R1-11	L20384-50	
MISS-S3-R1-12	L20384-51	
MISS-S3-R1-13	L20384-52	
MISS-S3-R1-14	L20384-53	
MISS-S3-R1-15	L20384-54	
MISS-S3-R1-16	L20384-55	
MISS-S3-R1-17	L20384-56	
MISS-S3-R1-18	L20384-57	
MISS-S3-R1-19	L20384-58	WG45227
MISS-S3-R1-20	L20384-59	
MISS-S3-R1-21	L20384-60	
MISS-S3-R1-22	L20384-61	

Sample ID	Lab Sample ID	Lab SDG
MISS-S3-R1-23	L20384-62	
MISS-S3-R1-24	L20384-63	
MISS-S3-R1-25	L20384-64	
MISS-S3-R2-01	L20384-65	
MISS-S3-R2-02	L20384-66	
MISS-S3-R2-03	L20384-67	
MISS-S3-R2-04	L20384-68	
MISS-S3-R2-05	L20384-69	
MISS-S3-R2-06	L20384-70	
MISS-S3-R2-07	L20384-71	
MISS-S3-R2-08	L20384-72	
MISS-S3-R2-09	L20384-73	
MISS-S3-R2-10	L20384-74	

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control (QA/QC) guidelines outlined in the analytical procedures and data quality objective sections of the Quality Assurance Project Plan (QAPP; Cardno ENTRIX, 2011) and in the Sampling and Analysis Plan (SAP; Anchor QEA, 2013). Laboratory results were reviewed using the following guidelines:

- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA 1999)
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA 2008)

Laboratory and method QC criteria were also used as stated in USEPA 1986 (SW-846, Third Edition), *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, update 1, August 1993; update II, January 1995; update IIA, February 1994; update IIB, August 1995; update III, June 1997; update IIIA, May 1999; update IIIB, June 2008; update IVA and IVB, January 2008. Unless noted in this report, laboratory results for the samples listed above were within QC criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by Axys at the time of sample receipt and the samples were received in good condition.

Holding Times and Sample Preservation

Samples were analyzed within holding times. Samples collected on September 23, 2013 were received at the laboratory above the -10°C preservation requirement specified in the QAPP and some samples were received above the < 4°C requirement specified in the FSAP. Samples were received chilled between 3°C and 6°C. The samples were frozen upon receipt at the laboratory and data are not expected to be impacted so no results were qualified. Samples collected on September 25, 2013 were received frozen (< 0°C) at the laboratory, which is within the acceptable range for tissues.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

Field Quality Control

Field Blanks

Field blanks were not required with these sample sets.

Field Duplicates

No field duplicates were collected in association with these sample sets. The QAPP indicates tissue field duplicates will be generated at a rate of one per ten samples processed. The tissue samples were sent to the laboratory as whole-body samples and fileted and homogenized by the laboratory so no field duplicates were generated. Laboratory duplicates were generated and analyzed at the required laboratory QC frequencies (one per 20 samples processed). See the Laboratory Duplicate section below for a discussion of duplicate results.

Labeled Compound Recoveries

Labeled compounds were added to all field and QC samples and recoveries were within laboratory control limits with some exceptions. However, since results are corrected for labeled compound recoveries, no data were qualified.

Laboratory Control Sample

Laboratory control samples (LCS) were analyzed at the required frequencies. All LCS recoveries were within project-required control limits.

Matrix Spike and Matrix Spike Duplicate

Matrix spike (MS) samples were analyzed at the required frequency. Laboratory duplicates were analyzed in place of matrix spike duplicate (MSD) samples. All MS recoveries were within project-required control limits with the exception of perfluorobutanesulfonate (PFBS) in the MS analyzed on sample MISS-S1-R2-07, which recovered above the control limit. The parent sample result was below detection, however, so no data were qualified.

Laboratory Duplicates

Laboratory duplicates were analyzed in place of MSD samples at the required frequency and resulted in relative percent difference (RPD) values within project-required control limits.

Method Reporting Limits and Method Detection Limits

Reporting limits and detection limits were acceptable as reported. Limits were reported as adjusted due to sample size and as undiluted.

Overall Assessment

This evaluation determined that the laboratory followed the specified analytical method and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the labeled compound, LCS and MS recoveries, with the exceptions noted above. Precision was also acceptable as demonstrated by the laboratory duplicate RPD values. All data are acceptable as reported.

REFERENCES

Anchor QEA, 2013. Sampling and Analysis Plan; Mississippi River – Pool 2. September.

Cardno Entrix, 2011. Quality Assurance Project Plan; In Support of 2011 Fish and Water Collection from Mississippi River Pool 2. June.

USEPA (U.S. Environmental Protection Agency), 1986. Test methods for Evaluating Solid Waste: Physical/Chemical Methods. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA 530/SW-846.

USEPA, 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. USEPA 540/R-99/008. October.

USEPA, 2008. USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation. USEPA 540-R-08-01. June.

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DATA VALIDATION REVIEW REPORT – USEPA STAGE 2A

Project:	Mississippi River Pool 2 Surface Water Sampling
Project Number:	110800-01.01
Date:	January 5, 2014

This report summarizes the review of analytical results for 241 tissue samples collected September 23 through October 1, 2013. The samples were collected by Anchor QEA, LLC, and submitted to Axys Analytical Services, Ltd. (Axys) in Sidney, British Columbia. The samples were analyzed for perfluorinated organic compounds (PFCs) by Axys method MLA-060, Revision 10. Sample IDs, lab sample IDs, and sample data group (SDG) numbers of the data reviewed in this report are presented in Table 1.

Table 1
Samples ID Summary

Sample ID	Lab Sample ID	Lab SDG
MISS-S1-R4-02	L20382-1	WG45228
MISS-S1-R5-01	L20382-2	
MISS-S2A-R1-01	L20382-3	
MISS-S2A-R1-02	L20382-4	
MISS-S2A-R1-03	L20382-5	
MISS-S2A-R1-04	L20382-6	
MISS-S2A-R1-05	L20382-7	
MISS-S2A-R1-06	L20382-8	
MISS-S2A-R1-07	L20382-9	
MISS-S2A-R1-08	L20382-10	
MISS-S2A-R1-09	L20382-11	
MISS-S2A-R1-10	L20382-12	
MISS-S2A-R1-11	L20382-13	
MISS-S2A-R1-12	L20382-14	
MISS-S2A-R1-13	L20382-15	
MISS-S3-R2-11	L20384-75	
MISS-S3-R2-12	L20384-76	
MISS-S3-R2-13	L20384-77	
MISS-S3-R2-14	L20384-78	
MISS-S3-R2-15	L20384-79	
MISS-S2A-R1-14	L20382-16	WG45229
MISS-S2A-R1-15	L20382-17	
MISS-S2A-R1-16	L20382-18	
MISS-S2A-R1-17	L20382-19	
MISS-S2A-R1-18	L20382-20	

Sample ID	Lab Sample ID	Lab SDG
MISS-S2A-R1-19	L20382-21	
MISS-S2A-R1-20	L20382-22	
MISS-S2A-R1-21	L20382-23	
MISS-S2A-R1-22	L20382-24	
MISS-S2A-R1-23	L20382-25	
MISS-S2A-R1-24	L20382-26	
MISS-S2A-R1-25	L20382-27	
MISS-S2A-R2-01	L20382-28	
MISS-S2A-R2-02	L20382-29	
MISS-S2A-R2-03	L20382-30	
MISS-S2A-R2-04	L20382-31	
MISS-S2A-R2-05	L20382-32	
MISS-S2A-R2-06	L20382-33	
MISS-S2A-R2-07	L20382-34	
MISS-S2A-R2-08	L20382-35	
MISS-S2A-R2-09	L20382-36	
MISS-S2A-R2-10	L20382-37	
MISS-S2A-R2-11	L20382-38	
MISS-S2A-R2-12	L20382-39	
MISS-S2B-R1-01	L20382-40	
MISS-S2B-R1-02	L20382-41	
MISS-S2B-R1-03	L20382-42	
MISS-S2B-R1-04	L20382-43	
MISS-S2B-R1-05	L20382-44	
MISS-S2B-R1-06	L20382-45	WG45243
MISS-S2B-R1-08	L20382-47	
MISS-S2B-R1-09	L20382-48	
MISS-S2B-R1-10	L20382-49	
MISS-S2B-R1-11	L20382-50	
MISS-S2B-R1-12	L20382-51	
MISS-S2B-R1-13	L20382-52	
MISS-S2B-R1-14	L20382-53	
MISS-S2B-R1-15	L20382-54	
MISS-S2B-R2-01	L20382-55	
MISS-S2B-R2-02	L20382-56	
MISS-S2B-R2-03	L20382-57	
MISS-S2B-R2-04	L20382-58	
MISS-S2B-R2-05	L20382-59	
MISS-S2B-R2-06	L20382-60	
MISS-S2B-R2-07	L20382-61	
MISS-S2B-R2-08	L20382-62	WG45244
MISS-S2B-R2-09	L20382-63	
MISS-S2B-R2-10	L20382-64	
MISS-S2B-R2-11	L20382-65	
MISS-S2B-R2-12	L20382-66	
MISS-S2B-R2-13	L20382-67	
MISS-S2B-R2-14	L20382-68	
MISS-S2B-R2-15	L20382-69	

Sample ID	Lab Sample ID	Lab SDG
MISS-S3-R3-01	L20393-1	
MISS-S3-R3-02	L20393-2	
MISS-S3-R3-03	L20393-3	
MISS-S3-R3-04	L20393-4	
MISS-S3-R3-05	L20393-5	
MISS-S3-R3-06	L20393-6	
MISS-S3-R3-07	L20393-7	
MISS-S3-R3-08	L20393-8	
MISS-S3-R3-09	L20393-9	
MISS-S3-R3-10	L20393-10	
MISS-S3-R3-11	L20393-11	
MISS-S3-R3-12	L20393-12	
MISS-S3-R3-13	L20393-13	
MISS-S3-R3-14	L20393-14	
MISS-S3-R3-15	L20393-15	
MISS-S3-R3-16	L20393-16	
MISS-S3-R3-17	L20393-17	
MISS-S3-R3-18	L20393-18	
MISS-S3-R3-19	L20393-19	
MISS-S3-R3-20	L20393-20	
MISS-S4A-R1-01	L20393-21	
MISS-S4A-R1-02	L20393-22	
MISS-S4A-R1-03	L20393-23	
MISS-S4A-R1-04	L20393-24	
MISS-S4A-R1-05	L20393-25	
MISS-S4A-R1-06	L20393-26	
MISS-S4A-R1-07	L20393-27	
MISS-S4A-R1-08	L20393-28	
MISS-S4A-R1-09	L20393-29	
MISS-S4A-R1-10	L20393-30	
MISS-S4A-R1-11	L20393-31	
MISS-S4A-R1-12	L20393-32	
MISS-S4A-R1-13	L20393-33	
MISS-S4A-R1-14	L20393-34	
MISS-S4A-R1-15	L20393-35	
MISS-S4A-R1-16	L20393-36	
MISS-S4A-R1-17	L20393-37	
MISS-S4A-R1-18	L20393-38	
MISS-S4A-R1-19	L20393-39	
MISS-S4A-R1-20	L20393-40	
MISS-S4A-R1-21	L20393-41	
MISS-S4A-R1-22	L20393-42	
MISS-S4A-R1-23	L20393-43	
MISS-S4A-R1-24	L20393-44	
MISS-S4A-R1-25	L20393-45	
MISS-S4A-R1-26	L20393-46	
MISS-S4A-R1-27	L20393-47	
MISS-S4A-R1-28	L20393-48	

Sample ID	Lab Sample ID	Lab SDG
MISS-S4A-R1-29	L20393-49	
MISS-S4A-R1-30	L20393-50	
MISS-S4A-R1-31	L20393-51	
MISS-S4A-R1-32	L20393-52	
MISS-S4A-R1-33	L20393-53	
MISS-S4A-R1-34	L20393-54	
MISS-S4A-R1-35	L20393-55	
MISS-S4B-R1-01	L20393-56	
MISS-S4B-R1-02	L20393-57	
MISS-S4B-R1-03	L20393-58	
MISS-S4B-R1-04	L20393-59	
MISS-S4B-R1-05	L20393-60	
MISS-S4B-R1-06	L20393-61	
MISS-S4B-R1-07	L20393-62	
MISS-S4B-R1-08	L20393-63	
MISS-S4B-R1-09	L20393-64	
MISS-S4B-R1-10	L20393-65	
MISS-S4B-R1-11	L20393-66	
MISS-S4B-R1-12	L20393-67	
MISS-S4B-R1-13	L20393-68	
MISS-S4B-R1-14	L20393-69	
MISS-S4B-R1-15	L20393-70	
MISS-S4B-R1-16	L20393-71	
MISS-S4B-R1-17	L20393-72	
MISS-S4B-R1-18	L20393-73	
MISS-S4B-R1-19	L20393-74	
MISS-S4B-R1-20	L20393-75	
MISS-S4B-R1-21	L20393-76	
MISS-S4B-R1-22	L20393-77	WG45248
MISS-S4B-R1-23	L20393-78	
MISS-S4B-R2-01	L20393-79	
MISS-S4B-R2-02	L20393-80	
MISS-S4B-R2-03	L20393-81	
MISS-S4B-R2-04	L20393-82	
MISS-S4B-R2-05	L20393-83	
MISS-S4B-R2-06	L20393-84	
MISS-S4B-R2-07	L20403-1	
MISS-S4B-R2-08	L20403-2	
MISS-S4A-R2-01	L20397-1	
MISS-S4A-R2-02	L20397-2	
MISS-S4A-R2-03	L20397-3	
MISS-S4A-R2-04	L20397-4	
MISS-S4B-R2-09	L20403-3	WG45249
MISS-S4B-R2-10	L20403-4	
MISS-S4B-R2-11	L20403-5	
MISS-S4B-R2-12	L20403-6	
MISS-S4B-R2-13	L20403-7	
MISS-S4B-R2-14	L20403-8	

Sample ID	Lab Sample ID	Lab SDG
MISS-S4B-R2-15	L20403-9	
MISS-S4B-R2-16	L20403-10	
MISS-S4B-R2-17	L20403-11	
MISS-S4B-R2-18	L20403-12	
MISS-S4B-R2-19	L20403-13	
MISS-S4B-R2-20	L20403-14	
MISS-S4B-R2-21	L20403-15	
MISS-S4B-R2-22	L20403-16	
MISS-S4B-R2-23	L20403-17	
MISS-S4B-R2-24	L20403-18	
MISS-S4A-R2-05	L20397-5	
MISS-S4A-R2-06	L20397-6	
MISS-S4A-R2-07	L20397-7	
MISS-S4A-R2-08	L20397-8	
MISS-S4A-R2-09	L20397-9	
MISS-S4A-R2-10	L20397-10	
MISS-S4A-R2-11	L20397-11	
MISS-S4A-R2-12	L20397-12	
MISS-S4A-R3-01	L20397-13	
MISS-S4A-R3-02	L20397-14	WG45250
MISS-S4A-R3-03	L20397-15	
MISS-S4B-R3-01	L20397-16	
MISS-S1-R6-01	L20416-1	
MISS-S1-R6-02	L20416-2	
MISS-S1-R6-03	L20416-3	
MISS-S1-R6-04	L20416-4	
MISS-S1-R6-05	L20416-5	
MISS-S1-R6-06	L20416-6	
MISS-S1-R6-07	L20416-7	
MISS-S1-R6-08	L20416-8	
MISS-S1-R6-09	L20416-9	
MISS-S1-R6-10	L20416-10	
MISS-S1-R6-11	L20416-11	
MISS-S1-R6-12	L20416-12	
MISS-S1-R6-13	L20416-13	
MISS-S1-R6-14	L20416-14	
MISS-S2B-R5-01	L20416-15	
MISS-S2B-R5-02	L20416-16	
MISS-S2B-R5-03	L20416-17	
MISS-S2B-R5-04	L20416-18	WG45251
MISS-S2B-R5-05	L20416-19	
MISS-S2B-R5-06	L20416-20	
MISS-S2B-R5-07	L20416-21	
MISS-S2B-R5-08	L20416-22	
MISS-S2B-R5-09	L20416-23	
MISS-S2B-R5-10	L20416-24	
MISS-S2B-R5-11	L20416-25	
MISS-S2B-R5-12	L20416-26	

Sample ID	Lab Sample ID	Lab SDG
MISS-S2B-R5-13	L20416-27	
MISS-S2B-R5-14	L20416-28	
MISS-S3-R4-01	L20416-29	WG45252
MISS-S4A-R4-01	L20416-30	
MISS-S4A-R4-02	L20416-31	
MISS-S4A-R4-03	L20416-32	
MISS-S4B-R4-01	L20416-33	
MISS-S4B-R4-02	L20416-34	
MISS-S4B-R4-04	L20416-35	
MISS-S4B-R5-01	L20416-36	
MISS-S4B-R5-02	L20416-37	
MISS-S4B-R5-03	L20416-38	
MISS-S4B-R5-04	L20416-39	
MISS-S4B-R5-05	L20416-40	
MISS-S4B-R5-06	L20416-41	
MISS-S4B-R5-07	L20416-42	
MISS-S4B-R5-08	L20416-43	
MISS-S4B-R5-09	L20416-44	
MISS-S3-R5-01	L20437-1	
MISS-S4A-R5-01	L20437-2	
MISS-S4A-R5-02	L20437-3	
MISS-S4A-R5-03	L20437-4	
MISS-S4B-R6-01	L20437-5	WG45253
MISS-S4B-R6-02	L20437-6	

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control (QA/QC) guidelines outlined in the analytical procedures and data quality objective sections of the Quality Assurance Project Plan (QAPP; Cardno ENTRIX, 2011) and in the Sampling and Analysis Plan (SAP; Anchor QEA, 2013). Laboratory results were reviewed using the following guidelines:

- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA 1999)
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA 2008)

Laboratory and method QC criteria were also used as stated in USEPA 1986 (SW-846, Third Edition), *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, update 1, August 1993; update II, January 1995; update IIA, February 1994; update IIB, August 1995; update III, June 1997; update IIIA, May 1999; update IIIB, June 2008; update IVA and IVB,

January 2008. Unless noted in this report, laboratory results for the samples listed above were within QC criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by Axys at the time of sample receipt and the samples were received in good condition. Sample MISS-S2B-R1-07 did not arrive with the shipment received on September 25, 2013. Two samples (MISS-S2A-R1-13 and MISS-S2A-R1-15) were received with wet water ice in their bags.

Holding Times and Sample Preservation

Samples were analyzed within holding times. Samples collected on September 23, 24, 26 and October 1, 2013 were received at the laboratory above the -10°C preservation requirement specified in the QAPP and some samples were received above the < 4°C requirement specified in the FSAP. Samples were received chilled between -0.2°C and 12.9°C. The samples were frozen upon receipt at the laboratory and data are not expected to be impacted so no results were qualified.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

Field Quality Control

Field Blanks

Field blanks were not required with these sample sets.

Field Duplicates

No field duplicates were collected in association with these sample sets. The QAPP indicates tissue field duplicates will be generated at a rate of one per ten samples processed. The tissue samples were sent to the laboratory as whole-body samples and fileted and homogenized by the laboratory so no field duplicates were generated. Laboratory duplicates were generated

and analyzed at the required laboratory QC frequencies (one per 20 samples processed). See the Laboratory Duplicate section below for a discussion of duplicate results.

Labeled Compound Recoveries

Labeled compounds were added to all field and QC samples and recoveries were within laboratory control limits with some exceptions. However, since results are corrected for labeled compound recoveries, no data were qualified.

Laboratory Control Sample

Laboratory control samples (LCS) were analyzed at the required frequencies. All LCS recoveries were within project-required control limits, with the exception of the ongoing precision and recovery (OPR) sample in SDG WG45248, which recovered below the project control limit for Perfluoropentanoate (PFPeA). Twenty results were qualified "UJ" to indicate a potentially low bias.

Matrix Spike and Matrix Spike Duplicate

Matrix spike (MS) samples were analyzed at the required frequency. Laboratory duplicates were analyzed in place of matrix spike duplicate (MSD) samples. All MS recoveries were within project-required control limits with the exception of PFPeA in the MS analyzed on sample MISS-S4A-R1-16, which recovered above the control limit. However, the parent sample result was below detection, so no data were qualified.

Laboratory Duplicates

Laboratory duplicates were analyzed in place of MSD samples at the required frequency and resulted in relative percent difference (RPD) values within project-required control limits with the exception of PFOS in the duplicate analyzed on sample MISS-S4A-R1-16. The parent sample result has been qualified "J" to indicate that it is estimated.

Method Reporting Limits and Method Detection Limits

Most reporting limits were deemed acceptable as reported. Limits were reported as adjusted due to sample size and as undiluted. One non-detected value for PFOS was reported to the method detection limit (MDL) provided by the laboratory. One result detected above the MDL and below the method reporting limit (MRL), with a signal to noise (S/N) ratio greater

than 3 was qualified with a "J" to indicate that the result is estimated. Results (detects and non-detects) for other compounds were reported to the MRL.

Overall Assessment

This evaluation determined that the laboratory followed the specified analytical method and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the labeled compound, LCS and MS recoveries, with the exceptions noted above. Precision was also acceptable as demonstrated by the laboratory duplicate RPD values, with the exception noted above. Most data were deemed acceptable as reported; other data are acceptable as qualified.

Data Qualifier Definitions

J Indicates an estimated value.

UJ Indicates the compound or analyte was analyzed for but not detected and the specified limit reported is estimated

Table 3
Qualifier Summary

Sample ID	Lab ID	Analyte	Reported Result	Qualified Result	Reason
MISS-S4A-R1-16	L20393-36	PFOS	5.17 ng/g	5.17J ng/g	High duplicate RPD
MISS-S4B-R1-12	L20393-67	PFPeA	0.459U ng/g	0.459UJ ng/g	Low LCS %R
MISS-S4B-R1-13	L20393-68	PFPeA	0.485U ng/g	0.485UJ ng/g	Low LCS %R
MISS-S4B-R1-14	L20393-69	PFPeA	0.472U ng/g	0.472UJ ng/g	Low LCS %R
MISS-S4B-R1-15	L20393-70	PFPeA	0.488U ng/g	0.488UJ ng/g	Low LCS %R
MISS-S4B-R1-16	L20393-71	PFPeA	0.476U ng/g	0.476UJ ng/g	Low LCS %R
MISS-S4B-R1-17	L20393-72	PFPeA	0.485U ng/g	0.485UJ ng/g	Low LCS %R
MISS-S4B-R1-18	L20393-73	PFPeA	0.455U ng/g	0.455UJ ng/g	Low LCS %R
MISS-S4B-R1-19	L20393-74	PFPeA	0.469U ng/g	0.469UJ ng/g	Low LCS %R
MISS-S4B-R1-20	L20393-75	PFPeA	0.508U ng/g	0.508UJ ng/g	Low LCS %R
MISS-S4B-R1-21	L20393-76	PFPeA	0.483U ng/g	0.483UJ ng/g	Low LCS %R
MISS-S4B-R1-22	L20393-77	PFPeA	0.485U ng/g	0.485UJ ng/g	Low LCS %R
MISS-S4B-R1-23	L20393-78	PFPeA	0.495U ng/g	0.495UJ ng/g	Low LCS %R
MISS-S4B-R2-01	L20393-79	PFPeA	0.49U ng/g	0.49UJ ng/g	Low LCS %R
MISS-S4B-R2-02	L20393-80	PFPeA	0.49U ng/g	0.49UJ ng/g	Low LCS %R
MISS-S4B-R2-03	L20393-81	PFPeA	0.51U ng/g	0.51UJ ng/g	Low LCS %R
MISS-S4B-R2-04	L20393-82	PFPeA	0.50U ng/g	0.50UJ ng/g	Low LCS %R
MISS-S4B-R2-05	L20393-83	PFPeA	0.50U ng/g	0.50UJ ng/g	Low LCS %R
MISS-S4B-R2-06	L20393-84	PFPeA	0.498U ng/g	0.498UJ ng/g	Low LCS %R
MISS-S4B-R2-07	L20403-1	PFPeA	0.495U ng/g	0.495UJ ng/g	Low LCS %R
MISS-S4B-R2-08	L20403-2	PFPeA	0.50U ng/g	0.50UJ ng/g	Low LCS %R

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Anchor QEA, 2013. Sampling and Analysis Plan; Mississippi River – Pool 2. September.

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DATA VALIDATION REVIEW REPORT – EPA STAGE 2A

Project:	Mississippi River Pool 2
Project Number:	110800-01.01
Date:	March 3, 2014

This report summarizes the review of analytical results for 21 sediment and 21 porewater samples collected in September, 2013. The samples were collected by Anchor QEA, LLC, and submitted to Axys Analytical Services, Ltd. (Axys) in Sidney, British Columbia and Pace Analytical Services, Inc. (Pace) in Minneapolis, Minnesota. The samples were analyzed for the following parameters:

- Perfluorinated organic compounds (PFCs) by Axys method MLA-060, Revision 10 and MLA-041, Revision 9
- Total dissolved solids (TDS) by Standard Method (SM) 2540C
- Total suspended solids (TSS) by SM 2540D
- Total organic carbon (TOC) by United States Environmental Protection Agency (USEPA) method 9060 and 9060 Modified
- Percent moisture (%M) by ASTM method D2974 and Axys method SLA-015

Axys sample data group (SDG) numbers WG44960, WG44961, WG45148, WG45304, and WG45161 and Pace SDG numbers 10243225 and 10244164 were reviewed in this report. IDs of samples reviewed in this report are presented in Table 1.

Table 1
Samples Reviewed

Sample ID	Lab Sample ID	Matrix	Analyses Requested
BALDWIN_LAKE-PW-201309211418	10243225001, L20361-1	Porewater	TOC, PFCs
BALDWIN_LAKE-SED-201309231314	10243225002, L20358-1	Sediment	%M, TOC, PFCs
MISS-RM814.3-4-201309120921	L20281-5	Porewater	PFCs
MISS-RM816.7-PW-201309291345	L20418-1	Porewater	PFCs
MISS-RM816.7-SED-201309291543	10244164001, L20419-1	Sediment	%M, TOC, PFCs
MISS-RM817.0-PW-201309290831	L20418-2	Porewater	PFCs
MISS-RM817.0-SED-201309291542	10244164002, L20419-2	Sediment	%M, TOC, PFCs
MISS-RM817.1-1-PW-201309291008	L20418-3	Porewater	PFCs
MISS-RM817.1-1-SED-201309291541	10244164003, L20419-3	Sediment	%M, TOC, PFCs
MISS-RM817.1-2-PW-201309291331	L20418-4	Porewater	PFCs
MISS-RM817.1-2-SED-201309291542	10244164004, L20419-4	Sediment	%M, TOC, PFCs

Sample ID	Lab Sample ID	Matrix	Analyses Requested
MISS-RM817.4-1-PW-201309290936	10244164005, L20418-5	Porewater	TDS, TSS, PFCs
MISS-RM817.4-1-SED-201309291539	10244164006, L20419-5	Sediment	%M, TOC, PFCs
MISS-RM817.4-2-PW-201309270916	L20418-6	Porewater	PFCs
MISS-RM817.4-2-SED-201309280924	10244164007, L20419-6	Sediment	%M, TOC, PFCs
MISS-RM817.7-1-PW-201309221251	10243225003, L20361-2	Porewater	TDS, TSS, TOC, PFCs
MISS-RM817.7-1-SED-201309231314	10243225004, L20358-2	Sediment	PFCs, %M, TOC
MISS-RM817.7-2-PW-201309261210	10244164008, L20418-7	Porewater	TDS, TSS, TOC, PFCs
MISS-RM817.7-2-SED-201309280938	10244164010, L20419-7	Sediment	%M, TOC, PFCs
MISS-RM818.0-1-PW-201309220958	10243225005, L20361-3	Porewater	TDS, TSS, TOC, PFCs
MISS-RM818.0-1-SED-201309231315	10243225006, L20358-3	Sediment	PFCs, %M, TOC
MISS-RM818.0-2-PW-201309260815	L20418-9	Porewater	PFCs
MISS-RM818.0-2-SED-201309231329	10243225007, L20358-4	Sediment	PFCs, %M, TOC
MISS-RM818.2-PW-201309211313	10243225008, L20361-4	Porewater	TDS, TSS, TOC, PFCs
MISS-RM818.2-SED-201309231316	10243225009, L20358-5	Sediment	PFCs, %M, TOC
MISS-RM819.0-PW-201309220854	L20361-5	Porewater	PFCs
MISS-RM819.0-SED-201309231316	10243225010, L20358-6	Sediment	%M, TOC, PFCs
MISS-RM828.5-PW-201309201319	10243225011, L20361-6	Porewater	TDS, TSS, TOC, PFCs
MISS-RM828.5-SED-201309201939	10243225012, L20358-7	Sediment	%M, TOC, PFCs
MISS-RM829.6-PW-201309201245	L20361-7	Porewater	PFCs
MISS-RM829.6-SED-201309201939	L20358-8	Sediment	PFCs, %M
MISS-RM829.6-PW-201309201245	10243225013	Porewater	TDS, TSS, TOC
MISS-RM829.6-SED-201309201939	10243225014	Sediment	%M, TOC
MISS-RM833.6-PW-201309201049	10243225015, L20361-8	Porewater	TDS, TSS, TOC, PFCs
MISS-RM833.6-SED-201309231259	10243225016, L20358-9	Sediment	%M, TOC, PFCs
MISS-RM834.2-PW-201309201159	10243225017, L20361-9	Porewater	TDS, TSS, TOC, PFCs
MISS-RM834.2-SED-201309201938	10243225018, L20358-10	Sediment	%M, TOC, PFCs
PIGSEYE_OF-PW-201309201115	L20361-10	Porewater	PFCs
PIGSEYE_OF-SED-201309201936	10243225019, L20358-11	Sediment	%M, TOC, PFCs
PW-FD-20130926	10244164009, L20418-8	Porewater	TDS, TSS, TOC, PFCs
SED-FD-20130928	10244164011, L20419-8	Sediment	%M, TOC, PFCs
SPRING_LAKE_N-PW-201309211445	L20361-11	Porewater	PFCs
SPRING_LAKE_N-SED-201309231324	10243225020, L20358-12	Sediment	%M, TOC, PFCs
SPRING_LAKE_S-PW-201309221158	10243225021, L20361-12	Porewater	TOC, PFCs
SPRING_LAKE_S-SED-201309231323	10243225022, L20358-13	Sediment	%M, TOC, PFCs

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control (QA/QC) guidelines outlined in the analytical procedures and data quality objective sections of the Quality Assurance Project Plan (QAPP; Cardno ENTRIX, 2011) and in the Sampling and Analysis Plan (SAP; Anchor QEA, 2013). Laboratory results were reviewed using the following guidelines:

- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004)

- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA 1999)
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA 2008)

Laboratory and method QC criteria were also used as stated in USEPA 1986 (SW-846, Third Edition), *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, update 1, August 1993; update II, January 1995; update IIA, February 1994; update IIB, August 1995; update III, June 1997; update IIIA, May 1999; update IIIB, June 2008; update IVA and IVB, January 2008. Unless noted in this report, laboratory results for the samples listed above were within QC criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody (COC) forms were signed by Axys and Pace at the time of sample receipt; the samples were received within the recommended temperature ranges and in good condition.

Holding Times and Sample Preservation

Samples were appropriately preserved and analyzed within holding times with the exceptions of the TDS and TSS analyses. All but one sample for TDS was analyzed past the recommended seven-day holding time. Associated sample results have been qualified "J" or "UJ" to indicate they are estimated. See Table 3 for qualified data.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes with the exception of PFOA and PFOS in the PFC method blank associated with SDG WG5148. Associated sample results were significantly greater than (>5x) the concentrations detected in the method blank so no data were qualified.

Field Quality Control

Rinse Blanks

No rinse blanks were collected in association with these sample sets.

Field Duplicates

One porewater and one sediment field duplicate were collected in association with these sample sets. Detected results are summarized in Table 2.

Table 2
Field Duplicate Summary

Analyte	MISS-RM817.7-2-PW-201309261210	PW-FD-20130926	RPD
Perfluorobutanesulfonate (PFBS)	43600D ng/L	26600D ng/L	48%
Perfluorobutanoate (PFBA)	27600D ng/L	29900 ng/L	8%
Perfluorodecanoate (PFDA)	93.1 ng/L	82.5 ng/L	12%
Perfluoroheptanoate (PFHpA)	2730 ng/L	2540 ng/L	7%
Perfluorohexanesulfonate (PFHxS)	3760 ng/L	4310 ng/L	14%
Perfluorohexanoate (PFHxA)	4110 ng/L	3910 ng/L	5%
Perfluorononanoate (PFNA)	823 ng/L	759 ng/L	8%
Perfluorooctanesulfonate (PFOS)	27100D ng/L	34800D ng/L	25%
Perfluorooctanoate (PFOA)	177000D ng/L	142000D ng/L	22%
Perfluoropentanoate (PFPeA)	4950 ng/L	4820 ng/L	3%
Total dissolved solids	511 mg/L	522 mg/L	2%
Total organic carbon	8.3 mg/L	8.2 mg/L	1%
Total suspended solids	17.2 mg/L	16 mg/L	7%

Analyte	MISS-RM817.7-2-SED-201309280938	SED-FD-20130928	RPD
Moisture, percent	21.4 pct	30 pct	33%
Moisture, percent	49.8 pct	49.5 pct	1%
Perfluorobutanesulfonate (PFBS)	0.638 ng/g	0.762 ng/g	18%
Perfluorobutanoate (PFBA)	0.769 ng/g	0.798 ng/g	4%
Perfluorohexanesulfonate (PFHxS)	0.299 ng/g	0.28U ng/g	200%
Perfluorooctanesulfonate (PFOS)	11.5 ng/g	9.66 ng/g	17%
Perfluorooctanoate (PFOA)	8.98 ng/g	8.61 ng/g	4%
Total organic carbon	13800 ng/g	14300 ng/g	4%

Results at or near the reporting limit (RL) may have exaggerated relative percent difference (RPD) values. Non-detected results were treated as zeroes for the purpose of calculating RPD values. No data were qualified based on field duplicate results.

Labeled Compound Recoveries

Labeled compounds were added to all field and QC samples for PFC analyses and recoveries were within laboratory control limits with some exceptions. Since results are corrected for labeled compound recoveries, no data were qualified.

Laboratory Control Sample and Laboratory Control Sample Duplicate

Laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) were analyzed at the required frequencies. All LCS/LCSD analyses resulted in recoveries and/or RPD values within project-required control limits with the following exceptions:

- SDG WG44960 PFCs - PFBA recovered above the control limit in the LCS. All associated sample results have been qualified "J" to indicate a potentially high bias.
- SDG WG45148 PFCs – PFHxA, PFHpA, and PFOA recovered above the control limit in the LCS. All associated sample results were above detection and have been qualified "J" to indicate a potentially high bias.

Matrix Spike and Matrix Spike Duplicate

Matrix spike (MS) and matrix spike duplicate (MSD) samples were analyzed at the required frequency. Laboratory duplicates were analyzed in place of matrix spike duplicate (MSD) samples for some analyses. MS and/or MSD analyses resulted in recoveries and/or RPD values within project-required control limits with the exception of PFHpA in the MS analyzed on sample MISS-RM829.6-PW-201309201245. The associated parent sample result has been qualified "J" to indicate a potentially high bias.

Laboratory Duplicates

Laboratory duplicates were analyzed at the required frequencies and in place of MSD samples for PFC analyses. If the sample or duplicate result was less than five times the method reporting limit (MRL), than the RPD control limit is no longer appropriate. Sample results within ± 2 times the MRL for solids and ± the MRL for waters becomes the control limit in these situations. Most duplicate results were within required limits with the exceptions of some duplicate analyses conducted on non-project samples. No data are qualified based on results from non-project samples.

Method Reporting Limits

Reporting limits were acceptable as reported. All values were reported using the laboratory reporting limits. Values were reported as undiluted, or when reported as diluted, the reporting limit accurately reflects the dilution factor.

Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the labeled compound, LCS, and MS/MSD recovery values, with the exceptions noted above. Precision was also acceptable as demonstrated by the laboratory duplicates, MS/MSD, RPD values. Some TDS and TSS results were qualified due to hold time exceedances. Most data were acceptable as reported; all other data are acceptable as qualified. Table 3 summarizes the qualifiers applied to samples reviewed in this report.

Data Qualifier Definitions

U Indicates the compound or analyte was analyzed for but not detected at or above the specified limit.

J Indicates an estimated value.

R Indicates data is rejected and unusable

UJ Indicates the compound or analyte was analyzed for but not detected and the specified limit reported is estimated

DNR Do not report

Table 3
Data Qualification Summary

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
MISS-RM817.4-1-PW-201309290936	Conventionals	TSS	244 mg/L	244J mg/L	Analyzed past hold time
MISS-RM817.7-1-PW-201309221251	Conventionals	TDS	513 mg/L	513J mg/L	Analyzed past hold time
		TSS	888 mg/L	888J mg/L	
	PFCs	PFBA	19300D ng/L	19300J ng/L	LCS %R above control limit
MISS-RM817.7-2-PW-201309261210	Conventionals	TDS	511 mg/L	511J mg/L	Analyzed past hold time
		TSS	17.2 mg/L	17.2J mg/L	
MISS-RM818.0-1-PW-201309220958	Conventionals	TDS	1270 mg/L	1270J mg/L	Analyzed past hold time
		TSS	515 mg/L	515J mg/L	
	PFCs	PFBA	31.1 ng/L	31.1J ng/L	LCS %R above control limit
MISS-RM818.2-PW-201309211313	Conventionals	TDS	337 mg/L	337J mg/L	Analyzed past hold time
		TSS	668 mg/L	668J mg/L	
	PFCs	PFBA	67.6 ng/L	67.6J ng/L	LCS %R above control limit

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
MISS-RM828.5-PW-201309201319	Conventionals	TDS	425 mg/L	425J mg/L	Analyzed past hold time
		TSS	10U mg/L	10UJ mg/L	
	PFCs	PFBA	19.1 ng/L	19.1J ng/L	LCS %R above control limit
MISS-RM829.8-PW-201309201245	Conventionals	TDS	494 mg/L	494J mg/L	Analyzed past hold time
		TSS	10.8 mg/L	10.8J mg/L	
MISS-RM833.6-PW-201309201049	Conventionals	TDS	1370 mg/L	1370J mg/L	Analyzed past hold time
		TSS	114 mg/L	114J mg/L	
	PFCs	PFBA	23 ng/L	23J ng/L	LCS %R above control limit
MISS-RM834.2-PW-201309201159	Conventionals	TDS	540 mg/L	540J mg/L	Analyzed past hold time
		TSS	79.6 mg/L	79.6J mg/L	
	PFCs	PFBA	413 ng/L	413J ng/L	LCS %R above control limit
PW-FD-20130926	Conventionals	TDS	522 mg/L	522J mg/L	Analyzed past hold time
		TSS	16 mg/L	16J mg/L	
BALDWIN_LAKE-PW-201309211418	PFCs	PFBA	22.7 ng/L	22.7J ng/L	LCS %R above control limit
MISS-RM817.4-2-PW-201309270916	PFCs	PFHxA	7580D ng/L	7580J ng/L	LCS %R above control limit
		PFOA	3510B D ng/L	3510J ng/L	
		PFHpA	1040D ng/L	1040J ng/L	
MISS-RM818.5-4-201309111026	PFCs	PFBA	29.6 ng/L	29.6J ng/L	LCS %R above control limit
MISS-RM819.0-PW-201309220854	PFCs	PFBA	25.9 ng/L	25.9J ng/L	LCS %R above control limit
MISS-RM829.6-PW-201309201245	PFCs	PFBA	972 ng/L	972J ng/L	LCS %R above control limit
		PFHpA	6.21 ng/L	6.21J ng/L	MS %R above control limit
PIGSEYE_OF-PW-201309201115	PFCs	PFBA	40.9 ng/L	40.9J ng/L	LCS %R above control limit
SPRING_LAKE_N-PW-201309211445	PFCs	PFBA	10.2 ng/L	10.2J ng/L	LCS %R above control limit
SPRING_LAKE_S-PW-201309221158	PFCs	PFBA	22.5 ng/L	22.5J ng/L	LCS %R above control limit

%R = Percent recovery

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Anchor QEA, 2013. Sampling and Analysis Plan; Mississippi River – Pool 2. September.

Cardno Entrix, 2011. Quality Assurance Project Plan; In Support of 2011 Fish and Water Collection from Mississippi River Pool 2. June.

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