2018 Water Quality Report

U.S. Army Corps of Engineers
Saint Louis District

Water Quality Conditions in the Mississippi and Illinois Rivers: 2012-2018

April 2019

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Prepared for

United States Army Corps of Engineers
Saint Louis District
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EXECUTIVE SUMMARY

The United States Army Corps of Engineers (USACE) commitment to environmental compliance and protection of estuaries, rivers, lakes, and navigable waters arises from the national policy and directives expressed in Federal Statutes, Executive Orders, and internal regulations. These regulations were designed to minimize pollution, maximize recreation, protect aesthetics, preserve natural resources, and promote the comprehensive planning and use of water bodies to enhance the public interest rather than private gain; therefore, USACE, in the design, construction, management, operation, and maintenance of its facilities, will exert leadership within existing authorities and appropriations in the nationwide effort to protect, enhance, and sustain the quality of the nation's resources. It is USACEs policy to comply with requirements of the Clean Water Act and not to degrade existing water quality conditions to the maximum extent that is practicable, consistent with project authorities, Federal legal and regulatory requirements, the public interest, and water control manuals.

The United States Army Corps of Engineers, Saint Louis District (CEMVS), implemented a water quality monitoring program during the 1970s to evaluate how its civil projects may be affecting water resources. Data collected from this effort serves as an invaluable tool for evaluating the significance of annual water quality measurements and tracking long-term trends. Water quality data is provided to the Missouri Department of Natural Resources and the Illinois Environmental Protection Agency to be used as a screening mechanism for the Missouri and Illinois Water Quality Report which is required every two years by the Clean Water Act Sections 303(d) and 305(b).

The National Water Quality Inventory Report to Congress (305(b) report) is the primary vehicle for informing law makers and the public about general water quality conditions in the United States. This document characterizes our water quality, identifies widespread water quality problems of national significance and describes various programs implemented to restore and protect our waters.

Under Section 303(d) of the 1972 Clean Water Act, states, territories, and authorized tribes are required to develop a list of water quality impaired areas. These waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water on the lists and develop action plans named Total Maximum Daily Loads, to guide water quality improvement.

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INTRODUCTION

The Mississippi River is, in many ways, the nation's best known and most important river systems. The river drains all or part of 31 states, two Canadian Provinces, or approximately 40% of the lower 48 states. The river serves as a migratory flyway for more than 40% of all North American waterfowl and shorebirds, while also providing habitat for 260 species of fish, 50 mammal species, 145 species of amphibians and reptiles, and 38 species of mussels (Weller and Russell, 2016). Anthropogenic services provided by the river includes food and fiber production, recreation, commercial transportation, and drinking water to 18 million Americans (Thorp et al. 2010).

Water quality is of paramount importance for sustaining ecological integrity and services provided by the Mississippi River. Water quality is influenced by a range of both point and nonpoint pollution sources, which may include natural processes, industrial and municipal effluents, and surface runoff from agricultural arenas. Additionally, channel maintenance (bank stabilization, dredging, locks and dams, etc.) may also disrupt the way in which the river processes and transports pollutants (USACE 2017).

The Saint Louis District (CEMVS) of United States Army Corps of Engineers (USACE) has implemented a Water Quality Management Plan (WQMP) as part of the operation and maintenance activities associated with managing USACEs' civil works projects on the Mississippi and Illinois Rivers. The WQMP addresses surface water quality management issues and adheres to the guidance and requirements specified by Clean Water Act (CWA), as well as the self-imposed Engineering Regulation (ER) 1110-2-8154, "Water Quality and Environmental Management for USACE Civil Works Projects" (USACE, 2018). Water quality monitoring is implemented to fulfill five primary objectives that drive the CEMVS WQMP:

1) Establish baseline conditions, identify significant water quality trends, and document problems and accomplishments.
2) Ensure that surface water quality, as affected by CEMVS projects, is suitable for project purposes, existing water uses, public health and safety, and in compliance with applicable state and federal water quality standards.
3) Provide support to water control, project operations, and navigation for regulations and modifications.
4) Investigate special problems, design and implement modifications, and improve water management procedures
5) Establish and maintain strong working partnerships and collaborations with appropriate entities within and outside USACE regarding water quality.

This report is intended to document and assess water quality conditions occurring on the Mississippi and Illinois Rivers. The report describes conditions observed in 2018, as well as baseline data collected from 2012-2017. Additional historical data are available upon request.

SAINT LOUIS DISTRICT WQMP COVERAGE

Upper Mississippi River (RM 200 – 301)

The Saint Louis District manages the lower 100 miles of the Upper Mississippi River (UMR; Figure 1a), which is defined as the river reach between Locks and Dam 22 near Saverton Missouri (RM: 301), and Melvin Price Locks and Dam in Alton Illinois (RM: 200). Flow and depth on the UMR are regulated by two additional locks and dams near Clarksville (RM: 274) and Winfield (RM: 242) Missouri. The primary function of lock and dam projects on the UMR is navigation. The UMR is also altered by dredge maintenance, river training structures, and a confined levee system. The Illinois River is a major tributary to the UMR near Grafton IL (RM: 218).

Saint Louis Harbor (RM 160 – 200)

Saint Louis Harbor (SLH) is defined as the river reach of the Mississippi River between Melvin Price Locks and Dam near Alton, Illinois (RM: 200), and the confluence of the Meramec River near Arnold, Missouri (RM: 160). SLH includes Locks No. 27, situated at the southern end of the Chain of Rocks Canal. The primary mission for Locks No. 27 is navigation, and has little influence on flow and depth. Nevertheless, SLH is greatly altered by dredge maintenance, river training structures, and a confined levee system. The Missouri River is a major tributary to SLH near North Saint Louis (RM: 195).

Middle Mississippi River (RM 000 – 160)

The Middle Mississippi River (MMR) is recognized as the most southern stretch of the Mississippi River managed by CEMVS. The MMR spans from the Meramec River confluence (RM: 160) to the Ohio River Confluence (RM: 0). The MMR is often referred to as the Open River (OPR), as flow is not impeded by lock and dams, although, the MMR is greatly altered by dredge maintenance, river training structures, and a confined levee system. Major tributaries include the Kaskaskia River (RM: 117) and the Big Muddy River (RM: 76).

Illinois River (RM 000 – 80)

The Saint Louis District is responsible for channel maintenance on the lower 80 miles of the Illinois River (ILR). This segment of the ILR runs between the La Grange Lock and Dam (RM: 80) and the confluence with the Mississippi River (RM: 0). Although there are no impeding structures within the reach, this section of the ILR is greatly altered by dredge maintenance, river training structures, and a confined levee system.

Major Tributaries

In addition to the ILR, major tributaries to the Mississippi River influenced by USACE Civil Works projects include the Salt River, Missouri River (MOR), Kaskaskia River (KAS), and Big Muddy River. This report includes confluence data for MOR and KAS (Appendix B). Water quality data for the Salt River (near Mark Twain Lake), Kaskaskia River (near Carlyle and Shelbyville Lakes) and the Big Muddy River (near Rend Lake) are available upon request.

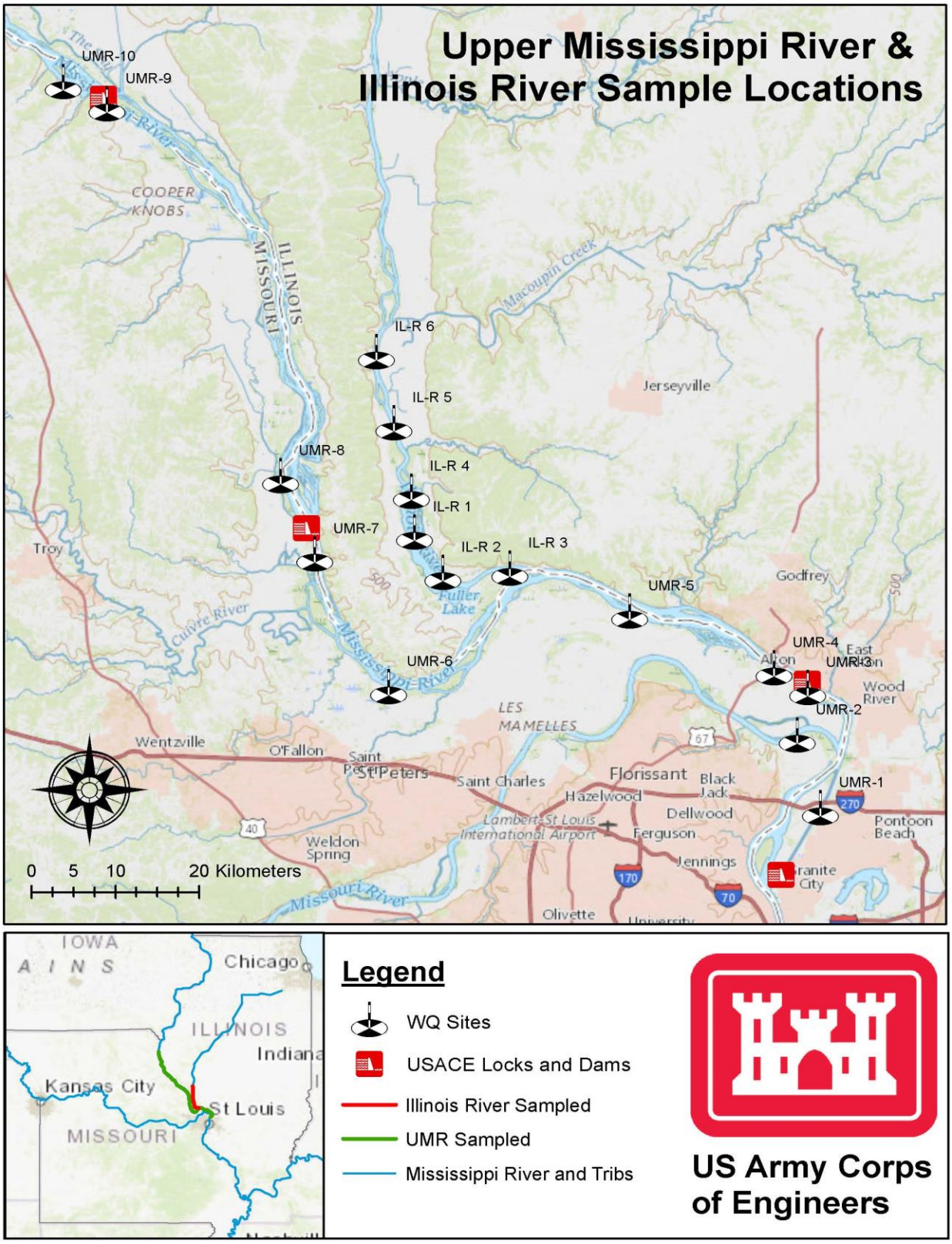


Figure 1a. Water Quality (WQ) Sampling Locations in 2018 on the Upper Mississippi and Illinois Rivers

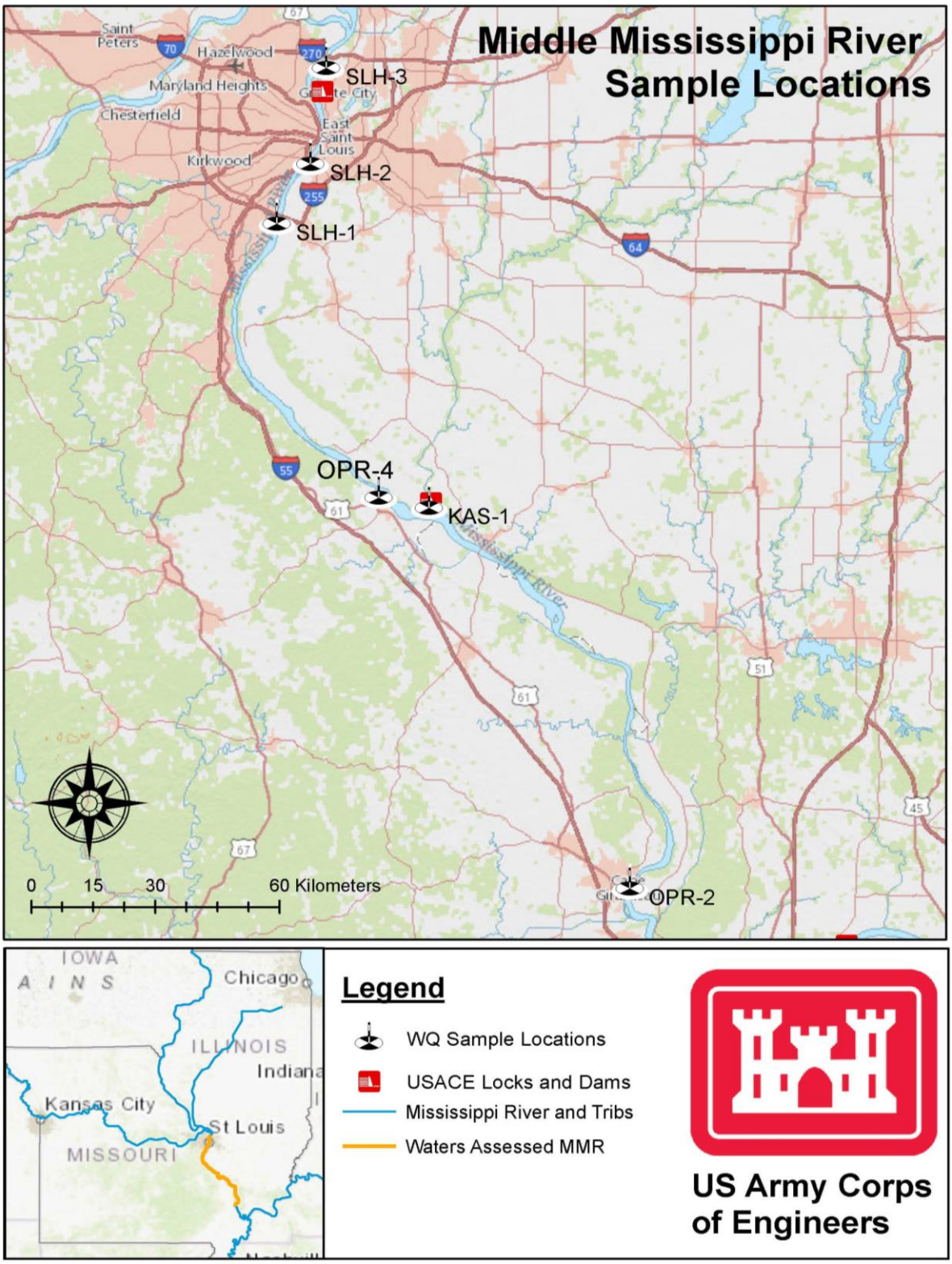


Figure 1b: Water Quality (WQ) Sampling Locations for Saint Louis Harbor and the Middle Mississippi River

Sample Location Summary Table

Table 1: Sample Location Summary and Geographic Location (NAD 1983)

River Segment	Sample ID	River Mile	Latitude	Longitude
Upper Mississippi River	UMR-10	276	39.389522	-90.949005
	UMR-9	273	39.370276	-90.902122
	UMR-8	245	39.049161	-90.716641
	UMR-7	240	38.9817710	-90.6799690
	UMR-6	231	38.866632	-90.601036
	UMR-5	213	38.9321510	-90.3427440
	UMR-4	203	38.8828580	-90.1883340
Saint Louis Harbor	UMR-3	200	38.8658600	-90.1525290
	UMR-2*	196	38.8247120	-90.1636940
	UMR-1	191	38.761549	-90.138858
	SLH-3	191	38.7559320	-90.1719580
	SLH-2	177	38.5887780	-90.2063280
	SLH-1	169	38.4844270	-90.2795520
Middle Mississippi River	OPR-4	126	38.0048110	-90.0582800
	KAS-1**	118	37.9871950	-89.9492610
	OPR-2	53	37.3151700	-89.5125400
Illinois River	ILR-3***	2	38.969149	-90.471323
	ILR-2	5	38.965781	-90.542952
	ILR-1	8	39.000522	-90.573408
	ILR-4	10	39.035815	-90.576717
	ILR-5	15	39.094905	-90.595317
	ILR-6	19	39.156435	-90.614168

*UMR-2 is taken from the Missouri River, two miles upstream of the SLH confluence at RM 196.
**KAS-1 is taken from the Kaskaskia River, two miles upstream of the MMR confluence at RM 118.
***IL-3 data not included in this assessment.

METHODS AND ANALYSIS: WATER QUALITY

Data Collection and Historical Reference Data

During 2018, water quality samples were collected and analyzed for 22 locations during four separate sampling events (n=88; Table 1). Three duplicate samples were also collected during each sampling period for quality control purposes. Samples were collected from the upper one meter of the water column, preserved, and transported to the Applied Research and Development Laboratory (ARDL) in Mount Vernon, Illinois for analysis.

For the purpose of this report, historical reference data refers to water quality data collected during the previous five years (2012-2017) on the Mississippi River, and previous three years (2015-2017) on the Illinois River. Historical reference data are intended to represent the current condition of the Mississippi and Illinois Rivers.

Statistical Summary and Comparison to Applicable Water Quality Standards

Statistical analyses were performed on water quality monitoring data collected for 19 locations, and classified as ILR (n= 5), MMR (n=2), SLH (n=5), and UMR (n=7). Tributary data collected from the MOR (UMR-2) and KAS (KAS-1) are not included in summary tables, however, data are available in Appendix B. Descriptive statistics were calculated to describe central tendencies and corresponding 95% confidence intervals for the geometric mean. Monitoring results were compared to applicable water quality standard criteria established by the appropriate state agencies pursuant to the Federal Clean Water Act. If a state water quality standard criteria was not available, recommended criteria from the literature were considered. A one-sample Mann-Whitney Rank Sum Test with continuity correction was used to determine if a parameter was within an acceptable water quality criteria.

Seasonal data are classified as: Winter (December 01 - March 14), Spring (March 15 – May 31), Summer (June 1 – September 15), Fall (September 16 – November 30).

Quality Assurance

The United States Army Corps of Engineers, Saint Louis District quality assurance procedures considers two primary focus areas: (1) those that involve laboratory analysis of samples, and (2) those concerning the collection and processing of the water samples in the field.

Since 2012, ARDL has analyzed water quality samples for CEMVS. Their quality assurance program includes the use of quality control charts, check standards, field and in-house matrix spikes, laboratory blanks and performance evaluation samples. In addition, one blind duplicate sample is submitted for every 20 samples collected.

Internal checks are also used for field sampling. This includes adherence to operating procedures for data collection and periodic evaluation of sampling personnel. Field sampling equipment and multimeters are calibrated/serviced in accordance with factory recommendations.

Water Quality Parameters and Criteria

Parameters used to characterize water quality have been generally accepted criteria for assessing aquatic life and human health include:

Temperature (Temp) is important because it controls several aspects of water quality. Colder water holds more dissolved oxygen which is required by aquatic organisms. Plants grow more rapidly and use more oxygen in warmer water. Decomposition of organic matter which uses oxygen is accelerated in warmer water. Temperature can also determine the availability of toxic compounds such as ammonia. Since aquatic organisms are cold blooded, water temperature regulates their metabolism and ability to survive. The number and kinds of organisms that are found in streams or lakes is directly related to temperature. Certain organisms require a specific temperature range, such as Salmonids, which require water temperatures below 20°C. Water temperature criteria for warm water bodies in Missouri and Illinois are less than 33°C or within 2.5°C of the seasonal norm.

Dissolved Oxygen (DO) refers to the measurement of free oxygen molecules (O_2) that are not bonded to any other elements; thus, oxygen bonded in water (H_2O) would not be considered in a measurement of dissolved oxygen. Oxygen is dissolved in surface waters through interactions with the atmosphere and as a waste product of photosynthesis ($CO_2 + H_2O$ (CH_2O) + O_2) from phytoplankton and aquatic vegetation. Additional factors influencing DO include temperature, pressure, and salinity.

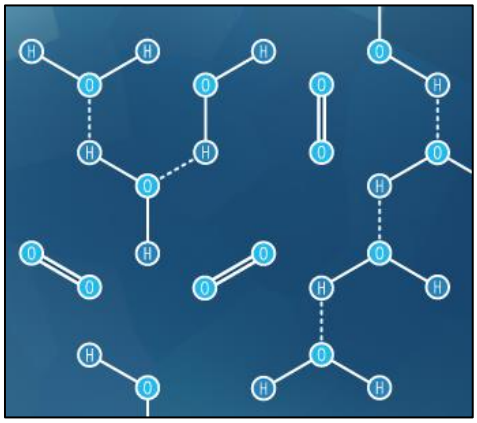


Figure 1: Dissolved oxygen (O_2) vs oxygen bonded in water (H_2O).

Dissolved oxygen is required for most aquatic life including fish, invertebrates, bacteria, and plants. Fish and invertebrates utilize DO for respiration through gills and cutaneous breathing, and plants require dissolved oxygen for respiration when photosynthesis is not possible. Smaller microbes and bacteria utilize DO for decomposition of organic materials, a process essential for nutrient cycling. Bottom feeders such as worms and mussels can persist when DO is ≥1mg/L, while most inland fish species require a minimum DO of 4mg/L. The DO water quality criteria for Missouri and Illinois is ≥5mg/L.

Potential of Hydrogen (pH) is a measure of how acidic or basic water is. Potential of Hydrogen is reported on a logarithmic scale ranging from 0 – 14, with 7.0 being neutral. As pH increases from 7.0, water increases in alkalinity, whereas a decrease from 7.0 indicates an increase in acidity. Since pH is measured on a logarithmic scale, every

one-unit change in pH indicates a 10-fold change in acidity; thus, a pH of 6.0 is ten times more acidic than a pH of 7.0 and a pH of 4.0 would be one-thousand times more than a pH of 7.0.

The pH of water varies considerably beyond the local level. Natural variation in bedrock and soil composition through which water moves has been reported as one of the most influential factors. Additional factors include decomposition of organic materials, acidity of local precipitation, discharge of effluents and chemicals, and mining operations.

Most freshwater streams and rivers have a natural pH ranging from 6 to 8. As pH approaches 5 (acidic), less tolerant fish and aquatic invertebrate assemblages may be extirpated, and a pH below 4.5 would be without most desired aquatic life. Conversely, when pH exceeds 9.5 (alkaline), aquatic fish and invertebrate begins to rapidly decrease and beyond 10, fish become extirpated. The pH water quality criteria for Missouri and Illinois ranges from 6.5 – 9.0.

Conductivity is a measure of water's ability to conduct electrical current. In its purist form, water has a *near* neutral charge, indicating that it is an inefficient conductor of electrical current. Thus the ability to carry electrical current is driven by water soluble ions (atoms and molecules with a charge) such as salts and other inorganic materials. Conductivity is also influenced by water temperature; as temperature increases, conductivity increases. For this reason, conductivity is commonly reported as Specific Conductivity (SpCond), which is the measurement of conductivity at 25 degrees Celsius.

Conductivity in streams and rivers is affected by the geology of the area. Streams running through granite tend to have lower conductivity due to granite being composed of inert material; materials that do not ionize or dissolve into ionic compounds in water. Conversely, streams that run through areas of limestone or clay soils tend to have higher conductivity readings because of the presence of materials that ionize. Conductivity is useful as a general measure of water quality. A stream tends to have a relatively constant range of conductivity that, once established, can be used as a baseline. Significant changes, either increases or decreases, might indicate a source of pollution has been introduced into the water. The pollution source could be a treatment plant, which raises the conductivity, or an oil spill, which would lower the conductivity. In general, there are no water quality criteria for SpCond. The District threshold of 500 µS/cm is a rule of thumb value that is often associated with some form of biological impairment.

Oxidation Reduction Potential (ORP) is a measurement of the net status of all the oxidation and reduction reactions in a given water sample. Oxidation involves an exchange of electrons between 2 atoms. The atom that loses an electron is oxidized and the one that gains an electron is reduced. Oxidation reduction potential sensors measure the electrochemical potential between the solution and a reference electrode. Readings are expressed in millivolts. Positive readings indicate increased oxidizing potential and negative readings increased reduction. Oxidation reduction potential

values are used much like pH values to determine water quality. While pH readings characterize the state of a system relative to the receiving or donating hydrogen ions (base or acid), ORP readings characterize the relative state of losing or gaining electrons. Generally ORP readings above 400mV are harmful to aquatic life; however, ORP is a non-specific measurement, which is a reflection of a combination of effects of all the dissolved materials in the water. Therefore, the measurement of ORP in relatively clean water has only limited utility unless a predominant redox-active material is known to be present.

Total Suspended Solids (TSS) concentrations, which cause the photosynthetic activity to be reduced by more than 10% from the seasonably established norm, can have a detrimental effect on aquatic life. Soil particles, organic material, and other debris comprise suspended solids in the water column. **Turbidity (FNU)** measurements are inverse to suspended solid measurements. As TSS increases, the FNU or water transparency decreases. Total suspended solids can be an important indicator of the type and degree of FNU. Total Suspended Solids measurements represent a combination of **Volatile Suspended Solids (VSS)**, which consist of organic material, and **Nonvolatile Suspended Solids (NVSS)**, which is comprised of inorganic mineral particles in the water. In order to more accurately determine the types and amounts of suspended solids, VSS are analyzed. Volatile suspended solid concentration represents the organic portion of the total suspended solids. Organic material often includes plankton, and additional plant and animal debris present in water. Total VSS indicates the presence of organics in suspension; and, therefore, show additional demand levels of oxygen. Illinois Environmental Protection Agency (EPA) recommends that TSS not exceed 116 mg/L. Neither Missouri nor Illinois currently have a standard criteria for NVSS or VSS.

Figure 2: Confluence of the Missouri and Mississippi River. Historically, sediment inputs from the Missouri River result in significant TSS increases in the Mississippi River.

Total Organic Carbon (TOC) is a measure of the amount of organic carbon in a waterbody. In addition to natural organic substances, TOC includes insecticides and herbicides, as well as domestic and industrial waste. Industrial waste effluent may include carbon-containing compounds with various toxicity levels. Further, a high organic content means an increase in the growth of microorganisms which contribute to the depletion of oxygen supplies.

Currently, there are no state or federal water quality standard criteria set for TOC. Because carbon occurs naturally, its concentration varies based on physical and chemical attributes in a watershed; thus, this study relies on historical reference conditions to identify unfavorable conditions.

Pesticides are commonly used throughout much of the agricultural landscape that the Mississippi River and its tributaries flow. This study considers one insecticide and seven herbicides. During 2018, pesticides were analyzed only for ILR and KAS.

Nitrogen occurs naturally in water through several forms including nitrogen (N2), nitrite (NO2-N), nitrate (NO3-N), ammonia (NH3), and ammonium (NH4). Nitrates are the most commonly reported form of nitrogen, and may have a meaningful influence on a waterbody's trophic status. Algae and other plants use NO3-N as a food source, thus excess levels of NO3-N can promote increases in algae production and hypereutrophic conditions.

In general, NO3-N does not have a *direct* effect on fish or aquatic insects. Missouri and Illinois both have set criteria standards for NO3-N to 10 mg/L to accommodate safe drinking waters for human and livestock; however, this threshold likely exceeds the concentration that is appropriate for assessing ecosystem health.

Total Ammonia Nitrogen (TAN) includes NH3 and NH4. Total ammonia nitrogen is a colorless gas with a strong pungent odor. Ammonia occurs naturally and is a biological requirement for aquatic life, however elevated concentrations can be toxic to freshwater organisms. Unnatural sources of ammonia include, accidental releases of ammonia rich fertilizer, effluent from sewage treatment plants, improper disposal of ammonia products, and livestock waste.

Toxic concentrations for freshwater organisms range from 0.53 – 22.8 mg/L, and are strongly dependent on both pH and temperature. In general, an increase in pH and/or temperature corresponds with an increase in toxicity. Additional information in regards to the relationship between pH, temperature, and ammonia, as it relates to toxicity, can be reviewed in Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater (USEPA 2013).

Nitrogen as Total Kjeldahl (TKN) describes the amount of organic nitrogen and TAN in water. Organic nitrogen is the byproduct of living organisms, and includes natural materials such as proteins and peptides, nucleic acids and urea, and numerous synthetic organic materials. Typical organic nitrogen concentrations vary from a few milligrams per liter in the Mississippi and Illinois Rivers, to more than 20 mg/L in raw sewage. There are currently no state or federal standard criteria for TKN.

Total Phosphorus (TP) is analyzed as phosphorus, and has been monitored due to the potential for uptake by nuisance algae. Levels of phosphate can indicate the potential for rapid growth of algae (algae bloom) which can cause serious oxygen depletion during the algae decay process. Phosphorous is typically the limiting nutrient in a water

body; therefore, any addition of phosphorous to the ecosystem stimulates the growth of plants and algae. Phosphorous is delivered to lakes and streams by way of runoff from agricultural fields and urban environments. Other sources of phosphorous are anaerobic decomposition of organic matter, leaking sewer systems, and point source pollution. The general standard for phosphorous in lake water is 0.05 mg/L. Dissolved phosphorous, also called **Orthophosphate (PO_4-P)** is generally found in much smaller concentrations than total phosphorous, and is readily available for algal uptake. Orthophosphate concentrations in a water body vary widely over short periods of time as plants take it up and release it.

Chlorophyll a (CHL_a) is a measure of the amount of algae growing in a waterbody, and therefore can be used to classify trophic status. Although algae are a natural part of freshwater ecosystems, too much algae can cause aesthetic problems such as green scums and bad odors, and can result in decreased levels of DO. Some algae also produce toxins that can be of public health concern when found in high concentrations.

Pheophytin a (PHEO a) is a natural degradation product or digestion of CHL_a. The ratio of PHEO_a to CHL_a can provide an indication of the decline or growth in eukaryotic algae and cyanobacteria populations.

Trophic Status is determined using a modified **Trophic State Index (TSI)**, as described by Carlson (1977). Trophic State Index is calculated from secchi-depth transparency (turbidity was converted to secchi depth using equation $y = 4.5905x^{-0.459}$), total phosphorus, and chlorophyll-a measurements. Values for these three parameters are converted to an index number ranging from 0-100 according to the following equations:

TSI (Seechi Depth) = 10(6 - (ln SD/ln 2))
TSI (Chlorophyll-*a*) = TSI(Chl) = 10(6 - ((2.04 - 0.68 ln Chl)/ln 2))
TSI (Total Phosphorus) = TSI(TP) = 10(6 – (ln (48/TP)/ln 2))

where ln indicates the Natural Logarithm

A TSI average value, calculated as the average of the three individually determined TSI metrics, is used as an overall indicator of a water body's trophic state. The relationship between TSI and trophic condition is defined as follows:

TSI	Trophic Condition
0-40	Oligotrophic
40-60	Mesotrophic
60-70	Eutrophic
80-100	Hypereutrophic

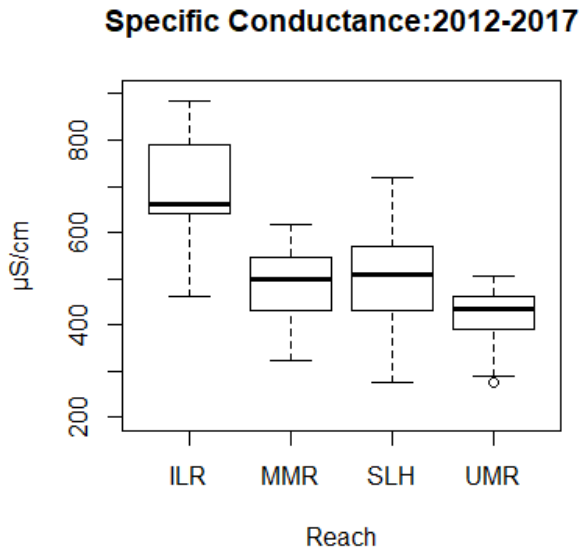
Laboratory Methods and Water Quality Criteria Summary Table

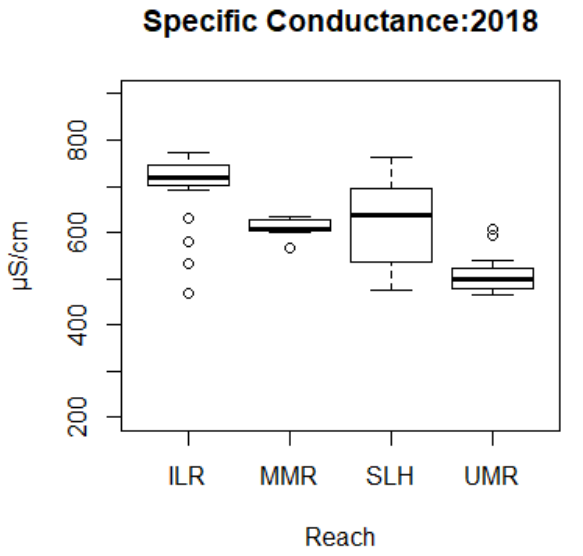
Table 2: Metrics, Methods, and Water Quality Criteria Used for Evaluating Water Quality

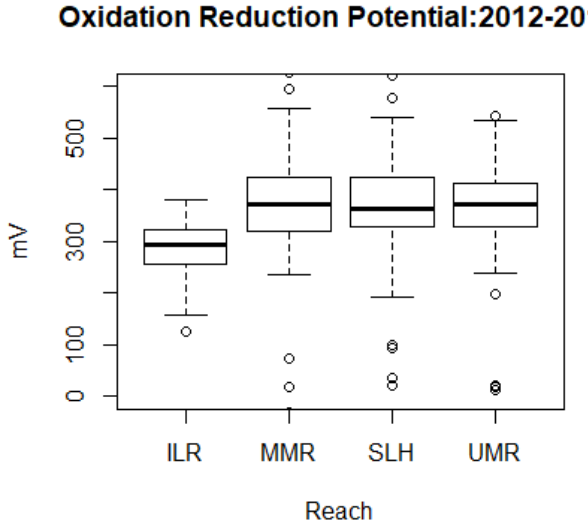
Metric	Abbreviation	Analysis Method	Water Quality Criteria	Source
Ammonia Nitrogen	NH_3	EPA Method 350.1	Temp and pH dependent	United States EPA
Atrazine	Atrazine	EPA Method 8270C	9 ug/L: Chronic or 82 ug/L: Acute	Illinois EPA
Chlorophyll a	Chl_a	SM Method 10200H	Less than 25mg/cm^3 (Eutrophic Upper Limit)	Carlson 1977
Depth	Depth	Multiparameter Meter	Measurements reported at ~1 meter	-----
Dissolved Oxygen	DO	Multiparameter Meter	Greater than 5.0mg/L	Missouri DNR/Illinois EPA
Dissolved Oxygen Saturated	DO%	Multiparameter Meter	Range: 50 – 140%	Brown 1970
Metolachlor	Metolachlor	EPA Method 8270C	30.4 ug/L: Chronic or 380 ug/L: Acute	Illinois EPA
Nitrate as Nitrogen	NO_3	Green Method	Less than 10 mg/L	Missouri DNR/Illinois EPA
Non-Volatile Suspended Solids	NVSS	TSS - VSS	-----	-----
Orthophosphate	Ortho	EPA Method 365.2	-----	-----
Pheophytin a	Phpy_a	SM Method 10200H	-----	-----
Potential of Hydrogen	pH	Multiparameter Meter	Range: 6.5 – 9.0pH	Missouri DNR/Illinois EPA
Specific Conductivity	SpCond	Multiparameter Meter	500 uS/cm	-----
Temperature	Temp	Multiparameter Meter	Less than 32-2/9 °C	Missouri DNR
Total Dissolved Solids	TDS	Multiparameter Meter	Less than 500 mg/L	Illinois EPA
Total Kjeldahl Nitrogen	TKN	EPA Method 351.2	-----	-----
Total Organic Carbon	TOC	EPA Method 415.1	-----	-----
Total Phosphorus	TP	EPA Method 365.2	Less than 0.10 mg/L	EPA 1986 (Gold Book)
Total Solids	TS	TSS + TDS	Less than 500 mg/L	Brown 1970
Total Suspended Solids	TSS	EPA Method 160.2	Less than 116 mg/L	Illinois EPA
Turbidity	Turb	Multiparameter Meter	-----	-----
Volatile Suspended Solids	VSS	EPA Method 160.4	-----	-----

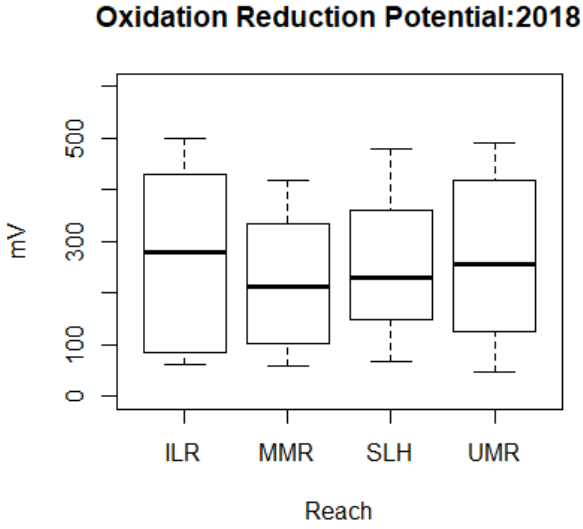
**1 mg/L is equivalent to 1 drop in two bathtubs and 1 ug/L is equivalent to 1 drop in an Olympic size swimming pool.*

RESULTS AND SUMMARY STATISTICS: WATER QUALITY



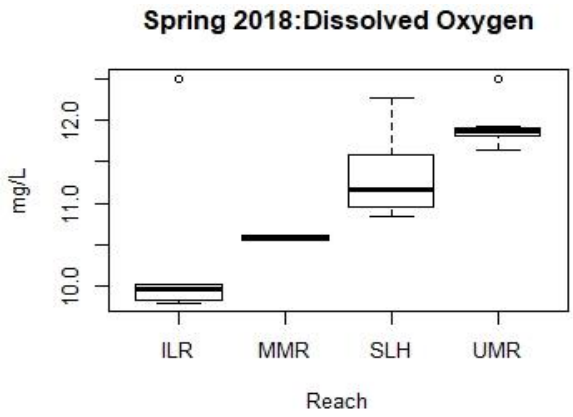


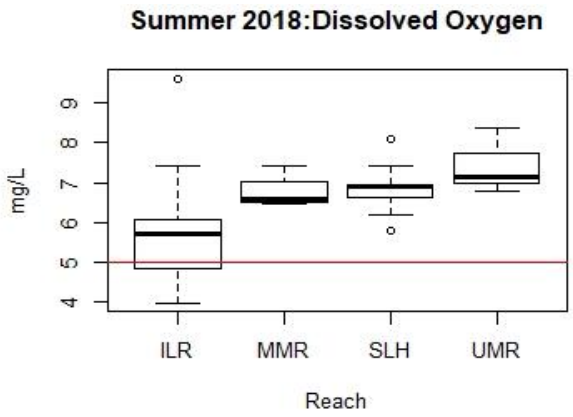


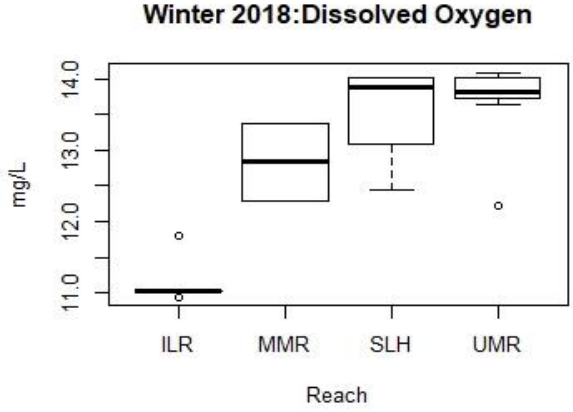


		Historical Reference: 2012-2017			2018		
Metric	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
SpCond	ILR	691.37	660.75	37.19	700.72	720.00	31.76
	MMR	487.00	499.30	27.09	610.77	608.58	17.73
	SLH	506.94	510.00	20.58	624.03	638.00	42.25
	UMR	420.88	433.95	10.81	504.69	499.20	13.61
ORP	ILR	284.69	292.50	19.39	257.80	280.70	72.21
	MMR	363.19	371.50	43.35	222.53	212.95	116.55
	SLH	366.81	364.00	24.20	247.55	229.10	61.99
	UMR	362.65	373.00	20.44	266.05	255.55	58.66

**This report does not acknowledge a water quality criteria for SpCond or ORP.*

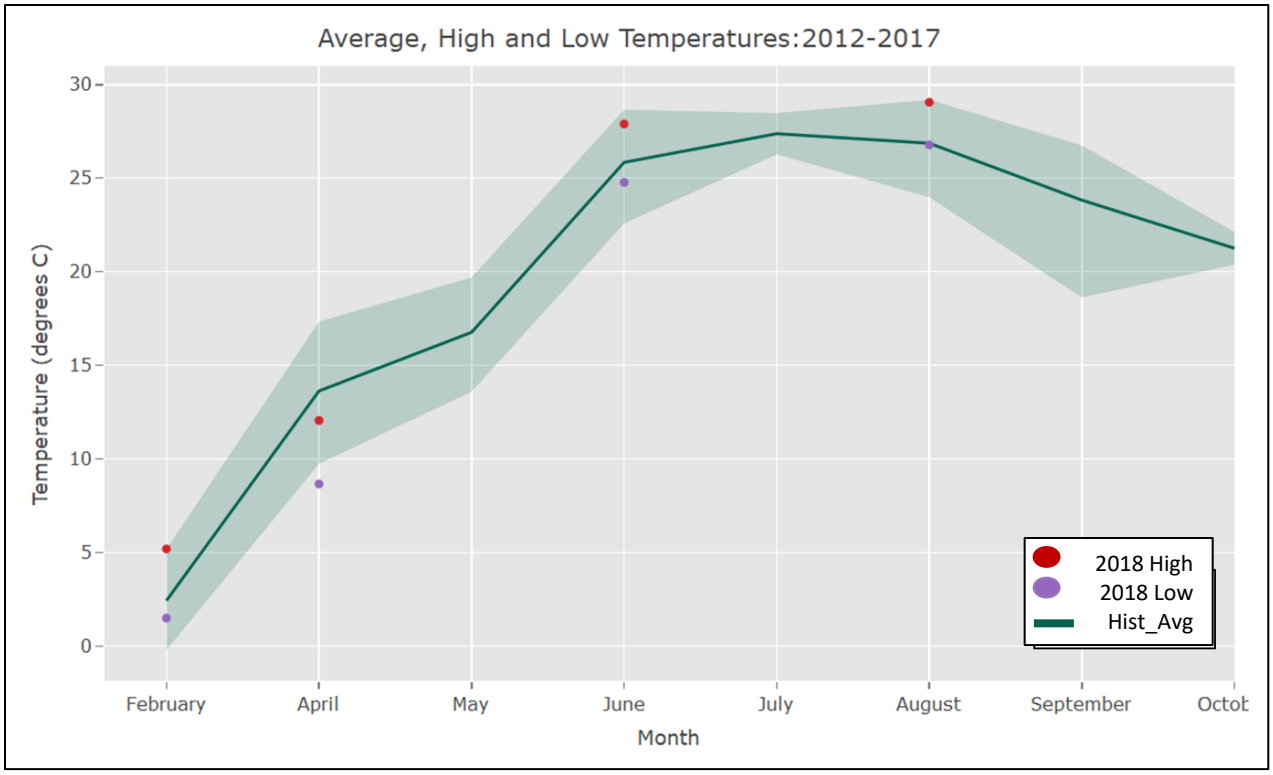






		Historical Reference: 2012-2018			2018		
Season	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
Spring	ILR	9.78	9.61	0.44	10.34	9.96	1.11
	MMR	9.65	9.52	0.79	10.59	10.59	0.44
	SLH	9.90	9.77	0.44	11.36	11.16	0.72
	UMR	10.40	9.96	0.39	11.92	11.87	0.25
Summer	ILR	**4.88**	**4.72**	**1.00**	**5.79**	**5.75**	**0.96**
	MMR	6.82	6.69	0.32	6.77	6.59	0.71
	SLH	6.83	6.84	0.31	6.86	6.89	0.44
	UMR	7.37	6.89	0.39	7.41	7.15	0.32
Fall	MMR	7.94	7.12	3.25			
	SLH	7.52	7.76	0.83			
	UMR	7.84	7.71	0.59			
Winter	ILR	14.53	14.50	0.21	11.14	11.03	0.34
	MMR	13.84	13.84	0.44	12.84	12.84	6.92
	SLH	14.31	14.30	1.07	13.49	13.88	0.87
	UMR	15.20	15.10	0.26	13.66	13.81	0.60

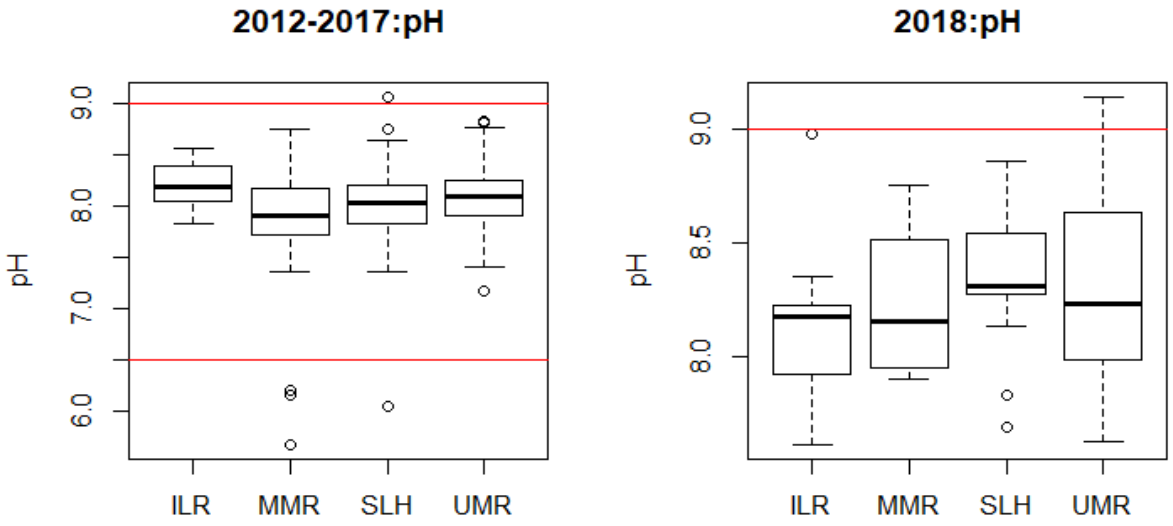
**Missouri and Illinois State standards for DO was not met at five locations on the Illinois River during June 2018. For the entire summer, observed DO was not statistically greater or less than 5.0 mg/L ($p > 0.05$).*

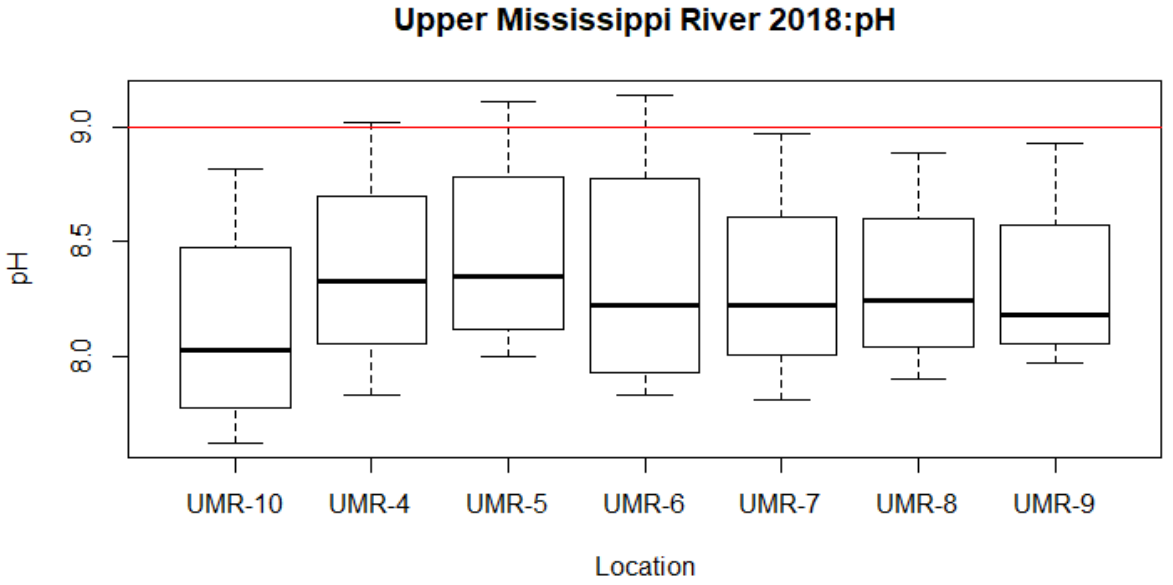


Solid green line represents average temperature, and green shaded area shows the high and low monthly temperatures from 2012-2017. Red and purple dots represent high and low tempertures observed during 2018. Figure represents all river segments.

		Historical Reference: 2012-2017			2018		
Season	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
Spring	ILR	16.16	15.69	1.34	10.35	10.56	0.71
	MMR	13.25	12.90	1.70	10.81	10.81	1.72
	SLH	13.98	14.00	1.27	10.21	10.17	1.41
	UMR	13.73	14.28	1.31	9.33	9.39	0.41
Summer	ILR	26.58	26.45	0.24	27.97	27.78	0.64
	MMR	26.44	26.68	0.53	27.00	26.98	0.56
	SLH	26.20	26.44	0.36	26.72	26.78	0.54
	UMR	26.07	26.33	0.33	26.11	26.34	0.60
Fall	MMR	22.81	23.21	3.07			
	SLH	22.55	21.35	1.35			
	UMR	21.65	20.47	1.36			
Winter	ILR	3.45	3.53	0.30	4.63	4.75	0.44
	MMR	4.33	4.34	1.46	4.25	4.25	12.07
	SLH	3.15	2.76	2.32	3.52	3.30	0.87
	UMR	0.51	0.39	0.45	2.40	2.10	0.75

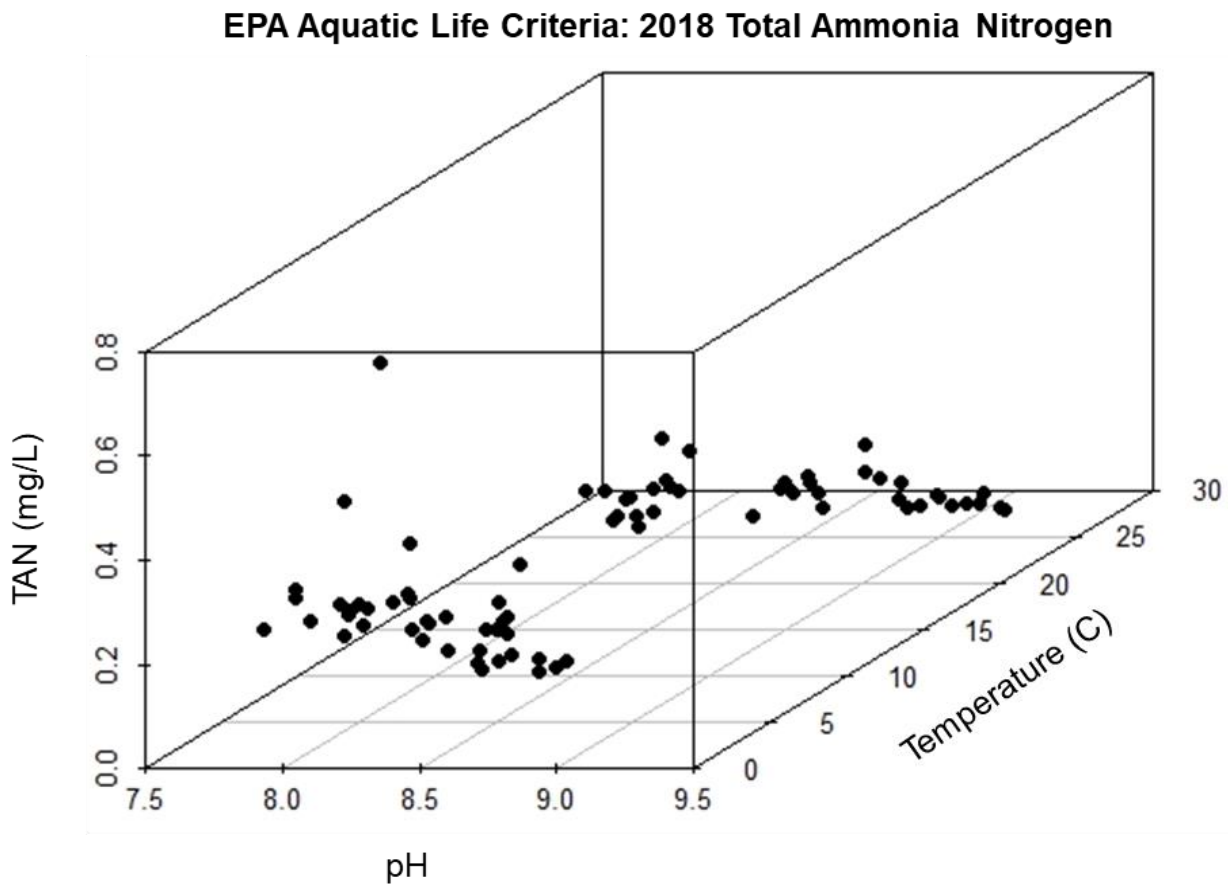
**Temperatures were within acceptable range of water quality criteria during 2018*





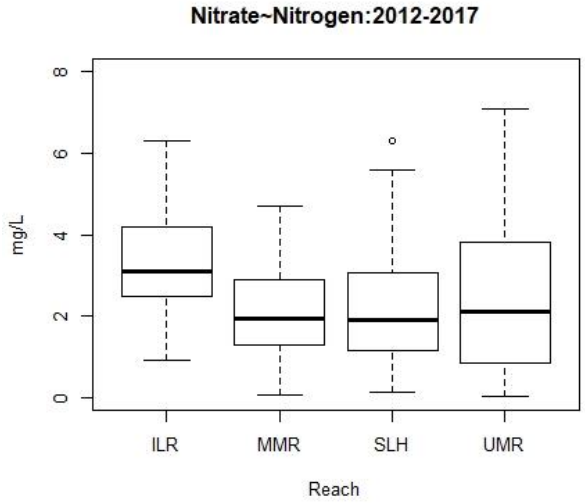
	Historical Reference: 2012-2017			2018		
Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
ILR	8.18	8.19	0.07	8.10	8.18	0.11
MMR	7.84	7.92	0.20	8.23	8.15	0.29
SLH	8.04	8.03	0.08	8.31	8.36	0.13
UMR	8.10	8.09	0.06	8.32	8.23	0.17

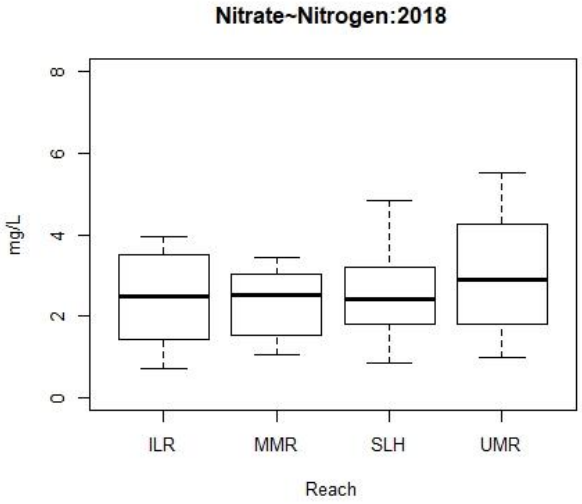
Missouri and Illinois State standards for pH were exceeded at three locations on the Upper Mississippi River during June 2018. Observed pH was not statistically greater than the criteria acknowledged by this study ($p > 0.05$).

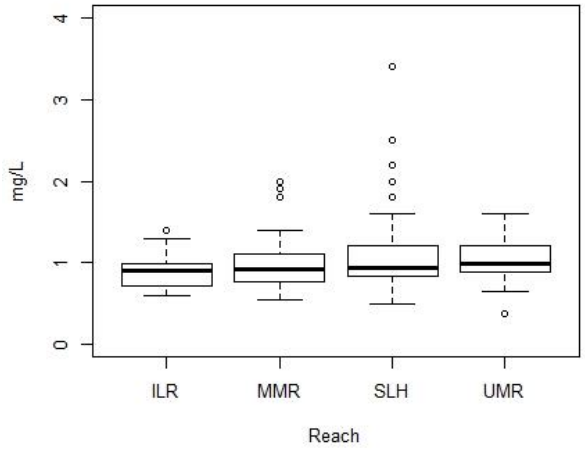


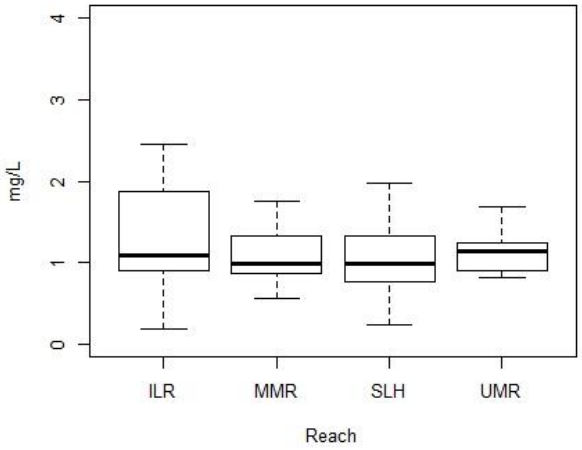
		Historical Reference: 2012-2017			2018		
Season	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
Spring	ILR	0.10	0.09	0.03	0.08	0.08	0.03
	MMR	0.12	0.14	0.06	0.05	0.05	0.08
	SLH	0.10	0.09	0.02	0.09	0.07	0.09
	UMR	0.08	0.07	0.01	0.05	0.04	0.03
Summer	ILR	0.10	0.10	0.02	0.04	0.04	0.01
	MMR	0.11	0.07	0.08	0.10	0.10	0.09
	SLH	0.10	0.08	0.02	0.05	0.04	0.02
	UMR	0.10	0.09	0.02	0.04	0.03	0.01
Fall	MMR	0.07	0.07	0.03			
	SLH	0.10	0.10	0.02			
	UMR	0.09	0.08	0.02			
Winter	ILR	0.18	0.21	0.04	0.23	0.23	0.02
	MMR	0.19	0.21	0.07	0.21	0.21	0.06
	SLH	0.26	0.22	0.07	0.27	0.22	0.10
	UMR	0.32	0.28	0.08	0.36	0.28	0.17

**All measurements for total ammonia nitrogen (TAN) were below EPA threshold criteria for aquatic life. See Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater (EPA 2013).*



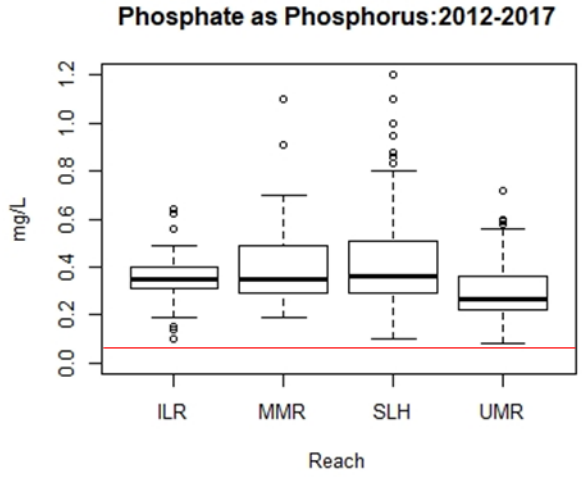


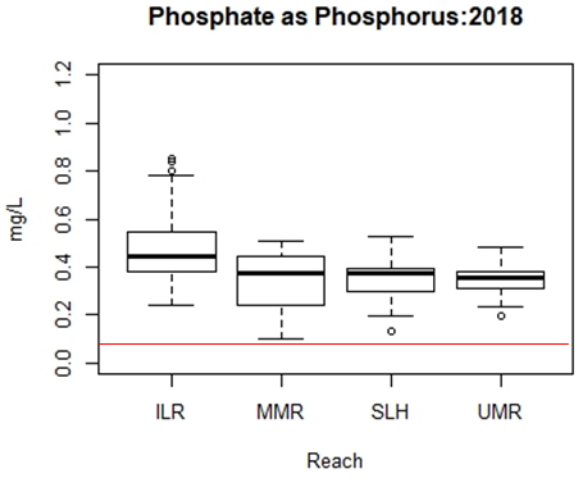


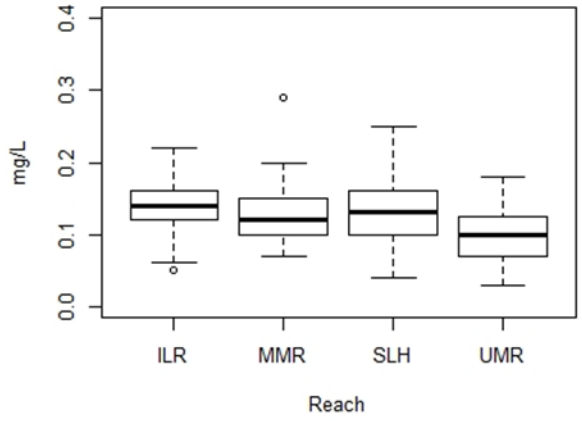


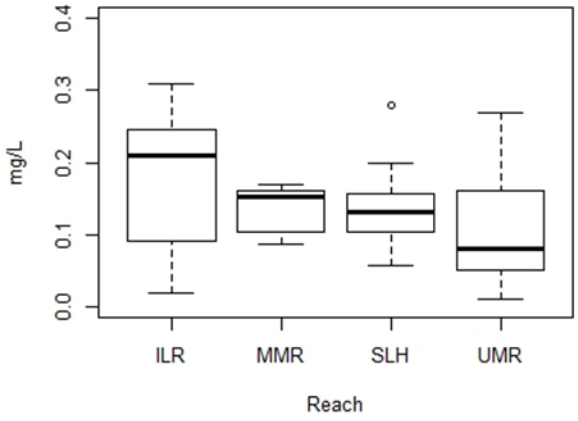
		Historical: 2012-2017			2018		
Metric	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
NO3-N	ILR	3.32	3.10	0.50	2.50	2.50	0.50
	MMR	2.07	1.95	0.39	2.34	2.53	0.76
	SLH	2.15	1.90	0.30	2.49	2.42	0.52
	UMR	2.10	2.48	0.33	3.07	2.89	0.58
TKN	ILR	0.90	0.90	0.07	1.33	1.09	0.28
	MMR	1.02	0.92	0.13	1.08	0.98	0.32
	SLH	1.07	0.94	0.09	1.04	0.98	0.20
	UMR	1.05	0.99	0.04	1.13	1.14	0.09

**All measurements for Nitrates as Nitrogen were below the Missouri and Illinois state standards of 10mg/L. This study does not acknowledge a criteria for Total Kjeldahl Nitrogen.*



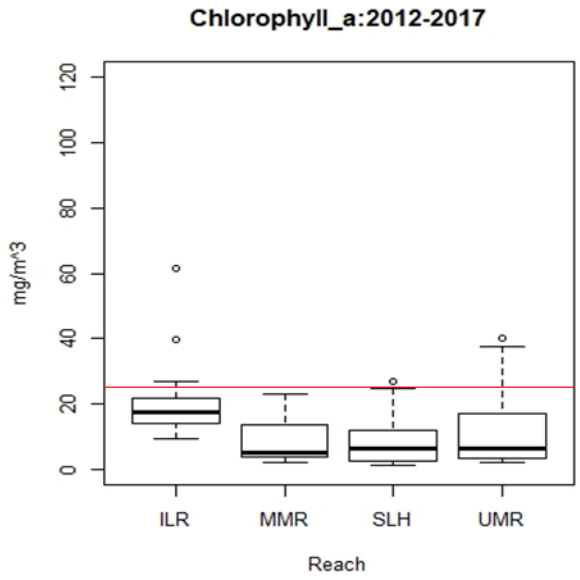


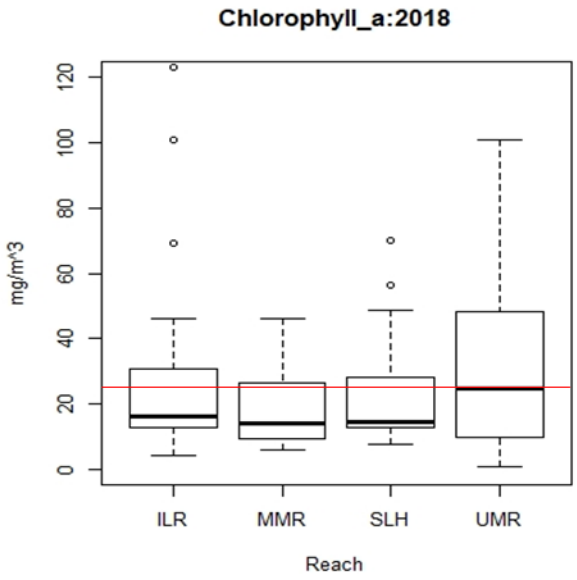


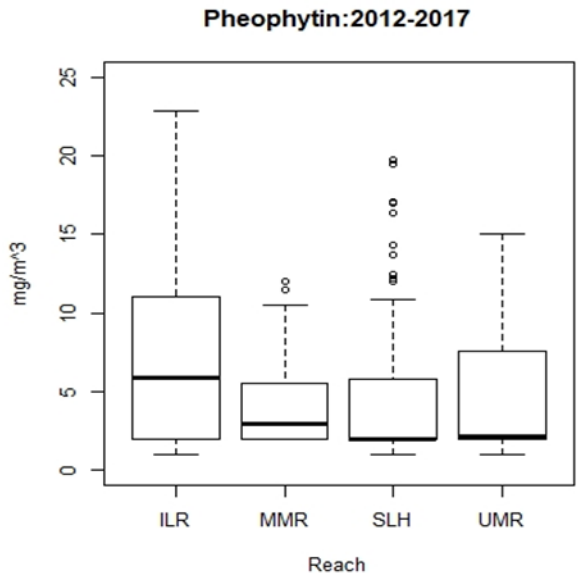


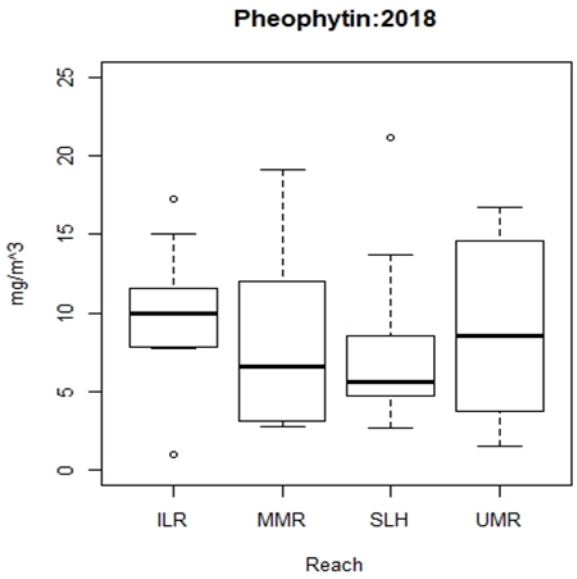
		Historical: 2012-2017			2018		
Metric	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
TP	ILR	0.34	0.35	0.04	0.49	0.45	0.08
	MMR	0.42	0.35	0.06	0.34	0.38	0.12
	SLH	0.44	0.36	0.05	0.35	0.37	0.05
	UMR	0.30	0.27	0.02	0.35	0.35	0.03
PO4	ILR	0.14	0.14	0.01	0.18	0.21	0.03
	MMR	0.14	0.12	0.03	0.14	0.15	0.03
	SLH	0.13	0.13	0.01	0.14	0.13	0.02
	UMR	0.10	0.10	0.01	0.11	0.08	0.03

**Total phosphorus exceeded the proposed criteria of 0.10mg/L for all river segments (p<0.05). This study does not acknowledge a water quality criteria for orthophosphate.*



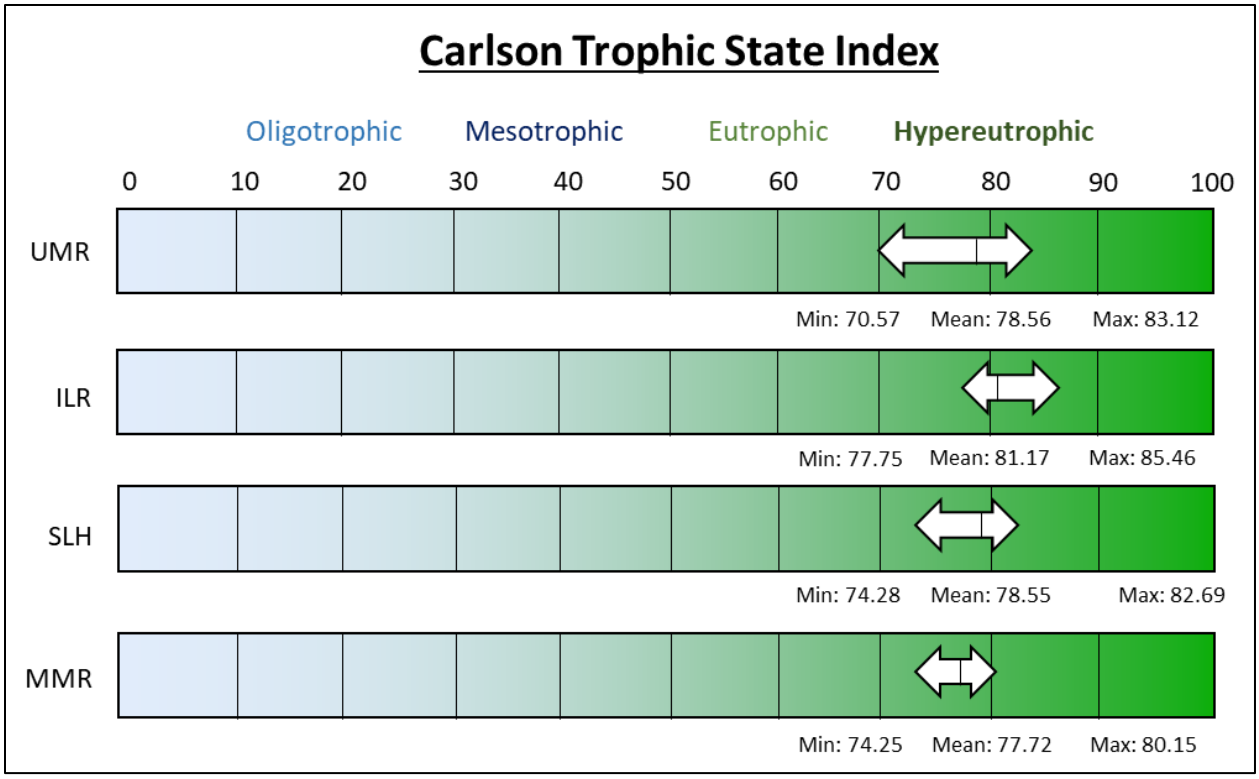






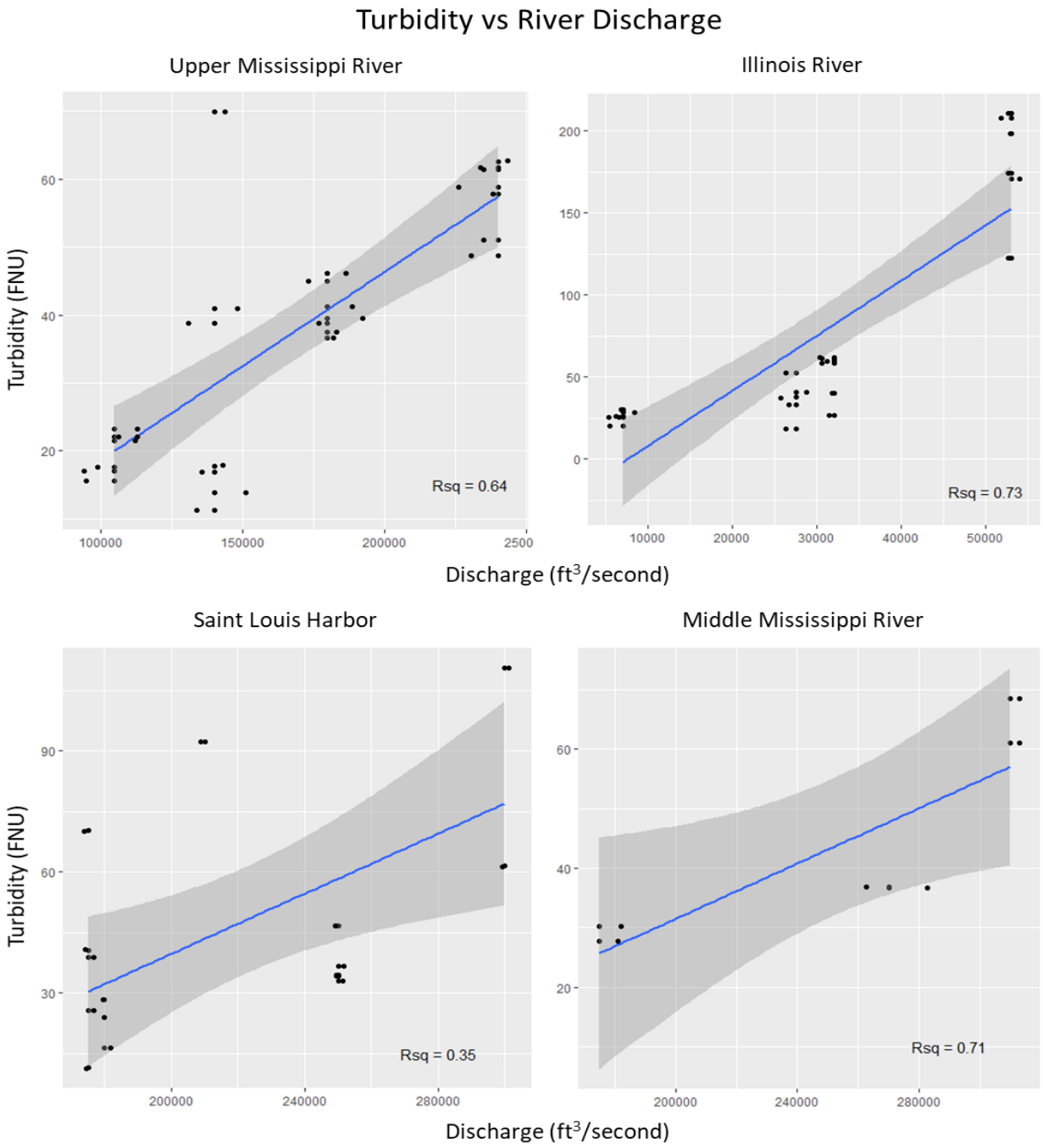
		Historical: 2012-2017			2018		
Metric	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
Chl_a	ILR	19.47	17.65	3.16	28.40	16.20	12.40
	MMR	8.31	5.30	1.96	19.03	13.95	11.96
	SLH	8.36	6.40	1.38	22.60	14.50	8.04
	UMR	10.80	6.40	1.67	33.73	24.60	11.82
PHEO_a	ILR	7.24	5.90	2.00	8.95	10.00	1.97
	MMR	4.35	2.95	1.01	8.18	6.60	4.91
	SLH	4.78	2.00	0.10	7.19	5.60	1.10
	UMR	5.01	2.15	0.72	8.83	8.20	2.21

Chlorophyl_a was not statistically greater than the proposed criteria for this study of 25mg/cm^3 ($p > 0.05$). This study does not acknowledge a criteria for pheophytin.



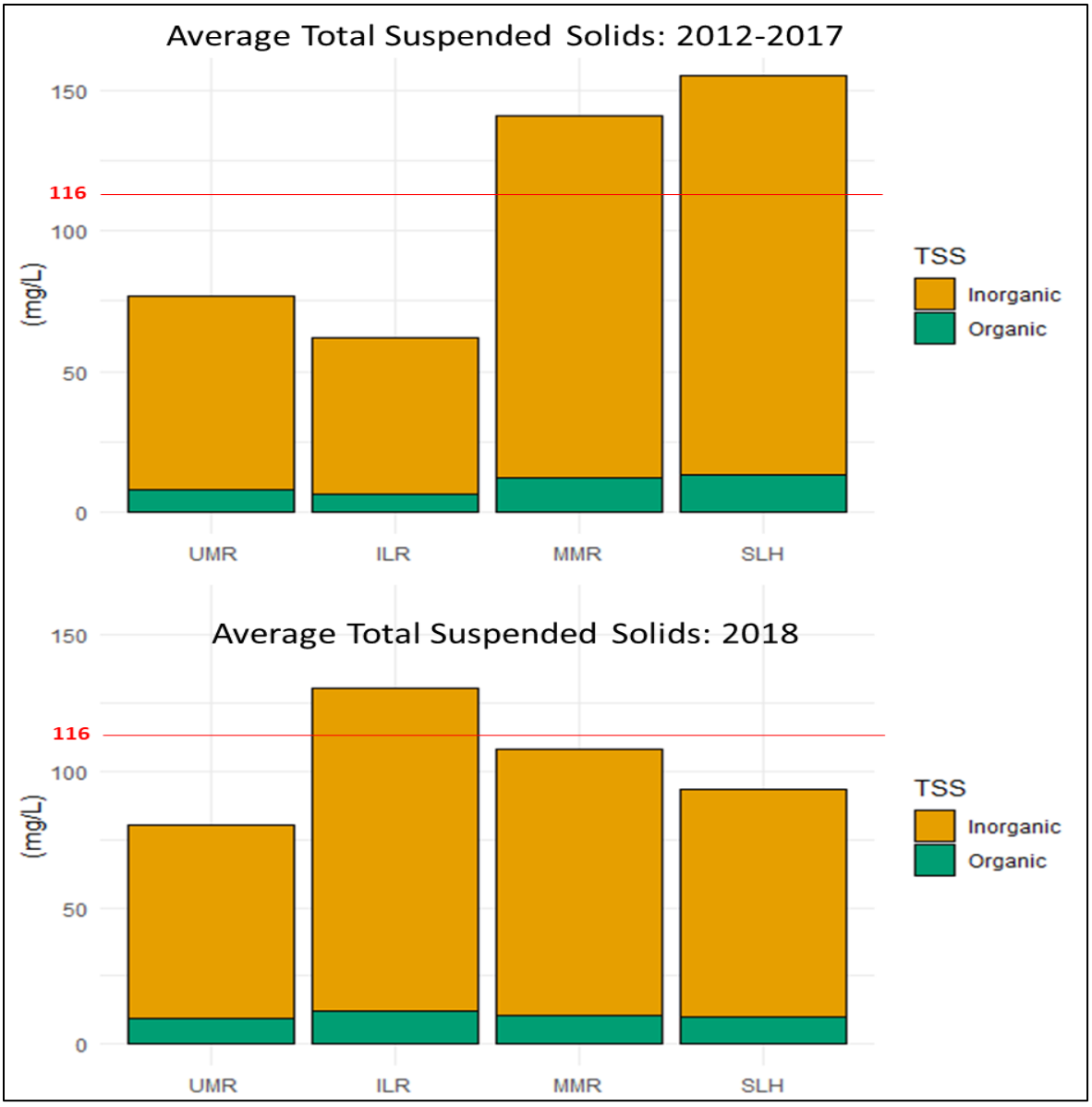
<40 = Oligotrophic __ 40-60 = Mesotrophic __ 60-70 = Eutrophic __ >80 Hypereutrophic

State	***Description***	***Chla***	***TP***	***Turb***
Oligotrophic	*Clear water and oxygenated hypolimnion throughout the year, minimal primary production.*	*Less than 2.5mg/m^3*	*Less than 0.01mg/L*	*Less than 1.0 FNU*
Mesotrophic	*Moderately clear water, but Increasing probability of anoxia during the summer, increased primary production.*	*2.5-8.0mg/m^3*	*0.01 – 0.08mg/L*	*1.0-12 FNU*
Eutrophic	*Decreased transparency, anoxic summer hypolimnion, extensive macrophyte and algal production, warm water fishery.*	*8.0-25.0mg/m^3*	*0.08-0.10mg/L*	*12 – 25.0 FNU*
Hypereutrophic	*Turbid water, anoxic hypolimnion, frequent algal blooms, few macrophytes, fish kills during summer.*	*Greater than 25.0mg/m^3*	*Greater than 0.10mg/L*	*Greater than 25.0 FNU*



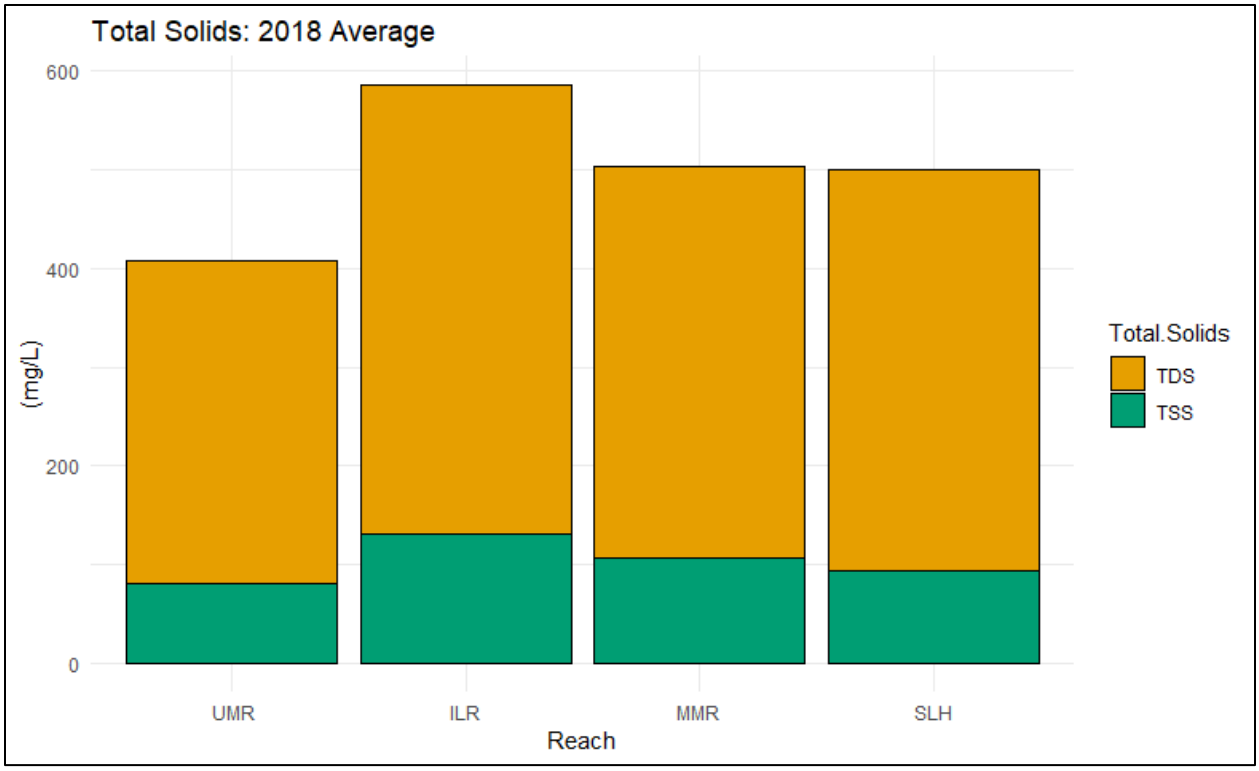
		Historical: 2012-2017			2018		
Metric	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
Turbidity	ILR	---	---	---	75.29	40.74	29.07
	MMR	---	---	---	43.47	36.74	17.86
	SLH	---	---	---	47.95	36.80	15.79
	UMR	---	---	---	36.98	38.79	6.86

This study does not acknowledge a criteria for turbidity.



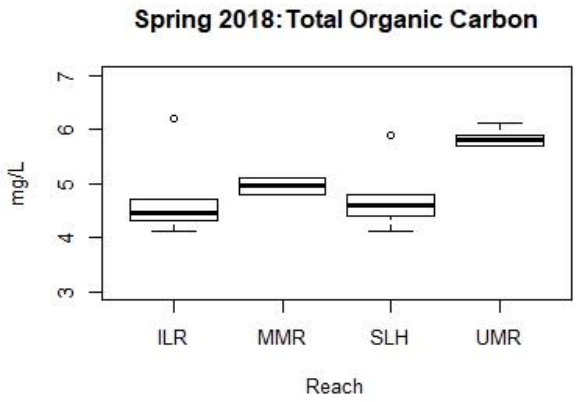
		Historical: 2012-2017			2018		
Metric	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
Inorganic (NVSS)	ILR	55.61	49.40	12.98	118.38	68.90	45.30
	MMR	128.32	95.10	33.46	97.69	81.12	33.56
	SLH	141.60	81.65	33.52	83.38	63.00	25.30
	UMR	68.85	60.60	8.85	70.76	74.25	13.46
Organic (VSS)	ILR	6.36	5.30	0.99	12.02	10.15	2.35
	MMR	12.43	9.35	2.82	9.59	9.87	1.71
	SLH	13.56	8.59	2.79	10.01	8.40	2.62
	UMR	7.92	7.00	0.73	9.40	10.00	1.24

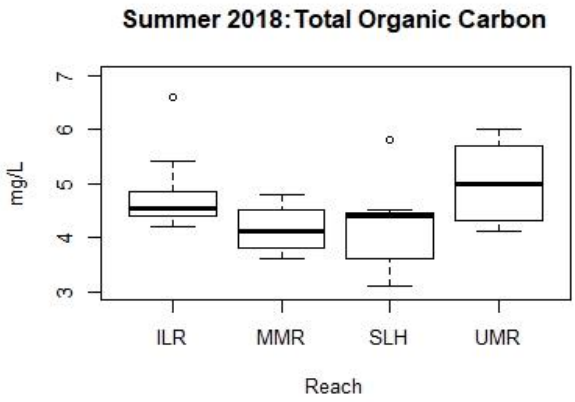
This study does not acknowledge a criteria for Non Volatile Suspended Solids or Volatile Suspended Solids. Total Suspended Solids (water quality criteria = 116 mg/L) were not statistically greater than the criteria used for this study ($p > 0.05$).

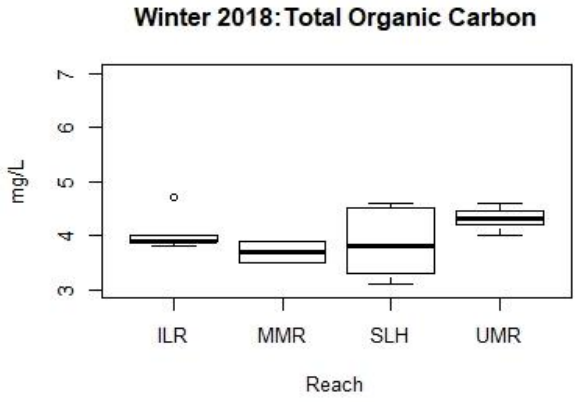


		2018		
Metric	Reach	Mean	Median	CI (95%)
TDS	ILR	455.44	468.23	20.62
	MMR	396.82	395.50	11.41
	SLH	407.73	420.25	28.58
	UMR	327.95	324.50	8.85
TSS	ILR	130.40	77.85	47.54
	MMR	107.28	88.25	34.35
	SLH	93.39	72.50	27.47
	UMR	80.16	86.25	14.37

Total Dissolved Solids (water quality criteria = 500 mg/L) and Total Suspended Solids (water quality criteria = 116 mg/L) were not statistically greater than the criteria used for this study (p > 0.05).

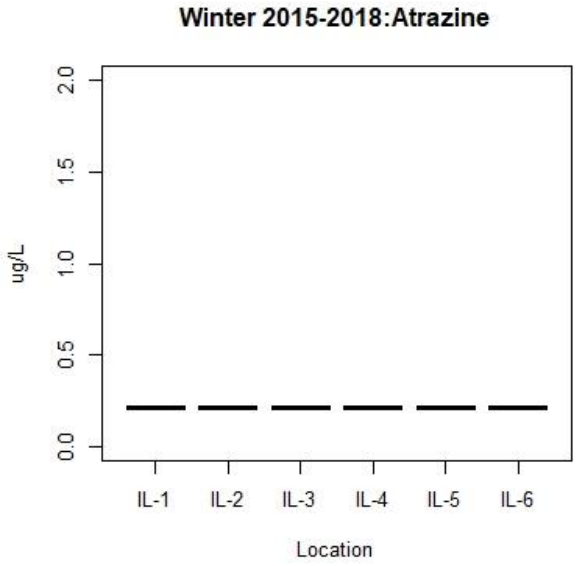


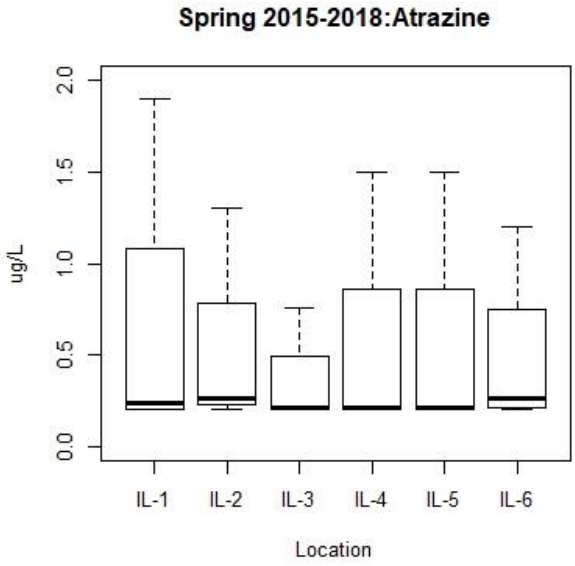


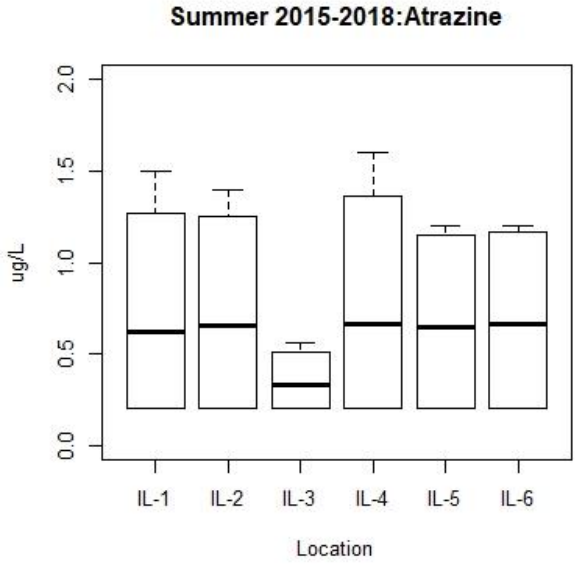


		Historical: 2012-2017			2018		
Season	Reach	Mean	Median	CI (95%)	Mean	Median	CI (95%)
Spring	ILR	4.20	4.10	0.20	4.70	4.45	0.80
	MMR	4.40	4.60	0.43	4.95	4.95	1.91
	SLH	4.75	4.40	0.88	4.76	4.60	0.85
	UMR	4.39	4.50	0.18	5.83	5.80	0.14
Summer	ILR	4.35	4.65	0.36	4.78	4.55	0.41
	MMR	4.69	4.65	0.38	4.15	4.10	0.80
	SLH	4.55	4.30	0.23	4.31	4.40	0.59
	UMR	5.54	5.40	0.30	5.03	5.00	0.43
Fall	MMR	4.20	4.30	1.96			
	SLH	5.13	5.80	0.83			
	UMR	6.51	6.50	0.32			
Winter	ILR	3.75	3.60	0.55	4.03	3.90	0.35
	MMR	4.00	4.00	1.27	3.70	3.70	2.54
	SLH	4.20	4.10	0.56	3.86	3.80	0.84
	UMR	4.91	4.90	0.03	4.31	4.30	0.19

This study does not acknowledge a water quality criteria for Total Organic Carbon.

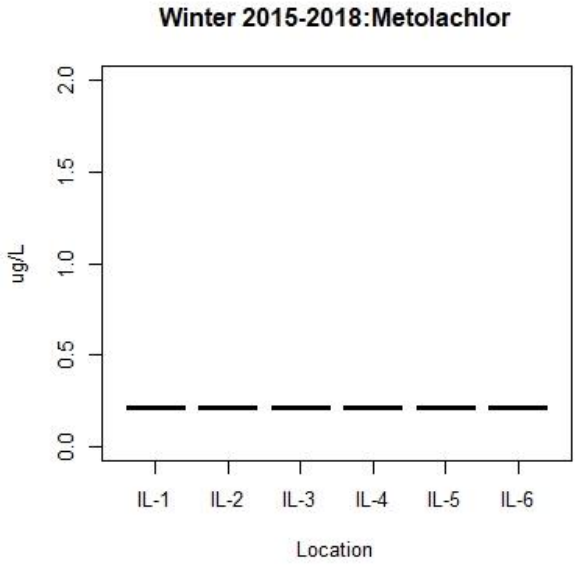


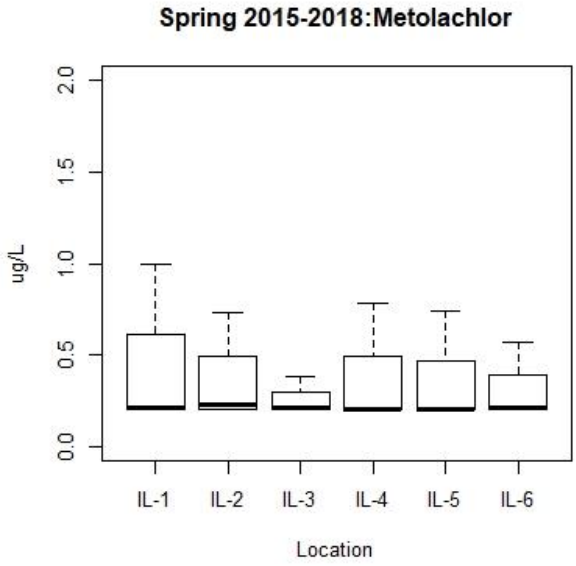


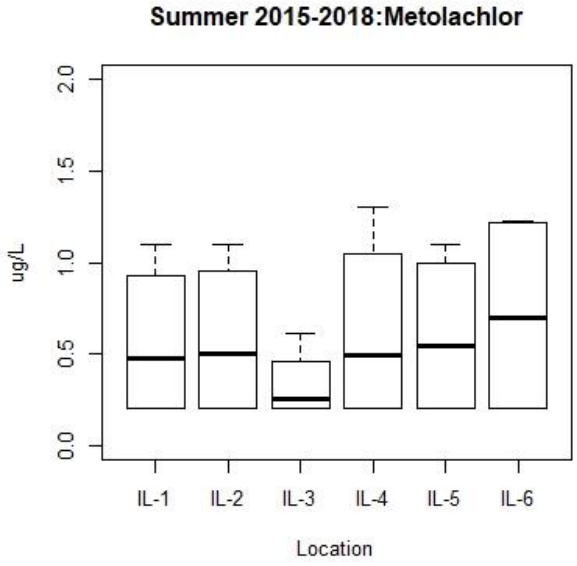


	Historical Illinois River: 2015-2017			Illinois River: 2018		
Season	Mean	Median	CI (95%)	Mean	Median	CI (95%)
Winter	0.22	0.22	0.00	0.20	0.20	0.00
Spring	0.59	0.20	0.30	0.25	0.25	0.04
Summer	0.71	0.33	0.38	0.61	0.38	0.29
Fall	---	---	---	---	---	---

All measurements for Atrazine were below the recommended criteria for this study (9 ug/L).







	Historical Illinois River: 2015-2017			Illinois River: 2018		
Season	Mean	Median	CI (95%)	Mean	Median	CI (95%)
Winter	0.22	0.22	0.00	0.20	0.20	0.00
Spring	0.37	0.20	0.13	0.21	0.20	0.01
Summer	0.63	0.41	0.31	0.50	0.26	0.23
Fall	---	---	---	---	---	---

All measurements for Metolachlor were below the recommended criteria for this study (30.4 ug/L).

DISCUSSION: WATER QUALITY

Water quality metrics assessed by CEMVS can be sporadic and highly variable from year to year, thus long-term data collection using consistent and comparable methodology is critical to identify trends or patterns. In general, conditions observed during 2018 did not deviate far from conditions observed during the reference period (2012-2017); nevertheless, concerns for all years assessed regarding DO, pH, TP, Chl-a, and TSS were evident.

The average DO measured on the Illinois River above Grafton during the summers of 2017 and 2018 was $\bar{x}$ = 4.98 mg/L. Stratification on the Illinois River is minimal, thus conditions in the top meter where samples are collected would be representative of for the entire water column. Note that the average DO for the UMR, SLH, and MMR was $\bar{x}$ = 6.94 mg/L during the same period.

The elevated levels for TP and Chl-a observed on the ILR are indicators of a hypereutrophic system, which may explain the lower DO concentrations. Phosphorus is considered to be a limiting nutrient for primary producers (e.g., plants and algae); thus elevated levels of TP can stimulate rapid growth of algae which may cause depletion of DO during respiration and decaying processes. During June of 2018, a harmful algal bloom was reported on the ILR above the La Grange Lock and Dam (outside the spatial scope of this study). The Illinois EPA reported TP levels as being ~0.30 mg/L, which is below ILR concentrations reported in this study ($\bar{x}$ = 0.49 mg/L). Accordingly, Chl-a levels during 2018 were $\bar{x}$ = 29 mg/cm3, which exceeds concentrations characteristic of a hypereutrophic system (25 mg/cm^3). Similar hypereutrophic characteristics were also observed on the UMR, SLH, and MMR.

Total solids can affect water quality by increasing temperature through the absorption of sunlight by suspended particles in the water column, and consequently reduce DO. Total solids are also strongly correlated with water clarity and the presence of Macrophytes. Historically, TSS has been of greatest concern for SLH and MMR where concentrations frequently exceed the recommended criteria of 116 mg/L. Inputs from the Missouri River are likely the leading cause for increased concentrations. From 2005-2018, TSS was $\bar{x}$ = 207 mg/L on the Missouri River near the confluence (UMR-2), which exceeds what was observed on the UMR during the same time period by greater than two-fold ($\bar{x}$ = 80 mg/L). Although TSS was relatively low for SLH and MMR in 2018, the average concentration of TSS on the ILR ($\bar{x}$ = 130 mg/L) exceeded the recommended criteria; however, it was not statistically greater ($t_{23,\ 0.05}$ = 0.63).

Measurements for pH on the UMR during June 2018 were greater than all other measurements reported during the historical reference period (2012-2017). Long-term increases in pH have been a general trend at several USACE projects that the CEMVS monitors. Tributary data collected from the Salt, Big Muddy, and Kaskaskia Rivers have all observed significant increases in pH during the prior 40 years (see Appendix A).

SPECIAL STUDY: SEDIMENT CHARACTERIZATION

Introduction

Channel maintenance activities utilized by USACE have meaningful impacts on the fate and transfer of suspended and bedded sediments. Suspended and bedded sediments are defined by the EPA as particulate organic and inorganic matter that suspend in or carried by the water and/or accumulate in a loose, unconsolidated form on the bottom of natural water bodies. This includes the frequently used terms of clean sediment, suspended sediment, total suspended solids, bedload, turbidity, or in common terms, dirt, soils or eroded materials.

The United States Army Corps of Engineers, Saint Louis District, performs routine sediment sampling at dredge locations to characterize sediments by grain particle size. In general, sediments within the navigation channel are classified as being predominantly sand (98%), followed by gravel (1.8%), and silt/clay (0.2%). The purpose of this study was to build from what is known about sediment grain size by introducing data regarding contaminants, nutrients, and metals within sediments from the navigation channel.

Data Collection

During August 2018, sediments were collected and analyzed for contaminants, nutrients, and metals (Table 3). Sediments were collected at 22 locations (Table 1) using a 6”x6” petite ponar dredge, preserved, and transported to the Applied Research and Development Laboratory in Mount Vernon, Illinois, (ARDL) for analysis. In general, a petite ponar targets the upper 4” of substrate.

Quality Assurance

Since 2012, ARDL has analyzed water quality samples for CEMVS. Their quality assurance program includes the use of quality control charts, check standards, field and in-house matrix spikes, laboratory blanks and performance evaluations samples. In addition, one blind duplicate sample is submitted for every 20 samples submitted.

Comparison to Applicable Sediment Standards

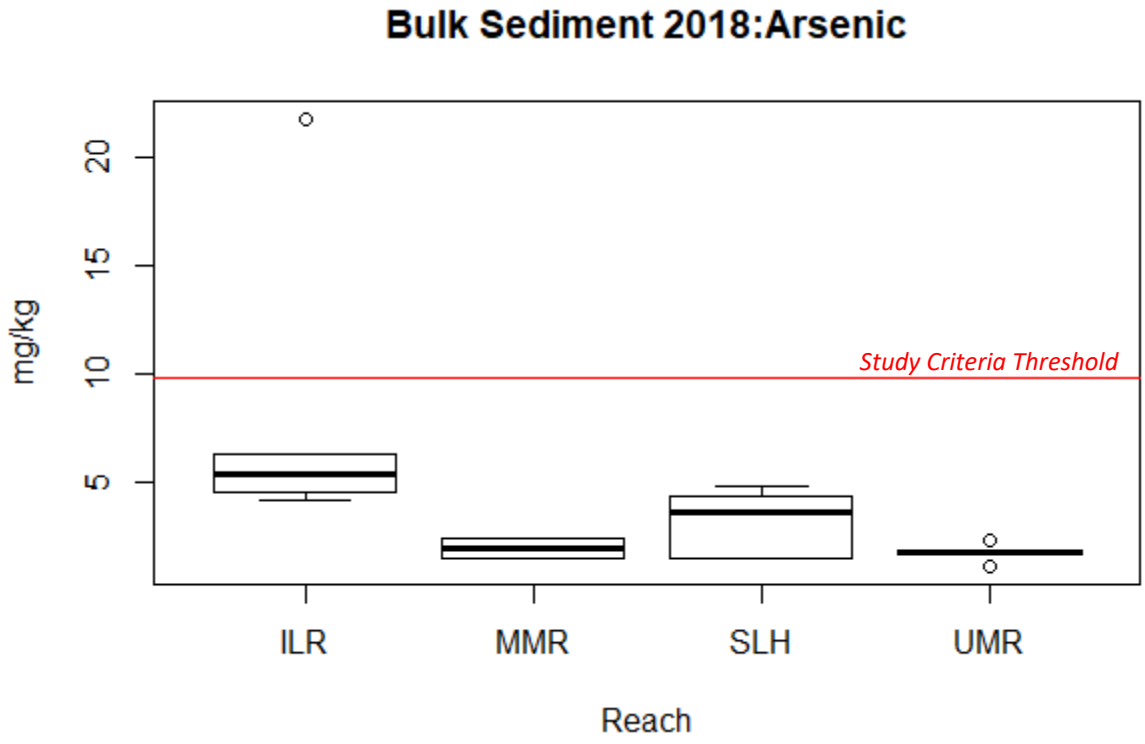
Laboratory results were compared to applicable sediment standards criteria established by the appropriate states pursuant to regulatory guidelines. If a state sediment standard was not available, standard criteria from the literature was considered (Table 3).

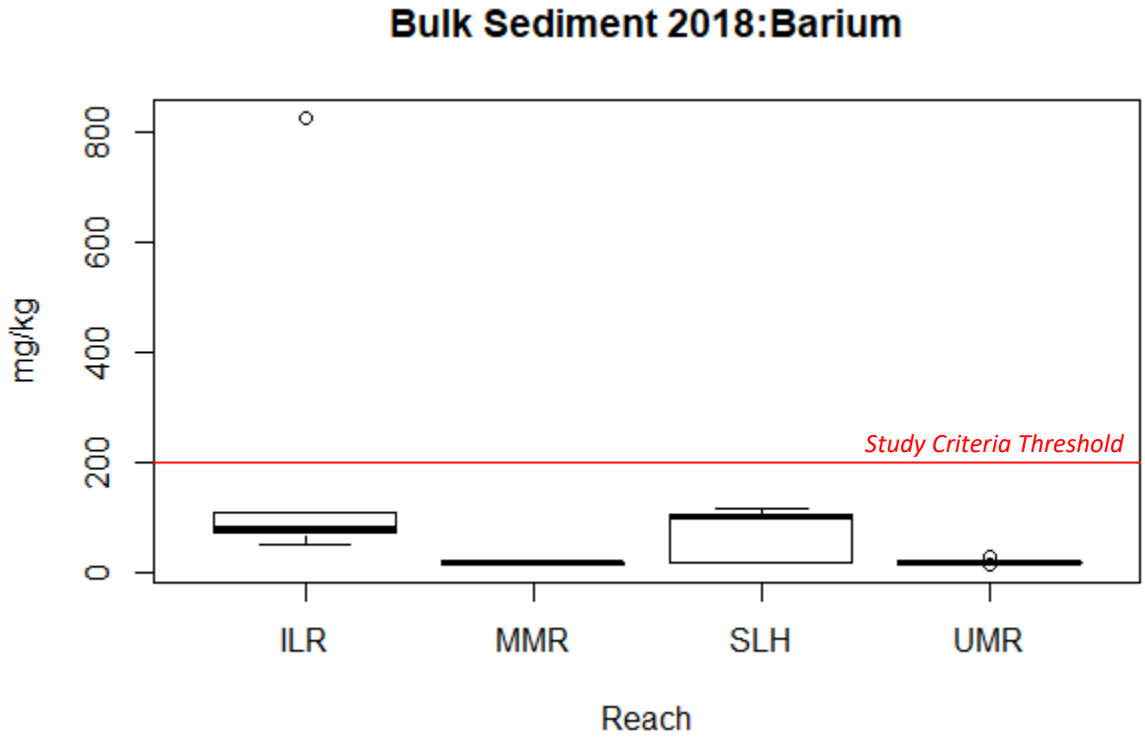
Laboratory Methods and Sediment Criteria Summary

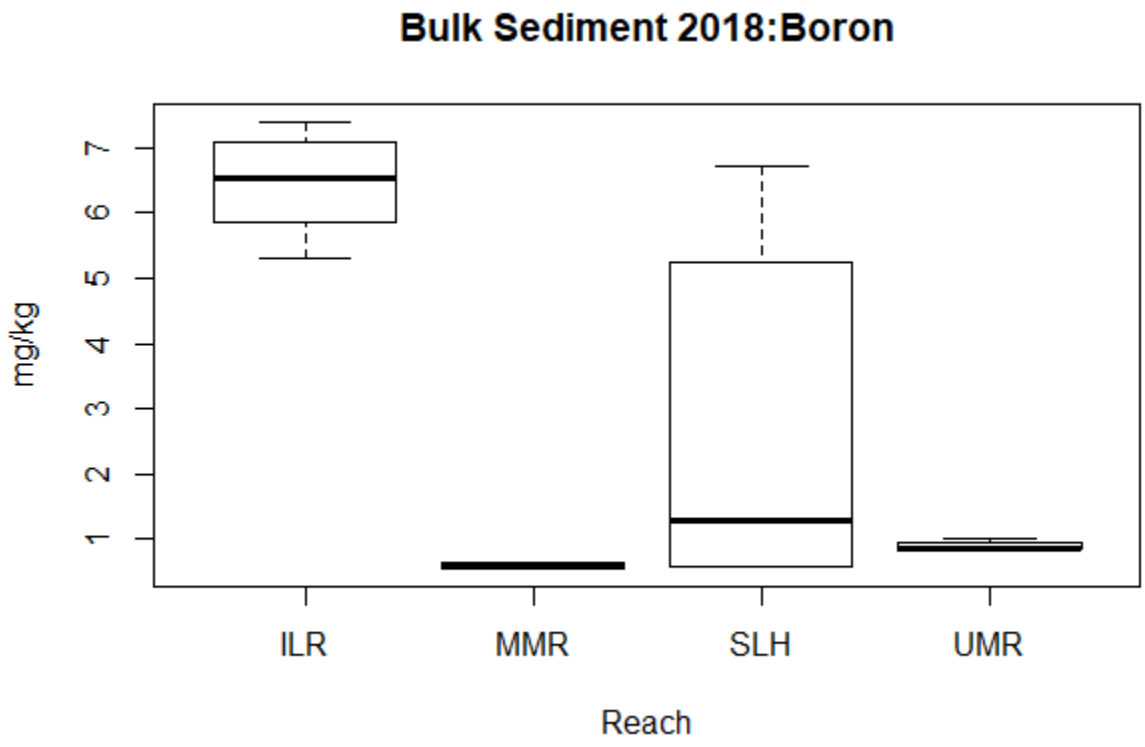
Table 3: Metrics, Methods and Criteria Used to Evaluate Sediment Characteristics

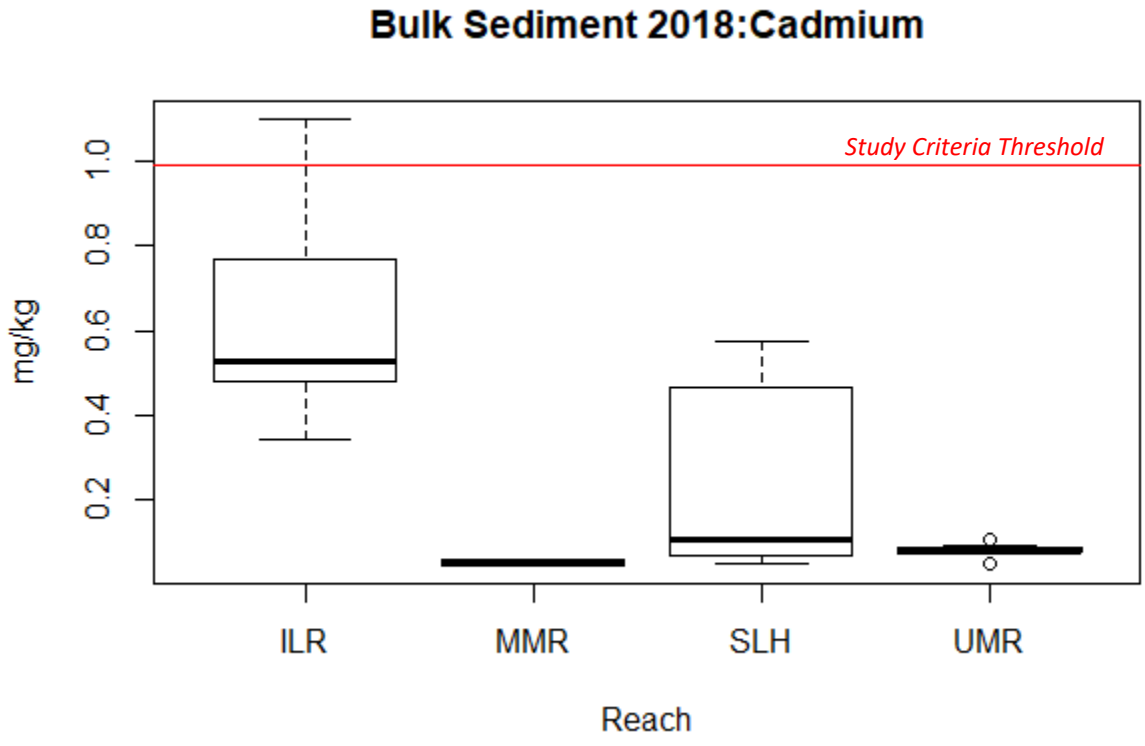
Metric	Analysis Method	Sediment Criteria	Source
Arsenic	6010C	9.79 mg/kg	Macdonald et al. 2000
Barium	6010C	200 mg/kg	Friday 1999
Boron	6010C	---	---
Cadmium	6010C	0.99 mg/kg	Macdonald et al. 2000
Chromium	6010C	43.4 mg/kg	Macdonald et al. 2000
Copper	6010C	31.6 mg/kg	Macdonald et al. 2000
Iron	6010C	20000 mg/kg	Persaud et al. 1993
Kjeldahl nitrogen	351.2	---	---
Lead	6010C	35.8 mg/kg	Macdonald et al. 2000
Manganese	6010C	460 mg/kg	Persaud et al. 1993
Mercury	7470A	0.18 mg/kg	Macdonald et al. 2000
Nickel	6010C	22.7 mg/kg	Macdonald et al. 2000
Nitrate-N	GREEN	---	---
Pest/Insecticides	8270C	---	---
Phosphorus, total	365.2	---	---
Selenium	6010C	2 mg/kg	Lemley 2002
Silver	6010C	2 mg/kg	Friday 1999
Solids, total	160.3	---	---
Total Organic Carbon	9060	---	---
Zinc	6010C	121 mg/kg	Macdonald et al. 2000

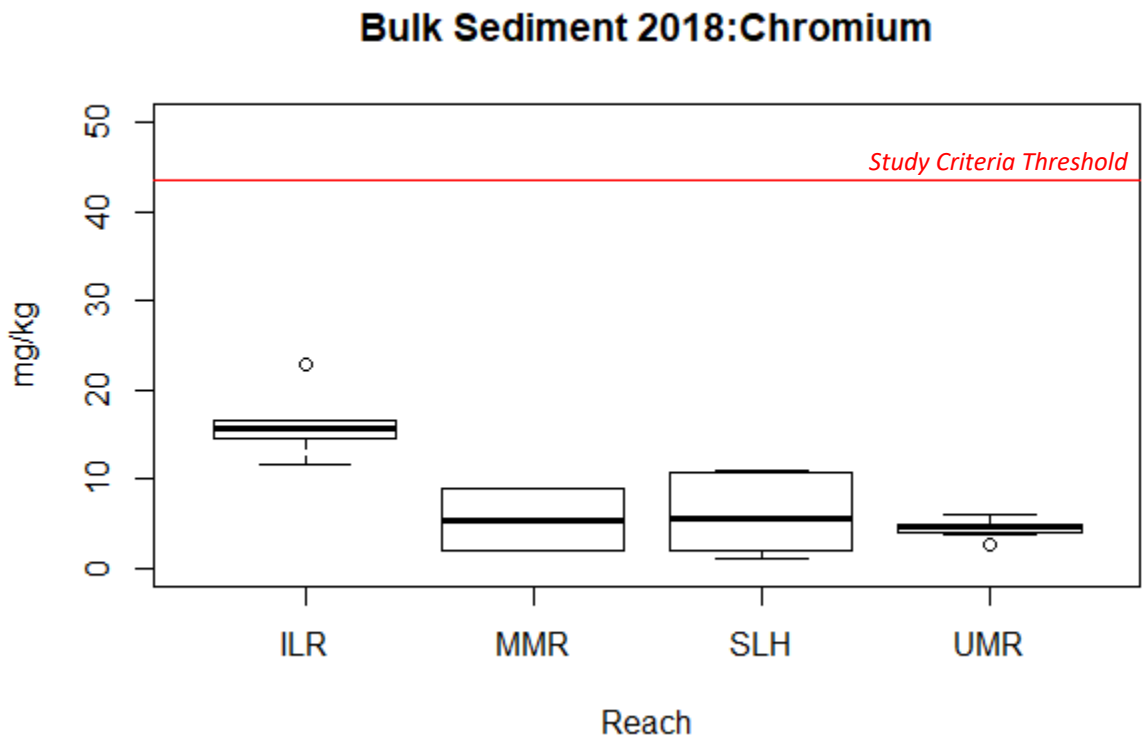
Results: Bulk Sediment

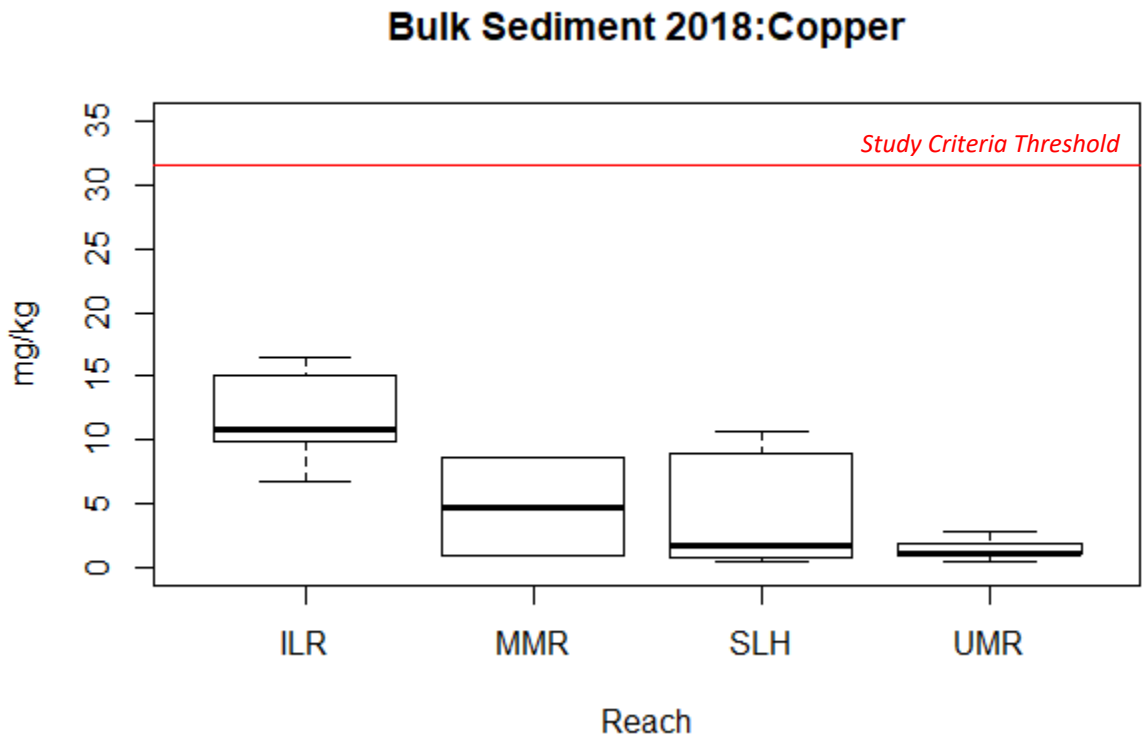


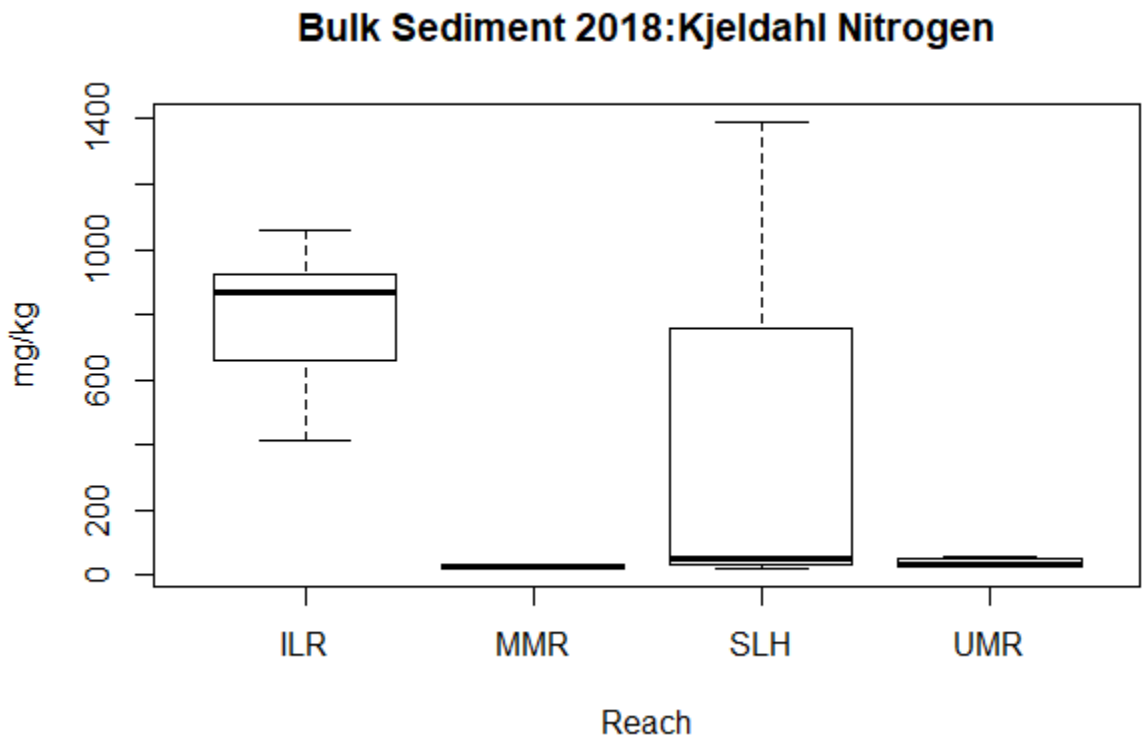


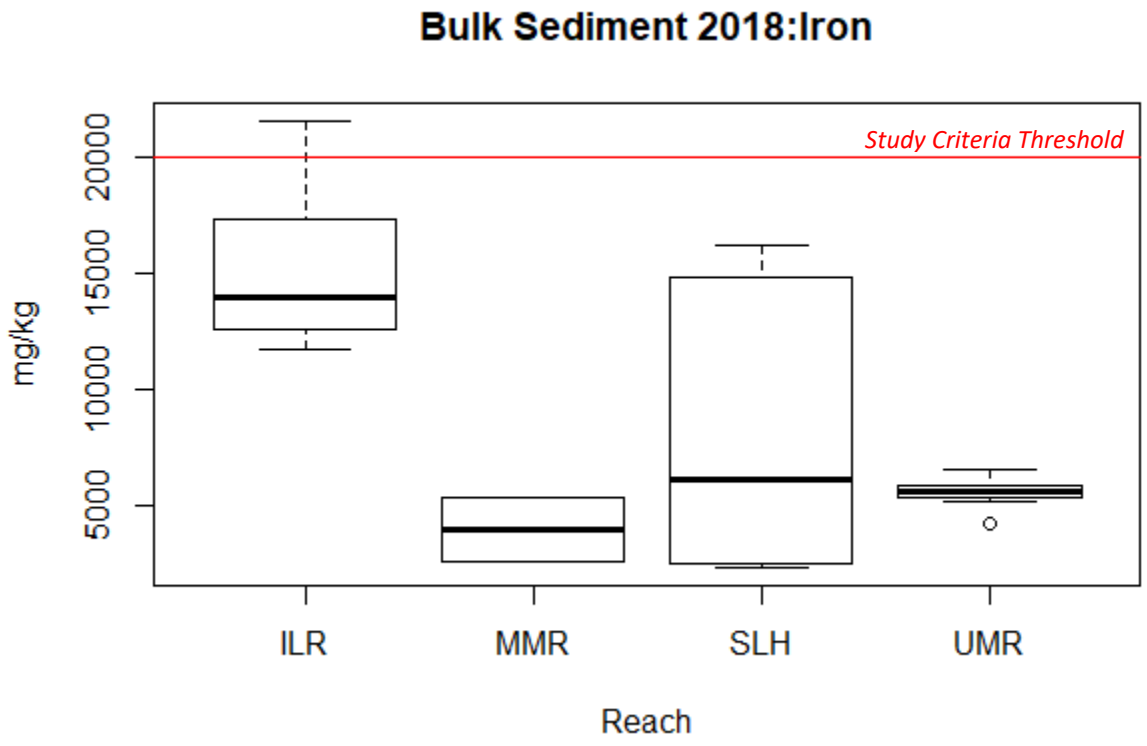

Bulk Sediment 2018:Boron
mg/kg
1
2
3
4
5
6
7
ILR
MMR
SLH
UMR
Reach

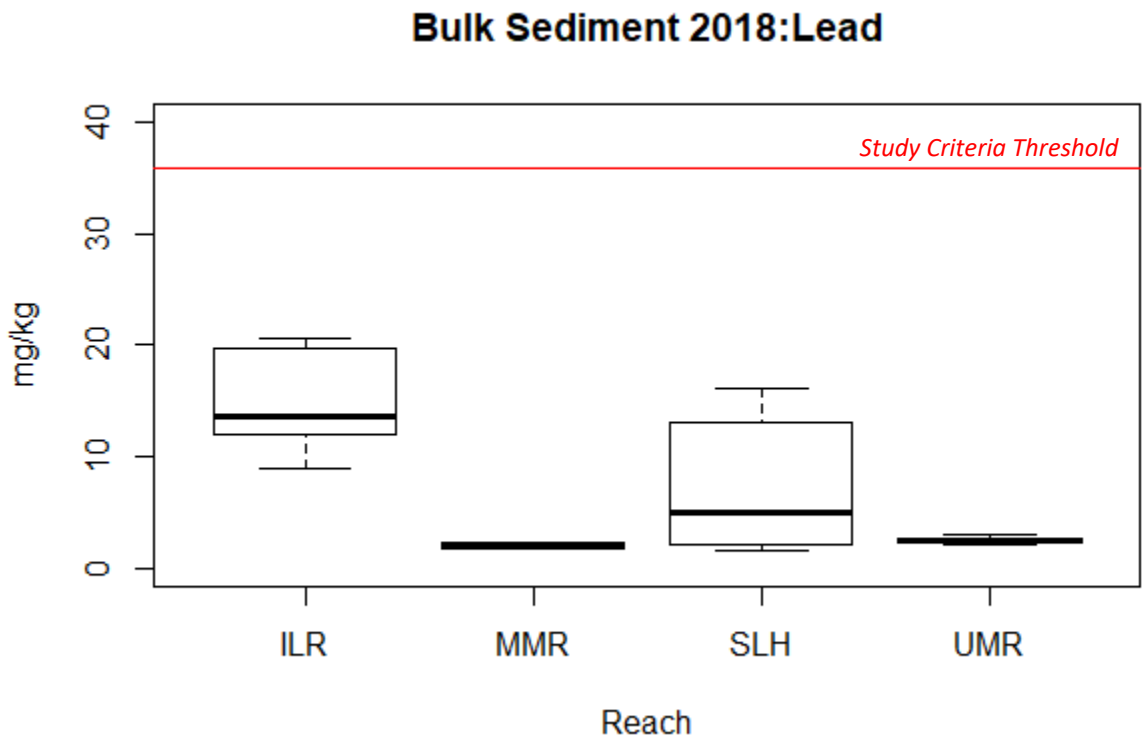

Bulk Sediment 2018:Cadmium
Study Criteria Threshold
mg/kg
0.2
0.4
0.6
0.8
1.0
ILR
MMR
SLH
UMR
Reach

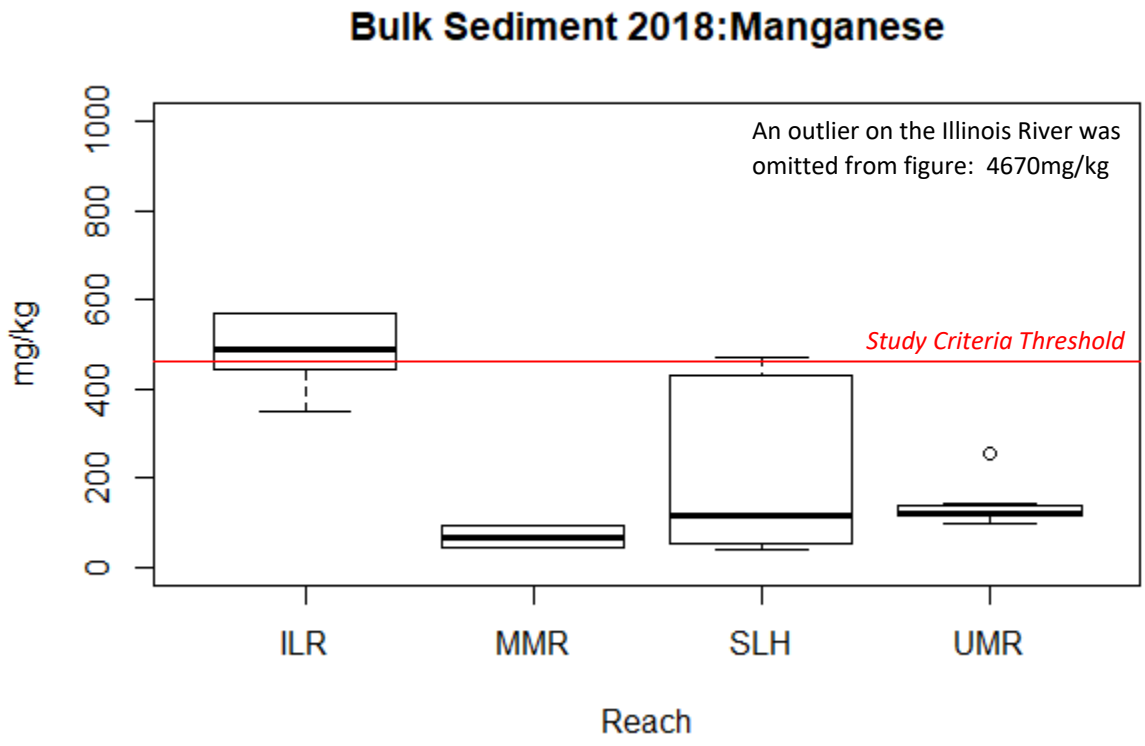

Bulk Sediment 2018:Chromium
Study Criteria Threshold
mg/kg
0
10
20
30
40
50
ILR
MMR
SLH
UMR
Reach

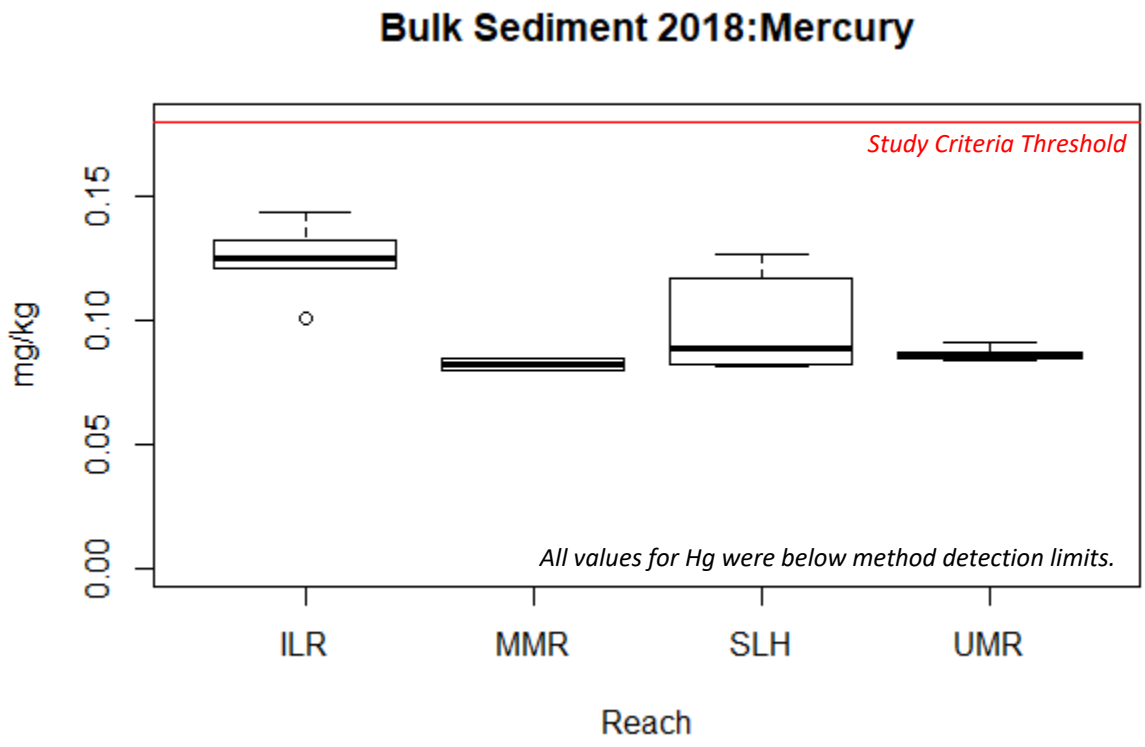

Bulk Sediment 2018:Copper
Study Criteria Threshold
mg/kg
0
5
10
15
20
25
30
35
ILR
MMR
SLH
UMR
Reach

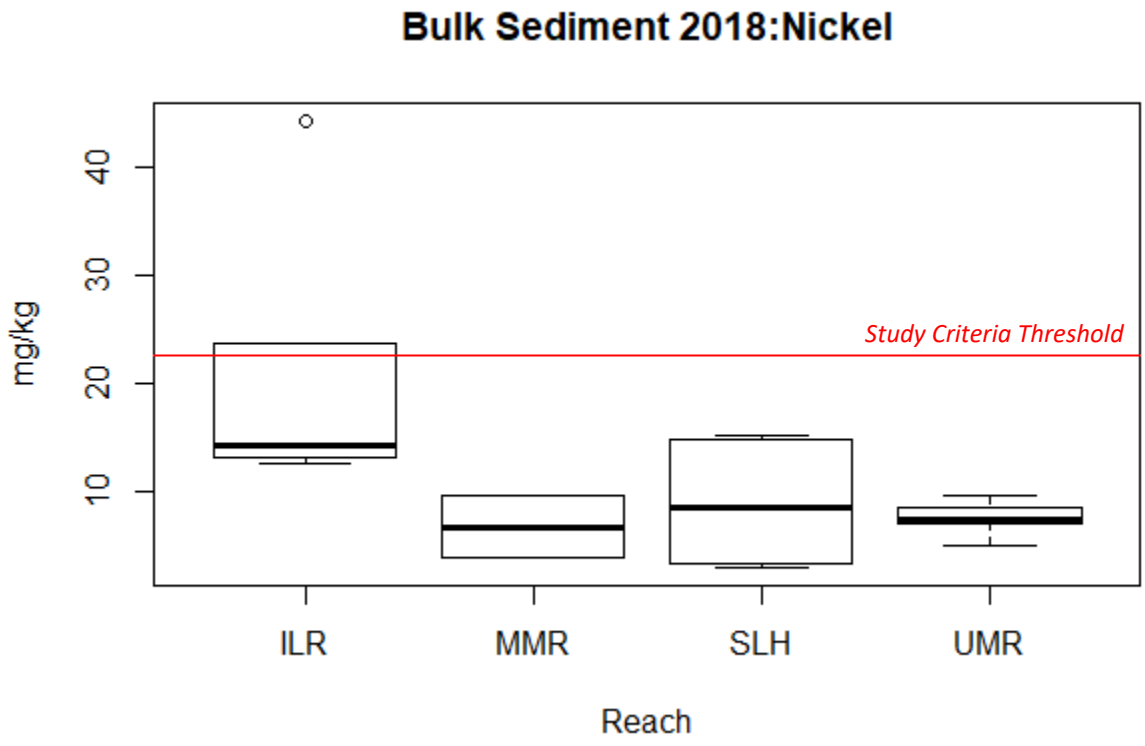

Bulk Sediment 2018:Kjeldahl Nitrogen
mg/kg
0
200
600
1000
1400
ILR
MMR
SLH
UMR
Reach

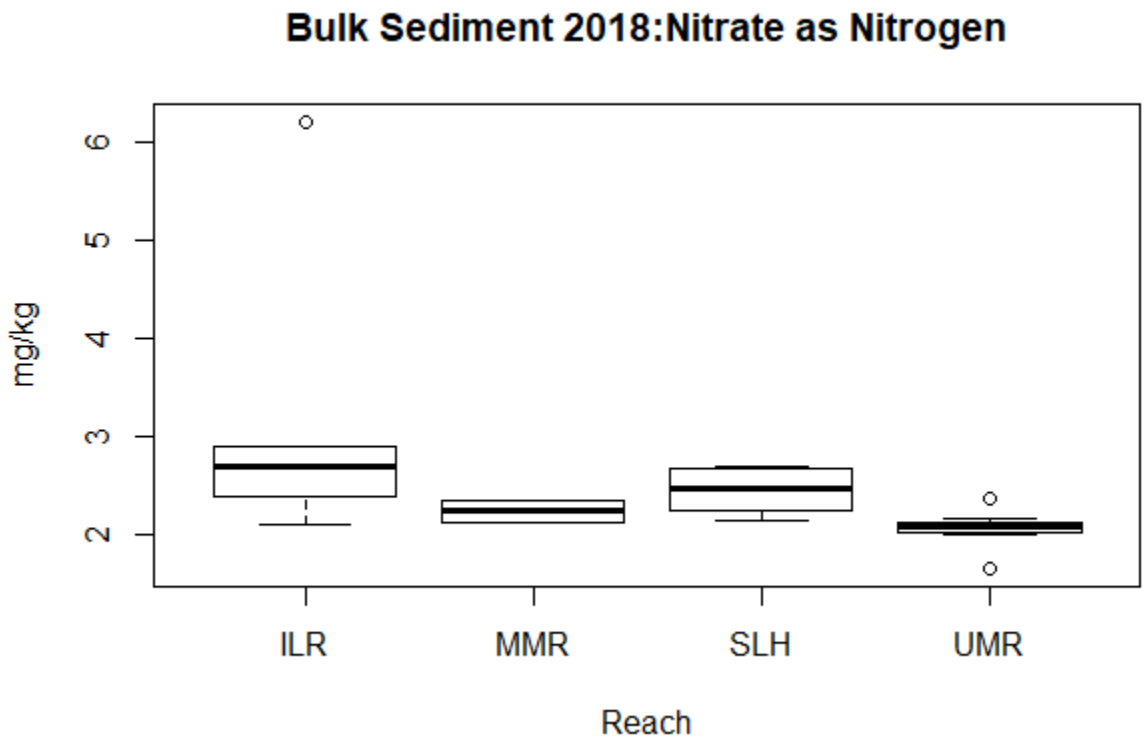

Bulk Sediment 2018:Iron
Study Criteria Threshold
mg/kg
5000
10000
15000
20000
ILR
MMR
SLH
UMR
Reach

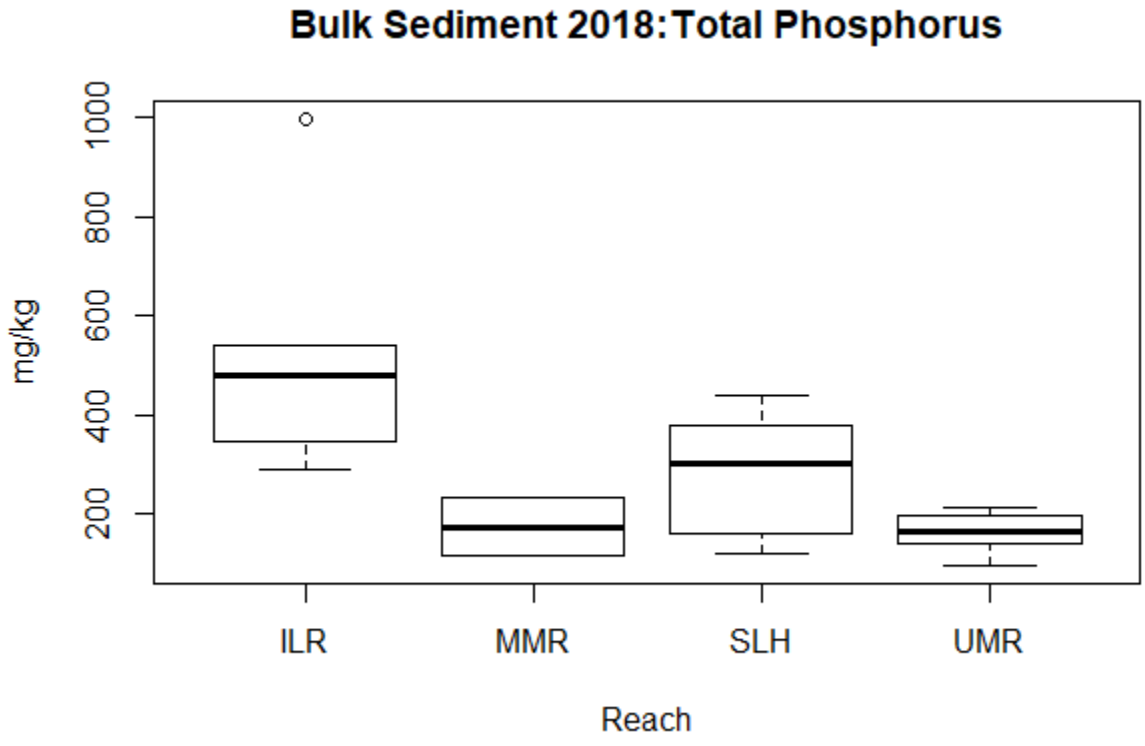

Bulk Sediment 2018:Lead
Study Criteria Threshold
mg/kg
0
10
20
30
40
ILR
MMR
SLH
UMR
Reach

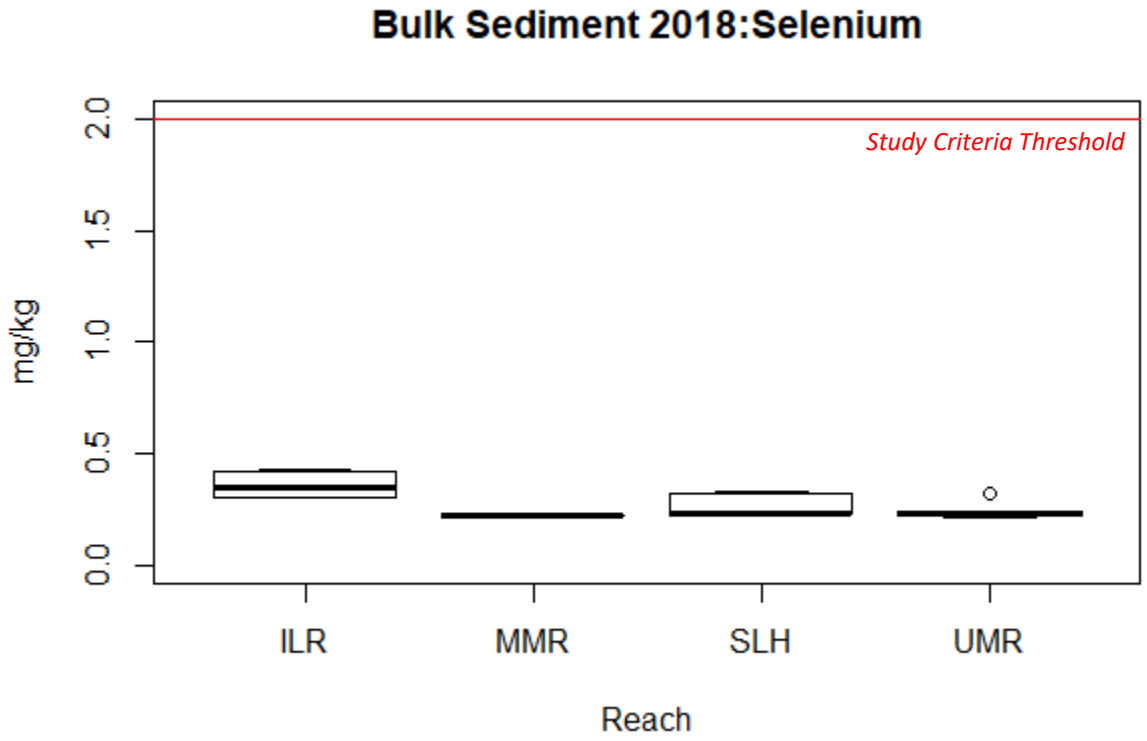

Bulk Sediment 2018:Manganese
An outlier on the Illinois River was omitted from figure: 4670mg/kg
Study Criteria Threshold
mg/kg
0
200
400
600
800
1000
ILR
MMR
SLH
UMR
Reach

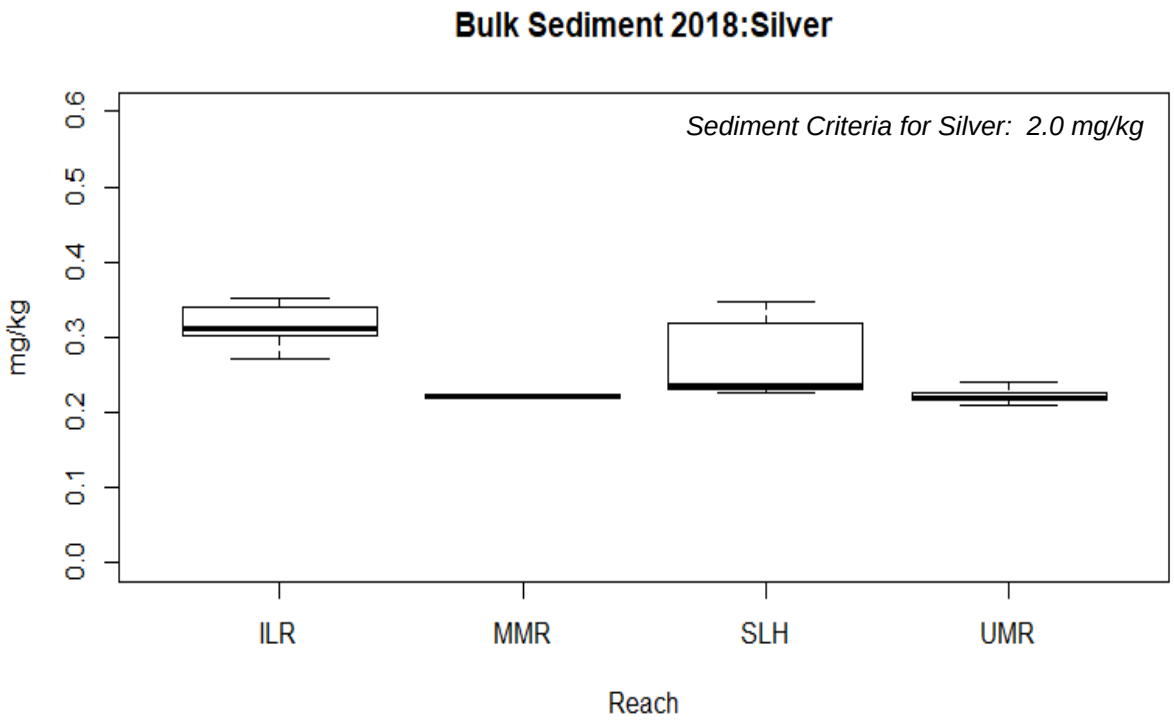

Bulk Sediment 2018:Mercury
Study Criteria Threshold
All values for Hg were below method detection limits.
mg/kg
0.00
0.05
0.10
0.15
ILR
MMR
SLH
UMR
Reach

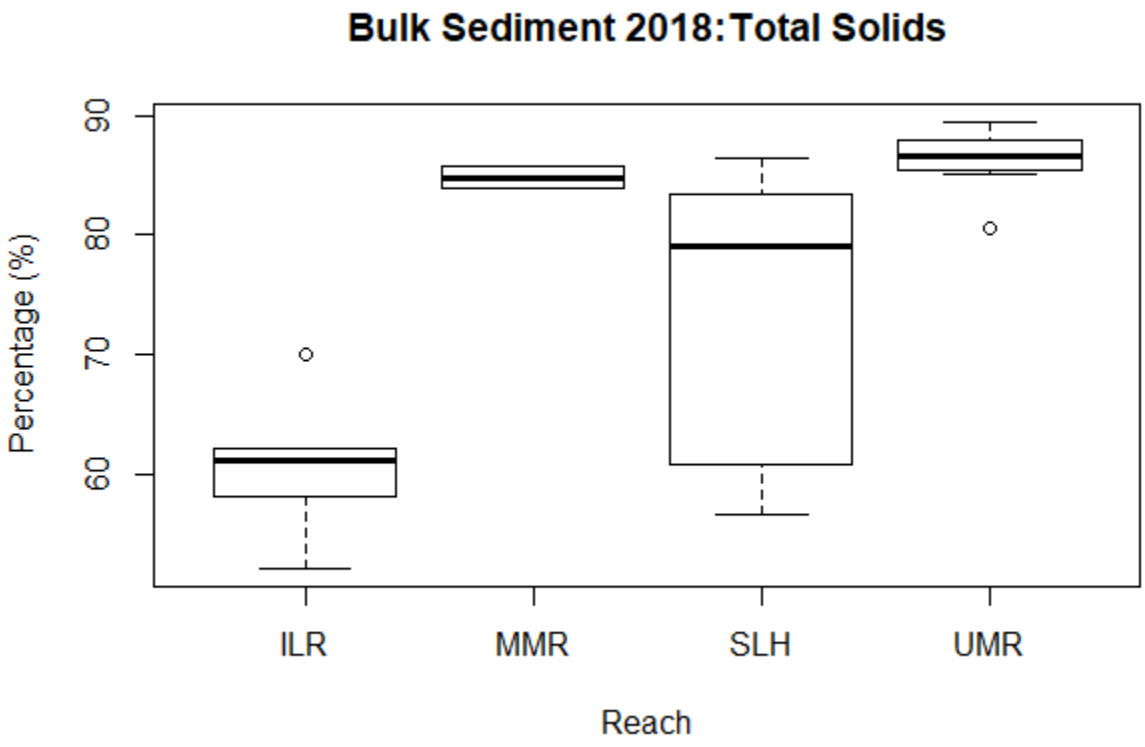

Bulk Sediment 2018:Nickel
Study Criteria Threshold
mg/kg
10
20
30
40
ILR
MMR
SLH
UMR
Reach

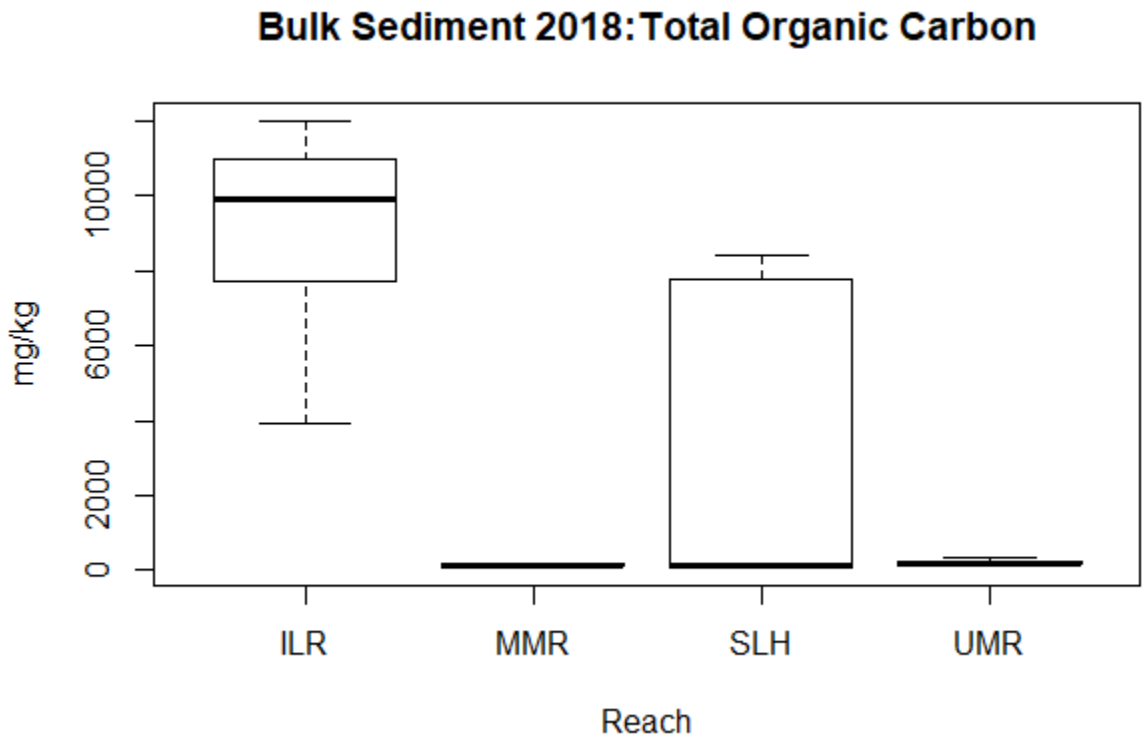

Bulk Sediment 2018:Nitrate as Nitrogen
mg/kg
2
3
4
5
6
ILR
MMR
SLH
UMR
Reach

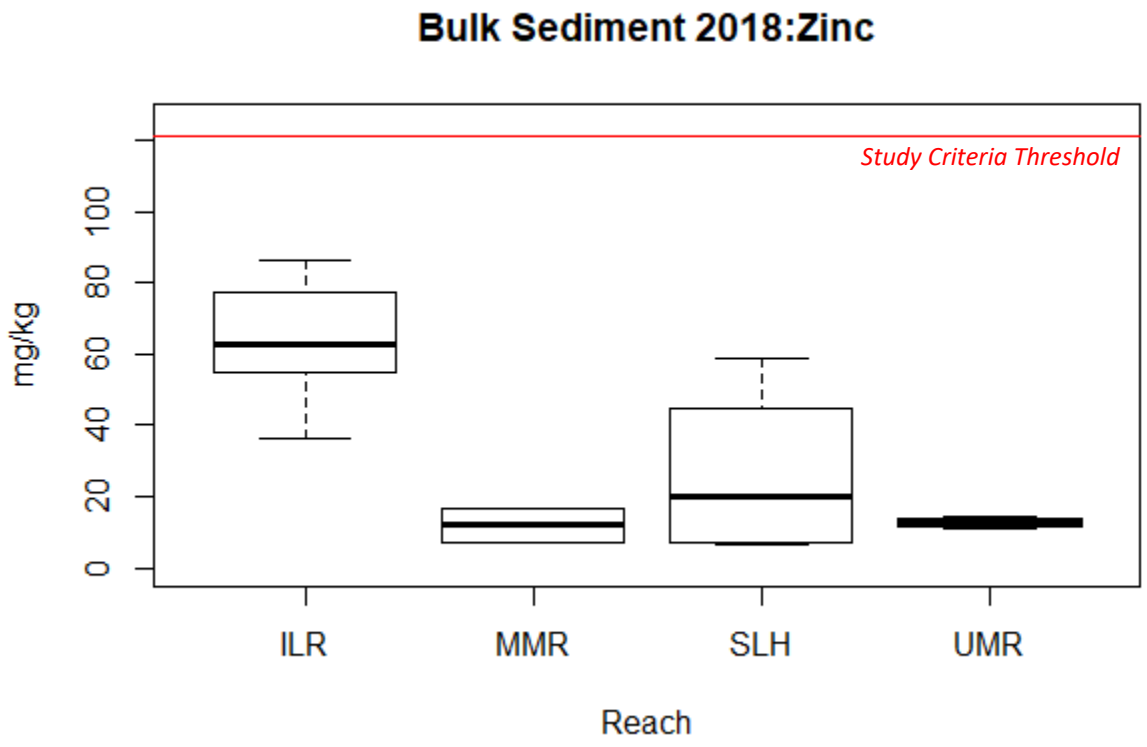

Bulk Sediment 2018:Total Phosphorus
mg/kg
200
400
600
800
1000
ILR
MMR
SLH
UMR
Reach


Bulk Sediment 2018:Selenium
Study Criteria Threshold
mg/kg
0.0
0.5
1.0
1.5
2.0
ILR
MMR
SLH
UMR
Reach


Bulk Sediment 2018:Silver
Sediment Criteria for Silver: 2.0 mg/kg
mg/kg
0.0
0.1
0.2
0.3
0.4
0.5
0.6
ILR
MMR
SLH
UMR
Reach


Bulk Sediment 2018:Total Solids
Percentage (%)
60
70
80
90
ILR
MMR
SLH
UMR
Reach


Bulk Sediment 2018:Total Organic Carbon
mg/kg
0
2000
6000
10000
ILR
MMR
SLH
UMR
Reach


Bulk Sediment 2018:Zinc
Study Criteria Threshold
mg/kg
0
20
40
60
80
100
ILR
MMR
SLH
UMR
Reach

Discussion: Sediment

Sediment results for samples collected on the Mississippi River were encouraging. During recent years, Mercury, Lead, and Zinc have been concerns on the Mississippi River (both Missouri Department of Natural Resources (DNR) and Illinois EPA 303D List); however, concentrations reported in the current study were below sediment criteria for the three elements. There was, however, one occurrence of Manganese that exceeded this study's sediment criteria in SLH (UMR-1; Chain of Rocks Canal). Although sediment grain size (e.g., gravel, sand, fine) was not analyzed for this study, prior sampling within the Chain of Rocks Canal have reported fine sediments as being relatively common, which is not typical for the CEMVS navigation channel. Fine sediments such as clay and silt are commonly associated with contaminants including Manganese.

Conversely, sediment conditions observed within the Illinois River were not encouraging. At least one observation exceeded sediment criteria set for Arsenic, Barium, Cadmium, Iron, Manganese, and Nickel. Excessive concentrations of Manganese occurred in 67% of samples, including one sample that exceeded the recommended criteria by ten-fold. Manganese is currently not listed on the Illinois 303D List for Impaired Waters.

Caution should be used when interpreting sediment results for this study. Unlike the water quality section of this report, the sediment results were based on a relatively small sample size, and lack adequate statistical power; however, the utility of this data would increase by combining the current study's results with future sampling data.

MONITORING PROGRAM RECOMMENDATIONS

The Middle Mississippi River includes more than half of the Mississippi river miles monitored by CEMVS; however, only two locations are currently monitored (OPR-2 and OPR-4). Consequently, there is a high level of variability for annual data. Increasing the number of samples collected on the MMR would decrease the amount of variability in data, and allow for a more accurate analysis; therefore, it is recommended that three additional locations be added to annual monitoring for the MMR.

Conversely, variability for metrics evaluated on the ILR is minimal. Although minimal variability is desired, the six sampling locations occur on the lower 18 miles of the ILR. Note that CEMVS is responsible for maintaining the lower 80 miles of the ILR, thus leaving a large spatial data gap; therefore, it is recommended that sample locations are spread further apart to obtain water quality data from a larger portion of the lower 80 miles of the ILR.

There are also opportunities to improve water quality monitoring on the UMR by spreading sites separated by three river miles or less: UMR-9 & UMR-10 (separated by three RMs), UMR-7 & UMR-8 (separated by two RMs), and UMR-3 & UMR-4 (separated by three RMs). A paired t-test was used to compare historical data from those sites (2012-2018), and showed no significant differences in data for most water quality metrics ($p=0.05$).

In general, the Kaskaskia River watershed has been highly modified to accommodate barge navigation (lower 36 RM), as well as flood control and recreational opportunities (Lakes Carlyle and Shelbyville). Currently, CEMVS supports an adequate water quality monitoring program for its two lake projects, although conditions between the lakes (RM 100-180), as well as between Lake Carlyle and the confluence of the Mississippi River are unknown. Thus, it is recommended that two additional sampling locations be added near RM-36 (near Fayetteville, Illinois) and RM-157 (near Cowden, Illinois).

Given the hypereutrophic status of the river systems monitored by CEMVS, it is recommended that Nitrite (NO_2) be added to the monitoring program. Doing so would allow CEMVS to evaluate Total Nitrogen (TN), which is a strong indicator of trophic status. The cost of including NO_2 could be offset by eliminating pesticide monitoring from the Illinois River. Since 2002, CEMVS has never observed a pesticide concentration that exceeded state or federal guidelines in the Mississippi or Illinois Rivers (n=182).

Lastly, sediments are annually collected and evaluated for grain size (e.g., gravel, sand, silt/clay) during dredge season; however, 2018 was the first time in nearly a decade that contaminants had been analyzed. Given the potential impacts contaminated sediments may have on ecological processes, it is recommended that navigation channel sediments be evaluated every one to three years. In addition to bulk sediment testing, elutriate testing should also be considered following guidelines referenced in *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. Testing Manual*.

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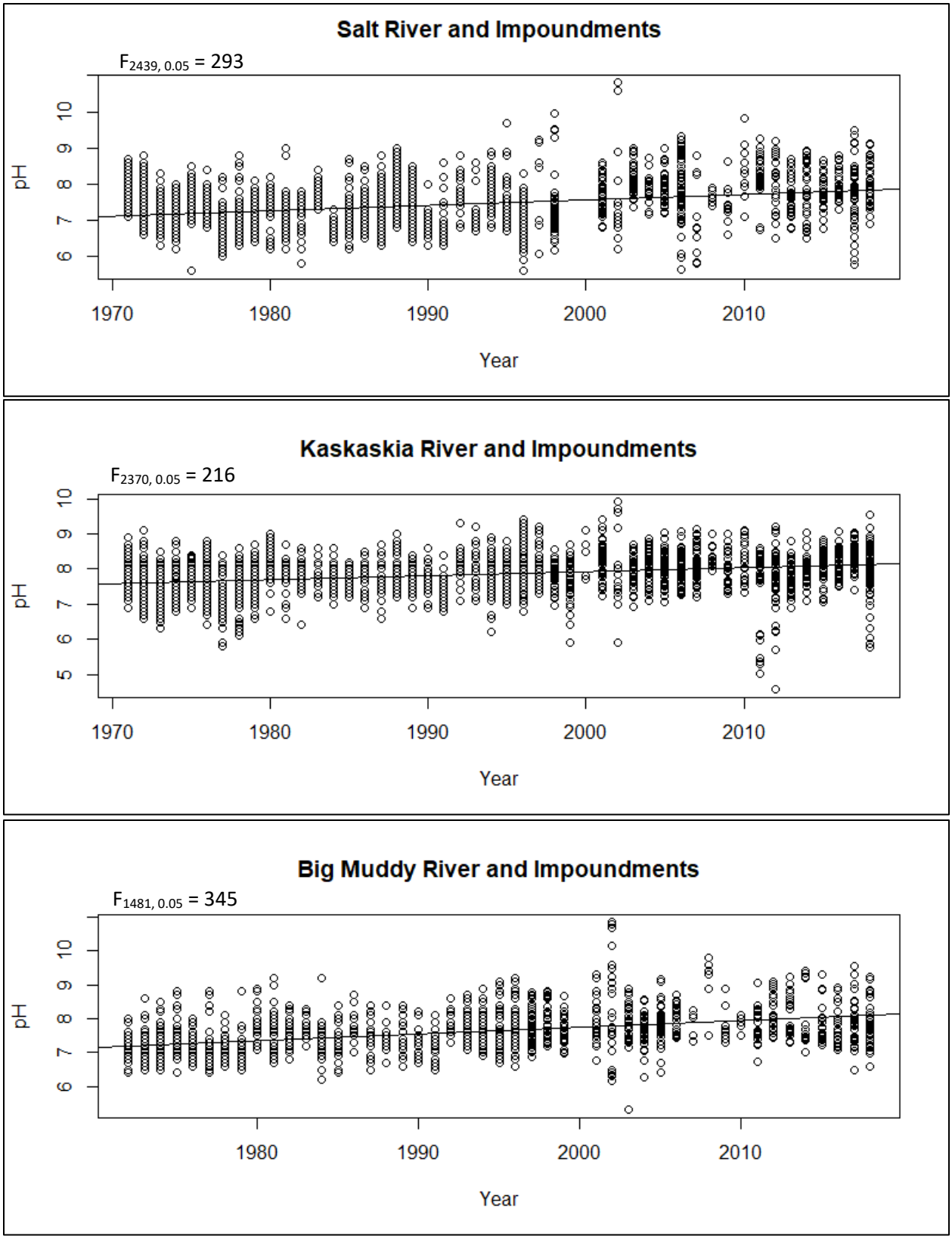
APPENDIX A: HISTORICAL TRENDS FOR pH



Historical pH measurements for major tributaries to the Mississippi River. Increases in pH were significant for the three rivers evaluated.

APPENDIX B: LABORATORY RESULTS

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008416-02 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-2 CONFLUENCE Sampling Date: 08/22/2018 Moisture: NA
Received: 08/22/2018 Sampling Time: 1320

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0272	MG/L	NONE	350.1	NA	08/24/18	10024152
Chlorophyll-a, Correcte	1.0	1.00		12.0	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Kjeldahl Nitrogen	0.190	0.200		0.511	MG/L	351.2	351.2	09/13/18	09/17/18	09194088
Nitrate as Nitrogen	0.0190	0.0200		0.743	MG/L	NONE	GREEN	NA	09/18/18	10014148
Pheophytin-a	1.0	1.00		4.2	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Phosphorus	0.00800	0.0100		0.46	MG/L	365.2	365.2	09/12/18	09/13/18	09264133
Phosphorus, -ortho	0.00800	0.0100		0.12	MG/L	NONE	365.2	NA	08/23/18	08273985
Solids, Total Suspended	4.0	4.00		93.6	MG/L	NONE	160.2	NA	08/27/18	09074040
Solids, Volatile Suspen	4.0	4.00		10.4	MG/L	NONE	160.4	NA	08/27/18	09074041
Total Organic Carbon	0.500	1.00		3.4	MG/L	NONE	415.1	NA	08/28/18	TA38574A

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	UMR-2 CONFLUENCE	ARDL Lab No.:	008416-10
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0926805
Sample Date:	08/22/2018	Received Date:	08/22/2018
Sample Time:	1320	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	29.9 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	20.9	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	8.50	8.50	ND		UG/KG	1
Atrazine	8.50	8.50	ND		UG/KG	1
Metribuzin	8.50	8.50	ND		UG/KG	1
Alachlor	8.50	8.50	ND		UG/KG	1
Metolachlor	8.50	8.50	ND		UG/KG	1
Chlorpyrifos	8.50	8.50	ND		UG/KG	1
Cyanazine	8.50	8.50	ND		UG/KG	1
Pendimethalin	8.50	8.50	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	92%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:
Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008416-10
Field ID: UMR-2 CONFLUENCE
Received: 08/22/2018
Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 08/22/2018
Sampling Time: 1320
Matrix: SEDIMENT
Moisture: 20.9

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.235	0.352		2.70	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Barium	0.0470	1.17		45.4	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Boron	0.587	3.52	J	1.40	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Cadmium	0.0470	0.235	J	0.106	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Chromium	0.186	0.465		3.53	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Copper	0.470	1.17		ND	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Iron	2.35	5.87		4710	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Lead	0.235	0.352		3.65	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Manganese	0.252	0.630		118	MG/KG	3050B	6010C	09/05/18	09/05/18	P7070A
(a) Mercury	0.0976	0.103		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.282	1.76		5.91	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Selenium	0.252	0.630		ND	MG/KG	3050B	6010C	09/05/18	09/05/18	P7070A
(a) Silver	0.235	0.587		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Zinc	0.504	0.630		18.0	MG/KG	3050B	6010C	09/05/18	09/05/18	P7070A
Kjeldahl Nitrogen	22.2	23.4		44.9	MG/KG	351.2	351.2	09/17/18	09/19/18	09244115
Nitrate as Nitrogen	2.40	2.40		ND	MG/KG	NONE	GREEN	NA	09/19/18	10014149
Phosphorus	4.82	6.02		232	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		79.1	%	NONE	160.3	NA	08/28/18	09044009
Total Organic Carbon	77.0	150		230	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

Sample 008416-10, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008376-03 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-3 MILE 200 Sampling Date: 02/21/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 1316

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.382	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		15.4	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.68	MG/L	351.2	351.2	03/01/18	03/02/18	03053163
Nitrate as Nitrogen	0.0380	0.0400		2.3	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		6.2	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.393	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.183	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.350	0.350		67.1	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.350	0.350		6.0	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	03/09/18	03133194

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008389-03 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-3 MILE 200 Sampling Date: 04/24/2018 Moisture: NA
Received: 04/25/2018 Sampling Time: 1430

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0391	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		56.3	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		1.05	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		3.2	MG/L	NONE	GREEN	NA	05/01/18	05073382
Pheophytin-a	1.0	1.00		21.2	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.393	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.0721	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	5.0	5.00		88.0	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	5.0	5.00		12.0	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		5.9	MG/L	NONE	415.1	NA	05/02/18	05103397

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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 008405 Report Date: 07/23/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008405-02 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-3 MILE 200 Sampling Date: 06/28/2018 Moisture: NA
Received: 06/28/2018 Sampling Time: 1400

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0619	MG/L	NONE	350.1	NA	07/05/18	07193747
Chlorophyll-a, Correcte	1.0	1.00		7.5	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Kjeldahl Nitrogen	0.190	0.200		0.885	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		4.82	MG/L	NONE	GREEN	NA	06/29/18	07033698
Pheophytin-a	1.0	1.00		3.7	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Phosphorus	0.00800	0.0100		0.371	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.157	MG/L	NONE	365.2	NA	06/29/18	07193746
Solids, Total Suspended	6.67	6.67		150	MG/L	NONE	160.2	NA	06/29/18	07053709
Solids, Volatile Suspen	6.67	6.67		12.0	MG/L	NONE	160.4	NA	06/29/18	07053710
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	07/10/18	07163729

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008416-03
Field ID: UMR-3 MILE 200
Received: 08/22/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 08/22/2018
Sampling Time: 1410

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0378	MG/L	NONE	350.1	NA	08/24/18	10024152
Chlorophyll-a, Correcte	1.0	1.00		70.1	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Kjeldahl Nitrogen	0.190	0.200		0.876	MG/L	351.2	351.2	09/13/18	09/17/18	09194088
Nitrate as Nitrogen	0.0190	0.0200		1.11	MG/L	NONE	GREEN	NA	09/18/18	10014148
Pheophytin-a	1.0	1.00		7.1	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Phosphorus	0.00800	0.0100		0.224	MG/L	365.2	365.2	09/12/18	09/13/18	09264133
Phosphorus, -ortho	0.00800	0.0100		0.0566	MG/L	NONE	365.2	NA	08/23/18	08273985
Solids, Total Suspended	4.0	4.00		34.0	MG/L	NONE	160.2	NA	08/27/18	09074040
Solids, Volatile Suspen	4.0	4.00		7.2	MG/L	NONE	160.4	NA	08/27/18	09074041
Total Organic Carbon	0.500	1.00		5.8	MG/L	NONE	415.1	NA	08/28/18	TA38574A

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Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	UMR-3 MILE 200	ARDL Lab No.:	008416-11
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0926820
Sample Date:	08/22/2018	Received Date:	08/22/2018
Sample Time:	1410	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	29.7 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	39.2	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	11.1	11.1	ND		UG/KG	1
Atrazine	11.1	11.1	ND		UG/KG	1
Metribuzin	11.1	11.1	ND		UG/KG	1
Alachlor	11.1	11.1	ND		UG/KG	1
Metolachlor	11.1	11.1	ND		UG/KG	1
Chlorpyrifos	11.1	11.1	ND		UG/KG	1
Cyanazine	11.1	11.1	ND		UG/KG	1
Pendimethalin	11.1	11.1	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	91%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008416-11
Field ID: UMR-3 MILE 200
Received: 08/22/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 08/22/2018
Sampling Time: 1410

Matrix: SEDIMENT
Moisture: 39.2

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.319	0.479		4.76	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Barium	0.0639	1.60		116	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Boron	0.798	4.79		5.25	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Cadmium	0.0639	0.319		0.463	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Chromium	0.194	0.485		10.6	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Copper	0.639	1.60		8.88	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Iron	3.19	7.98		14800	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Lead	0.319	0.479		13.0	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Manganese	0.303	0.759		432	MG/KG	3050B	6010C	09/05/18	09/05/18	P7070A
(a) Mercury	0.117	0.123		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.383	2.40		14.9	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Selenium	0.303	0.759	J	0.334	MG/KG	3050B	6010C	09/05/18	09/05/18	P7070A
(a) Silver	0.319	0.798		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Zinc	0.607	0.759		44.8	MG/KG	3050B	6010C	09/05/18	09/05/18	P7070A
Kjeldahl Nitrogen	156	164		757	MG/KG	351.2	351.2	09/17/18	09/19/18	09244115
Nitrate as Nitrogen	2.67	2.67		ND	MG/KG	NONE	GREEN	NA	09/19/18	10014149
Phosphorus	5.72	7.15		378	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		60.8	%	NONE	160.3	NA	08/28/18	09044009
Total Organic Carbon	300	600		8400	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008376-04 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-4 MILE 201 Sampling Date: 02/21/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 1323

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.278	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		17.6	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.2	MG/L	351.2	351.2	03/01/18	03/02/18	03053163
Nitrate as Nitrogen	0.0380	0.0400		2.36	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		4.4	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.325	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.197	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.350	0.350		29.7	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.350	0.350		4.0	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

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400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008389-04 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-4 MILE 201 Sampling Date: 04/24/2018 Moisture: NA
Received: 04/25/2018 Sampling Time: 1520

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0359	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		42.7	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		1.14	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		3.76	MG/L	NONE	GREEN	NA	05/01/18	05073382
Pheophytin-a	1.0	1.00		14.7	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.376	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.0773	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	5.0	5.00		87.0	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	5.0	5.00		12.0	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		5.8	MG/L	NONE	415.1	NA	05/02/18	05103397

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008405 Report Date: 07/23/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008405-03 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-4 MILE 201 Sampling Date: 06/28/2018 Moisture: NA
Received: 06/28/2018 Sampling Time: 1330

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0628	MG/L	NONE	350.1	NA	07/05/18	07193747
Chlorophyll-a, Correcte	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Kjeldahl Nitrogen	0.190	0.200		0.884	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		4.7	MG/L	NONE	GREEN	NA	06/29/18	07033698
Pheophytin-a	1.0	1.00		7.2	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Phosphorus	0.00800	0.0100		0.375	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.154	MG/L	NONE	365.2	NA	06/29/18	07193746
Solids, Total Suspended	6.67	6.67		143	MG/L	NONE	160.2	NA	06/29/18	07053709
Solids, Volatile Suspen	6.67	6.67		12.0	MG/L	NONE	160.4	NA	06/29/18	07053710
Total Organic Carbon	0.500	1.00		4.1	MG/L	NONE	415.1	NA	07/10/18	07163729

(a) DOD and/or NELAC Accredited Analyte.

Sample 008405-03, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416

Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008416-04
Field ID: UMR-4 MILE 201
Received: 08/22/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 08/22/2018
Sampling Time: 0846

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0236	MG/L	NONE	350.1	NA	08/24/18	10024152
Chlorophyll-a, Correcte	1.0	1.00		56.4	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Kjeldahl Nitrogen	0.190	0.200		0.911	MG/L	351.2	351.2	09/13/18	09/17/18	09194088
Nitrate as Nitrogen	0.0190	0.0200		0.999	MG/L	NONE	GREEN	NA	09/18/18	10014148
Pheophytin-a	1.0	1.00		8.8	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Phosphorus	0.00800	0.0100		0.295	MG/L	365.2	365.2	09/12/18	09/13/18	09264133
Phosphorus, -ortho	0.00800	0.0100		0.0803	MG/L	NONE	365.2	NA	08/23/18	08273985
Solids, Total Suspended	4.0	4.00		28.0	MG/L	NONE	160.2	NA	08/27/18	09074040
Solids, Volatile Suspen	4.0	4.00		6.0	MG/L	NONE	160.4	NA	08/27/18	09074041
Total Organic Carbon	0.500	1.00		5.5	MG/L	NONE	415.1	NA	08/28/18	TA38574A

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	UMR-4 MILE 201	ARDL Lab No.:	008416-12
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0926806
Sample Date:	08/22/2018	Received Date:	08/22/2018
Sample Time:	0846	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	30.3 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	14.9	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.80	7.80	ND		UG/KG	1
Atrazine	7.80	7.80	ND		UG/KG	1
Metribuzin	7.80	7.80	ND		UG/KG	1
Alachlor	7.80	7.80	ND		UG/KG	1
Metolachlor	7.80	7.80	ND		UG/KG	1
Chlorpyrifos	7.80	7.80	ND		UG/KG	1
Cyanazine	7.80	7.80	ND		UG/KG	1
Pendimethalin	7.80	7.80	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	93%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:
Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008416-12
Field ID: UMR-4 MILE 201
Received: 08/22/2018
Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 08/22/2018
Sampling Time: 0846
Matrix: SEDIMENT
Moisture: 14.9

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.220	0.329		1.60	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Barium	0.0439	1.10		17.5	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Boron	0.549	3.29	J	0.868	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Cadmium	0.0439	0.220	J	0.0769	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Chromium	0.187	0.467		4.96	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Copper	0.439	1.10	J	0.933	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Iron	2.20	5.49		5980	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Lead	0.220	0.329		2.62	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Manganese	0.226	0.565		114	MG/KG	3050B	6010C	09/05/18	09/05/18	P7070A
(a) Mercury	0.0865	0.0911		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.264	1.65		9.66	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Selenium	0.220	0.549		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Silver	0.220	0.549		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Zinc	0.452	0.565		13.1	MG/KG	3050B	6010C	09/05/18	09/05/18	P7070A
Kjeldahl Nitrogen	19.9	21.0		30.8	MG/KG	351.2	351.2	09/17/18	09/19/18	09244115
Nitrate as Nitrogen	2.15	2.15		ND	MG/KG	NONE	GREEN	NA	09/19/18	10014149
Phosphorus	2.35	2.94		128	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		85.1	%	NONE	160.3	NA	08/28/18	09044009
Total Organic Carbon	77.0	150		180	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

Sample 008416-12, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-05 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-5 MILE 212.5 Sampling Date: 02/21/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 1235

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.273	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		14.2	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.39	MG/L	351.2	351.2	03/01/18	03/02/18	03053163
Nitrate as Nitrogen	0.0380	0.0400		2.37	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		2.7	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.311	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.167	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.450	0.450		26.4	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.450	0.450		3.11	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		4.3	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008389-05
Field ID: UMR-5 MILE 212.5
Received: 04/25/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 04/24/2018
Sampling Time: 1545

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		47.8	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		1.14	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		3.35	MG/L	NONE	GREEN	NA	05/01/18	05073382
Pheophytin-a	1.0	1.00		16.7	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.367	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.0695	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	5.0	5.00		85.5	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	5.0	5.00		12.0	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		6.1	MG/L	NONE	415.1	NA	05/02/18	05103397

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008405 Report Date: 07/23/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008405-04 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-5 MILE 212.5 Sampling Date: 06/28/2018 Moisture: NA
Received: 06/28/2018 Sampling Time: 1245

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0914	MG/L	NONE	350.1	NA	07/05/18	07193747
Chlorophyll-a, Correcte	1.0	1.00		ND	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Kjeldahl Nitrogen	0.190	0.200		0.832	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		4.89	MG/L	NONE	GREEN	NA	06/29/18	07033698
Pheophytin-a	1.0	1.00		264	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Phosphorus	0.00800	0.0100		0.375	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.162	MG/L	NONE	365.2	NA	06/29/18	07193746
Solids, Total Suspended	6.67	6.67		121	MG/L	NONE	160.2	NA	06/29/18	07053709
Solids, Volatile Suspen	6.67	6.67		11.3	MG/L	NONE	160.4	NA	06/29/18	07053710
Total Organic Carbon	0.500	1.00		4.3	MG/L	NONE	415.1	NA	07/10/18	07163729

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008416-05
Field ID: UMR-5 MILE 212.5
Received: 08/22/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 08/22/2018
Sampling Time: 0926

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	08/24/18	10024152
Chlorophyll-a, Correcte	1.0	1.00		48.7	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Kjeldahl Nitrogen	0.190	0.200		0.901	MG/L	351.2	351.2	09/17/18	09/18/18	09194090
Nitrate as Nitrogen	0.0190	0.0200		1.06	MG/L	NONE	GREEN	NA	09/18/18	10014148
Pheophytin-a	1.0	1.00		5.1	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Phosphorus	0.00800	0.0100		0.233	MG/L	365.2	365.2	09/12/18	09/13/18	09264133
Phosphorus, -ortho	0.00800	0.0100		0.0461	MG/L	NONE	365.2	NA	08/23/18	08273985
Solids, Total Suspended	4.0	4.00		33.6	MG/L	NONE	160.2	NA	08/27/18	09074040
Solids, Volatile Suspen	4.0	4.00		6.8	MG/L	NONE	160.4	NA	08/27/18	09074041
Total Organic Carbon	0.500	1.00		5.7	MG/L	NONE	415.1	NA	08/28/18	TA38574A

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	UMR-5 MILE 212.5	ARDL Lab No.:	008416-13
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0926807
Sample Date:	08/22/2018	Received Date:	08/22/2018
Sample Time:	0926	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	30.5 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	11.5	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.45	7.45	ND		UG/KG	1
Atrazine	7.45	7.45	ND		UG/KG	1
Metribuzin	7.45	7.45	ND		UG/KG	1
Alachlor	7.45	7.45	ND		UG/KG	1
Metolachlor	7.45	7.45	ND		UG/KG	1
Chlorpyrifos	7.45	7.45	ND		UG/KG	1
Cyanazine	7.45	7.45	ND		UG/KG	1
Pendimethalin	7.45	7.45	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	91%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008416-13 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: SEDIMENT
Field ID: UMR-5 MILE 212.5 Sampling Date: 08/22/2018 Moisture: 11.5
Received: 08/22/2018 Sampling Time: 0926

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.218	0.327		1.71	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Barium	0.0436	1.09		18.6	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Boron	0.545	3.27	J	0.840	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Cadmium	0.0436	0.218	J	0.0763	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Chromium	0.193	0.483		4.33	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Copper	0.436	1.09		1.09	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Iron	2.18	5.45		5810	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Lead	0.218	0.327		2.49	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Manganese	0.216	0.540		96.5	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Mercury	0.0845	0.0890		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.262	1.64		7.35	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Selenium	0.216	0.540		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Silver	0.218	0.545		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Zinc	0.432	0.540		11.2	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
Kjeldahl Nitrogen	17.3	18.2		24.2	MG/KG	351.2	351.2	09/17/18	09/19/18	09244115
Nitrate as Nitrogen	2.08	2.08		ND	MG/KG	NONE	GREEN	NA	09/19/18	10014149
Phosphorus	1.97	2.46		.164	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		88.5	%	NONE	160.3	NA	08/28/18	09044009
Total Organic Carbon	77.0	150		230	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-06 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-6 MILE 231 Sampling Date: 02/21/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 1146

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.453	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		15.7	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.69	MG/L	351.2	351.2	03/01/18	03/02/18	03053163
Nitrate as Nitrogen	0.0380	0.0400		2.28	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		10.3	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.364	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.172	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.200	0.200		109	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.200	0.200		10.0	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		4.6	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:
Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008389-06
Field ID: UMR-6 MILE 231
Received: 04/25/2018
Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 04/24/2018
Sampling Time: 1320
Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		47.0	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		1.19	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		3.31	MG/L	NONE	GREEN	NA	05/01/18	05073382
Pheophytin-a	1.0	1.00		16.4	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.436	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.0592	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	5.0	5.00		96.0	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	5.0	5.00		13.0	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		5.9	MG/L	NONE	415.1	NA	05/02/18	05103397

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008405 Report Date: 07/23/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008405-05
Field ID: UMR-6 MILE 231
Received: 06/28/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 06/28/2018
Sampling Time: 1145

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.040	MG/L	NONE	350.1	NA	07/05/18	07193747
Chlorophyll-a, Correcte	1.0	1.00		5.0	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Kjeldahl Nitrogen	0.190	0.200		0.823	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		4.82	MG/L	NONE	GREEN	NA	06/29/18	07033698
Pheophytin-a	1.0	1.00		3.0	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Phosphorus	0.00800	0.0100		0.379	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.151	MG/L	NONE	365.2	NA	06/29/18	07193746
Solids, Total Suspended	6.67	6.67		151	MG/L	NONE	160.2	NA	06/29/18	07053709
Solids, Volatile Suspen	6.67	6.67		14.0	MG/L	NONE	160.4	NA	06/29/18	07053710
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	07/10/18	07163729

(a) DOD and/or NELAC Accredited Analyte.

Sample 008405-05, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008416-06 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-6 MILE 231 Sampling Date: 08/22/2018 Moisture: NA
Received: 08/22/2018 Sampling Time: 1030

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	08/24/18	10024152
Chlorophyll-a, Correcte	1.0	1.00		82.0	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Kjeldahl Nitrogen	0.190	0.200		0.889	MG/L	351.2	351.2	09/17/18	09/18/18	09194090
Nitrate as Nitrogen	0.0190	0.0200		1.04	MG/L	NONE	GREEN	NA	09/18/18	10014148
Pheophytin-a	1.0	1.00		14.3	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Phosphorus	0.00800	0.0100		0.198	MG/L	365.2	365.2	09/12/18	09/13/18	09264133
Phosphorus, -ortho	0.00800	0.0100		0.025	MG/L	NONE	365.2	NA	08/23/18	08273985
Solids, Total Suspended	4.0	4.00		38.8	MG/L	NONE	160.2	NA	08/27/18	09074040
Solids, Volatile Suspen	4.0	4.00		7.2	MG/L	NONE	160.4	NA	08/27/18	09074041
Total Organic Carbon	0.500	1.00		6.0	MG/L	NONE	415.1	NA	08/28/18	TA38574A

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	UMR-6 MILE 231	ARDL Lab No.:	008416-14
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0926808
Sample Date:	08/22/2018	Received Date:	08/22/2018
Sample Time:	1030	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	29.7 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	19.5	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	8.41	8.41	ND		UG/KG	1
Atrazine	8.41	8.41	ND		UG/KG	1
Metribuzin	8.41	8.41	ND		UG/KG	1
Alachlor	8.41	8.41	ND		UG/KG	1
Metolachlor	8.41	8.41	ND		UG/KG	1
Chlorpyrifos	8.41	8.41	ND		UG/KG	1
Cyanazine	8.41	8.41	ND		UG/KG	1
Pendimethalin	8.41	8.41	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	90%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008416-14 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: SEDIMENT
Field ID: UMR-6 MILE 231 Sampling Date: 08/22/2018 Moisture: 19.5
Received: 08/22/2018 Sampling Time: 1030

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.241	0.361		1.10	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Barium	0.0481	1.20		15.4	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Boron	0.602	3.61	J	0.831	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Cadmium	0.0481	0.241	J	0.0481	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Chromium	0.194	0.484		2.52	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Copper	0.481	1.20		ND	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Iron	2.41	6.02		4210	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Lead	0.241	0.361		2.02	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Manganese	0.230	0.575		121	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Mercury	0.0908	0.0956		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.289	1.81		4.98	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Selenium	0.241	0.602		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Silver	0.241	0.602		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Zinc	0.460	0.575		14.7	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
Kjeldahl Nitrogen	17.4	18.3		26.3	MG/KG	351.2	351.2	09/17/18	09/19/18	09244115
Nitrate as Nitrogen	2.36	2.36		ND	MG/KG	NONE	GREEN	NA	09/19/18	10014149
Phosphorus	2.48	3.11		96.4	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		80.5	%	NONE	160.3	NA	08/28/18	09044009
Total Organic Carbon	77.0	150		170	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-08 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-7 MILE 241 Sampling Date: 02/21/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 1100

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.743	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		13.3	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.58	MG/L	351.2	351.2	03/01/18	03/02/18	03053163
Nitrate as Nitrogen	0.0380	0.0400		2.47	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		4.7	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.484	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		ND	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.250	0.250		99.2	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.250	0.250		9.2	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		4.1	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008389-08
Field ID: UMR-7 MILE 241
Received: 04/25/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 04/24/2018
Sampling Time: 1210

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0372	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		33.3	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		1.06	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		3.81	MG/L	NONE	GREEN	NA	05/01/18	05073382
Pheophytin-a	1.0	1.00		13.3	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.419	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.0592	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	5.0	5.00		98.0	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	5.0	5.00		11.5	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		5.9	MG/L	NONE	415.1	NA	05/02/18	05103397

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008405 Report Date: 07/23/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008405-07 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-7 MILE 241 Sampling Date: 06/28/2018 Moisture: NA
Received: 06/28/2018 Sampling Time: 0823

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0326	MG/L	NONE	350.1	NA	07/05/18	07193747
Chlorophyll-a, Correcte	1.0	1.00		7.5	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Kjeldahl Nitrogen	0.190	0.200		0.884	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		5.21	MG/L	NONE	GREEN	NA	06/29/18	07033698
Pheophytin-a	1.0	1.00		4.5	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Phosphorus	0.00800	0.0100		0.334	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.154	MG/L	NONE	365.2	NA	06/29/18	07193746
Solids, Total Suspended	6.67	6.67		115	MG/L	NONE	160.2	NA	06/29/18	07053709
Solids, Volatile Suspen	6.67	6.67		10.7	MG/L	NONE	160.4	NA	06/29/18	07053710
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	07/10/18	07163729

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/02/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:
Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008414-01
Field ID: UMR-7 MILE 241
Received: 08/21/2018
Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 08/21/2018
Sampling Time: 1530
Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0252	MG/L	NONE	350.1	NA	08/24/18	08273983
Chlorophyll-a, Correcte	1.0	1.00		101	MG/CU.M.	10200H	10200H	08/22/18	09/04/18	09064039
Kjeldahl Nitrogen	0.190	0.200		1.25	MG/L	351.2	351.2	09/13/18	09/17/18	09194088
Nitrate as Nitrogen	0.0190	0.0200		1.32	MG/L	NONE	GREEN	NA	09/17/18	09194087
Pheophytin-a	1.0	1.00		14.0	MG/CU.M.	10200H	10200H	08/22/18	09/04/18	09064039
Phosphorus	0.00800	0.0100		0.346	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.0394	MG/L	NONE	365.2	NA	08/22/18	08273984
Solids, Total Suspended	4.0	4.00		55.2	MG/L	NONE	160.2	NA	08/27/18	09064036
Solids, Volatile Suspen	4.0	4.00		10.8	MG/L	NONE	160.4	NA	08/27/18	09064038
Total Organic Carbon	0.500	1.00		5.6	MG/L	NONE	415.1	NA	08/28/18	TA38574A

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	UMR-7 MILE 241	ARDL Lab No.:	008414-05
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0925805
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	1530	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	30 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	14.4	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.83	7.83	ND		UG/KG	1
Atrazine	7.83	7.83	ND		UG/KG	1
Metribuzin	7.83	7.83	ND		UG/KG	1
Alachlor	7.83	7.83	ND		UG/KG	1
Metolachlor	7.83	7.83	ND		UG/KG	1
Chlorpyrifos	7.83	7.83	ND		UG/KG	1
Cyanazine	7.83	7.83	ND		UG/KG	1
Pendimethalin	7.83	7.83	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	80%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/02/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008414-05 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: SEDIMENT
Field ID: UMR-7 MILE 241 Sampling Date: 08/21/2018 Moisture: 14.4
Received: 08/21/2018 Sampling Time: 1530

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.224	0.336		1.76	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0448	1.12		17.9	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.561	3.36	J	0.998	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0448	0.224	J	0.0897	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.224	0.561		3.77	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.448	1.12		2.06	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	2.24	5.61		5160	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.224	0.336		2.23	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.224	0.561		118	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.0881	0.0927		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.269	1.68		6.69	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.224	0.561	J	0.235	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.224	0.561		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.448	0.561		11.0	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	24.1	25.4		53.0	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	2.02	2.12		ND	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	2.12	2.66		149	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		85.6	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	77.0	150		320	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

Sample 008414-05, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-09 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-8 MILE 245 Sampling Date: 02/21/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 1035

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.242	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		13.9	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.28	MG/L	351.2	351.2	03/01/18	03/02/18	03053163
Nitrate as Nitrogen	0.0380	0.0400		2.43	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		3.3	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.46	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		ND	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.200	0.200		80.0	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.200	0.200		7.0	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008389-09
Field ID: UMR-8 MILE 245
Received: 04/25/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 04/24/2018
Sampling Time: 1130

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0504	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		39.3	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		1.27	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		3.67	MG/L	NONE	GREEN	NA	05/01/18	05073382
Pheophytin-a	1.0	1.00		15.7	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.363	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.0824	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	5.0	5.00		82.5	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	5.0	5.00		9.0	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		5.7	MG/L	NONE	415.1	NA	05/02/18	05103397

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008405 Report Date: 07/23/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008405-08 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-8 MILE 245 Sampling Date: 06/28/2018 Moisture: NA
Received: 06/28/2018 Sampling Time: 0835

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0402	MG/L	NONE	350.1	NA	07/05/18	07193747
Chlorophyll-a, Correcte	1.0	1.00		6.0	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Kjeldahl Nitrogen	0.190	0.200		0.85	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		5.19	MG/L	NONE	GREEN	NA	06/29/18	07033698
Pheophytin-a	1.0	1.00		4.2	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Phosphorus	0.00800	0.0100		0.321	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.157	MG/L	NONE	365.2	NA	06/29/18	07193746
Solids, Total Suspended	6.67	6.67		90.0	MG/L	NONE	160.2	NA	06/29/18	07053709
Solids, Volatile Suspen	6.67	6.67		10.0	MG/L	NONE	160.4	NA	06/29/18	07053710
Total Organic Carbon	0.500	1.00		4.3	MG/L	NONE	415.1	NA	07/10/18	07163729

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Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/02/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:
Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008414-02 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-8 MILE 245 Sampling Date: 08/21/2018 Moisture: NA
Received: 08/21/2018 Sampling Time: 1025

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0414	MG/L	NONE	350.1	NA	08/24/18	08273983
Chlorophyll-a, Correcte	1.0	1.00		93.1	MG/CU.M.	10200H	10200H	08/22/18	09/04/18	09064039
Kjeldahl Nitrogen	0.190	0.200		1.18	MG/L	351.2	351.2	09/13/18	09/17/18	09194088
Nitrate as Nitrogen	0.0190	0.0200		1.27	MG/L	NONE	GREEN	NA	09/17/18	09194087
Pheophytin-a	1.0	1.00		15.7	MG/CU.M.	10200H	10200H	08/22/18	09/04/18	09064039
Phosphorus	0.00800	0.0100		0.292	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.0549	MG/L	NONE	365.2	NA	08/22/18	08273984
Solids, Total Suspended	4.0	4.00		80.8	MG/L	NONE	160.2	NA	08/27/18	09064036
Solids, Volatile Suspen	4.0	4.00		15.2	MG/L	NONE	160.4	NA	08/27/18	09064038
Total Organic Carbon	0.500	1.00		6.0	MG/L	NONE	415.1	NA	08/28/18	TA38574A

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Lab Report No: 008414 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	UMR-8 MILE 245	ARDL Lab No.:	008414-06
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0925808
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	1025	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	30.4 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	10.6	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.40	7.40	ND		UG/KG	1
Atrazine	7.40	7.40	ND		UG/KG	1
Metribuzin	7.40	7.40	ND		UG/KG	1
Alachlor	7.40	7.40	ND		UG/KG	1
Metolachlor	7.40	7.40	ND		UG/KG	1
Chlorpyrifos	7.40	7.40	ND		UG/KG	1
Cyanazine	7.40	7.40	ND		UG/KG	1
Pendimethalin	7.40	7.40	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	79%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/02/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008414-06 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: SEDIMENT
Field ID: UMR-8 MILE 245 Sampling Date: 08/21/2018 Moisture: 10.6
Received: 08/21/2018 Sampling Time: 1025

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.210	0.315		2.27	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0420	1.05		28.9	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.525	3.15	J	0.860	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0420	0.210	J	0.105	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.210	0.525		4.78	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.420	1.05		1.73	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	2.10	5.25		6570	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.210	0.315		2.99	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.210	0.525		255	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.0837	0.0881		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.252	1.57		9.49	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.210	0.525		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.210	0.525		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.420	0.525		14.4	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	22.1	23.3		50.6	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	2.08	2.19		ND	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	1.95	2.43		213	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		89.4	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	77.0	150		260	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-10 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-9 MILE 273 Sampling Date: 02/21/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 0939

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.233	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		11.1	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.19	MG/L	351.2	351.2	03/01/18	03/02/18	03053163
Nitrate as Nitrogen	0.0380	0.0400		2.35	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		2.1	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.325	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.274	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.300	0.300		40.7	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.300	0.300		4.33	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		4.0	MG/L	NONE	415.1	NA	03/09/18	03133194

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400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008389-10
Field ID: UMR-9 MILE 273
Received: 04/25/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 04/24/2018
Sampling Time: 1025

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0667	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		31.6	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		1.57	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		3.8	MG/L	NONE	GREEN	NA	05/01/18	05073382
Pheophytin-a	1.0	1.00		14.4	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.414	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.0773	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	5.0	5.00		96.5	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	5.0	5.00		11.0	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		5.7	MG/L	NONE	415.1	NA	05/02/18	05103397

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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 008405 Report Date: 07/23/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008405-09
Field ID: UMR-9 MILE 273
Received: 06/28/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 06/28/2018
Sampling Time: 0947

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.054	MG/L	NONE	350.1	NA	07/05/18	07193747
Chlorophyll-a, Correcte	1.0	1.00		3.6	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Kjeldahl Nitrogen	0.190	0.200		1.04	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		5.51	MG/L	NONE	GREEN	NA	06/29/18	07033698
Pheophytin-a	1.0	1.00		1.9	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Phosphorus	0.00800	0.0100		0.325	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.159	MG/L	NONE	365.2	NA	06/29/18	07193746
Solids, Total Suspended	6.67	6.67		101	MG/L	NONE	160.2	NA	06/29/18	07053709
Solids, Volatile Suspen	6.67	6.67		9.33	MG/L	NONE	160.4	NA	06/29/18	07053710
Total Organic Carbon	0.500	1.00		4.3	MG/L	NONE	415.1	NA	07/10/18	07163729

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ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/02/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008414-03 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-9 MILE 273 Sampling Date: 08/21/2018 Moisture: NA
Received: 08/21/2018 Sampling Time: 1350

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0249	MG/L	NONE	350.1	NA	08/24/18	08273983
Chlorophyll-a, Correcte	1.0	1.00		100	MG/CU.M.	10200H	10200H	08/22/18	09/04/18	09064039
Kjeldahl Nitrogen	0.190	0.200		1.15	MG/L	351.2	351.2	09/13/18	09/17/18	09194088
Nitrate as Nitrogen	0.0190	0.0200		1.25	MG/L	NONE	GREEN	NA	09/17/18	09194087
Pheophytin-a	1.0	1.00		14.9	MG/CU.M.	10200H	10200H	08/22/18	09/04/18	09064039
Phosphorus	0.00800	0.0100		0.307	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.0394	MG/L	NONE	365.2	NA	08/22/18	08273984
Solids, Total Suspended	4.0	4.00		52.4	MG/L	NONE	160.2	NA	08/27/18	09064036
Solids, Volatile Suspen	4.0	4.00		9.2	MG/L	NONE	160.4	NA	08/27/18	09064038
Total Organic Carbon	0.500	1.00		5.7	MG/L	NONE	415.1	NA	08/28/18	TA38574A

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Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	UMR-9 MILE 273	ARDL Lab No.:	008414-07
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0925809
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	1350	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	30.1 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	13.5	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.72	7.72	ND		UG/KG	1
Atrazine	7.72	7.72	ND		UG/KG	1
Metribuzin	7.72	7.72	ND		UG/KG	1
Alachlor	7.72	7.72	ND		UG/KG	1
Metolachlor	7.72	7.72	ND		UG/KG	1
Chlorpyrifos	7.72	7.72	ND		UG/KG	1
Cyanazine	7.72	7.72	ND		UG/KG	1
Pendimethalin	7.72	7.72	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	65%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/02/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008414-07 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: SEDIMENT
Field ID: UMR-9 MILE 273 Sampling Date: 08/21/2018 Moisture: 13.5
Received: 08/21/2018 Sampling Time: 1350

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.230	0.345		1.85	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0461	1.15		18.7	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.576	3.45	J	0.933	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0461	0.230	J	0.0806	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.230	0.576		4.70	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.461	1.15	J	1.04	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	2.30	5.76		5550	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.230	0.345		2.36	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.230	0.576		144	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.0851	0.0896		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.276	1.73		7.51	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.230	0.576		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.230	0.576		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.461	0.576		12.8	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	23.9	25.1		48.3	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	1.65	1.74		ND	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	2.20	2.75		206	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		86.5	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	77.0	150		150	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

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400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-11 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-10 MILE 276 Sampling Date: 02/21/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 0918

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.285	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		11.4	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		0.996	MG/L	351.2	351.2	03/01/18	03/02/18	03053165
Nitrate as Nitrogen	0.0380	0.0400		2.32	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		2.1	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.292	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.23	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.300	0.300		32.3	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.300	0.300		3.33	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		4.3	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008389-11 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-10 MILE 276 Sampling Date: 04/24/2018 Moisture: NA
Received: 04/25/2018 Sampling Time: 1000

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.128	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		32.5	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		1.08	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		3.82	MG/L	NONE	GREEN	NA	05/01/18	05073382
Pheophytin-a	1.0	1.00		14.2	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.444	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.0799	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	6.67	6.67		97.3	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	6.67	6.67		12.0	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		5.7	MG/L	NONE	415.1	NA	05/02/18	05103397

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400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008405 Report Date: 07/23/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008405-10
Field ID: UMR-10 MILE 276
Received: 06/28/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 06/28/2018
Sampling Time: 1008

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0238	MG/L	NONE	350.1	NA	07/05/18	07193747
Chlorophyll-a, Correcte	1.0	1.00		3.7	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Kjeldahl Nitrogen	0.190	0.200		1.03	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		5.4	MG/L	NONE	GREEN	NA	06/29/18	07033698
Pheophytin-a	1.0	1.00		1.5	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Phosphorus	0.00800	0.0100		0.363	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.162	MG/L	NONE	365.2	NA	06/29/18	07193746
Solids, Total Suspended	6.67	6.67		137	MG/L	NONE	160.2	NA	06/29/18	07053709
Solids, Volatile Suspen	6.67	6.67		11.3	MG/L	NONE	160.4	NA	06/29/18	07053710
Total Organic Carbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	07/10/18	07163729

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/02/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008414-04 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: UMR-10 MILR 276 Sampling Date: 08/21/2018 Moisture: NA
Received: 08/21/2018 Sampling Time: 1300

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0259	MG/L	NONE	350.1	NA	08/24/18	08273983
Chlorophyll-a, Correcte	1.0	1.00		56.4	MG/CU.M.	10200H	10200H	08/22/18	09/04/18	09064039
Kjeldahl Nitrogen	0.190	0.200		1.24	MG/L	351.2	351.2	09/13/18	09/17/18	09194088
Nitrate as Nitrogen	0.0190	0.0200		1.31	MG/L	NONE	GREEN	NA	09/17/18	09194087
Pheophytin-a	1.0	1.00		8.2	MG/CU.M.	10200H	10200H	08/22/18	09/04/18	09064039
Phosphorus	0.00800	0.0100		0.263	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.0446	MG/L	NONE	365.2	NA	08/22/18	08273984
Solids, Total Suspended	4.0	4.00		37.6	MG/L	NONE	160.2	NA	08/27/18	09064036
Solids, Volatile Suspen	4.0	4.00		8.0	MG/L	NONE	160.4	NA	08/27/18	09064038
Total Organic Carbon	0.500	1.00		5.6	MG/L	NONE	415.1	NA	08/28/18	TA38574A

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	UMR-10 MILR 276	ARDL Lab No.:	008414-08
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0925810
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	1300	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	30.5 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	12.6	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.54	7.54	ND		UG/KG	1
Atrazine	7.54	7.54	ND		UG/KG	1
Metribuzin	7.54	7.54	ND		UG/KG	1
Alachlor	7.54	7.54	ND		UG/KG	1
Metolachlor	7.54	7.54	ND		UG/KG	1
Chlorpyrifos	7.54	7.54	ND		UG/KG	1
Cyanazine	7.54	7.54	ND		UG/KG	1
Pendimethalin	7.54	7.54	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	79%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008414 Report Date: 10/02/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008414-08 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: SEDIMENT
Field ID: UMR-10 MILR 276 Sampling Date: 08/21/2018 Moisture: 12.6
Received: 08/21/2018 Sampling Time: 1300

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.215	0.322		1.86	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0429	1.07		18.6	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.537	3.22	J	0.977	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0429	0.215	J	0.0751	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.215	0.537		5.96	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.429	1.07		2.72	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	2.15	5.37		5590	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.215	0.322		2.70	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.215	0.537		129	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.0856	0.0901		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.258	1.61		7.47	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.215	0.537	J	0.322	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.215	0.537		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.429	0.537		12.5	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	20.9	22.0		29.1	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	1.99	2.10		ND	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	2.29	2.86		185	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		87.4	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	77.0	170		170	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-17 Sampling Loc'n: LOWER MISSISSIPPI RIVER Matrix: WATER
Field ID: SLH-1 Sampling Date: 02/22/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 0800

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.211	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		12.8	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.64	MG/L	351.2	351.2	03/01/18	03/02/18	03053165
Nitrate as Nitrogen	0.0380	0.0400		1.99	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		5.1	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.383	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.183	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.250	0.250		96.0	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.250	0.250		6.4	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		3.3	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008390 Report Date: 05/21/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008390-04 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: SLH-1 Sampling Date: 04/26/2018 Moisture: NA
Received: 04/27/2018 Sampling Time: 1455

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0704	MG/L	NONE	350.1	NA	05/04/18	05083390
Chlorophyll-a, Correcte	1.0	1.00		12.8	MG/CU.M.	10200H	10200H	04/27/18	05/04/18	05083394
Kjeldahl Nitrogen	0.190	0.200		0.692	MG/L	351.2	351.2	05/15/18	05/16/18	05163434
Nitrate as Nitrogen	0.0190	0.0200		2.42	MG/L	NONE	GREEN	NA	05/01/18	05083395
Pheophytin-a	1.0	1.00		5.1	MG/CU.M.	10200H	10200H	04/27/18	05/04/18	05083394
Phosphorus	0.00800	0.0100		0.363	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.156	MG/L	NONE	365.2	NA	04/27/18	04303339
Solids, Total Suspended	5.0	5.00		62.0	MG/L	NONE	160.2	NA	04/30/18	05013348
Solids, Volatile Suspen	5.0	5.00		6.5	MG/L	NONE	160.4	NA	04/30/18	05013349
Total Organic Carbon	0.500	1.00		4.6	MG/L	NONE	415.1	NA	05/02/18	05103397

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008405 Report Date: 07/23/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008405-11 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: SLH-1 Sampling Date: 06/27/2018 Moisture: NA
Received: 06/28/2018 Sampling Time: 1600

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0237	MG/L	NONE	350.1	NA	07/05/18	07193747
Chlorophyll-a, Correcte	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Kjeldahl Nitrogen	0.190	0.200		1.32	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		3.14	MG/L	NONE	GREEN	NA	06/29/18	07033698
Pheophytin-a	1.0	1.00		4.9	MG/CU.M.	10200H	10200H	06/29/18	07/02/18	07053708
Phosphorus	0.00800	0.0100		0.525	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.149	MG/L	NONE	365.2	NA	06/29/18	07193746
Solids, Total Suspended	6.67	6.67		227	MG/L	NONE	160.2	NA	06/29/18	07053709
Solids, Volatile Suspen	6.67	6.67		20.7	MG/L	NONE	160.4	NA	06/29/18	07053710
Total Organic Carbon	0.500	1.00		3.5	MG/L	NONE	415.1	NA	07/10/18	07163729

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008417-04 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: SLH-1 Sampling Date: 08/23/2018 Moisture: NA
Received: 08/23/2018 Sampling Time: 1540

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	09/19/18	10034162
Chlorophyll-a, Correcte	1.0	1.00		41.9	MG/CU.M.	10200H	10200H	08/24/18	09/07/18	09114055
Kjeldahl Nitrogen	0.190	0.200		0.882	MG/L	351.2	351.2	09/17/18	09/19/18	09194090
Nitrate as Nitrogen	0.0380	0.0400		1.01	MG/L	NONE	GREEN	NA	09/20/18	10034161
Pheophytin-a	1.0	1.00		10.2	MG/CU.M.	10200H	10200H	08/24/18	09/07/18	09114055
Phosphorus	0.00800	0.0100		0.13	MG/L	365.2	365.2	09/19/18	09/20/18	10034153
Phosphorus, -ortho	0.00800	0.0100		0.112	MG/L	NONE	365.2	NA	08/24/18	08273987
Solids, Total Suspended	5.0	5.00		72.5	MG/L	NONE	160.2	NA	08/29/18	09074042
Solids, Volatile Suspen	5.0	5.00		9.5	MG/L	NONE	160.4	NA	08/29/18	09074043
Total Organic Carbon	0.500	1.00		4.3	MG/L	NONE	415.1	NA	08/28/18	TA38574A

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/01/2018

Project Name:	LOWER RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3550C

Field ID:	SLH-1	ARDL Lab No.:	008417-09
Desc/Location:	LOWER RIVER	Lab Filename:	E0926816
Sample Date:	08/23/2018	Received Date:	08/23/2018
Sample Time:	1540	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	30.3 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	16.6	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.95	7.95	ND		UG/KG	1
Atrazine	7.95	7.95	ND		UG/KG	1
Metribuzin	7.95	7.95	ND		UG/KG	1
Alachlor	7.95	7.95	ND		UG/KG	1
Metolachlor	7.95	7.95	ND		UG/KG	1
Chlorpyrifos	7.95	7.95	ND		UG/KG	1
Cyanazine	7.95	7.95	ND		UG/KG	1
Pendimethalin	7.95	7.95	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	88%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008417-09 Sampling Loc'n: LOWER RIVER Matrix: SEDIMENT
Field ID: SLH-1 Sampling Date: 08/23/2018 Moisture: 16.6
Received: 08/23/2018 Sampling Time: 1540

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.230	0.345		1.44	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Barium	0.0459	1.15		16.3	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Boron	0.574	3.45		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Cadmium	0.0459	0.230		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Chromium	0.230	0.574		1.94	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Copper	0.459	1.15	J	0.804	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Iron	2.30	5.74		2570	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Lead	0.230	0.345		2.06	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Manganese	0.230	0.574		38.8	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Mercury	0.0819	0.0863		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.276	1.72		3.42	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Selenium	0.230	0.574		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Silver	0.230	0.574		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Zinc	0.459	0.574		6.88	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
Kjeldahl Nitrogen	20.3	21.4		34.2	MG/KG	351.2	351.2	09/17/18	09/19/18	10034155
Nitrate as Nitrogen	2.24	2.24		ND	MG/KG	NONE	GREEN	NA	09/20/18	10034160
Phosphorus	2.28	2.85		159	MG/KG	365.2	365.2	09/19/18	09/20/18	10034154
Solids, Percent	0.100	0.100		83.4	%	NONE	160.3	NA	08/29/18	09044010
Total Organic Carbon	77.0	150	J	86.0	MG/KG	NONE	9060	NA	09/07/18	TA387744

(a) DOD and/or NELAC Accredited Analyte.

Sample 008417-09, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-16 Sampling Loc'n: LOWER MISSISSIPPI RIVER Matrix: WATER
Field ID: SLH-2 Sampling Date: 02/22/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 1210

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.19	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		12.8	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.25	MG/L	351.2	351.2	03/01/18	03/02/18	03053165
Nitrate as Nitrogen	0.0380	0.0400		1.8	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		4.1	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.33	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.128	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.200	0.200		87.0	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.200	0.200		5.5	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		3.1	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008389-12
Field ID: SLH-2
Received: 04/25/2018

Sampling Loc'n: UPPER MISSISSIPPI RIVER
Sampling Date: 04/23/2018
Sampling Time: 0924

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0765	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		17.1	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		0.697	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		1.99	MG/L	NONE	GREEN	NA	05/01/18	05073382
Pheophytin-a	1.0	1.00		5.6	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.371	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.126	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	5.0	5.00		69.5	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	5.0	5.00		7.5	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		4.1	MG/L	NONE	415.1	NA	05/02/18	05103397

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008404 Report Date: 07/17/2018

Project Name: LOWER RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008404-04
Field ID: SLH-2
Received: 06/25/2018

Sampling Loc'n: LOWER RIVER
Sampling Date: 06/25/2018
Sampling Time: 1530

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.104	MG/L	NONE	350.1	NA	06/27/18	07033704
Chlorophyll-a, Correcte	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Kjeldahl Nitrogen	0.190	0.200		0.59	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		2.21	MG/L	NONE	GREEN	NA	06/26/18	07033705
Pheophytin-a	1.0	1.00		4.0	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Phosphorus	0.00800	0.0100		0.384	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.135	MG/L	NONE	365.2	NA	06/26/18	06293673
Solids, Total Suspended	6.67	6.67		157	MG/L	NONE	160.2	NA	06/26/18	06293674
Solids, Volatile Suspen	6.67	6.67		13.3	MG/L	NONE	160.4	NA	06/26/18	06293675
Total Organic Carbon	0.500	1.00		3.7	MG/L	NONE	415.1	NA	06/28/18	07163728

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008417-11 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: SLH-2 Sampling Date: 08/26/2018 Moisture: NA
Received: 08/27/2018 Sampling Time: 1915

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	09/19/18	10034162
Chlorophyll-a, Correcte	1.0	1.00		17.3	MG/CU.M.	10200H	10200H	08/28/18	09/10/18	09114056
Kjeldahl Nitrogen	0.190	0.200		0.266	MG/L	351.2	351.2	09/19/18	09/20/18	10034157
Nitrate as Nitrogen	0.0380	0.0400		0.85	MG/L	NONE	GREEN	NA	09/20/18	10034161
Pheophytin-a	1.0	1.00		4.7	MG/CU.M.	10200H	10200H	08/28/18	09/10/18	09114056
Phosphorus	0.00800	0.0100		0.195	MG/L	365.2	365.2	09/19/18	09/20/18	10034153
Phosphorus, -ortho	0.00800	0.0100		0.12	MG/L	NONE	365.2	NA	08/28/18	08314002
Solids, Total Suspended	5.0	5.00		164	MG/L	NONE	160.2	NA	08/29/18	09074042
Solids, Volatile Suspen	5.0	5.00		15.5	MG/L	NONE	160.4	NA	08/29/18	09074043
Total Organic Carbon	0.500	1.00		3.1	MG/L	NONE	415.1	NA	09/05/18	TA387366

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/01/2018

Project Name:	LOWER RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3550C

Field ID:	SLH-2	ARDL Lab No.:	008417-12
Desc/Location:	LOWER RIVER	Lab Filename:	E0926817
Sample Date:	08/26/2018	Received Date:	08/27/2018
Sample Time:	1915	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	29.8 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	21	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	8.54	8.54	ND		UG/KG	1
Atrazine	8.54	8.54	ND		UG/KG	1
Metribuzin	8.54	8.54	ND		UG/KG	1
Alachlor	8.54	8.54	ND		UG/KG	1
Metolachlor	8.54	8.54	ND		UG/KG	1
Chlorpyrifos	8.54	8.54	ND		UG/KG	1
Cyanazine	8.54	8.54	ND		UG/KG	1
Pendimethalin	8.54	8.54	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	85%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008417-12 Sampling Loc'n: LOWER RIVER Matrix: SEDIMENT
Field ID: SLH-2 Sampling Date: 08/26/2018 Moisture: 21
Received: 08/27/2018 Sampling Time: 1915

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.235	0.353		3.61	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Barium	0.0471	1.18		102	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Boron	0.588	3.53	J	1.29	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Cadmium	0.0471	0.235	J	0.106	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Chromium	0.235	0.588		5.54	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Copper	0.471	1.18		1.66	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Iron	2.35	5.88		6120	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Lead	0.235	0.353		4.91	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Manganese	0.235	0.588		117	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Mercury	0.088	0.093		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.282	1.76		8.53	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Selenium	0.235	0.588		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Silver	0.235	0.588		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Zinc	0.471	0.588		20.2	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
Kjeldahl Nitrogen	22.3	23.4		48.7	MG/KG	351.2	351.2	09/19/18	09/20/18	10034156
Nitrate as Nitrogen	2.46	2.46		ND	MG/KG	NONE	GREEN	NA	09/20/18	10034160
Phosphorus	2.41	3.01		300	MG/KG	365.2	365.2	09/19/18	09/20/18	10034154
Solids, Percent	0.100	0.100		79.0	%	NONE	160.3	NA	08/29/18	09044010
Total Organic Carbon	77.0	150	J	94.0	MG/KG	NONE	9060	NA	09/18/18	TA390008

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-12 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: SLH-3 Sampling Date: 02/21/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 1455

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.219	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		13.3	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.98	MG/L	351.2	351.2	03/01/18	03/02/18	03053165
Nitrate as Nitrogen	0.0380	0.0400		2.48	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		3.3	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.527	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.276	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.300	0.300		55.0	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.300	0.300		4.67	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		3.8	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008389 Report Date: 05/17/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008389-13 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: SLH-3 Sampling Date: 04/23/2018 Moisture: NA
Received: 04/25/2018 Sampling Time: 1120

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0456	MG/L	NONE	350.1	NA	05/04/18	05083389
Chlorophyll-a, Correcte	1.0	1.00		28.2	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Kjeldahl Nitrogen	0.190	0.200		1.12	MG/L	351.2	351.2	05/14/18	05/15/18	05163432
Nitrate as Nitrogen	0.0190	0.0200		3.73	MG/L	NONE	GREEN	NA	05/02/18	05073382
Pheophytin-a	1.0	1.00		13.7	MG/CU.M.	10200H	10200H	04/25/18	05/04/18	05083393
Phosphorus	0.00800	0.0100		0.41	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.0824	MG/L	NONE	365.2	NA	04/25/18	04263328
Solids, Total Suspended	5.0	5.00		90.0	MG/L	NONE	160.2	NA	04/26/18	04273332
Solids, Volatile Suspen	5.0	5.00		8.5	MG/L	NONE	160.4	NA	04/26/18	04273333
Total Organic Carbon	0.500	1.00		4.8	MG/L	NONE	415.1	NA	05/02/18	05103397

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008404 Report Date: 07/17/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008404-03 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: SLH-3 Sampling Date: 06/25/2018 Moisture: NA
Received: 06/25/2018 Sampling Time: 1445

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.060	MG/L	NONE	350.1	NA	06/27/18	07033704
Chlorophyll-a, Correcte	1.0	1.00		11.4	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Kjeldahl Nitrogen	0.190	0.200		0.929	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		3.95	MG/L	NONE	GREEN	NA	06/26/18	07033705
Pheophytin-a	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Phosphorus	0.00800	0.0100		0.40	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.128	MG/L	NONE	365.2	NA	06/26/18	06293673
Solids, Total Suspended	5.0	5.00		126	MG/L	NONE	160.2	NA	06/26/18	06293674
Solids, Volatile Suspen	5.0	5.00		23.5	MG/L	NONE	160.4	NA	06/26/18	06293675
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	06/28/18	07163728

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008416-08 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: WATER
Field ID: SLH-3 Sampling Date: 08/22/2018 Moisture: NA
Received: 08/22/2018 Sampling Time: 1500

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0245	MG/L	NONE	350.1	NA	08/24/18	10024152
Chlorophyll-a, Correcte	1.0	1.00		48.7	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Kjeldahl Nitrogen	0.190	0.200		0.769	MG/L	351.2	351.2	09/17/18	09/19/18	09194090
Nitrate as Nitrogen	0.0190	0.0200		0.975	MG/L	NONE	GREEN	NA	09/18/18	10014148
Pheophytin-a	1.0	1.00		10.5	MG/CU.M.	10200H	10200H	08/23/18	09/06/18	09114052
Phosphorus	0.00800	0.0100		0.313	MG/L	365.2	365.2	09/12/18	09/13/18	09264133
Phosphorus, -ortho	0.00800	0.0100		0.0803	MG/L	NONE	365.2	NA	08/23/18	08273985
Solids, Total Suspended	4.0	4.00		56.4	MG/L	NONE	160.2	NA	08/27/18	09074040
Solids, Volatile Suspen	4.0	4.00		8.4	MG/L	NONE	160.4	NA	08/27/18	09074041
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	08/28/18	TA38574A

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/01/2018

Project Name: UPPER MISSISSIPPI RI Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	SLH-3	ARDL Lab No.:	008416-16
Desc/Location:	UPPER MISSISSIPPI RIVER	Lab Filename:	E0926810
Sample Date:	08/22/2018	Received Date:	08/22/2018
Sample Time:	1500	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	29.7 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	13.6	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.83	7.83	ND		UG/KG	1
Atrazine	7.83	7.83	ND		UG/KG	1
Metribuzin	7.83	7.83	ND		UG/KG	1
Alachlor	7.83	7.83	ND		UG/KG	1
Metolachlor	7.83	7.83	ND		UG/KG	1
Chlorpyrifos	7.83	7.83	ND		UG/KG	1
Cyanazine	7.83	7.83	ND		UG/KG	1
Pendimethalin	7.83	7.83	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	95%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008416 Report Date: 10/04/2018

Project Name: UPPER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008416-16 Sampling Loc'n: UPPER MISSISSIPPI RIVER Matrix: SEDIMENT
Field ID: SLH-3 Sampling Date: 08/22/2018 Moisture: 13.6
Received: 08/22/2018 Sampling Time: 1500

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.226	0.340		1.47	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Barium	0.0453	1.13		15.6	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Boron	0.566	3.40		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Cadmium	0.0453	0.226	J	0.0679	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Chromium	0.196	0.489		1.04	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Copper	0.453	1.13		ND	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Iron	2.26	5.66		2390	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Lead	0.226	0.340		1.56	MG/KG	3050B	6010C	08/27/18	09/04/18	P7065A
(a) Manganese	0.213	0.532		50.7	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Mercury	0.0817	0.0861		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.272	1.70		3.09	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Selenium	0.226	0.566		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Silver	0.226	0.566		ND	MG/KG	3050B	6010C	08/27/18	08/31/18	P7065A
(a) Zinc	0.426	0.532		6.46	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
Kjeldahl Nitrogen	22.0	23.1		ND	MG/KG	351.2	351.2	09/17/18	09/19/18	09244115
Nitrate as Nitrogen	2.14	2.14		ND	MG/KG	NONE	GREEN	NA	09/19/18	10014149
Phosphorus	2.20	2.76		120	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		86.4	%	NONE	160.3	NA	08/28/18	09044009
Total Organic Carbon	77.0	150	J	120	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-13 Sampling Loc'n: LOWER MISSISSIPPI RIVER Matrix: WATER
Field ID: OPR-2 Sampling Date: 02/22/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 1110

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.203	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		10.7	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.76	MG/L	351.2	351.2	03/01/18	03/02/18	03053165
Nitrate as Nitrogen	0.0380	0.0400		1.98	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		2.8	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.479	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.147	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.150	0.150		188	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.150	0.150		12.0	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		3.5	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008390 Report Date: 05/21/2018

Project Name: LOWER RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008390-01
Field ID: OPR-2
Received: 04/27/2018

Sampling Loc'n: LOWER RIVER
Sampling Date: 04/26/2018
Sampling Time: 1240

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0388	MG/L	NONE	350.1	NA	05/04/18	05083390
Chlorophyll-a, Correcte	1.0	1.00		17.1	MG/CU.M.	10200H	10200H	04/27/18	05/04/18	05083394
Kjeldahl Nitrogen	0.190	0.200		1.18	MG/L	351.2	351.2	05/15/18	05/16/18	05163434
Nitrate as Nitrogen	0.0190	0.0200		2.66	MG/L	NONE	GREEN	NA	05/01/18	05083395
Pheophytin-a	1.0	1.00		12.2	MG/CU.M.	10200H	10200H	04/27/18	05/04/18	05083394
Phosphorus	0.00800	0.0100		0.333	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.086	MG/L	NONE	365.2	NA	04/27/18	04303339
Solids, Total Suspended	5.0	5.00		78.0	MG/L	NONE	160.2	NA	04/30/18	05013348
Solids, Volatile Suspen	5.0	5.00		8.5	MG/L	NONE	160.4	NA	04/30/18	05013349
Total Organic Carbon	0.500	1.00		4.8	MG/L	NONE	415.1	NA	05/02/18	05103397

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008404 Report Date: 07/17/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008404-01 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: OPR-2 Sampling Date: 06/25/2018 Moisture: NA
Received: 06/25/2018 Sampling Time: 1415

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.13	MG/L	NONE	350.1	NA	06/27/18	07033704
Chlorophyll-a, Correcte	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Kjeldahl Nitrogen	0.190	0.200		0.957	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		3.45	MG/L	NONE	GREEN	NA	06/26/18	07033705
Pheophytin-a	1.0	1.00		8.4	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Phosphorus	0.00800	0.0100		0.408	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.156	MG/L	NONE	365.2	NA	06/26/18	06293673
Solids, Total Suspended	6.67	6.67		141	MG/L	NONE	160.2	NA	06/26/18	06293674
Solids, Volatile Suspen	6.67	6.67		9.33	MG/L	NONE	160.4	NA	06/26/18	06293675
Total Organic Carbon	0.500	1.00		3.6	MG/L	NONE	415.1	NA	06/28/18	07163728

(a) DOD and/or NELAC Accredited Analyte.

Sample 008404-01, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008417-01 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: OPR-2 Sampling Date: 08/23/2018 Moisture: NA
Received: 08/23/2018 Sampling Time: 1150

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.029	MG/L	NONE	350.1	NA	09/19/18	10034162
Chlorophyll-a, Correcte	1.0	1.00		46.1	MG/CU.M.	10200H	10200H	08/24/18	09/07/18	09114055
Kjeldahl Nitrogen	0.190	0.200		0.927	MG/L	351.2	351.2	09/17/18	09/19/18	09194090
Nitrate as Nitrogen	0.0380	0.0400		1.05	MG/L	NONE	GREEN	NA	09/20/18	10034161
Pheophytin-a	1.0	1.00		19.1	MG/CU.M.	10200H	10200H	08/24/18	09/07/18	09114055
Phosphorus	0.00800	0.0100		0.144	MG/L	365.2	365.2	09/19/18	09/20/18	10034153
Phosphorus, -ortho	0.00800	0.0100		0.117	MG/L	NONE	365.2	NA	08/24/18	08273987
Solids, Total Suspended	4.0	4.00		80.0	MG/L	NONE	160.2	NA	08/29/18	09074042
Solids, Volatile Suspen	4.0	4.00		10.4	MG/L	NONE	160.4	NA	08/29/18	09074043
Total Organic Carbon	0.500	1.00		4.2	MG/L	NONE	415.1	NA	08/28/18	TA38574A

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/02/2018

Project Name: LOWER RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	OPR-2	ARDL Lab No.:	008417-06
Desc/Location:	LOWER RIVER	Lab Filename:	E0926813
Sample Date:	08/23/2018	Received Date:	08/23/2018
Sample Time:	1150	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	30 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	16.1	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.99	7.99	ND		UG/KG	1
Atrazine	7.99	7.99	ND		UG/KG	1
Metribuzin	7.99	7.99	ND		UG/KG	1
Alachlor	7.99	7.99	ND		UG/KG	1
Metolachlor	7.99	7.99	ND		UG/KG	1
Chlorpyrifos	7.99	7.99	ND		UG/KG	1
Cyanazine	7.99	7.99	ND		UG/KG	1
Pendimethalin	7.99	7.99	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	91%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008417-06 Sampling Loc'n: LOWER RIVER Matrix: SEDIMENT
Field ID: OPR-2 Sampling Date: 08/23/2018 Moisture: 16.1
Received: 08/23/2018 Sampling Time: 1150

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.220	0.330		2.38	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Barium	0.0441	1.10		17.8	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Boron	0.551	3.30	J	0.628	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Cadmium	0.0441	0.220	J	0.0551	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Chromium	0.220	0.551		8.87	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Copper	0.441	1.10		8.57	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Iron	2.20	5.51		5410	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Lead	0.220	0.330		2.24	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Manganese	0.220	0.551		90.8	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Mercury	0.0845	0.0889		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.264	1.65		9.68	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Selenium	0.220	0.551		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Silver	0.220	0.551		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Zinc	0.441	0.551		16.8	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
Kjeldahl Nitrogen	21.0	22.1		ND	MG/KG	351.2	351.2	09/17/18	09/19/18	10034155
Nitrate as Nitrogen	2.34	2.34		ND	MG/KG	NONE	GREEN	NA	09/20/18	10034160
Phosphorus	2.27	2.84		232	MG/KG	365.2	365.2	09/19/18	09/20/18	10034154
Solids, Percent	0.10	0.10		83.9	%	NONE	160.3	NA	09/04/18	09054018
Total Organic Carbon	77.0	150	J	130	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-14 Sampling Loc'n: LOWER MISSISSIPPI RIVER Matrix: WATER
Field ID: OPR-4 Sampling Date: 02/22/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 0900

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.211	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		11.7	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		1.47	MG/L	351.2	351.2	03/01/18	03/02/18	03053165
Nitrate as Nitrogen	0.0380	0.0400		2.4	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		3.2	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		0.513	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.172	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.250	0.250		87.2	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.250	0.250		5.6	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		3.9	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/01/2018

Project Name: LOWER RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	OPR-4	ARDL Lab No.:	008417-07
Desc/Location:	LOWER RIVER	Lab Filename:	E0926814
Sample Date:	08/23/2018	Received Date:	08/23/2018
Sample Time:	1500	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	29.9 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	14.3	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	7.84	7.84	ND		UG/KG	1
Atrazine	7.84	7.84	ND		UG/KG	1
Metribuzin	7.84	7.84	ND		UG/KG	1
Alachlor	7.84	7.84	ND		UG/KG	1
Metolachlor	7.84	7.84	ND		UG/KG	1
Chlorpyrifos	7.84	7.84	ND		UG/KG	1
Cyanazine	7.84	7.84	ND		UG/KG	1
Pendimethalin	7.84	7.84	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	95%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008417-07
Field ID: OPR-4
Received: 08/23/2018

Sampling Loc'n: LOWER RIVER
Sampling Date: 08/23/2018
Sampling Time: 1500

Matrix: SEDIMENT
Moisture: 14.3

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.223	0.334		1.40	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Barium	0.0445	1.11		14.8	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Boron	0.557	3.34		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Cadmium	0.0445	0.223		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Chromium	0.223	0.557		1.95	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Copper	0.445	1.11	J	0.824	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Iron	2.23	5.57		2580	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Lead	0.223	0.334		1.79	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Manganese	0.223	0.557		41.9	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Mercury	0.0797	0.0839		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.267	1.67		3.95	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Selenium	0.223	0.557		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Silver	0.223	0.557		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Zinc	0.445	0.557		7.25	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
Kjeldahl Nitrogen	21.3	22.4		31.5	MG/KG	351.2	351.2	09/17/18	09/19/18	10034155
Nitrate as Nitrogen	2.12	2.12		ND	MG/KG	NONE	GREEN	NA	09/20/18	10034160
Phosphorus	2.12	2.65		116	MG/KG	365.2	365.2	09/19/18	09/20/18	10034154
Solids, Percent	0.100	0.100		85.7	%	NONE	160.3	NA	08/29/18	09044010
Total Organic Carbon	77.0	150		150	MG/KG	NONE	9060	NA	09/07/18	TA387744

(a) DOD and/or NELAC Accredited Analyte.

Sample 008417-07, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008390 Report Date: 05/21/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008390-02 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: OPR-4 Sampling Date: 04/26/2018 Moisture: NA
Received: 04/27/2018 Sampling Time: 1000

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0514	MG/L	NONE	350.1	NA	05/04/18	05083390
Chlorophyll-a, Correcte	1.0	1.00		16.2	MG/CU.M.	10200H	10200H	04/27/18	05/04/18	05083394
Kjeldahl Nitrogen	0.190	0.200		0.999	MG/L	351.2	351.2	05/15/18	05/16/18	05163434
Nitrate as Nitrogen	0.0190	0.0200		2.86	MG/L	NONE	GREEN	NA	05/01/18	05083395
Pheophytin-a	1.0	1.00		11.9	MG/CU.M.	10200H	10200H	04/27/18	05/04/18	05083394
Phosphorus	0.00800	0.0100		0.38	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.166	MG/L	NONE	365.2	NA	04/27/18	04303339
Solids, Total Suspended	6.67	6.67		89.3	MG/L	NONE	160.2	NA	04/30/18	05013348
Solids, Volatile Suspen	6.67	6.67		8.67	MG/L	NONE	160.4	NA	04/30/18	05013349
Total Organic Carbon	0.500	1.00		5.1	MG/L	NONE	415.1	NA	05/02/18	05103397

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008404 Report Date: 07/17/2018

Project Name: LOWER RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008404-02
Field ID: OPR-4
Received: 06/25/2018

Sampling Loc'n: LOWER RIVER
Sampling Date: 06/25/2018
Sampling Time: 1105

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.16	MG/L	NONE	350.1	NA	06/27/18	07033704
Chlorophyll-a, Correcte	1.0	1.00		6.0	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Kjeldahl Nitrogen	0.190	0.200		0.556	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		3.21	MG/L	NONE	GREEN	NA	06/26/18	07033705
Pheophytin-a	1.0	1.00		3.0	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Phosphorus	0.00800	0.0100		0.371	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.156	MG/L	NONE	365.2	NA	06/26/18	06293673
Solids, Total Suspended	5.0	5.00		126	MG/L	NONE	160.2	NA	06/26/18	06293674
Solids, Volatile Suspen	5.0	5.00		11.5	MG/L	NONE	160.4	NA	06/26/18	06293675
Total Organic Carbon	0.500	1.00		4.0	MG/L	NONE	415.1	NA	06/28/18	07163728

(a) DOD and/or NELAC Accredited Analyte.

Sample 008404-02, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008417-02 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: OPR-4 Sampling Date: 08/23/2018 Moisture: NA
Received: 08/23/2018 Sampling Time: 1500

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0692	MG/L	NONE	350.1	NA	09/19/18	10034162
Chlorophyll-a, Correcte	1.0	1.00		35.9	MG/CU.M.	10200H	10200H	08/24/18	09/07/18	09114055
Kjeldahl Nitrogen	0.190	0.200		0.795	MG/L	351.2	351.2	09/17/18	09/19/18	09194090
Nitrate as Nitrogen	0.0380	0.0400		1.07	MG/L	NONE	GREEN	NA	09/20/18	10034161
Pheophytin-a	1.0	1.00		4.8	MG/CU.M.	10200H	10200H	08/24/18	09/07/18	09114055
Phosphorus	0.00800	0.0100		0.102	MG/L	365.2	365.2	09/19/18	09/20/18	10034153
Phosphorus, -ortho	0.00800	0.0100		0.0902	MG/L	NONE	365.2	NA	08/24/18	08273987
Solids, Total Suspended	6.67	6.67		68.7	MG/L	NONE	160.2	NA	08/29/18	09074042
Solids, Volatile Suspen	6.67	6.67		10.7	MG/L	NONE	160.4	NA	08/29/18	09074043
Total Organic Carbon	0.500	1.00		4.8	MG/L	NONE	415.1	NA	08/28/18	TA38574A

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008376 Report Date: 03/15/2018

Project Name: UPPER & LOWER MISSISSIPPI RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008376-18 Sampling Loc'n: LOWER MISSISSIPPI RIVER Matrix: WATER
Field ID: KAS-1 Sampling Date: 02/22/2018 Moisture: NA
Received: 02/22/2018 Sampling Time: 0933

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.204	MG/L	NONE	350.1	NA	03/06/18	03073168
Chlorophyll-a, Correcte	1.0	1.00		21.4	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Kjeldahl Nitrogen	0.190	0.200		2.82	MG/L	351.2	351.2	03/01/18	03/02/18	03053165
Nitrate as Nitrogen	0.0380	0.0400		0.894	MG/L	NONE	GREEN	NA	03/02/18	03073171
Pheophytin-a	1.0	1.00		1.1	MG/CU.M.	10200H	10200H	02/23/18	03/01/18	03023158
Phosphorus	0.00800	0.0100		1.08	MG/L	365.2	365.2	03/07/18	03/08/18	03133192
Phosphorus, -ortho	0.00800	0.0100		0.20	MG/L	NONE	365.2	NA	02/23/18	02273156
Solids, Total Suspended	0.0500	0.0500		248	MG/L	NONE	160.2	NA	02/27/18	03053161
Solids, Volatile Suspen	0.0500	0.0500		ND	MG/L	NONE	160.4	NA	02/27/18	03053162
Total Organic Carbon	0.500	1.00		5.3	MG/L	NONE	415.1	NA	03/09/18	03133194

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008390 Report Date: 05/21/2018

Project Name: LOWER RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008390-05
Field ID: KAS-1
Received: 04/27/2018

Sampling Loc'n: LOWER RIVER
Sampling Date: 04/26/2018
Sampling Time: 0904

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0572	MG/L	NONE	350.1	NA	05/04/18	05083390
Chlorophyll-a, Correcte	1.0	1.00		29.0	MG/CU.M.	10200H	10200H	04/27/18	05/04/18	05083394
Kjeldahl Nitrogen	0.190	0.200		1.0	MG/L	351.2	351.2	05/15/18	05/16/18	05163434
Nitrate as Nitrogen	0.0190	0.0200		0.917	MG/L	NONE	GREEN	NA	05/01/18	05083395
Pheophytin-a	1.0	1.00		5.6	MG/CU.M.	10200H	10200H	04/27/18	05/04/18	05083394
Phosphorus	0.00800	0.0100		0.371	MG/L	365.2	365.2	05/02/18	05/03/18	05073383
Phosphorus, -ortho	0.00800	0.0100		0.18	MG/L	NONE	365.2	NA	04/27/18	04303339
Solids, Total Suspended	6.67	6.67		74.0	MG/L	NONE	160.2	NA	04/30/18	05013348
Solids, Volatile Suspen	6.67	6.67		ND	MG/L	NONE	160.4	NA	04/30/18	05013349
Total Organic Carbon	0.500	1.00		5.8	MG/L	NONE	415.1	NA	05/02/18	05103397

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008404 Report Date: 07/17/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008404-05 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: KAS-1 Sampling Date: 06/25/2018 Moisture: NA
Received: 06/25/2018 Sampling Time: 1230

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.235	MG/L	NONE	350.1	NA	06/27/18	07033704
Chlorophyll-a, Correcte	1.0	1.00		13.7	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Kjeldahl Nitrogen	0.190	0.200		0.275	MG/L	351.2	351.2	07/10/18	07/11/18	07163726
Nitrate as Nitrogen	0.0950	0.100		0.773	MG/L	NONE	GREEN	NA	06/26/18	07033705
Pheophytin-a	1.0	1.00		6.1	MG/CU.M.	10200H	10200H	06/26/18	06/27/18	06293672
Phosphorus	0.00800	0.0100		0.40	MG/L	365.2	365.2	07/02/18	07/03/18	07163727
Phosphorus, -ortho	0.00800	0.0100		0.217	MG/L	NONE	365.2	NA	06/26/18	06293673
Solids, Total Suspended	4.0	4.00		45.2	MG/L	NONE	160.2	NA	06/26/18	06293674
Solids, Volatile Suspen	4.0	4.00		4.8	MG/L	NONE	160.4	NA	06/26/18	06293675
Total Organic Carbon	0.500	1.00		4.8	MG/L	NONE	415.1	NA	06/28/18	07163728

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008417-05 Sampling Loc'n: LOWER RIVER Matrix: WATER
Field ID: KAS-1 Sampling Date: 08/23/2018 Moisture: NA
Received: 08/23/2018 Sampling Time: 0930

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.117	MG/L	NONE	350.1	NA	09/19/18	10034162
Chlorophyll-a, Correcte	1.0	1.00		18.8	MG/CU.M.	10200H	10200H	08/24/18	09/07/18	09114055
Kjeldahl Nitrogen	0.190	0.200		1.22	MG/L	351.2	351.2	09/17/18	09/19/18	09194090
Nitrate as Nitrogen	0.0380	0.0400		0.38	MG/L	NONE	GREEN	NA	09/20/18	10034161
Pheophytin-a	1.0	1.00		6.3	MG/CU.M.	10200H	10200H	08/24/18	09/07/18	09114055
Phosphorus	0.00800	0.0100		0.246	MG/L	365.2	365.2	09/19/18	09/20/18	10034153
Phosphorus, -ortho	0.00800	0.0100		0.226	MG/L	NONE	365.2	NA	08/24/18	08273987
Solids, Total Suspended	5.0	5.00		51.5	MG/L	NONE	160.2	NA	08/29/18	09074042
Solids, Volatile Suspen	5.0	5.00		8.0	MG/L	NONE	160.4	NA	08/29/18	09074043
Total Organic Carbon	0.500	1.00		5.7	MG/L	NONE	415.1	NA	08/28/18	TA38574A

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/01/2018

Project Name:	LOWER RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3550C

Field ID:	KAS-1	ARDL Lab No.:	008417-10
Desc/Location:	LOWER RIVER	Lab Filename:	E0926821
Sample Date:	08/23/2018	Received Date:	08/23/2018
Sample Time:	0930	Prep. Date:	09/04/2018
Matrix:	SEDIMENT	Analysis Date:	09/26/2018
Amount Used:	30.4 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10942
% Moisture:	42.9	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	11.6	11.6	ND		UG/KG	1
Atrazine	11.6	11.6	ND		UG/KG	1
Metribuzin	11.6	11.6	ND		UG/KG	1
Alachlor	11.6	11.6	ND		UG/KG	1
Metolachlor	11.6	11.6	ND		UG/KG	1
Chlorpyrifos	11.6	11.6	ND		UG/KG	1
Cyanazine	11.6	11.6	ND		UG/KG	1
Pendimethalin	11.6	11.6	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	91%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008417 Report Date: 10/10/2018

Project Name: LOWER RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008417-10
Field ID: KAS-1
Received: 08/23/2018

Sampling Loc'n: LOWER RIVER
Sampling Date: 08/23/2018
Sampling Time: 0930

Matrix: SEDIMENT
Moisture: 42.9

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.345	0.517		6.60	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Barium	0.0689	1.72		149	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Boron	0.862	5.17		5.41	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Cadmium	0.0689	0.345		0.345	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Chromium	0.345	0.862		21.6	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Copper	0.689	1.72		14.4	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Iron	3.45	8.62		18400	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Lead	0.345	0.517		13.7	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Manganese	0.345	0.862		737	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Mercury	0.127	0.134		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4019
(a) Nickel	0.414	2.59		17.2	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Selenium	0.345	0.862		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Silver	0.345	0.862		ND	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
(a) Zinc	0.689	0.862		80.8	MG/KG	3050B	6010C	09/05/18	09/06/18	P7070A
Kjeldahl Nitrogen	378	398		1530	MG/KG	351.2	351.2	09/19/18	09/20/18	10034156
Nitrate as Nitrogen	2.89	2.89		ND	MG/KG	NONE	GREEN	NA	09/20/18	10034160
Phosphorus	3.05	3.81		314	MG/KG	365.2	365.2	09/19/18	09/20/18	10034154
Solids, Percent	0.100	0.100		57.1	%	NONE	160.3	NA	08/29/18	09044010
Total Organic Carbon	154	300		10000	MG/KG	NONE	9060	NA	09/07/18	TA387744

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/19/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-1	ARDL Lab No.:	008379-01
Desc/Location:	ILLINOS RIVER	Lab Filename:	E0313816
Sample Date:	02/27/2018	Received Date:	02/27/2018
Sample Time:	1030	Prep. Date:	03/01/2018
Matrix:	WATER	Analysis Date:	03/13/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10865
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	57%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/20/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008379-01 Sampling Loc'n: ILLINOS RIVER Matrix: WATER
Field ID: IL-1 Sampling Date: 02/27/2018 Moisture: NA
Received: 02/27/2018 Sampling Time: 1030

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.216	MG/L	NONE	350.1	NA	03/06/18	03073170
Chlorophyll-a, Correcte	1.0	1.00		12.8	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Kjeldahl Nitrogen	0.380	0.400		2.14	MG/L	351.2	351.2	03/13/18	03/15/18	03163203
Nitrate as Nitrogen	0.0380	0.0400		3.83	MG/L	NONE	GREEN	NA	03/02/18	03083173
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Phosphorus	0.00800	0.0100		0.596	MG/L	365.2	365.2	03/14/18	03/15/18	03193204
Phosphorus, -ortho	0.00800	0.0100		0.252	MG/L	NONE	365.2	NA	02/28/18	03023160
Solids, Total Suspended	10.0	10.0		324	MG/L	NONE	160.2	NA	03/02/18	03063166
Solids, Volatile Suspen	10.0	10.0		20.0	MG/L	NONE	160.4	NA	03/02/18	03063167
Total Organic Carbon	0.500	1.00		4.0	MG/L	NONE	415.1	NA	03/12/18	TA355266

(a) DOD and/or NELAC Accredited Analyte.

Sample 008379-01, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/14/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-1	ARDL Lab No.:	008387-01
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0513805
Sample Date:	04/17/2018	Received Date:	04/18/2018
Sample Time:	1040	Prep. Date:	04/23/2018
Matrix:	WATER	Analysis Date:	05/13/2018
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10881
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	0.267		UG/L	1
Metribuzin	0.222	0.222	ND		UG/L	1
Alachlor	0.222	0.222	ND		UG/L	1
Metolachlor	0.222	0.222	0.222		UG/L	1
Chlorpyrifos	0.222	0.222	ND		UG/L	1
Cyanazine	0.222	0.222	ND		UG/L	1
Pendimethalin	0.222	0.222	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	52%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008387-01 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-1 Sampling Date: 04/17/2018 Moisture: NA
Received: 04/18/2018 Sampling Time: 1040

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0834	MG/L	NONE	350.1	NA	04/20/18	04243297
Chlorophyll-a, Correcte	1.0	1.00		15.0	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Kjeldahl Nitrogen	0.190	0.200		1.58	MG/L	351.2	351.2	04/25/18	04/26/18	04303340
Nitrate as Nitrogen	0.0190	0.0200		3.36	MG/L	NONE	GREEN	NA	04/26/18	05033369
Pheophytin-a	1.0	1.00		10.5	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Phosphorus	0.00800	0.0100		0.396	MG/L	365.2	365.2	04/18/18	04/19/18	05013347
Phosphorus, -ortho	0.00800	0.0100		0.0879	MG/L	NONE	365.2	NA	04/19/18	05013344
Solids, Total Suspended	6.67	6.67		153	MG/L	NONE	160.2	NA	04/23/18	04253308
Solids, Volatile Suspen	6.67	6.67		13.3	MG/L	NONE	160.4	NA	04/23/18	04253309
Total Organic Carbon	0.500	1.00		4.1	MG/L	NONE	415.1	NA	04/26/18	05023364

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/06/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-1	ARDL Lab No.:	008401-01
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0705809
Sample Date:	06/13/2018	Received Date:	06/13/2018
Sample Time:	0945	Prep. Date:	06/18/2018
Matrix:	WATER	Analysis Date:	07/05/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10905
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	1.04		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	0.760		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	64%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008401-01 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-1 Sampling Date: 06/13/2018 Moisture: NA
Received: 06/13/2018 Sampling Time: 0945

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0746	MG/L	NONE	350.1	NA	06/26/18	07033693
Chlorophyll-a, Correcte	1.0	1.00		16.2	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Kjeldahl Nitrogen	0.190	0.200		1.02	MG/L	351.2	351.2	06/21/18	06/22/18	07033694
Nitrate as Nitrogen	0.0380	0.0400		2.14	MG/L	NONE	GREEN	NA	06/15/18	06183611
Pheophytin-a	1.0	1.00		10.1	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Phosphorus	0.00800	0.0100		0.472	MG/L	365.2	365.2	06/25/18	06/26/18	06293668
Phosphorus, -ortho	0.00800	0.0100		0.227	MG/L	NONE	365.2	NA	06/14/18	06203629
Solids, Total Suspended	4.0	4.00		62.0	MG/L	NONE	160.2	NA	06/19/18	06293669
Solids, Volatile Suspen	4.0	4.00		6.8	MG/L	NONE	160.4	NA	06/19/18	06293670
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	06/20/18	TA37160B

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Lab Report No: 008413 Report Date: 09/17/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-1	ARDL Lab No.:	008413-01
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0914805
Sample Date:	08/13/2018	Received Date:	08/13/2018
Sample Time:	1010	Prep. Date:	08/16/2018
Matrix:	WATER	Analysis Date:	09/14/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10926
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	73%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Lab Report No: 008413 Report Date: 09/12/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008413-01 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-1 Sampling Date: 08/13/2018 Moisture: NA
Received: 08/13/2018 Sampling Time: 1010

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0341	MG/L	NONE	350.1	NA	08/24/18	08273979
Chlorophyll-a, Correcte	1.0	1.00		29.9	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Kjeldahl Nitrogen	0.190	0.200		0.86	MG/L	351.2	351.2	08/28/18	08/30/18	08314001
Nitrate as Nitrogen	0.0190	0.0200		0.841	MG/L	NONE	GREEN	NA	08/15/18	08163947
Pheophytin-a	1.0	1.00		9.0	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Phosphorus	0.00800	0.0100		0.469	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.261	MG/L	NONE	365.2	NA	08/14/18	08153934
Solids, Total Suspended	4.0	4.00		29.2	MG/L	NONE	160.2	NA	08/16/18	08273981
Solids, Volatile Suspen	4.0	4.00		8.0	MG/L	NONE	160.4	NA	08/16/18	08273982
Total Organic Carbon	0.500	1.00		4.2	MG/L	NONE	415.1	NA	08/24/18	TA541

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Lab Report No: 008415 Report Date: 10/01/2018

Project Name:	ILLINOIS RIVER
Project No.:	
NELAC Certified - IL100308	
Analysis:	NP PESTICIDES (8270SIM-MOD)
Analytical Method:	8270C
Prep Method:	3550C

Field ID:	IL-1	ARDL Lab No.:	008415-01
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0925812
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	0935	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	29.3 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	29.9	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	9.79	9.79	ND		UG/KG	1
Atrazine	9.79	9.79	ND		UG/KG	1
Metribuzin	9.79	9.79	ND		UG/KG	1
Alachlor	9.79	9.79	ND		UG/KG	1
Metolachlor	9.79	9.79	ND		UG/KG	1
Chlorpyrifos	9.79	9.79	ND		UG/KG	1
Cyanazine	9.79	9.79	ND		UG/KG	1
Pendimethalin	9.79	9.79	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	77%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Lab Report No: 008415 Report Date: 10/01/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008415-01 Sampling Loc'n: ILLINOIS RIVER Matrix: SEDIMENT
Field ID: IL-1 Sampling Date: 08/21/2018 Moisture: 29.9
Received: 08/21/2018 Sampling Time: 0935

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.272	0.408		6.14	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0544	1.36		50.3	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.681	4.08		5.31	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0544	0.272		0.340	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.272	0.681		11.5	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.544	1.36		6.79	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	2.72	6.81		11700	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.272	0.408		8.87	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.272	0.681		347	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.101	0.106		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.327	2.04		12.6	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.272	0.681	J	0.422	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.272	0.681		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.544	0.681		36.5	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	27.1	28.5		410	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	2.10	2.21		ND	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	13.6	17.0		997	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		70.1	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	154	300		3900	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

Sample 008415-01, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/19/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-2	ARDL Lab No.:	008379-02
Desc/Location:	ILLINOS RIVER	Lab Filename:	E0313819
Sample Date:	02/27/2018	Received Date:	02/27/2018
Sample Time:	1010	Prep. Date:	03/01/2018
Matrix:	WATER	Analysis Date:	03/13/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10865
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	63%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/20/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008379-02 Sampling Loc'n: ILLINOS RIVER Matrix: WATER
Field ID: IL-2 Sampling Date: 02/27/2018 Moisture: NA
Received: 02/27/2018 Sampling Time: 1010

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.263	MG/L	NONE	350.1	NA	03/06/18	03073170
Chlorophyll-a, Correcte	1.0	1.00		12.8	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Kjeldahl Nitrogen	0.380	0.400		2.4	MG/L	351.2	351.2	03/13/18	03/15/18	03163203
Nitrate as Nitrogen	0.0950	0.100		3.72	MG/L	NONE	GREEN	NA	03/02/18	03083173
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Phosphorus	0.00800	0.0100		0.84	MG/L	365.2	365.2	03/14/18	03/15/18	03193204
Phosphorus, -ortho	0.00800	0.0100		0.211	MG/L	NONE	365.2	NA	02/28/18	03023160
Solids, Total Suspended	13.3	13.3		349	MG/L	NONE	160.2	NA	03/02/18	03063166
Solids, Volatile Suspen	13.3	13.3		25.3	MG/L	NONE	160.4	NA	03/02/18	03063167
Total Organic Carbon	0.500	1.00		3.9	MG/L	NONE	415.1	NA	03/12/18	TA355266

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Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/14/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-2	ARDL Lab No.:	008387-02
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0513808
Sample Date:	04/17/2018	Received Date:	04/18/2018
Sample Time:	1025	Prep. Date:	04/23/2018
Matrix:	WATER	Analysis Date:	05/13/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10881
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.270		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	49%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008387-02 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-2 Sampling Date: 04/17/2018 Moisture: NA
Received: 04/18/2018 Sampling Time: 1025

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0763	MG/L	NONE	350.1	NA	04/20/18	04243297
Chlorophyll-a, Correcte	1.0	1.00		13.9	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Kjeldahl Nitrogen	0.190	0.200		1.08	MG/L	351.2	351.2	04/25/18	04/26/18	04303340
Nitrate as Nitrogen	0.0190	0.0200		3.36	MG/L	NONE	GREEN	NA	04/26/18	05033369
Pheophytin-a	1.0	1.00		12.3	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Phosphorus	0.00800	0.0100		0.421	MG/L	365.2	365.2	04/18/18	04/19/18	05013347
Phosphorus, -ortho	0.00800	0.0100		0.0852	MG/L	NONE	365.2	NA	04/19/18	05013344
Solids, Total Suspended	8.0	8.00		135	MG/L	NONE	160.2	NA	04/23/18	04253308
Solids, Volatile Suspen	8.0	8.00		12.8	MG/L	NONE	160.4	NA	04/23/18	04253309
Total Organic Carbon	0.500	1.00		4.3	MG/L	NONE	415.1	NA	04/26/18	05023364

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Lab Report No: 008401 Report Date: 07/06/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-2	ARDL Lab No.:	008401-02
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0705812
Sample Date:	06/13/2018	Received Date:	06/13/2018
Sample Time:	0936	Prep. Date:	06/18/2018
Matrix:	WATER	Analysis Date:	07/05/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10905
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	1.11		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	0.800		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	68%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008401-02 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-2 Sampling Date: 06/13/2018 Moisture: NA
Received: 06/13/2018 Sampling Time: 0936

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0517	MG/L	NONE	350.1	NA	06/26/18	07033693
Chlorophyll-a, Correcte	1.0	1.00		16.2	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Kjeldahl Nitrogen	0.190	0.200		1.08	MG/L	351.2	351.2	06/21/18	06/22/18	07033694
Nitrate as Nitrogen	0.0380	0.0400		2.09	MG/L	NONE	GREEN	NA	06/15/18	06183611
Pheophytin-a	1.0	1.00		8.9	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Phosphorus	0.00800	0.0100		0.362	MG/L	365.2	365.2	06/25/18	06/26/18	06293668
Phosphorus, -ortho	0.00800	0.0100		0.227	MG/L	NONE	365.2	NA	06/14/18	06203629
Solids, Total Suspended	4.0	4.00		38.0	MG/L	NONE	160.2	NA	06/19/18	06293669
Solids, Volatile Suspen	4.0	4.00		5.2	MG/L	NONE	160.4	NA	06/19/18	06293670
Total Organic Carbon	0.500	1.00		4.7	MG/L	NONE	415.1	NA	06/20/18	TA37160B

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Mt. Vernon, Illinois 62864

Lab Report No: 008413 Report Date: 09/17/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-2	ARDL Lab No.:	008413-02
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0914808
Sample Date:	08/13/2018	Received Date:	08/13/2018
Sample Time:	0955	Prep. Date:	08/16/2018
Matrix:	WATER	Analysis Date:	09/14/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10926
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	61%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008413 Report Date: 09/12/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008413-02 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-2 Sampling Date: 08/13/2018 Moisture: NA
Received: 08/13/2018 Sampling Time: 0955

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0448	MG/L	NONE	350.1	NA	08/24/18	08273979
Chlorophyll-a, Correcte	1.0	1.00		31.6	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Kjeldahl Nitrogen	0.190	0.200		0.415	MG/L	351.2	351.2	08/28/18	08/30/18	08314001
Nitrate as Nitrogen	0.0190	0.0200		0.832	MG/L	NONE	GREEN	NA	08/15/18	08163947
Pheophytin-a	1.0	1.00		12.0	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Phosphorus	0.00800	0.0100		0.483	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.273	MG/L	NONE	365.2	NA	08/14/18	08153934
Solids, Total Suspended	4.0	4.00		32.8	MG/L	NONE	160.2	NA	08/16/18	08273981
Solids, Volatile Suspen	4.0	4.00		7.6	MG/L	NONE	160.4	NA	08/16/18	08273982
Total Organic Carbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	08/24/18	TA541

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008415 Report Date: 10/01/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	IL-2	ARDL Lab No.:	008415-02
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0925813
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	0920	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	30 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	37.8	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	10.8	10.8	ND		UG/KG	1
Atrazine	10.8	10.8	ND		UG/KG	1
Metribuzin	10.8	10.8	ND		UG/KG	1
Alachlor	10.8	10.8	ND		UG/KG	1
Metolachlor	10.8	10.8	ND		UG/KG	1
Chlorpyrifos	10.8	10.8	ND		UG/KG	1
Cyanazine	10.8	10.8	ND		UG/KG	1
Pendimethalin	10.8	10.8	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	74%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008415 Report Date: 10/01/2018

Project Name: ILLINOIS RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008415-02 Sampling Loc'n: ILLINOIS RIVER Matrix: SEDIMENT
Field ID: IL-2 Sampling Date: 08/21/2018 Moisture: 37.8
Received: 08/21/2018 Sampling Time: 0920

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.320	0.479		6.30	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0639	1.60		107	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.799	4.79		7.10	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0639	0.320		0.767	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.320	0.799		22.8	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.639	1.60		16.4	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	3.20	7.99		17300	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.320	0.479		20.7	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.320	0.799		495	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.124	0.131		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.384	2.40		23.7	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.320	0.799	J	0.431	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.320	0.799		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.639	0.799		86.5	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	263	277		922	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	2.37	2.49		ND	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	6.12	7.66		541	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		62.2	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	154	300		10000	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

Sample 008415-02, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/19/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-3	ARDL Lab No.:	008379-03
Desc/Location:	ILLINOS RIVER	Lab Filename:	E0313820
Sample Date:	02/27/2018	Received Date:	02/27/2018
Sample Time:	0945	Prep. Date:	03/01/2018
Matrix:	WATER	Analysis Date:	03/13/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10865
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	64%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/20/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008379-03 Sampling Loc'n: ILLINOS RIVER Matrix: WATER
Field ID: IL-3 Sampling Date: 02/27/2018 Moisture: NA
Received: 02/27/2018 Sampling Time: 0945

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.256	MG/L	NONE	350.1	NA	03/06/18	03073170
Chlorophyll-a, Correcte	1.0	1.00		11.4	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Kjeldahl Nitrogen	0.380	0.400		2.45	MG/L	351.2	351.2	03/13/18	03/15/18	03163203
Nitrate as Nitrogen	0.0950	0.100		3.38	MG/L	NONE	GREEN	NA	03/02/18	03083173
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Phosphorus	0.00800	0.0100		0.797	MG/L	365.2	365.2	03/14/18	03/15/18	03193204
Phosphorus, -ortho	0.00800	0.0100		0.306	MG/L	NONE	365.2	NA	02/28/18	03023160
Solids, Total Suspended	13.3	13.3		225	MG/L	NONE	160.2	NA	03/02/18	03063166
Solids, Volatile Suspen	13.3	13.3		17.3	MG/L	NONE	160.4	NA	03/02/18	03063167
Total Organic Carbon	0.500	1.00		4.7	MG/L	NONE	415.1	NA	03/12/18	TA355266

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/14/2018

Project Name:	ILLINOIS RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	IL-3	ARDL Lab No.:	008387-03
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0513809
Sample Date:	04/17/2018	Received Date:	04/18/2018
Sample Time:	1000	Prep. Date:	04/23/2018
Matrix:	WATER	Analysis Date:	05/13/2018
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10881
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	ND		UG/L	1
Metribuzin	0.222	0.222	ND		UG/L	1
Alachlor	0.222	0.222	ND		UG/L	1
Metolachlor	0.222	0.222	ND		UG/L	1
Chlorpyrifos	0.222	0.222	ND		UG/L	1
Cyanazine	0.222	0.222	ND		UG/L	1
Pendimethalin	0.222	0.222	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	51%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008387-03 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-3 Sampling Date: 04/17/2018 Moisture: NA
Received: 04/18/2018 Sampling Time: 1000

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0307	MG/L	NONE	350.1	NA	04/20/18	04243297
Chlorophyll-a, Correcte	1.0	1.00		69.4	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Kjeldahl Nitrogen	0.190	0.200		0.884	MG/L	351.2	351.2	04/25/18	04/26/18	04303340
Nitrate as Nitrogen	0.0190	0.0200		2.64	MG/L	NONE	GREEN	NA	04/26/18	05033369
Pheophytin-a	1.0	1.00		17.3	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Phosphorus	0.00800	0.0100		0.241	MG/L	365.2	365.2	04/18/18	04/19/18	05013347
Phosphorus, -ortho	0.00800	0.0100		0.038	MG/L	NONE	365.2	NA	04/19/18	05013344
Solids, Total Suspended	5.0	5.00		52.0	MG/L	NONE	160.2	NA	04/23/18	04253308
Solids, Volatile Suspen	5.0	5.00		9.0	MG/L	NONE	160.4	NA	04/23/18	04253309
Total Organic Carbon	0.500	1.00		6.2	MG/L	NONE	415.1	NA	04/26/18	05023364

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/06/2018

Project Name:	ILLINOIS RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	IL-3	ARDL Lab No.:	008401-03
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0705813
Sample Date:	06/13/2018	Received Date:	06/13/2018
Sample Time:	0910	Prep. Date:	06/18/2018
Matrix:	WATER	Analysis Date:	07/05/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10905
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.560		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	0.310		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	68%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008401-03 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-3 Sampling Date: 06/13/2018 Moisture: NA
Received: 06/13/2018 Sampling Time: 0910

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0435	MG/L	NONE	350.1	NA	06/26/18	07033693
Chlorophyll-a, Correcte	1.0	1.00		46.1	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Kjeldahl Nitrogen	0.190	0.200		1.31	MG/L	351.2	351.2	06/21/18	06/22/18	07033694
Nitrate as Nitrogen	0.0380	0.0400		2.35	MG/L	NONE	GREEN	NA	06/15/18	06183611
Pheophytin-a	1.0	1.00		13.7	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Phosphorus	0.00800	0.0100		0.239	MG/L	365.2	365.2	06/25/18	06/26/18	06293668
Phosphorus, -ortho	0.00800	0.0100		0.11	MG/L	NONE	365.2	NA	06/14/18	06203629
Solids, Total Suspended	4.0	4.00		61.6	MG/L	NONE	160.2	NA	06/19/18	06293669
Solids, Volatile Suspen	4.0	4.00		8.0	MG/L	NONE	160.4	NA	06/19/18	06293670
Total Organic Carbon	0.500	1.00		5.4	MG/L	NONE	415.1	NA	06/20/18	TA37160B

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Sample 008401-03, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008413 Report Date: 09/17/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-3	ARDL Lab No.:	008413-03
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0914809
Sample Date:	08/13/2018	Received Date:	08/13/2018
Sample Time:	0930	Prep. Date:	08/16/2018
Matrix:	WATER	Analysis Date:	09/14/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10926
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	62%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008413 Report Date: 09/12/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008413-03 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-3 Sampling Date: 08/13/2018 Moisture: NA
Received: 08/13/2018 Sampling Time: 0930

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0262	MG/L	NONE	350.1	NA	08/24/18	08273979
Chlorophyll-a, Correcte	1.0	1.00		123	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Kjeldahl Nitrogen	0.190	0.200		1.09	MG/L	351.2	351.2	08/28/18	08/30/18	08314001
Nitrate as Nitrogen	0.0190	0.0200		0.711	MG/L	NONE	GREEN	NA	08/15/18	08163947
Pheophytin-a	1.0	1.00		10.9	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Phosphorus	0.00800	0.0100		0.243	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.0189	MG/L	NONE	365.2	NA	08/14/18	08153934
Solids, Total Suspended	4.0	4.00		36.8	MG/L	NONE	160.2	NA	08/16/18	08273981
Solids, Volatile Suspen	4.0	4.00		9.6	MG/L	NONE	160.4	NA	08/16/18	08273982
Total Organic Carbon	0.500	1.00		6.6	MG/L	NONE	415.1	NA	08/24/18	TA541

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008415 Report Date: 10/01/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	IL-3	ARDL Lab No.:	008415-03
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0925814
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	0850	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	29.3 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	38.5	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	11.2	11.2	ND		UG/KG	1
Atrazine	11.2	11.2	ND		UG/KG	1
Metribuzin	11.2	11.2	ND		UG/KG	1
Alachlor	11.2	11.2	ND		UG/KG	1
Metolachlor	11.2	11.2	ND		UG/KG	1
Chlorpyrifos	11.2	11.2	ND		UG/KG	1
Cyanazine	11.2	11.2	ND		UG/KG	1
Pendimethalin	11.2	11.2	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	75%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008415 Report Date: 10/01/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008415-03 Sampling Loc'n: ILLINOIS RIVER Matrix: SEDIMENT
Field ID: IL-3 Sampling Date: 08/21/2018 Moisture: 38.5
Received: 08/21/2018 Sampling Time: 0850

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.301	0.451		4.15	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0601	1.50		79.6	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.751	4.51		5.85	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0601	0.301		0.481	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.301	0.751		14.5	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.601	1.50		9.87	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	3.01	7.51		12600	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.301	0.451		12.0	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.301	0.751		484	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.121	0.127		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.361	2.25		13.1	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.301	0.751		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.301	0.751		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.601	0.751		54.9	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	309	325		1060	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	2.60	2.73		ND	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	6.50	8.13		469	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		61.5	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	154	300		12000	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

Sample 008415-03, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/19/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-4	ARDL Lab No.:	008379-04
Desc/Location:	ILLINOS RIVER	Lab Filename:	E0313821
Sample Date:	02/27/2018	Received Date:	02/27/2018
Sample Time:	1100	Prep. Date:	03/01/2018
Matrix:	WATER	Analysis Date:	03/13/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10865
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	57%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/20/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008379-04 Sampling Loc'n: ILLINOS RIVER Matrix: WATER
Field ID: IL-4 Sampling Date: 02/27/2018 Moisture: NA
Received: 02/27/2018 Sampling Time: 1100

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.23	MG/L	NONE	350.1	NA	03/06/18	03073170
Chlorophyll-a, Correcte	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Kjeldahl Nitrogen	0.380	0.400		2.39	MG/L	351.2	351.2	03/13/18	03/15/18	03163203
Nitrate as Nitrogen	0.0380	0.0400		3.9	MG/L	NONE	GREEN	NA	03/02/18	03083173
Pheophytin-a	1.0	1.00		9.4	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Phosphorus	0.00800	0.0100		0.849	MG/L	365.2	365.2	03/14/18	03/15/18	03193204
Phosphorus, -ortho	0.00800	0.0100		0.202	MG/L	NONE	365.2	NA	02/28/18	03023160
Solids, Total Suspended	20.0	20.0		288	MG/L	NONE	160.2	NA	03/02/18	03063166
Solids, Volatile Suspen	20.0	20.0		ND	MG/L	NONE	160.4	NA	03/02/18	03063167
Total Organic Carbon	0.500	1.00		3.9	MG/L	NONE	415.1	NA	03/12/18	TA355266

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/14/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-4	ARDL Lab No.:	008387-04
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0513810
Sample Date:	04/17/2018	Received Date:	04/18/2018
Sample Time:	1100	Prep. Date:	04/23/2018
Matrix:	WATER	Analysis Date:	05/13/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10881
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.220		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	51%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008387-04 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-4 Sampling Date: 04/17/2018 Moisture: NA
Received: 04/18/2018 Sampling Time: 1100

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0832	MG/L	NONE	350.1	NA	04/20/18	04243297
Chlorophyll-a, Correcte	1.0	1.00		16.0	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Kjeldahl Nitrogen	0.190	0.200		0.905	MG/L	351.2	351.2	04/25/18	04/26/18	04303340
Nitrate as Nitrogen	0.0190	0.0200		3.56	MG/L	NONE	GREEN	NA	04/26/18	05033369
Pheophytin-a	1.0	1.00		10.9	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Phosphorus	0.00800	0.0100		0.375	MG/L	365.2	365.2	04/18/18	04/19/18	05013347
Phosphorus, -ortho	0.00800	0.0100		0.0879	MG/L	NONE	365.2	NA	04/19/18	05013344
Solids, Total Suspended	5.0	5.00		112	MG/L	NONE	160.2	NA	04/23/18	04253308
Solids, Volatile Suspen	5.0	5.00		11.0	MG/L	NONE	160.4	NA	04/23/18	04253309
Total Organic Carbon	0.500	1.00		4.7	MG/L	NONE	415.1	NA	04/26/18	05023364

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/06/2018

Project Name:	ILLINOIS RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	IL-4	ARDL Lab No.:	008401-04
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0705814
Sample Date:	06/13/2018	Received Date:	06/13/2018
Sample Time:	1000	Prep. Date:	06/18/2018
Matrix:	WATER	Analysis Date:	07/05/2018
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10905
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	1.13		UG/L	1
Metribuzin	0.222	0.222	ND		UG/L	1
Alachlor	0.222	0.222	ND		UG/L	1
Metolachlor	0.222	0.222	0.789		UG/L	1
Chlorpyrifos	0.222	0.222	ND		UG/L	1
Cyanazine	0.222	0.222	ND		UG/L	1
Pendimethalin	0.222	0.222	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	65%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008401-04 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-4 Sampling Date: 06/13/2018 Moisture: NA
Received: 06/13/2018 Sampling Time: 1000

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0548	MG/L	NONE	350.1	NA	06/26/18	07033693
Chlorophyll-a, Correcte	1.0	1.00		17.1	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Kjeldahl Nitrogen	0.190	0.200		1.05	MG/L	351.2	351.2	06/21/18	06/22/18	07033694
Nitrate as Nitrogen	0.0380	0.0400		2.05	MG/L	NONE	GREEN	NA	06/15/18	06183611
Pheophytin-a	1.0	1.00		8.0	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Phosphorus	0.00800	0.0100		0.417	MG/L	365.2	365.2	06/25/18	06/26/18	06293668
Phosphorus, -ortho	0.00800	0.0100		0.24	MG/L	NONE	365.2	NA	06/14/18	06203629
Solids, Total Suspended	2.50	2.50		35.0	MG/L	NONE	160.2	NA	06/19/18	06293669
Solids, Volatile Suspen	2.50	2.50		4.5	MG/L	NONE	160.4	NA	06/19/18	06293670
Total Organic Carbon	0.500	1.00		4.9	MG/L	NONE	415.1	NA	06/20/18	TA37160B

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008413 Report Date: 09/17/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-4	ARDL Lab No.:	008413-04
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0914810
Sample Date:	08/13/2018	Received Date:	08/13/2018
Sample Time:	1025	Prep. Date:	08/16/2018
Matrix:	WATER	Analysis Date:	09/14/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10926
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	62%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008413 Report Date: 09/12/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008413-04 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-4 Sampling Date: 08/13/2018 Moisture: NA
Received: 08/13/2018 Sampling Time: 1025

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	08/24/18	08273979
Chlorophyll-a, Correcte	1.0	1.00		27.3	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Kjeldahl Nitrogen	0.190	0.200		0.849	MG/L	351.2	351.2	08/28/18	08/30/18	08314001
Nitrate as Nitrogen	0.0190	0.0200		0.801	MG/L	NONE	GREEN	NA	08/15/18	08163947
Pheophytin-a	1.0	1.00		11.5	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Phosphorus	0.00800	0.0100		0.469	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.258	MG/L	NONE	365.2	NA	08/14/18	08153934
Solids, Total Suspended	4.0	4.00		28.8	MG/L	NONE	160.2	NA	08/16/18	08273981
Solids, Volatile Suspen	4.0	4.00		7.6	MG/L	NONE	160.4	NA	08/16/18	08273982
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	08/24/18	TA541

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008415 Report Date: 10/01/2018

Project Name:	ILLINOIS RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3550C

Field ID:	IL-4	ARDL Lab No.:	008415-04
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0925815
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	0945	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	29.4 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	47.8	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	13.1	13.1	ND		UG/KG	1
Atrazine	13.1	13.1	ND		UG/KG	1
Metribuzin	13.1	13.1	ND		UG/KG	1
Alachlor	13.1	13.1	ND		UG/KG	1
Metolachlor	13.1	13.1	ND		UG/KG	1
Chlorpyrifos	13.1	13.1	ND		UG/KG	1
Cyanazine	13.1	13.1	ND		UG/KG	1
Pendimethalin	13.1	13.1	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	64%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008415 Report Date: 10/01/2018

Project Name: ILLINOIS RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008415-04
Field ID: IL-4
Received: 08/21/2018

Sampling Loc'n: ILLINOIS RIVER
Sampling Date: 08/21/2018
Sampling Time: 0945

Matrix: SEDIMENT
Moisture: 47.8

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.351	0.526		4.58	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0702	1.75		75.1	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.877	5.26		7.39	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0702	0.351		0.526	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.351	0.877		16.5	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.702	1.75		11.0	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	3.51	8.77		14200	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.351	0.526		14.1	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.351	0.877		570	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.144	0.152		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.421	2.63		14.7	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.351	0.877		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.351	0.877		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.702	0.877		63.1	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	314	330		819	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	3.57	3.76		6.2	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	7.30	9.12		490	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		52.2	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	154	300		11000	MG/KG	NONE	9060	NA	09/06/18	TA387698

(a) DOD and/or NELAC Accredited Analyte.

Sample 008415-04, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/19/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-5	ARDL Lab No.:	008379-05
Desc/Location:	ILLINOS RIVER	Lab Filename:	E0313822
Sample Date:	02/27/2018	Received Date:	02/27/2018
Sample Time:	1120	Prep. Date:	03/01/2018
Matrix:	WATER	Analysis Date:	03/14/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10865
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	61%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/20/2018

Project Name: ILLINOIS RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008379-05
Field ID: IL-5
Received: 02/27/2018

Sampling Loc'n: ILLINOS RIVER
Sampling Date: 02/27/2018
Sampling Time: 1120

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.216	MG/L	NONE	350.1	NA	03/06/18	03073170
Chlorophyll-a, Correcte	1.0	1.00		4.3	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Kjeldahl Nitrogen	0.380	0.400		2.15	MG/L	351.2	351.2	03/13/18	03/15/18	03163203
Nitrate as Nitrogen	0.0380	0.0400		3.84	MG/L	NONE	GREEN	NA	03/02/18	03083173
Pheophytin-a	1.0	1.00		7.7	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Phosphorus	0.00800	0.0100		0.784	MG/L	365.2	365.2	03/14/18	03/15/18	03193204
Phosphorus, -ortho	0.00800	0.0100		0.199	MG/L	NONE	365.2	NA	02/28/18	03023160
Solids, Total Suspended	13.3	13.3		320	MG/L	NONE	160.2	NA	03/02/18	03063166
Solids, Volatile Suspen	13.3	13.3		17.3	MG/L	NONE	160.4	NA	03/02/18	03063167
Total Organic Carbon	0.500	1.00		3.8	MG/L	NONE	415.1	NA	03/12/18	TA355266

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/14/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-5	ARDL Lab No.:	008387-05
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0513811
Sample Date:	04/17/2018	Received Date:	04/18/2018
Sample Time:	1120	Prep. Date:	04/23/2018
Matrix:	WATER	Analysis Date:	05/13/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10881
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.220		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	49%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008387-05 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-5 Sampling Date: 04/17/2018 Moisture: NA
Received: 04/18/2018 Sampling Time: 1120

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0985	MG/L	NONE	350.1	NA	04/20/18	04243297
Chlorophyll-a, Correcte	1.0	1.00		19.2	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Kjeldahl Nitrogen	0.190	0.200		1.12	MG/L	351.2	351.2	04/25/18	04/26/18	04303340
Nitrate as Nitrogen	0.0190	0.0200		3.39	MG/L	NONE	GREEN	NA	04/26/18	05033369
Pheophytin-a	1.0	1.00		9.9	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Phosphorus	0.00800	0.0100		0.379	MG/L	365.2	365.2	04/18/18	04/19/18	05013347
Phosphorus, -ortho	0.00800	0.0100		0.0852	MG/L	NONE	365.2	NA	04/19/18	05013344
Solids, Total Suspended	6.67	6.67		91.3	MG/L	NONE	160.2	NA	04/23/18	04253308
Solids, Volatile Suspen	6.67	6.67		10.7	MG/L	NONE	160.4	NA	04/23/18	04253309
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	04/26/18	05023364

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Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/06/2018

Project Name:	ILLINOIS RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	IL-5	ARDL Lab No.:	008401-05
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0705815
Sample Date:	06/13/2018	Received Date:	06/13/2018
Sample Time:	1020	Prep. Date:	06/18/2018
Matrix:	WATER	Analysis Date:	07/05/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10905
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	1.20		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	0.890		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	69%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008401-05 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-5 Sampling Date: 06/13/2018 Moisture: NA
Received: 06/13/2018 Sampling Time: 1020

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0536	MG/L	NONE	350.1	NA	06/26/18	07033693
Chlorophyll-a, Correcte	1.0	1.00		12.0	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Kjeldahl Nitrogen	0.190	0.200		1.11	MG/L	351.2	351.2	06/21/18	06/22/18	07033694
Nitrate as Nitrogen	0.0380	0.0400		2.06	MG/L	NONE	GREEN	NA	06/15/18	06183611
Pheophytin-a	1.0	1.00		9.6	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Phosphorus	0.00800	0.0100		0.387	MG/L	365.2	365.2	06/25/18	06/26/18	06293668
Phosphorus, -ortho	0.00800	0.0100		0.222	MG/L	NONE	365.2	NA	06/14/18	06203629
Solids, Total Suspended	4.0	4.00		64.4	MG/L	NONE	160.2	NA	06/19/18	06293669
Solids, Volatile Suspen	4.0	4.00		7.2	MG/L	NONE	160.4	NA	06/19/18	06293670
Total Organic Carbon	0.500	1.00		4.8	MG/L	NONE	415.1	NA	06/20/18	TA37160B

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Lab Report No: 008413 Report Date: 09/17/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-5	ARDL Lab No.:	008413-05
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0914811
Sample Date:	08/13/2018	Received Date:	08/13/2018
Sample Time:	1040	Prep. Date:	08/16/2018
Matrix:	WATER	Analysis Date:	09/14/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10926
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	58%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Mt. Vernon, Illinois 62864

Lab Report No: 008413 Report Date: 09/12/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008413-05 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-5 Sampling Date: 08/13/2018 Moisture: NA
Received: 08/13/2018 Sampling Time: 1040

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	08/24/18	08273979
Chlorophyll-a, Correcte	1.0	1.00		101	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Kjeldahl Nitrogen	0.190	0.200		ND	MG/L	351.2	351.2	08/28/18	08/30/18	08314001
Nitrate as Nitrogen	0.0190	0.0200		0.817	MG/L	NONE	GREEN	NA	08/15/18	08163947
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Phosphorus	0.00800	0.0100		0.469	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.266	MG/L	NONE	365.2	NA	08/14/18	08153934
Solids, Total Suspended	4.0	4.00		30.8	MG/L	NONE	160.2	NA	08/16/18	08273981
Solids, Volatile Suspen	4.0	4.00		8.4	MG/L	NONE	160.4	NA	08/16/18	08273982
Total Organic Carbon	0.500	1.00		4.6	MG/L	NONE	415.1	NA	08/24/18	TA541

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Lab Report No: 008415 Report Date: 10/01/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3550C

Field ID:	IL-5	ARDL Lab No.:	008415-05
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0925816
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	1006	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	29.7 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	39.2	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	11.1	11.1	ND		UG/KG	1
Atrazine	11.1	11.1	ND		UG/KG	1
Metribuzin	11.1	11.1	ND		UG/KG	1
Alachlor	11.1	11.1	ND		UG/KG	1
Metolachlor	11.1	11.1	ND		UG/KG	1
Chlorpyrifos	11.1	11.1	ND		UG/KG	1
Cyanazine	11.1	11.1	ND		UG/KG	1
Pendimethalin	11.1	11.1	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	70%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Mt. Vernon, Illinois 62864

Lab Report No: 008415 Report Date: 10/01/2018

Project Name: ILLINOIS RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008415-05 Sampling Loc'n: ILLINOIS RIVER Matrix: SEDIMENT
Field ID: IL-5 Sampling Date: 08/21/2018 Moisture: 39.2
Received: 08/21/2018 Sampling Time: 1006

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.305	0.457		21.8	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0609	1.52		825	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.761	4.57		6.35	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0609	0.305		1.10	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.305	0.761		15.6	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.609	1.52		15.0	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	3.05	7.61		21500	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.305	0.457		19.8	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.305	0.761		4670	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.127	0.134		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.365	2.28		44.2	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.305	0.761	J	0.305	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.305	0.761		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.609	0.761		77.1	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	150	158		661	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	2.89	3.05		ND	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	6.27	7.83		346	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		60.8	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	154	300		7700	MG/KG	NONE	9060	NA	09/06/18	TA387698

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/19/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-6	ARDL Lab No.:	008379-06
Desc/Location:	ILLINOS RIVER	Lab Filename:	E0313823
Sample Date:	02/27/2018	Received Date:	02/27/2018
Sample Time:	1155	Prep. Date:	03/01/2018
Matrix:	WATER	Analysis Date:	03/14/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10865
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	54%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008379 Report Date: 03/20/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008379-06 Sampling Loc'n: ILLINOS RIVER Matrix: WATER
Field ID: IL-6 Sampling Date: 02/27/2018 Moisture: NA
Received: 02/27/2018 Sampling Time: 1155

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.214	MG/L	NONE	350.1	NA	03/06/18	03073170
Chlorophyll-a, Correcte	1.0	1.00		12.8	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Kjeldahl Nitrogen	0.380	0.400		2.43	MG/L	351.2	351.2	03/13/18	03/15/18	03163203
Nitrate as Nitrogen	0.0950	0.100		3.95	MG/L	NONE	GREEN	NA	03/02/18	03083173
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	02/28/18	03/01/18	03023159
Phosphorus	0.00800	0.0100		0.744	MG/L	365.2	365.2	03/14/18	03/15/18	03193204
Phosphorus, -ortho	0.00800	0.0100		0.213	MG/L	NONE	365.2	NA	02/28/18	03023160
Solids, Total Suspended	20.0	20.0		322	MG/L	NONE	160.2	NA	03/02/18	03063166
Solids, Volatile Suspen	20.0	20.0		ND	MG/L	NONE	160.4	NA	03/02/18	03063167
Total Organic Carbon	0.500	1.00		3.9	MG/L	NONE	415.1	NA	03/12/18	TA355266

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Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/14/2018

Project Name:	ILLINOIS RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	IL-6	ARDL Lab No.:	008387-06
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0513812
Sample Date:	04/17/2018	Received Date:	04/18/2018
Sample Time:	1140	Prep. Date:	04/23/2018
Matrix:	WATER	Analysis Date:	05/13/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10881
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.300		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	53%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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Mt. Vernon, Illinois 62864

Lab Report No: 008387 Report Date: 05/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008387-06 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-6 Sampling Date: 04/17/2018 Moisture: NA
Received: 04/18/2018 Sampling Time: 1140

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.128	MG/L	NONE	350.1	NA	04/20/18	04243297
Chlorophyll-a, Correcte	1.0	1.00		19.2	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Kjeldahl Nitrogen	0.190	0.200		1.02	MG/L	351.2	351.2	04/25/18	04/26/18	04303340
Nitrate as Nitrogen	0.0190	0.0200		3.42	MG/L	NONE	GREEN	NA	04/26/18	05033369
Pheophytin-a	1.0	1.00		11.4	MG/CU.M.	10200H	10200H	04/19/18	04/24/18	04253305
Phosphorus	0.00800	0.0100		0.417	MG/L	365.2	365.2	04/18/18	04/19/18	05013347
Phosphorus, -ortho	0.00800	0.0100		0.0852	MG/L	NONE	365.2	NA	04/19/18	05013344
Solids, Total Suspended	6.67	6.67		132	MG/L	NONE	160.2	NA	04/23/18	04253308
Solids, Volatile Suspen	6.67	6.67		13.3	MG/L	NONE	160.4	NA	04/23/18	04253309
Total Organic Carbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	04/26/18	05023364

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Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/06/2018

Project Name: ILLINOIS RIVER Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	IL-6	ARDL Lab No.:	008401-06
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0705816
Sample Date:	06/13/2018	Received Date:	06/13/2018
Sample Time:	1041	Prep. Date:	06/18/2018
Matrix:	WATER	Analysis Date:	07/05/2018
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10905
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	1.13		UG/L	1
Metribuzin	0.222	0.222	ND		UG/L	1
Alachlor	0.222	0.222	ND		UG/L	1
Metolachlor	0.222	0.222	1.23		UG/L	1
Chlorpyrifos	0.222	0.222	ND		UG/L	1
Cyanazine	0.222	0.222	ND		UG/L	1
Pendimethalin	0.222	0.222	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	63%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

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400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008401 Report Date: 07/03/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008401-06 Sampling Loc'n: ILLINOIS RIVER Matrix: WATER
Field ID: IL-6 Sampling Date: 06/13/2018 Moisture: NA
Received: 06/13/2018 Sampling Time: 1041

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0571	MG/L	NONE	350.1	NA	06/26/18	07033693
Chlorophyll-a, Correcte	1.0	1.00		14.2	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Kjeldahl Nitrogen	0.190	0.200		1.62	MG/L	351.2	351.2	06/21/18	06/22/18	07033694
Nitrate as Nitrogen	0.0380	0.0400		2.01	MG/L	NONE	GREEN	NA	06/15/18	06183611
Pheophytin-a	1.0	1.00		11.7	MG/CU.M.	10200H	10200H	06/14/18	06/20/18	06223639
Phosphorus	0.00800	0.0100		0.421	MG/L	365.2	365.2	06/25/18	06/26/18	06293668
Phosphorus, -ortho	0.00800	0.0100		0.199	MG/L	NONE	365.2	NA	06/14/18	06203629
Solids, Total Suspended	6.67	6.67		173	MG/L	NONE	160.2	NA	06/19/18	06293669
Solids, Volatile Suspen	6.67	6.67		16.7	MG/L	NONE	160.4	NA	06/19/18	06293670
Total Organic Carbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	06/20/18	TA37160B

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008413 Report Date: 09/17/2018

Project Name:	ILLINOIS RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	IL-6	ARDL Lab No.:	008413-06
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0914812
Sample Date:	08/13/2018	Received Date:	08/13/2018
Sample Time:	1055	Prep. Date:	08/16/2018
Matrix:	WATER	Analysis Date:	09/14/2018
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10926
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	55%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008413

Report Date: 09/12/2018

Project Name: ILLINOIS RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008413-06
Field ID: IL-6
Received: 08/13/2018

Sampling Loc'n: ILLINOIS RIVER
Sampling Date: 08/13/2018
Sampling Time: 1055

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.034	MG/L	NONE	350.1	NA	08/24/18	08273979
Chlorophyll-a, Correcte	1.0	1.00		31.6	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Kjeldahl Nitrogen	0.190	0.200		0.679	MG/L	351.2	351.2	08/28/18	08/30/18	08314001
Nitrate as Nitrogen	0.0190	0.0200		0.86	MG/L	NONE	GREEN	NA	08/15/18	08163947
Pheophytin-a	1.0	1.00		15.0	MG/CU.M.	10200H	10200H	08/14/18	08/31/18	09064034
Phosphorus	0.00800	0.0100		0.488	MG/L	365.2	365.2	09/06/18	09/07/18	09114051
Phosphorus, -ortho	0.00800	0.0100		0.243	MG/L	NONE	365.2	NA	08/14/18	08153934
Solids, Total Suspended	4.0	4.00		34.0	MG/L	NONE	160.2	NA	08/16/18	08273981
Solids, Volatile Suspen	4.0	4.00		8.8	MG/L	NONE	160.4	NA	08/16/18	08273982
Total Organic Carbon	0.500	1.00		4.4	MG/L	NONE	415.1	NA	08/24/18	TA541

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Mt. Vernon, Illinois 62864

Lab Report No: 008415 Report Date: 10/01/2018

Project Name:	ILLINOIS RIVER	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3550C

Field ID:	IL-6	ARDL Lab No.:	008415-06
Desc/Location:	ILLINOIS RIVER	Lab Filename:	E0925817
Sample Date:	08/21/2018	Received Date:	08/21/2018
Sample Time:	1020	Prep. Date:	09/03/2018
Matrix:	SEDIMENT	Analysis Date:	09/25/2018
Amount Used:	29.2 g	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B10939
% Moisture:	41.9	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	11.8	11.8	ND		UG/KG	1
Atrazine	11.8	11.8	ND		UG/KG	1
Metribuzin	11.8	11.8	ND		UG/KG	1
Alachlor	11.8	11.8	ND		UG/KG	1
Metolachlor	11.8	11.8	ND		UG/KG	1
Chlorpyrifos	11.8	11.8	ND		UG/KG	1
Cyanazine	11.8	11.8	ND		UG/KG	1
Pendimethalin	11.8	11.8	ND		UG/KG	1

SURROGATE RECOVERIES:	Limits	Results
1,2-Dimethyl-3-Nitrobenzene	30-130	53%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008415 Report Date: 10/01/2018

Project Name: ILLINOIS RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008415-06 Sampling Loc'n: ILLINOIS RIVER Matrix: SEDIMENT
Field ID: IL-6 Sampling Date: 08/21/2018 Moisture: 41.9
Received: 08/21/2018 Sampling Time: 1020

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Arsenic	0.339	0.508		4.52	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Barium	0.0678	1.69		70.3	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Boron	0.847	5.08		6.69	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Cadmium	0.0678	0.339		0.525	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Chromium	0.339	0.847		15.5	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Copper	0.678	1.69		10.6	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Iron	3.39	8.47		13700	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Lead	0.339	0.508		13.1	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Manganese	0.339	0.847		444	MG/KG	3050B	6010C	08/27/18	09/05/18	P7064
(a) Mercury	0.132	0.139		ND	MG/KG	7470A	7470A	08/28/18	08/28/18	C4018
(a) Nickel	0.407	2.54		14.0	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Selenium	0.339	0.847		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Silver	0.339	0.847		ND	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
(a) Zinc	0.678	0.847		62.1	MG/KG	3050B	6010C	08/27/18	08/29/18	P7064
Kjeldahl Nitrogen	327	344		919	MG/KG	351.2	351.2	09/13/18	09/17/18	09194089
Nitrate as Nitrogen	2.64	2.78		2.78	MG/KG	NONE	GREEN	NA	09/17/18	09214102
Phosphorus	5.99	7.48		291	MG/KG	365.2	365.2	09/12/18	09/13/18	09274145
Solids, Percent	0.100	0.100		58.1	%	NONE	160.3	NA	08/28/18	09044008
Total Organic Carbon	154	300		9800	MG/KG	NONE	9060	NA	09/06/18	TA387698

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Sample 008415-06, Inorganic Analyses