2019 Water Quality Report

U.S. Army Corps of Engineers
Saint Louis District

Rend Lake Water Quality Conditions: 2014-2019

November 2020

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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. Currently the Illinois Environmental Protection Agency (IEPA, 2018) has listed Rend Lake as impaired for aesthetic quality and fish consumption caused by total suspended solids and mercury, respectively. The Big Muddy River upstream of Rend Lake is impaired for aquatic life and fish consumption with the sources listed as dissolved oxygen, pH, total phosphorus, sedimentation/siltation and mercury. The other main tributary, Casey Fork, is impaired for fish consumption and aquatic life. The sources are listed as polychlorinated biphenyls, chloride, iron, dissolved oxygen, pH, and total suspended solids. The smaller tributaries Gun Creek and Atchison Creek aquatic life is impaired by dissolved oxygen. Immediately downstream of Rend Lake, the Big Muddy River is impaired for aquatic life and fish consumption caused by sedimentation/siltation, mercury, and polychlorinated biphenyls.

Water quality sampling in 2019 revealed the following concerns at Rend Lake: dissolved oxygen, pH, pesticides, iron, manganese, phosphorus, and suspended solids.

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INTRODUCTION

The Big Muddy River Watershed is located in Southern Illinois and encompasses a drainage area of approximately 2,390 square miles within the following counties: Franklin, Jackson, Jefferson, Marion, Perry, Union Washington, and Williamson. The Big Muddy River originates in Jefferson County, southeast of Centralia, Illinois and flows southward for approximately 156 miles, where it joins the Mississippi River, just south of Grand Tower, Illinois in Jackson County. Major tributaries of the Big Muddy River include: Beaucoup Creek, Little Muddy River, Casey Creek, Middle Fork of the Big Muddy, and Crab Orchard Creek. Lakes and reservoirs within the Big Muddy River Watershed include: Kinkaid Lake, Rend Lake, Crab Orchard Lake, Devil's Kitchen Lake, Little Grassy Lake, and Cedar Lake.

The Rend Lake Watershed is located in south-central Illinois. It flows generally in a southerly direction and drains approximately 311,000 acres, located in the following four counties: Jefferson, Franklin, Washington, and Marion. Elevation within the watershed ranges from 642.0 feet NGVD (National Geodetic Vertical Datum) in the northern portion of the watershed to 396.0 feet NGVD at the outfall of the Rend Lake dam at the southern extent of the watershed. Approximately 37,400 people reside within the Rend Lake Watershed and the average precipitation is approximately 41.1 inches per year. Land cover data for the watershed indicate the largest percentage of area is used for crop production (35%). Approximately 27% of the watershed area is forest and 20% of the watershed is pasture.

Rend Lake is located in Franklin and Jefferson counties, about three miles northwest of Benton, Illinois. The dam is located on the Big Muddy River, 103.7 miles upstream from its confluence with the Mississippi River. The Rend Lake project is comprised of 40,840 acres of land and water. The lake has a water surface area of 20,633 acres at the normal operating pool elevation of 405.0 feet NGVD. At this pool elevation the lake shoreline is approximately 162 miles; and extends upstream from the dam approximately 13 miles. Roughly 10 miles above the main dam are two sub-impoundment dams; one on the Big Muddy River and the other on the Casey Fork River. These sub-impoundments are used for regulating water levels for fish and wildlife management activities. The lake width varies from 1.5 to 3 miles. The depth is fairly shallow, with a maximum depth of about 35 feet near the main dam, when the pool elevation is at 405.0 feet NGVD. The Rend Lake project contains 53 recreation areas, with 756 campsites, 104 picnic sites, 30 boat ramps, 235 marina slips and over 34 miles of trails. Each year, on average, over two-million people visit the lake, which annually generates nearly $35 million in visitor spending within 30-miles of the project.

There is virtually no municipal or industrial use of groundwater in the area because of the abundant water supply provided by Rend Lake, which serves as the major municipal water supply for approximately 300,000 residents of Southern Illinois. This water supply system is managed by the Rend Lake Conservancy District (RLCD), which is the largest public water supply system (1,800 square miles) in the State of Illinois and draws nearly

13 million gallons of water per day from Rend Lake. Also, the lake provides industrial water supply for a coal mine in the area, which is managed by Adena Resources.

Rend Lake is managed and operated by the CEMVS for the authorized purposes of flood risk management, water supply, water quality, fish and wildlife conservation, recreation, and area redevelopment. The lake serves as a heavy recreational usage lake. The land surrounding the lake is used predominately for agriculture. Agricultural runoff and municipal wastewater treatment facilities are the primary potential source of pollution into the Rend Lake watershed. Additional sources are marinas, recreational watercraft discharges and wildlife fecal material runoff.

Water quality is of paramount importance for sustaining ecological integrity and services provided by the Big Muddy River and Rend Lake. 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.

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 throughout the District which includes, among other reservoirs and rivers, the Big Muddy River and Rend Lake. 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 at Rend Lake. The report describes conditions observed in 2019, as well as baseline data collected from 2014-2018. Additional historical data are available upon request.

REND LAKE WQMP COVERAGE

The WQMP for Rend Lake includes water samples taken at the following locations: major tributaries (REN-7 and REN-5), main body of the lake (REN-2, REN-3, REN-4, REN-8, and Rend Marina), and just downstream of the dam (REN-1). See figures 1 and 2, and Table 1 for a site map and site coordinates.

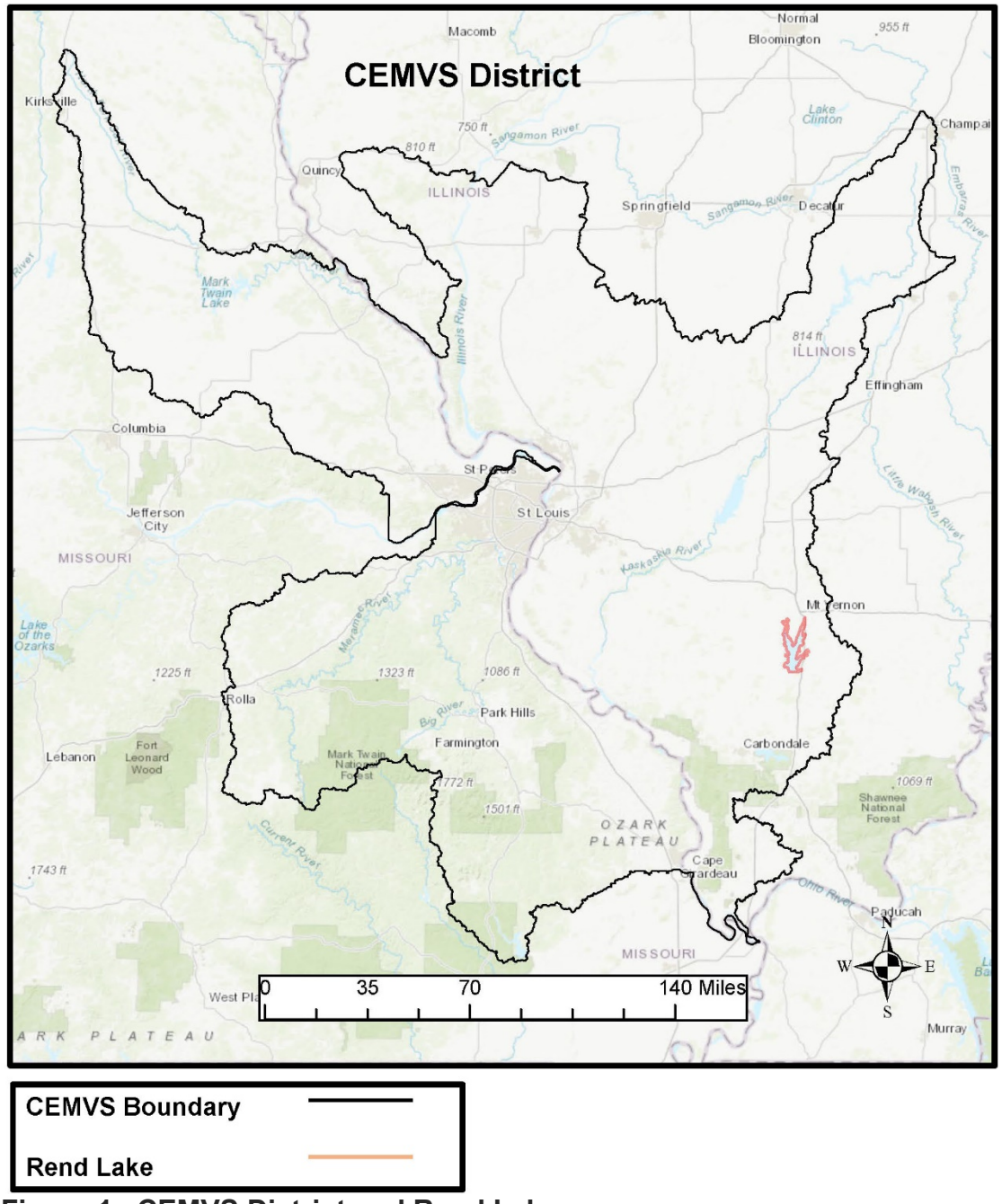


Figure 1. CEMVS District and Rend Lake

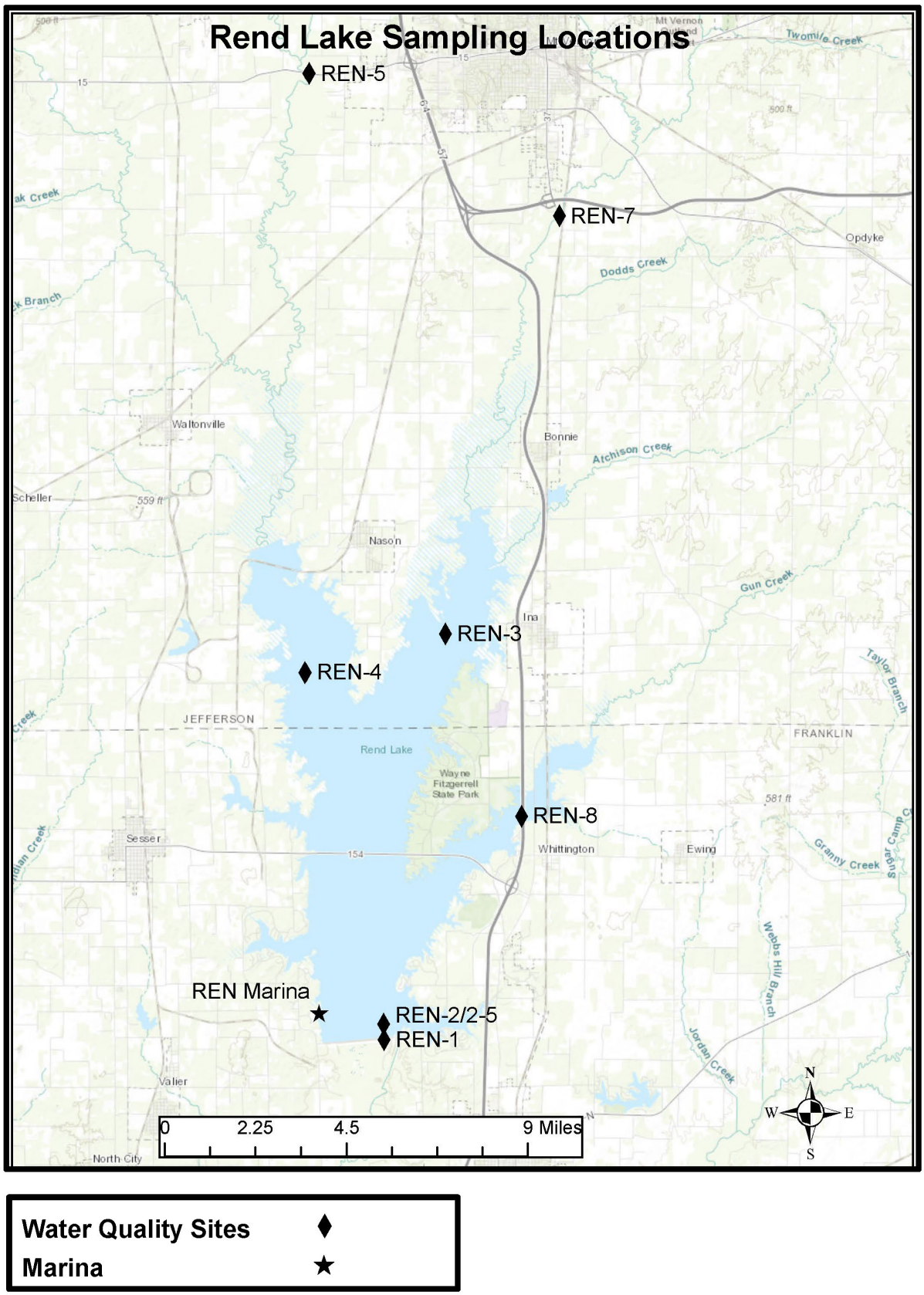


Figure 2. Water Quality (WQ) Sampling Locations in 2019 at Rend Lake

Sample Location Summary Table

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

Sample Location Type	Abbreviation	Site Name	Latitude	Longitude
Major Tributary	TRIB	REN-5	38.309795	-88.988575
	TRIB	REN-7	38.2695630	-88.8987040
Main Reservoir Surface	RS	REN-2	38.039294	-88.961891
	RS	REN-3	38.1517450	-88.9395220
	RS	REN-4	38.1407880	-88.9899850
	RS	REN-8	38.1002570	-88.9123030
	RS	REN-MAR	38.044727	-88.985267
Reservoir Benthic	RB	REN-2-5	38.039294	-88.961891
Tail Race (below dam)	TR	REN-1	38.0369550	-88.9615650

Samples at Marinas are not always taken in the exact same location.

METHODS AND ANALYSIS: WATER QUALITY

Data Collection and Historical Reference Data

During 2019, water quality samples were collected and analyzed for 9 locations during four separate sampling events (n=36; Table 1). One duplicate sample was also collected during each sampling event for quality control purposes. With the exception of the benthic sample location REN 2-5 in front of the dam, 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 (2014-2018) at Rend Lake. Historical reference data are intended to represent the current condition of Rend Lake.

Statistical Summary and Comparison to Applicable Water Quality Standards

Statistical analyses were performed on water quality monitoring data collected for 9 locations, and classified as TRIB (n= 2), RS (n=5), RB (n=1), and TR (n=1). Descriptive statistics were calculated to describe central tendencies and corresponding 95% confidence levels 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.

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 at least every 20 samples, or, in this case, every sampling event (one event/day at Rend Lake has 9 samples and one duplicate).

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 Illinois is within 2.8°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.

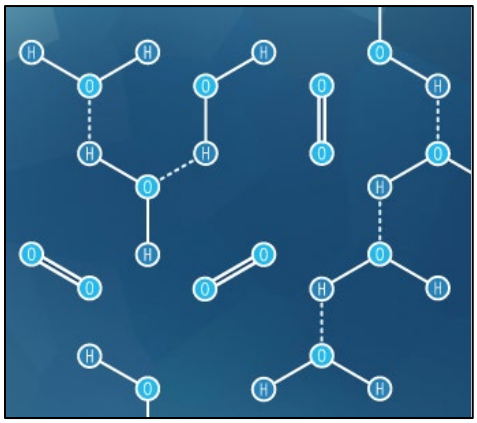


Figure 1: Dissolved oxygen (O_2) vs oxygen bonded in water (H_2O).

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 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 invertebrates begin to rapidly decrease and beyond 10, fish become extirpated. The pH water quality criteria for 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 for streams and 12 mg/L for lakes. Illinois does not currently have a standard criteria for NVSS or VSS.

Total Organic Carbon (TOC) is a measure of the amount of organic carbon in a water body. 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.

Metals Iron (TFe) and Manganese (TMn) (T=total) are nutrients for both plants and animals. Living organisms require trace amounts of metals. However, excessive amounts can be harmful to the organism. Heavy metals exist in surface waters in three forms, colloidal, particulate, and dissolved. Water chemistry determines the rate of adsorption and desorption of metals to and from sediment. Metals are desorbed from the sediment if the water experiences increases in salinity, decreases in redox potential, or decreases in pH. Metals in surface waters can be from natural or human sources. Metal levels in surface water may pose a health risk to humans and the environment.

Pesticides are commonly used throughout much of the agricultural landscape that the Big Muddy River flows. This study considers one insecticide and seven herbicides.

Atrazine and Alachlor herbicides are commonly used agricultural chemicals which can be readily transported by rainfall runoff. Both compounds are suspected of causing cancer; and therefore, were monitored for the protection of human and aquatic health. Herbicides which are pesticides used to kill vegetation are the most widely used and sampled. Two of the most widely used herbicides are Atrazine and Alachlor. Atrazine is a preemergence or postemergence herbicide use to control broadleaf weeds and annual grasses. Atrazine is most commonly detected in ground and surface water due to its wide use, and its ability to persist in soil and move in water. Alachlor is a Restricted Use Pesticide (RUP) due to the potential to contaminate groundwater. The water quality standards for the pesticides sampled are located in Table 2.

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 water body'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. Illinois has 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).

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.

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, 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
70-100	Hypereutrophic

Laboratory Methods and Water Quality Criteria Summary Table

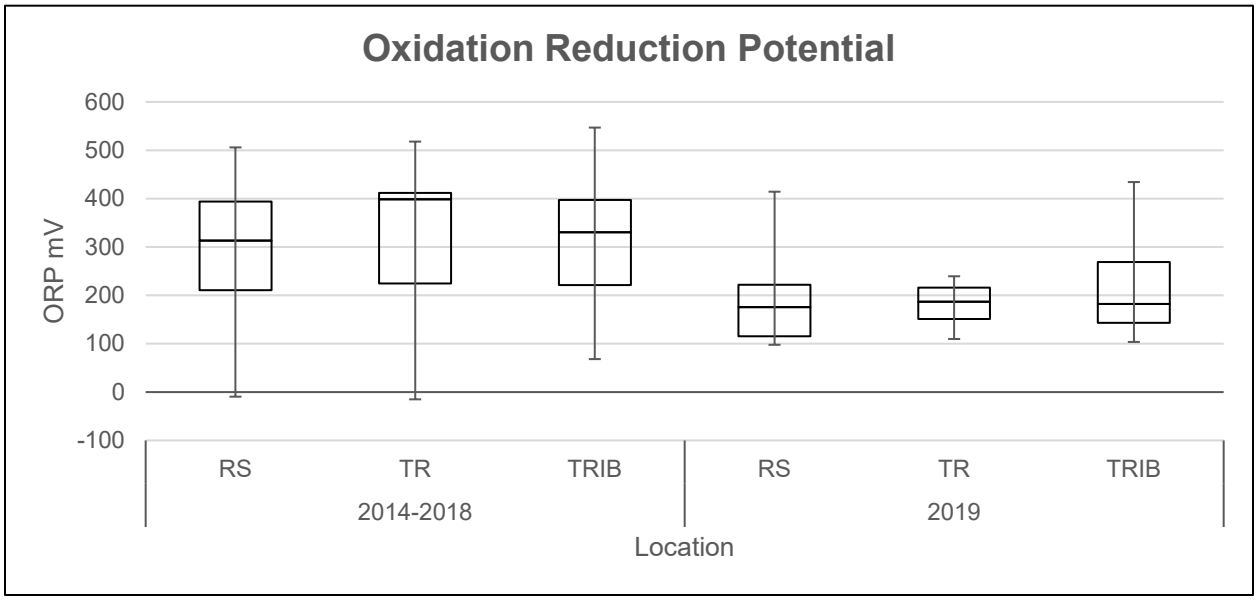
Table 2: Metrics, Methods, and Water Quality Criteria Used for Evaluating Water Quality

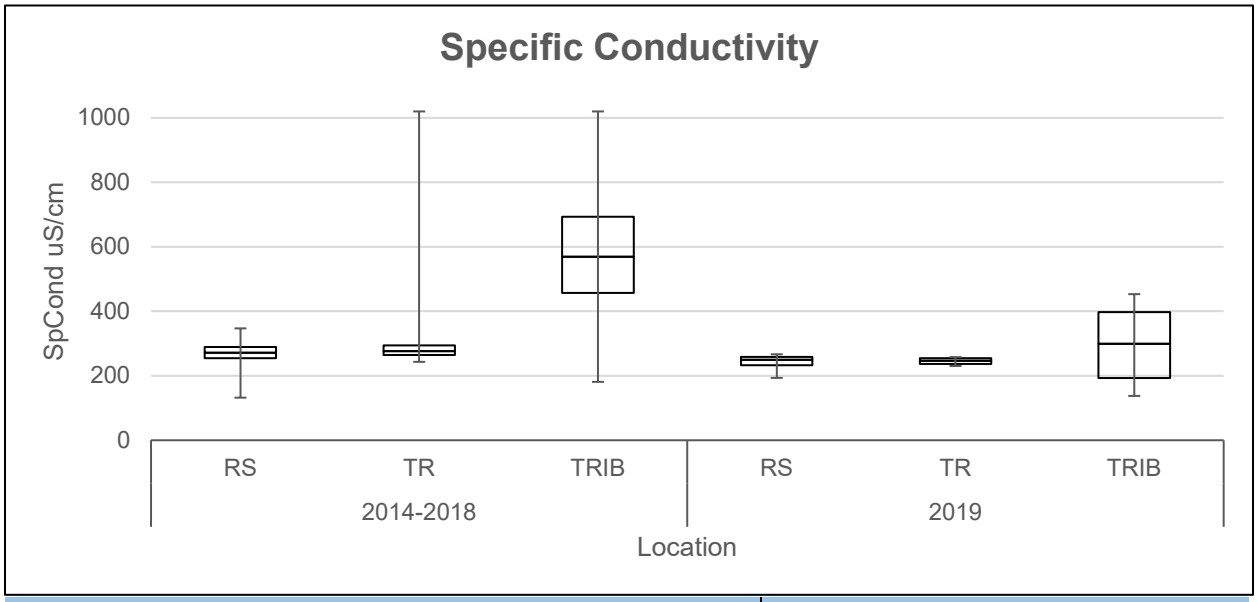
Metric	Abbreviation	Analysis Method	Water Quality Criteria	Source
Alachlor		EPA Method 8270C	< 2ug/L PWS or <1100 ug/L: aquatic life	Illinois EPA
Ammonia Nitrogen	NH_3	EPA Method 350.1	<15 mg/L	United States EPA
Atrazine	Atrazine	EPA Method 8270C	9 ug/L: Chronic or 82 ug/L: Acute or 3 ug/L DWS	Illinois EPA
Bacteria: E. Coliform	E Col	EPA Method 1604	< 235 E. Col per 100/mL for single sample	Illinois EPA
Chlorophyll a	Chl_a	SM Method 10200H	< 25mg/cm^3 (Eutrophic Upper Limit)	Carlson 1977
Chlorpyrifos		EPA Method 8270C	< .11 ug/L: aquatic life	Illinois EPA
Cyanazine		EPA Method 8270C	< 30 ug/L: chronic or < 370 ug/L acute (aquatic life)	Illinois EPA
Depth	Depth	Multiparameter Meter	Measurements reported at ~1 meter	-----
Dissolved Oxygen	DO	Multiparameter Meter	Greater than 5.0mg/L	Illinois EPA
Metolachlor		EPA Method 8270C	30.4 ug/L: Chronic or 380 ug/L: Acute	Illinois EPA
Metribuzin		EPA Method 8270C	8.4 mg/L: aquatic life or 8.3 mg/L: human health	Illinois EPA
Nitrate as Nitrogen	NO_3	Green Method	< 10 mg/L	Illinois EPA
Non-Volatile Suspended Solids	NVSS	TSS - VSS	-----	-----
Orthophosphate	Ortho	EPA Method 365.2	-----	-----
Pendmethalin		EPA Method 8270C	< 30 ug/L: chronic or < 350 ug/L acute (aquatic life)	Illinois EPA
Pheophytin a	Phpy_a	SM Method 10200H	-----	-----
Potential of Hydrogen	pH	Multiparameter Meter	Range: 6.5 – 9.0pH	Illinois EPA
Specific Conductivity	SpCond	Multiparameter Meter	500 uS/cm	-----
Temperature	Temp	Multiparameter Meter	Less than rise of 2.8°C above normal seasonal temperature	Illinois EPA
Total Dissolved Solids	TDS	Multiparameter Meter	< 500 mg/L	Illinois EPA
Total Manganese	TMn	EPA Method 6010C	< 1 mg/L	Illinois EPA

Metric	Abbreviation	Analysis Method	Water Quality Criteria	Source
Total Organic Carbon	TOC	EPA Method 415.1	-----	-----
Total Iron	TFe	EPA Method 6010C	< 1 mg/L	Illinois EPA
Total Phosphorus	TP	EPA Method 365.2	Less than 0.05 mg/L	Illinois EPA
Total Suspended Solids	TSS	EPA Method 160.2	< 116 mg/L: streams or <12 mg/L: lakes	Illinois EPA
Trifluralin		EPA Method 8270C	< 1.1 ug/L: chronic or < 26 ug/L acute (aquatic life)	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. PWS is public water supply. DWS is drinking water standard.*

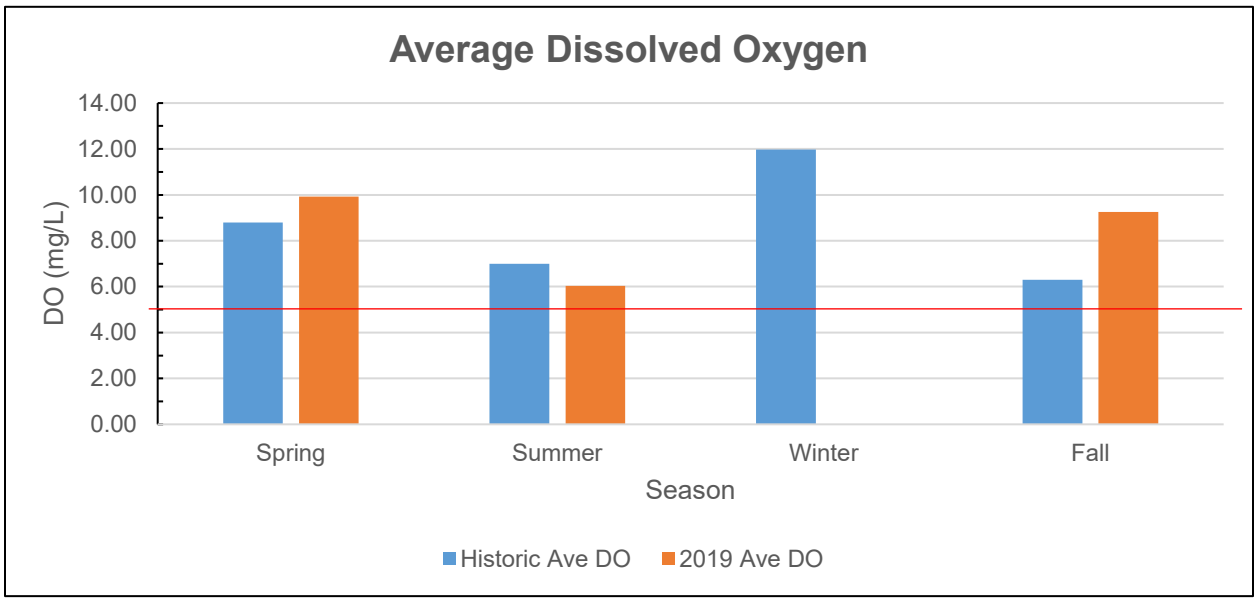
RESULTS AND SUMMARY STATISTICS: WATER QUALITY





		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
SpCond	RS	268.09	271.00	71	8.52	244.13	249.20	19	9.17
	TR	282.39	276.10	17	17.33	245.33	246.50	4	20.58
	TRIB	568.78	569.50	32	71.59	295.54	299.60	8	106.82
ORP	RS	289.27	313.00	71	28.26	186.32	175.60	19	39.13
	TR	324.11	398.70	17	76.45	180.78	186.90	4	89.52
	TRIB	321.37	330.50	32	42.88	225.90	182.40	8	106.50

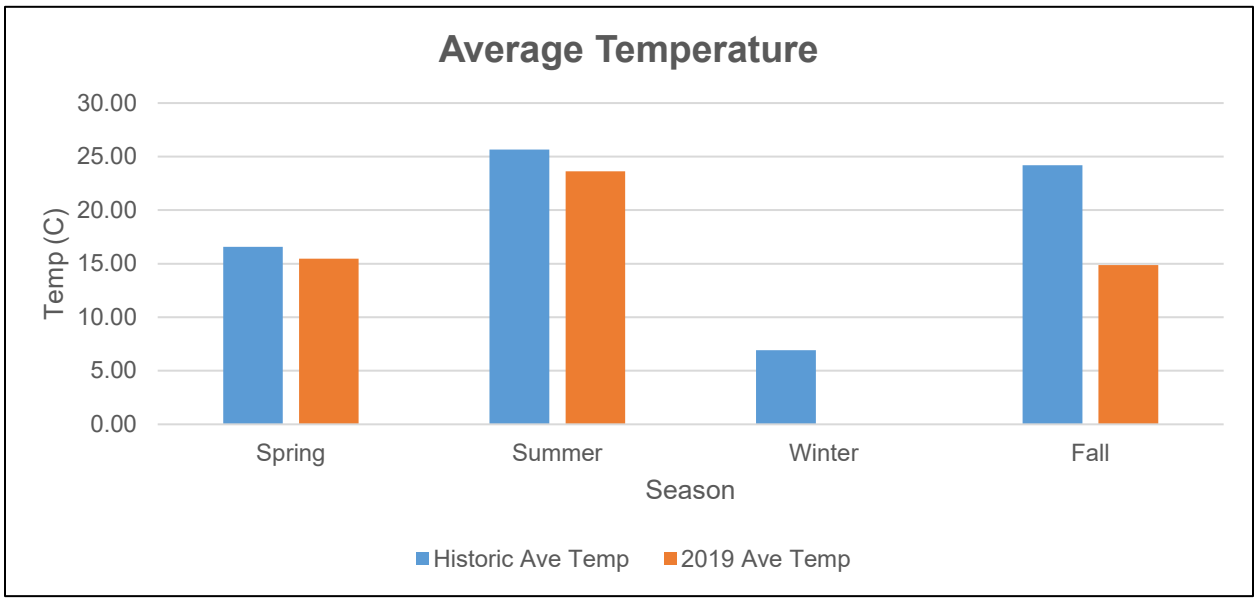
**This report does not acknowledge a water quality criteria for SpCond or ORP.*



Red line placed at the 5 mg/L level.

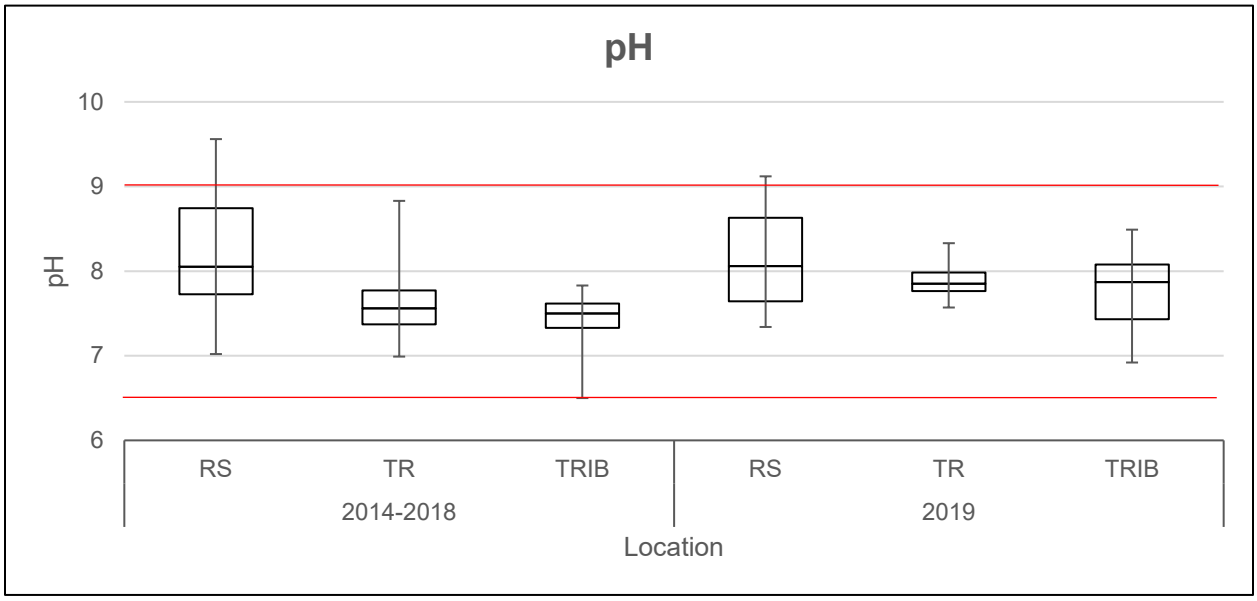
		Historical Reference 2014-2018				2019			
Season	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Spring	RS	9.96	10.39	20	0.60	10.92	11.06	4	2.20
	TR	7.12	8.15	5	4.43	9.51	9.51	1	
	TRIB	7.82	8.30	8	1.64	8.11	8.11	2	4.19
Summer	RS	8.51	7.83	37	0.87	5.89	6.36	10	1.55
	TR	5.27	5.90	9	1.94	5.17	5.17	2	5.15
	TRIB	6.21	6.33	18	0.92	6.34	6.45	4	0.97
Fall	RS	12.29	12.47	4	0.67	9.75	10.09	5	1.35
	TR	11.51	11.51	1		9.45	9.45	1	
	TRIB	11.46	11.46	2	1.78	7.96	7.96	2	13.15
Winter	RS	7.32	7.07	9	2.07				
	TR	5.21	5.21	2	7.18				
	TRIB	5.57	5.56	4	1.62				

** On May 22 2019 DO was recorded at <5 mg/L at REN-1. On August 13 2019 DO was recorded at <5 mg/ at the Marina and REN-2. All other observations met the Illinois state standard.*



		Historical Reference 2014-2018				2019			
Season	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Spring	RS	17.45	16.40	21	2.19	15.93	16.05	4	1.86
	TR	13.97	13.43	5	3.16	11.60	11.60	1	
	TRIB	17.87	17.11	8	3.20	16.50	16.50	2	6.35
Summer	RS	26.99	27.22	37	0.82	24.43	24.46	10	2.75
	TR	24.94	25.69	9	2.08	23.27	23.27	2	48.64
	TRIB	23.29	23.91	18	1.30	21.78	22.40	4	5.67
Fall	RS	24.78	23.83	9	1.05	15.50	15.00	5	1.78
	TR	24.60	24.60	2	11.90	16.70	16.70	1	
	TRIB	22.41	22.29	4	1.50	12.35	12.35	2	13.34
Winter	RS	6.99	6.94	4	0.46				
	TR	7.39	7.39	1					
	TRIB	6.56	6.56	2	21.18				

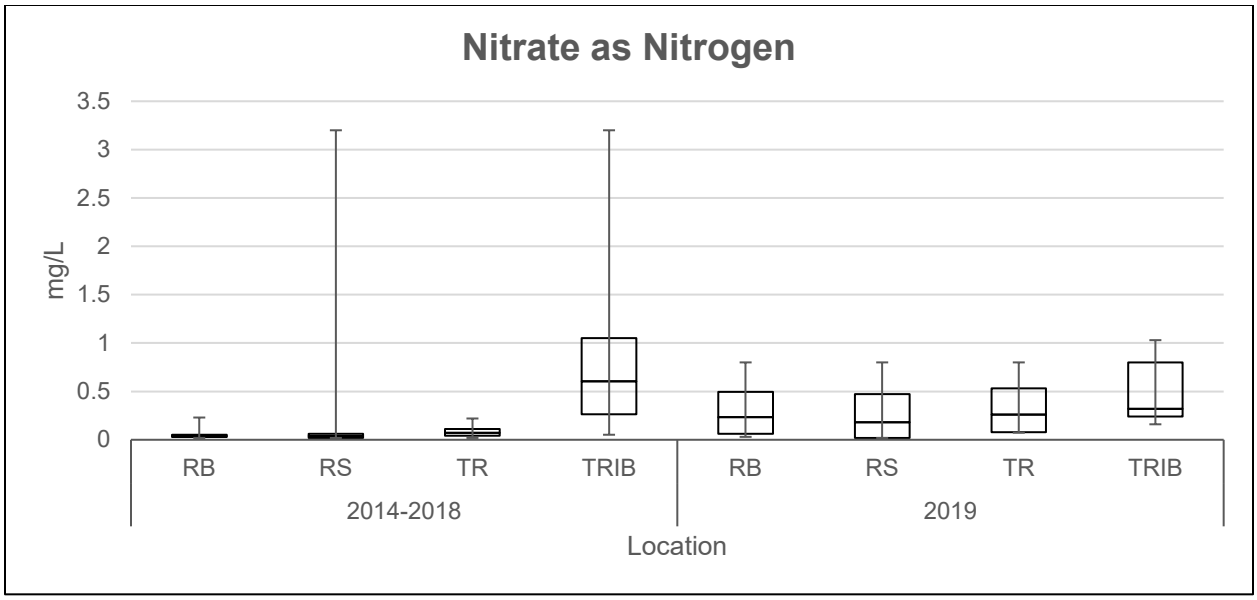
** On August 13, 2019 the temperature at REN-8 slightly exceeded the 2.8ºC rise above the historical seasonal average by 0.24ºC. All ofther temperatures were within acceptable range of water quality criteria during 2019.*

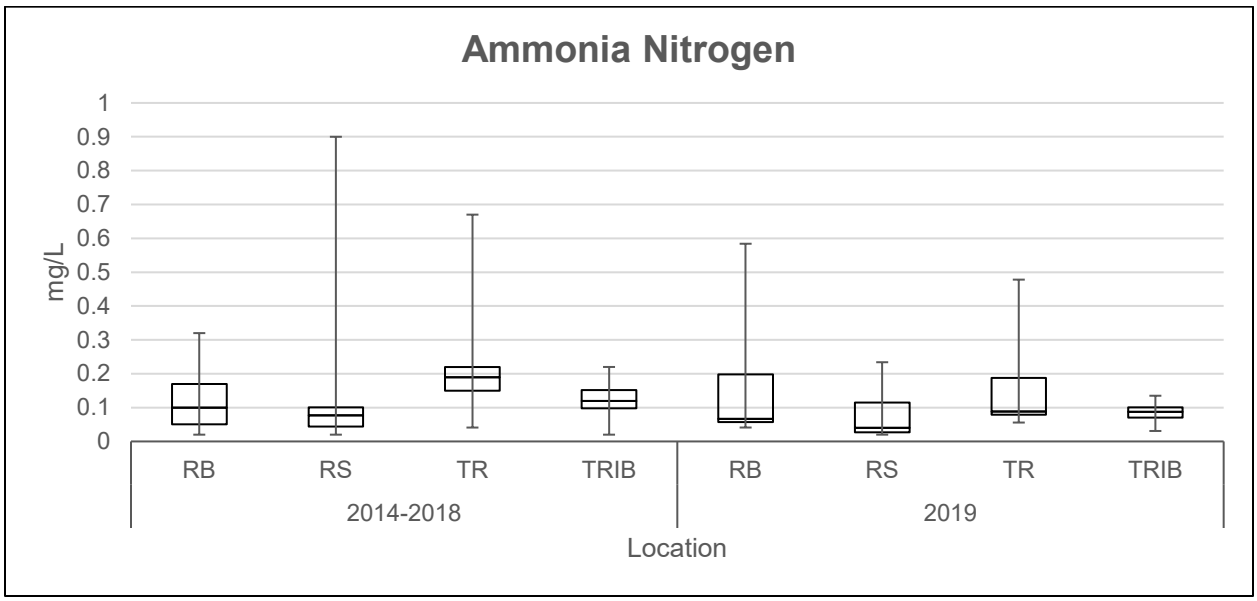


**Red lines indicate the upper and lower water quality criteria standards (between 6.5 and 9).*

		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
pH	RS	8.20	8.05	67	0.16	8.19	8.06	19	0.29
	TR	7.61	7.56	17	0.22	7.90	7.85	4	0.50
	TRIB	7.46	7.50	31	0.10	7.75	7.87	8	0.45

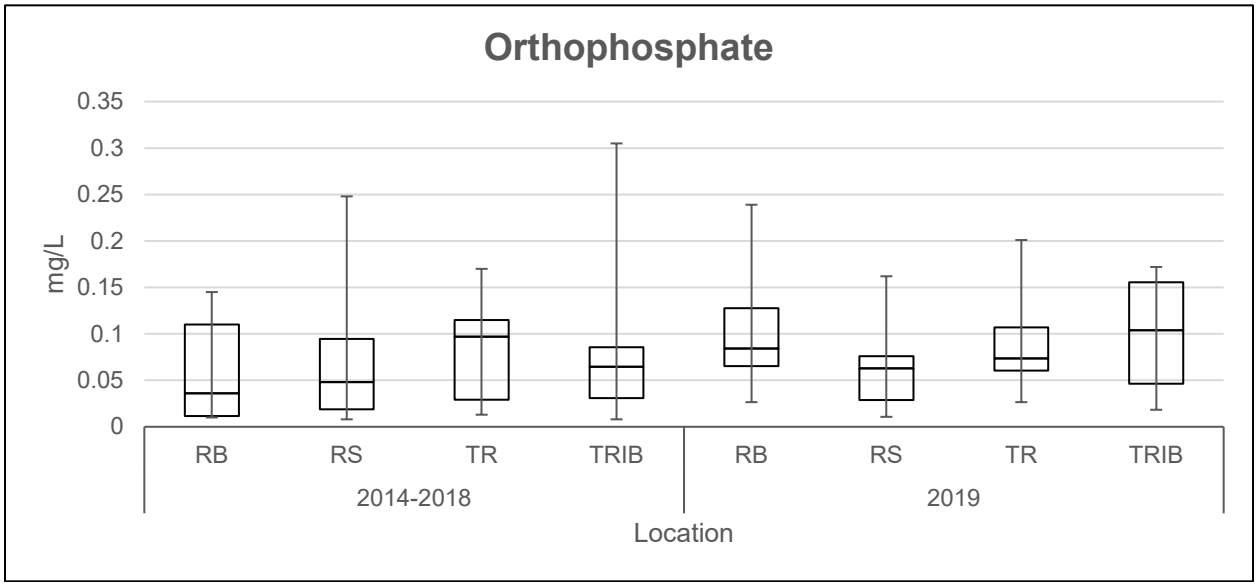
pH was recorded above 9 at REN-2 on April 9 as well as at REN-8 on October 17, 2019.. All other readings were within water quality standards during 2019.

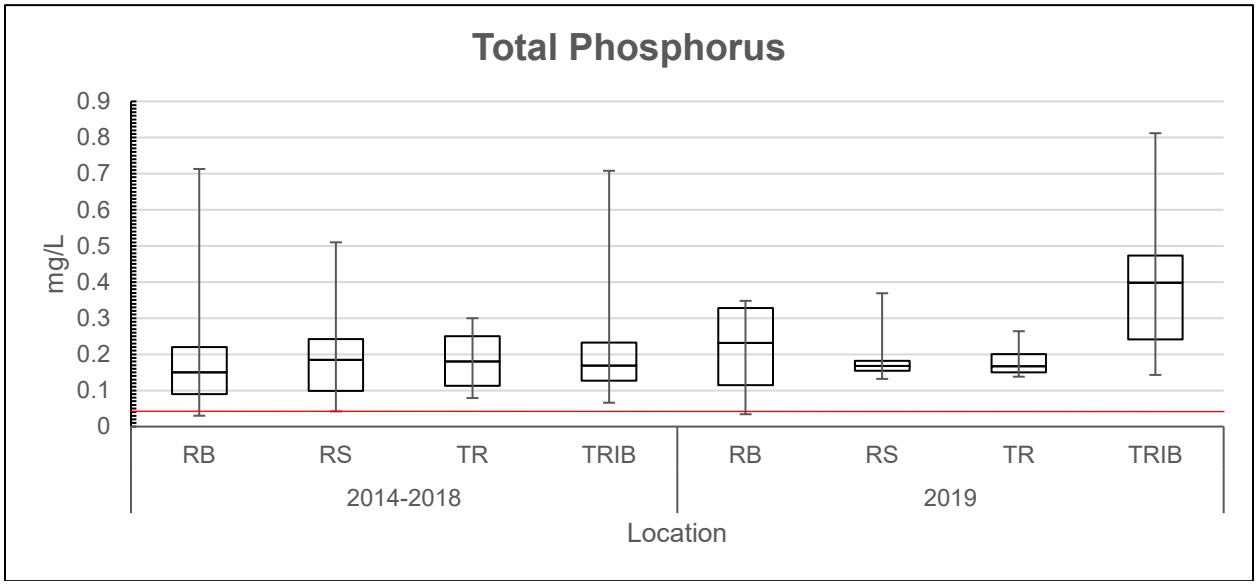




		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
NO3N	RB	0.06	0.04	17	0.03	0.32	0.23	4	0.57
	RS	0.12	0.04	68	0.10	0.29	0.18	16	0.17
	TR	0.09	0.07	17	0.03	0.35	0.26	4	0.55
	TRIB	0.75	0.61	32	0.25	0.49	0.32	8	0.28
NH3N	RB	0.11	0.10	17	0.04	0.19	0.07	4	0.42
	RS	0.09	0.08	68	0.03	0.07	0.04	16	0.03
	TR	0.23	0.19	17	0.08	0.18	0.09	4	0.32
	TRIB	0.12	0.12	32	0.02	0.09	0.09	8	0.03

**All observations of nitrate and ammonia nitrogen were within the water quality standard.*

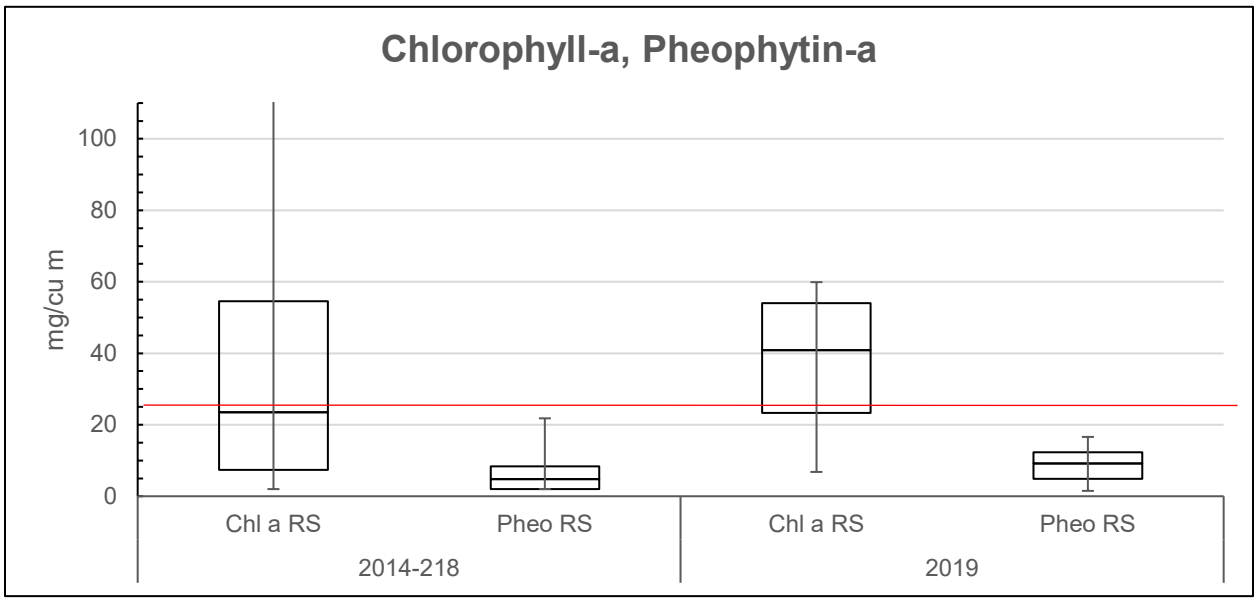




**Red line indicates the water quality standard of 0.05 mg/L.*

		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Ortho	RB	0.06	0.04	17	0.03	0.11	0.08	4	0.15
	RS	0.07	0.05	68	0.01	0.06	0.06	16	0.02
	TR	0.08	0.10	17	0.03	0.09	0.07	4	0.12
	TRIB	0.07	0.06	32	0.02	0.10	0.10	8	0.05
TP	RB	0.18	0.15	17	0.08	0.21	0.23	4	0.24
	RS	0.19	0.18	68	0.03	0.18	0.17	16	0.03
	TR	0.18	0.18	17	0.04	0.18	0.17	4	0.09
	TRIB	0.20	0.17	32	0.05	0.39	0.40	8	0.18

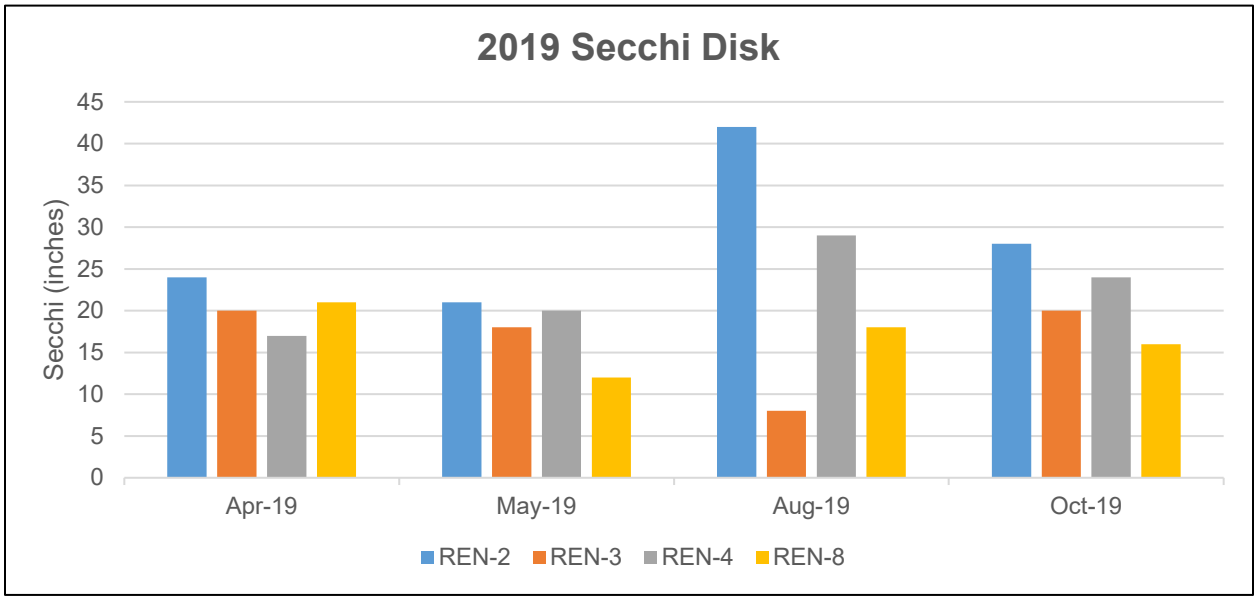
**Total phosphorus exceeded the proposed criteria of 0.05 mg/L for all locations. This study does not acknowledge a water quality criteria for orthophosphate.*

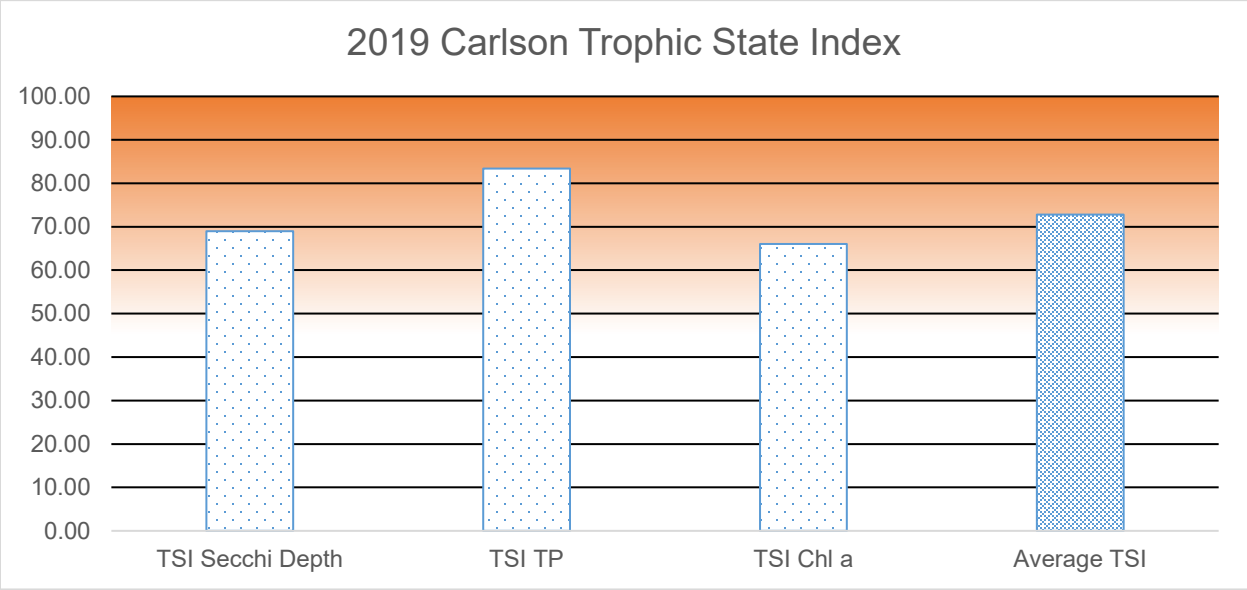


Red line indicates the water quality standard of 25 mg/cm^3. See Carlson 1977.

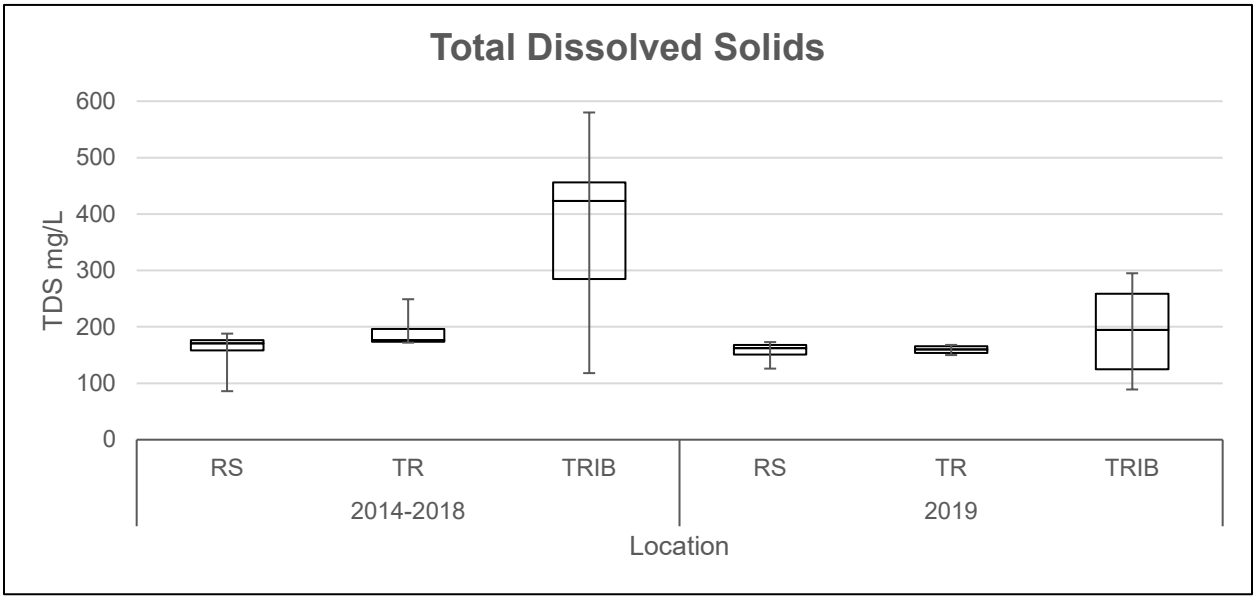
		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL(95.0 %)	Mean	Median	Count	CL(95.0 %)
Chl a	RS	36.38	23.50	68	8.24	37.04	40.90	16	9.88
Pheo a	RS	6.20	4.80	68	1.20	8.92	9.15	16	2.79

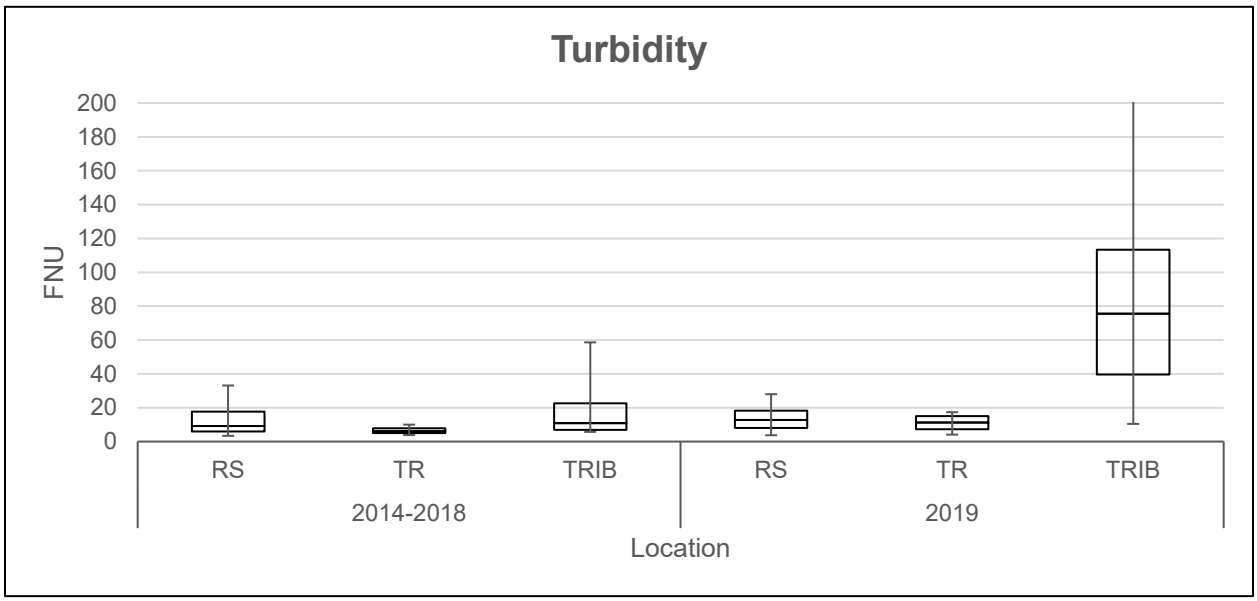
The proposed criteria for chlorophyll-a of 25mg/cm^3 was exceeded at all the lake sites at least one time in 2019. This study does not acknowledge a criteria for pheophytin.





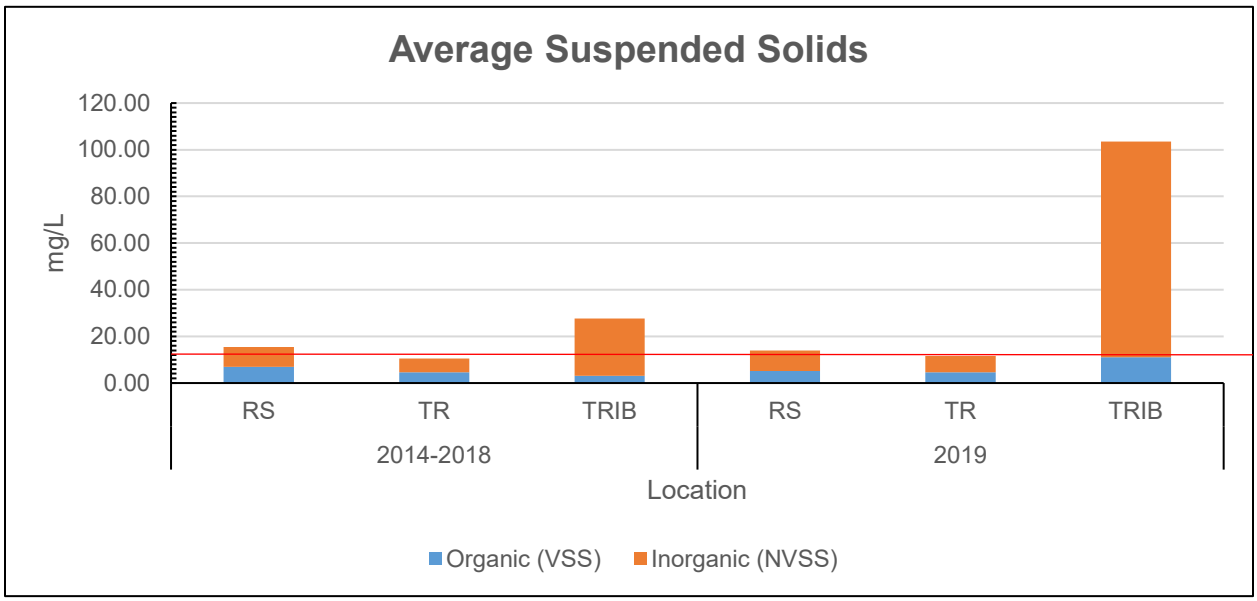
<40 = Oligotrophic __ 40-60 = Mesotrophic __ 60-70 = Eutrophic __ >70 Hypereutrophic





		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
FNU	RS	289.27	313.00	71	28.26	13.36	12.80	19	3.09
	TR	324.11	398.70	17	76.45	10.98	11.22	4	9.43
	TRIB	321.37	330.50	32	42.88	94.55	75.59	8	74.86
TDS	RS	162.37	171.00	19	12.08	158.68	162.00	19	5.96
	TR	193.50	176.50	4	59.06	159.50	160.00	4	13.41
	TRIB	369.25	423.00	8	132.40	192.00	194.50	8	69.67

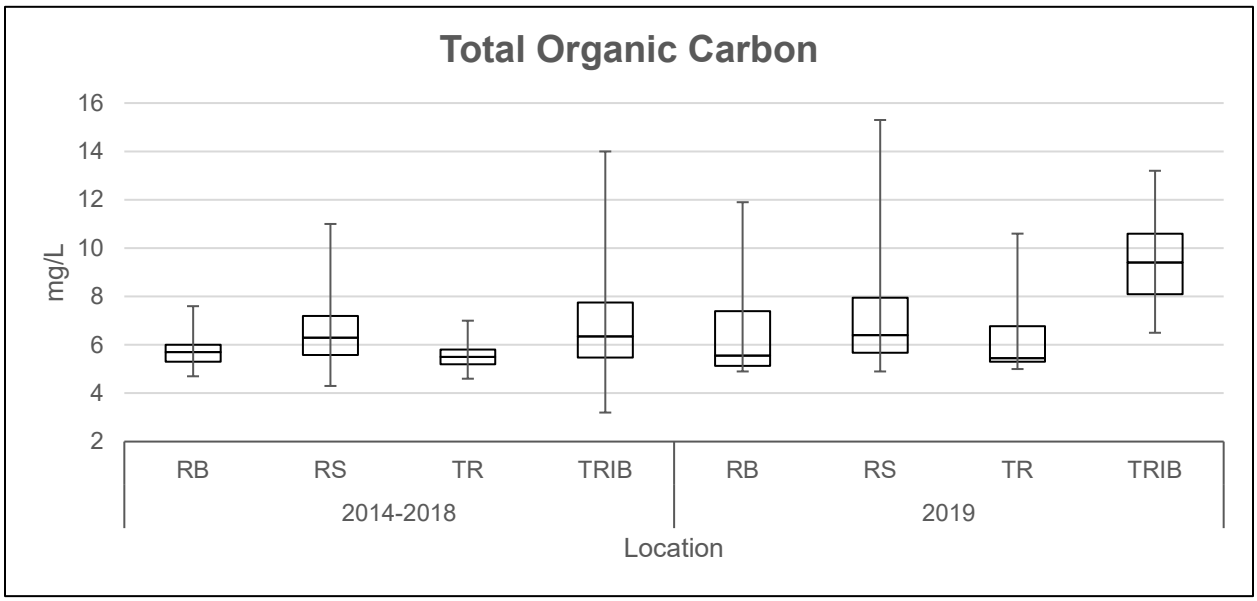
* *All observations of TDS were within the referenced water quality standard during 2019.*



**Red line indicates the TSS water quality standard of 12 mg/L for lakes.*

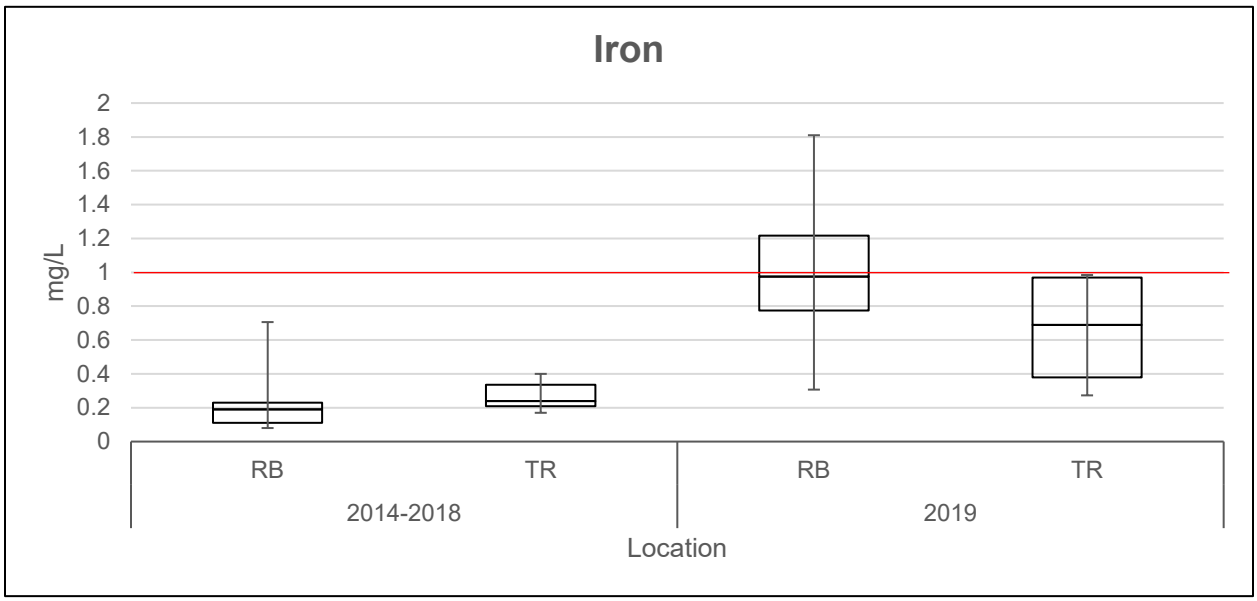
		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL(95.0%)	Mean	Median	Count	CL(95.0%)
TSS	RS	15.45	14.85	68	1.89	13.93	14.00	16	2.64
	TR	10.55	10.40	17	1.27	11.54	9.95	4	6.52
	TRIB	27.70	13.85	32	14.10	103.48	38.00	8	124.00
VSS	RS	6.97	6.64	68	0.81	5.21	5.40	16	1.05
	TR	4.60	3.75	17	0.93	4.59	4.60	4	2.82
	TRIB	3.17	2.00	32	1.16	11.00	8.11	8	10.57
NVSS	RS	8.48	7.50	68	1.59	8.72	8.48	16	2.18
	TR	5.95	5.70	17	0.82	6.95	6.70	4	6.78
	TRIB	24.53	12.05	32	13.00	92.47	32.40	8	113.78

**In 2019 the TSS stream standard (116 mg/L) was exceeded once at REN-5 on May 22, 2019 with a value of 440 mg/L, while the TSS lake standard (12 mg/L) was exceeded multiple times at all lake sites except REN-2.*

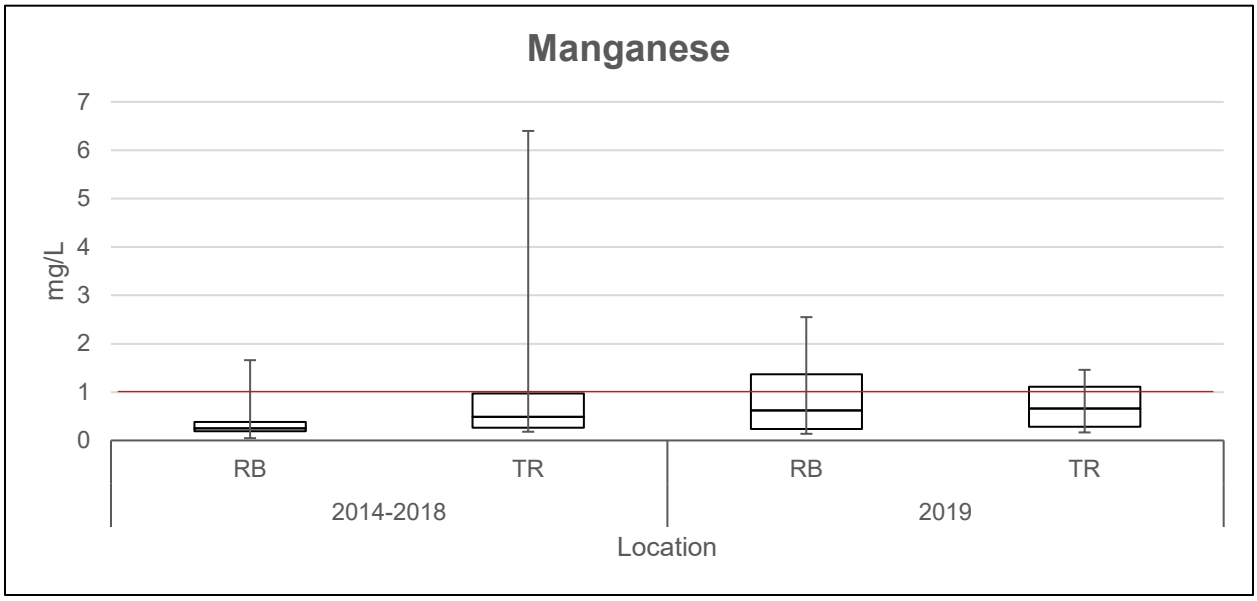


	Historical Reference 2014-2018				2019			
Location	Mean	Median	Count	CL(95.0%)	Mean	Median	Count	CL(95.0%)
RB	5.77	5.70	17	0.44	6.98	5.55	4	5.27
RS	6.39	6.30	68	0.29	7.46	6.40	16	1.52
TR	5.54	5.50	17	0.30	6.63	5.45	4	4.23
TRIB	6.76	6.35	32	0.80	9.59	9.40	8	1.92

**This study does not recognize a water quality criteria for TOC.*



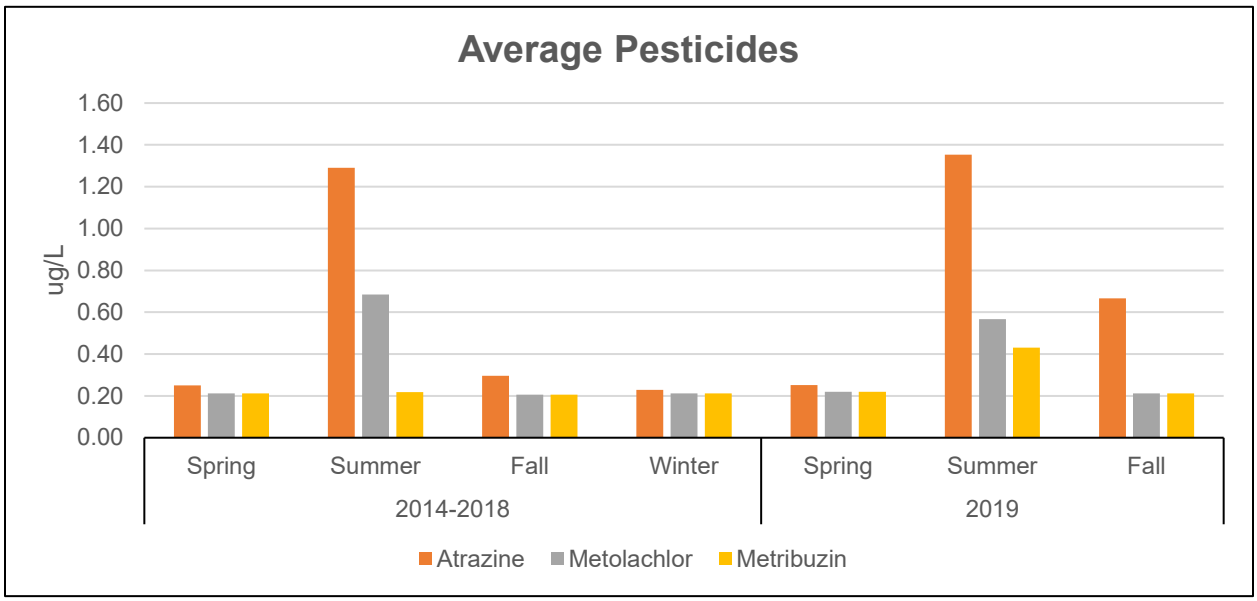
**Red line indicates the water quality standard of 1 mg/L.*



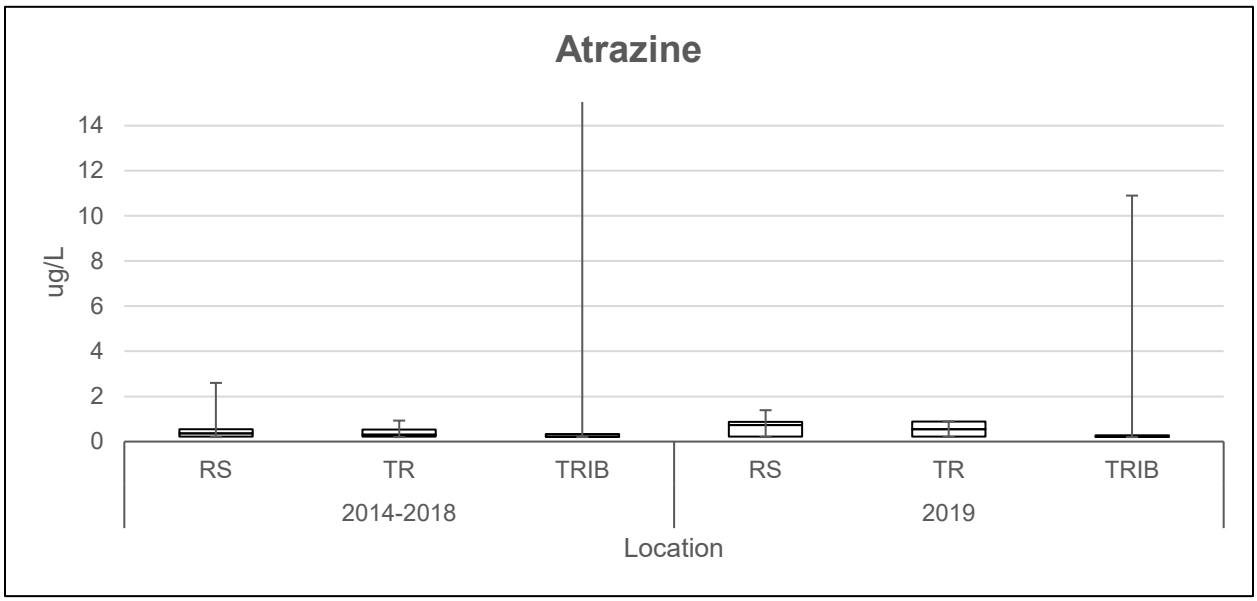
**Red line indicates the water quality standard of 1 mg/L.*

		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL(95.0%)	Mean	Median	Count	CL(95.0%)
Iron	RB	0.23	0.19	17	0.09	1.02	0.97	4	0.98
	TR	0.27	0.24	17	0.04	0.66	0.69	4	0.59
Mang	RB	0.39	0.25	17	0.19	0.98	0.62	4	1.76
	TR	1.02	0.49	17	0.76	0.74	0.66	4	0.96

**In 2019 iron exceeded the standard of 1 mg/L near the lake bottom in front of the dam two times. Manganese exceeded the criterion once near the bottom in front of the dam and once in the tailrace.*

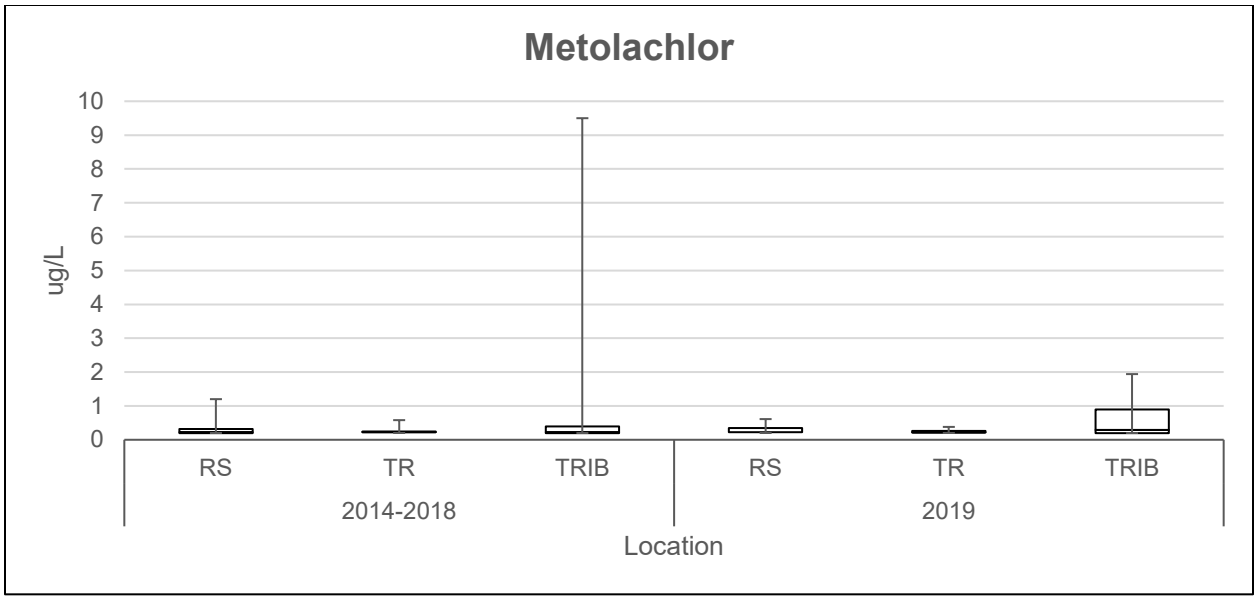


**Of the eight pesticides tested, only the above three were reported above detection levels for the period 2014-2019.*



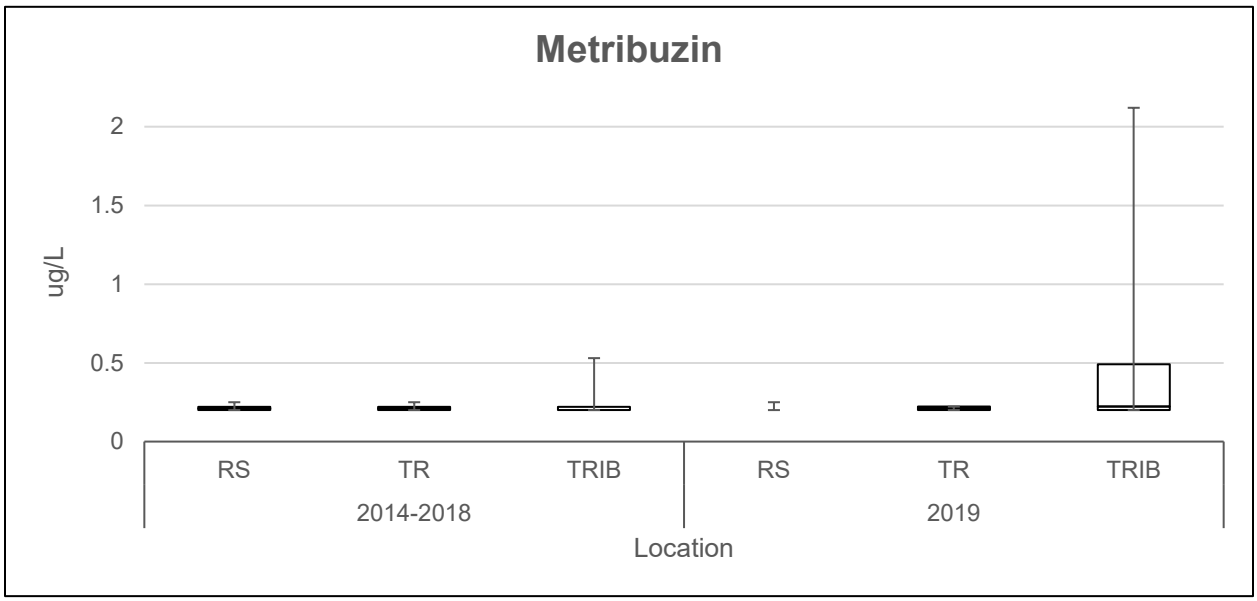
		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL(95.0 %)	Mean	Median	Count	CL(95.0 %)
Atrazine	RS	0.50	0.36	68	0.11	0.66	0.73	16	0.21
	TR	0.41	0.30	17	0.12	0.55	0.55	4	0.61
	TRIB	1.69	0.22	32	2.12	1.58	0.21	8	3.15

**Atrazine exceeded the water quality criteria once on May 22, 2019.*



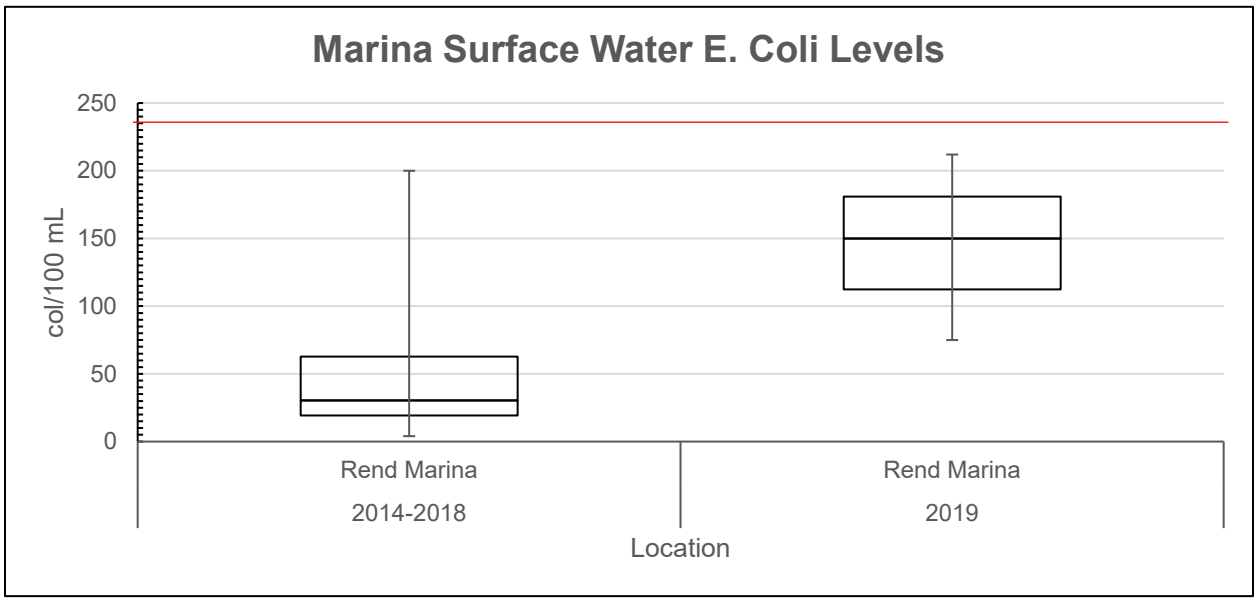
		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL(95.0 %)	Mean	Median	Count	CL(95.0 %)
Metolachlor	RS	0.32	0.22	68	0.05	0.30	0.22	16	0.07
	TR	0.27	0.22	17	0.06	0.26	0.22	4	0.13
	TRIB	0.88	0.22	32	0.67	0.63	0.29	8	0.53

**Metolachlor did not exceed water quality criteria in 2019.*



		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL(95.0%)	Mean	Median	Count	CL(95.0%)
Metribuzin	RS	0.21	0.21	68	0.00	0.22	0.22	16	0.01
	TR	0.21	0.21	17	0.01	0.21	0.21	4	0.02
	TRIB	0.22	0.20	32	0.02	0.59	0.22	8	0.61

**Metribuzin did not exceed water quality criteria in 2019.*



**Red line indicates the water quality standard of 235 col per 100 mL.*

	Historical Reference 2014-2018				2019			
Marina Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Rend Marina	58.63	30.50	8	56.98	145.67	150.00	3	170.42

**Marina bacteria levels did not exceed the water quality standard in 2019.*

2019 Swimming Beach Bacteria Levels (E. Coli / 100mL)						
	Dale Miller		North Marcum		Sandusky	
	Shallow	Deep	Shallow	Deep	Shallow	Deep
5/14/2019	2	1	1	1	8.4	4.1
5/30/2019	2	2	16.9	9.7	29.8	10.9
6/17/2019	4.1	1	2	2	35.5	6.2
7/1/2019	1	2	18.3	12.2	131.4	26.9
7/15/2019	20.9	27.9	1	1	2	1
7/30/2019	12.1	21.8	7.5	4.1	2	3.1
8/14/2019	4.1	4.1	35.5	5.2	3.1	2
8/28/2019	10.7	4.1	22.6	12.1	272.3	1
9/3/2019	1	1	2	2	7.5	1

**Beach bacteria levels exceeded the reference water quality criterion once in 2019.*

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 2019 did not deviate far from conditions observed during the reference period (2014-2018); nevertheless, concerns regarding DO, pH, Atrazine, TSS, Fe, Mn, and TP were evident. In addition CHL_a and subsequent TSI levels were indicative of a hyper eutrophic system.

With a few exceptions, all DO levels recorded in 2019 were above the 5 mg/L standard. On May 22 2019 DO was recorded at 4.76 mg/L at REN-1. On August 13 2019 DO was recorded at 2.35 mg/L at the Marina and 4.87 at REN-2. The DO was measured multiple times at various surface locations in the Marina on August 13 yielding an average of 2.35 mg/L. The exact cause of the very low DO level in the waters of the Marina are unknown. All other parameters measured at that time (pH, ORP, SpCond, Temp, TDS, & Turb) were within the normal ranges. The historic average DO level (8.01 mg/L) is similar to the 2019 average DO levels (7.74 mg/L).

During 2019, the criteria range for pH (6.5-9) was exceeded twice; at REN-2 on April 9 (9.08) and at REN-8 on October 17 (9.12). Historically, pH has been exceeded at various times in the lake, each occurrence being above 9. The 2019 average pH level (8.04) is comparable to the historical average (7.92). There are no significant differences between the historical and 2019 pH statistical data, indicating that pH levels are staying relatively the same. When pH exceeds 9.5 (alkaline), aquatic fish and invertebrates begin to rapidly decrease and beyond 10, fish become extirpated. Future monitoring is imperative to ensure pH levels stay within the range suitable for aquatic life.

Pesticides are commonly used throughout much of the agricultural landscape that the Big Muddy River flows. Of the eight pesticides tested, only Atrazine, Metolachlor, and Metribuzin were detected between 2014 and 2019. Of those three, only Atrazine was found to exceed the criteria. In 2019 the Atrazine drinking water standard (3 ug/L) and chronic exposure (9 ug/L) was exceeded once with a level of 10.9 ug/L at REN-5 on May 22. Atrazine levels were recorded over the standard multiple times in the tributaries historically. The 2019 Atrazine average (0.76 ug/L) is slightly higher than the historic Atrazine average (0.52 ug/L). Atrazine and Alachlor herbicides are commonly used agricultural chemicals which can be readily transported by rainfall runoff. Both compounds are suspected of causing cancer; and therefore, were monitored for the protection of human and aquatic health. Atrazine is most commonly detected in ground and surface water due to its wide use, and its ability to persist in soil and move in water. Only low levels of pesticides have been observed in the tailrace.

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. In 2019 the TSS stream standard (116 mg/L) was exceeded once at REN-

5 on May 22, 2019 with a value of 440 mg/L, while the TSS lake standard (12 mg/L) was exceeded multiple times at all lake sites except REN-2. Historical TSS levels are similar to the 2019 results with the following exception. Average TSS 2019 levels in the tributaries are much higher than historical tributary levels. This is likely due to the sampling events in 2019 occurring after rain events.

Living organisms require trace amounts of metals, but excessive levels can be harmful. TFe exceeded the criterion of 1 mg/L near the lake bottom in front of the dam two times. The average TFe levels in 2019 were significantly higher than historical (2014-2018) levels. Iron cycling is a function of oxidation-reduction processes. Elevated levels of iron near the bottom of a lake is not immediately detrimental to the overall lake system. Iron oxidizes relatively rapidly (minutes to hours); therefore, any iron released through the discharge should be oxidized in a short period of time. TFe levels in the tailrace in 2019 were found to be less than the criterion and lower than the levels in front of the dam. TMn in 2019 exceeded the criterion once near the bottom in front of the dam and once in the tailrace. Historically, TMn has exceeded the criterion multiple times in the tailrace and once in front of the dam. The averages of TMn in 2019 were comparable to the historical values.

TP levels have surpassed the 0.05 mg/L criterion for several years. In 2019 the TP criterion was exceeded at all locations with an average across all sites of 0.24 mg/L, which is an increase when compared to the historical average of 0.19 mg/L. Phosphorus is a limiting nutrient for primary producers (algae and plants) due to its relatively low amount in the environment. Higher inputs of TP and NO3-N into the lake contribute to a highly productive environment which stimulates algal growth that can lead to blooms that deplete the oxygen levels during die off. In addition, blooms can sometimes contain toxins which may be harmful to humans and wildlife.

Although there is not a state criterion for CHL_a the proposed standard of 25 mg/cm^3 was exceeded at all the lake sampling locations at least once in 2019. The 2019 average CHL_a level (37.04 mg/cm^3) was not significantly different compared to the historical average (36.38 mg/cm^3). CHL_a is an indicator of the abundance of phytoplankton. Any water environment with a level recorded above 25 mg/cm^3 is considered to be eutrophic (nutrient enrichment increases algal and plant growth and negative effects). The 2019 TSI level, an average of the individual trophic state indexes for secchi depth, CHL_a, and TP, for Rend Lake was 72.80. Rend Lake is considered hyper-eutrophic based on this TSI level. This does not necessarily mean the water quality is poor, but that its trophic level indicates nutrient levels are abundant, which can support an abundance of plants and algae. Long term monitoring and analyses are important to assess changes in trophic levels over time.

Swimming beach bacteria levels exceeded the criterion slightly one time in 2019 in August at Sandusky beach, but the sample immediately following was low. The seasonal surface water temperature criterion was exceeded once in the lake in August by a minimal amount, however the 2019 seasonal averages were well under the historical seasonal averages. All remaining parameters evaluated during the 2019 water

quality monitoring effort were within designated criteria or within historical reference norms.

MONITORING PROGRAM RECOMMENDATIONS

The Illinois Environmental Protection Agency (IEPA, 2018) has listed Rend Lake and its tributaries with multiple water quality impairments. In order to better understand the causes of these impairments the following additional monitoring is recommended: chemical and in-situ data collected downstream of the spillway (to include mercury), include mercury for site REN-1, augment current sampling suite at REN-7 (Casey Fork) to include chloride, iron, mercury, and augment the current sampling suite at site REN-5 (Big Muddy River) as well as all the lake sites to include mercury.

In accordance with EM-1110-2-1201, benthic sediment samples should be taken to monitor and assess potential impacts to aquatic and human health. Sediment sampling and analyses occurred at Rend Lake in 2018, and prior to that in 2007. During these last analyses multiple exceedances over the recommended criteria were observed. Identifying trends over time is much more achievable with more consistent data. Contaminated sediments may have negative impacts on ecological processes. It is recommended, if possible, to sample and analyze for sediment metals and nutrients, as well as grain size analyses yearly or every two years.

Given the hypereutrophic status of Rend Lake it is recommended that Nitrite (NO_2) and Total Khejdahl Nitrogen (TKN) be added to the monitoring program. Doing so would allow CEMVS to evaluate Total Nitrogen (TN), which is a strong indicator of trophic status. Similarly, it would strengthen the monitoring program to add CHL_a to every sample site. Currently CHL_a is only sampled at the lake sites and not the tributaries or lake discharge. This would allow for a trophic status comparison between the tributaries, lake, and discharge.

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APPENDIX A: FIELD DATA

DATE	SITE	Depth (m)	DO (mg/L)	pH	ORP	Temp (°C)	Sp Cond (µS/cm)	TDS (mg/L)	Turbidity (FNU)
4/9/2019	1	0.67	9.51	7.83	208.5	11.6	230.3	150	17.4
4/9/2019	2	0.00	12.49	9.11	208.4	17.3	224.9	146	15.4
4/9/2019	2	1.12	12.47	9.08	210.7	17.2	224.8	146	15.4
4/9/2019	2	2.27	12.55	9.01	214.3	14.4	224.4	146	15.9
4/9/2019	2	3.05	12.31	8.87	217.6	14.0	224.1	146	16.0
4/9/2019	2	4.10	10.77	8.30	223.2	12.4	225.3	146	16.3
4/9/2019	2	5.09	10.43	8.11	225.2	11.8	225.2	146	16.5
4/9/2019	2	6.19	10.06	7.98	227.4	11.4	225.6	147	16.7
4/9/2019	2	7.00	9.73	7.88	228.5	11.3	225.5	147	17.1
4/9/2019	3	0.21	11.10	8.96	178.1	15.9	230.0	150	20.4
4/9/2019	3	1.01	11.09	9.00	178.9	15.8	229.9	149	20.5
4/9/2019	3	2.08	10.86	8.93	180.2	15.4	230.3	150	20.5
4/9/2019	3	2.98	8.65	8.20	185.3	13.6	232.7	151	23.3
4/9/2019	3	3.88	8.24	8.16	106.1	13.1	232.5	151	130.9
4/9/2019	4	0.04	11.28	8.69	160.4	16.5	250.5	163	27.6
4/9/2019	4	1.07	11.02	8.60	164.2	16.3	250.6	163	28.0
4/9/2019	4	2.02	10.65	8.43	167.5	16.0	250.2	163	28.7
4/9/2019	4	3.01	8.84	8.15	154.1	14.3	245.2	159	28.7
4/9/2019	4	3.27	8.32	8.01	93.6	13.7	244.8	159	124.9
4/9/2019	5	0.87	7.78	7.54	221.3	16.0	386.5	251	100.6
4/9/2019	7	0.21	8.44	7.73	203.3	17.0	392.3	255	48.8
4/9/2019	8	0.89	9.10	8.06	185.5	14.4	221.0	144	18.2
4/9/2019	8	2.12	7.86	7.92	188.4	13.0	220.6	143	21.6
4/9/2019	8	3.07	7.21	7.65	190.0	12.9	221.1	144	23.1
5/22/2019	1	0.03	4.76	7.57	165.3	19.4	239.0	155	14.2
5/22/2019	2	0.00	6.97	7.55	152.7	20.1	234.1	152	10.9
5/22/2019	2	1.14	6.95	7.43	155.6	19.9	233.9	152	10.9
5/22/2019	2	2.09	6.90	7.39	157.2	19.8	233.6	152	10.7
5/22/2019	2	3.07	6.52	7.20	167.3	19.6	233.9	152	10.8
5/22/2019	2	4.00	6.26	7.05	174.8	19.4	234.2	152	11.4
5/22/2019	2	5.16	5.39	6.93	179.3	19.2	235.4	153	12.2
5/22/2019	2	6.06	4.93	6.83	184.2	19.0	235.9	153	12.0
5/22/2019	2	7.06	4.43	6.74	189.3	18.8	236.5	154	12.6
5/22/2019	3	0.03	7.88	7.63	161.3	20.8	231.4	150	18.9
5/22/2019	3	1.07	7.82	7.63	163.1	20.8	231.4	150	19.8
5/22/2019	3	2.08	7.81	7.50	171.4	20.8	231.2	150	19.6
5/22/2019	3	2.93	7.75	7.43	176.3	20.8	231.2	150	21.4
5/22/2019	4	0.00	8.00	7.66	174.6	20.6	237.3	154	18.6
5/22/2019	4	1.21	7.79	7.59	175.6	20.6	237.3	154	18.5
5/22/2019	4	2.11	7.77	7.56	176.7	20.6	237.2	154	18.5
5/22/2019	4	3.00	7.72	7.32	190.9	20.6	237.4	154	18.9

5/22/2019	4	3.82	7.58	7.28	143.0	20.6	237.5	154	20.8
5/22/2019	5	1.03	6.90	6.92	149.9	17.3	202.1	131	281.8
5/22/2019	5	1.46	6.90	6.91	196.4	17.3	201.2	131	222.9
5/22/2019	7	0.00	5.54	7.11	161.5	20.5	137.5	89	52.8
5/22/2019	8	0.00	5.34	7.44	189.3	21.7	188.4	122	26.6
5/22/2019	8	1.09	5.48	7.34	188.7	21.6	193.4	126	21.1
5/22/2019	8	2.10	5.51	7.28	190.8	21.6	193.9	126	21.4
5/22/2019	8	3.00	5.45	7.24	192.4	21.6	195.5	127	21.0
5/22/2019	8	3.83	5.11	7.24	190.5	21.4	198.8	129	48.9
5/22/2019	RL MAR	0.38	7.80	7.62	111.8	21.3	234.0	152	11.0
5/22/2019	RL MAR	0.98	7.60	7.66	113.3	21.1	234.2	152	11.4
5/22/2019	RL MAR	2.03	6.13	7.50	122.1	19.8	234.6	152	12.1
5/22/2019	RL MAR	2.62	5.07	7.39	41.9	19.4	235.7	153	13.4
8/13/2019	1	0.23	5.57	7.87	239.5	27.1	254.0	165	4.1
8/13/2019	2	0.29	5.23	8.12	241.7	28.0	248.3	161	3.8
8/13/2019	2	1.05	4.87	8.04	245.1	27.9	248.5	162	3.8
8/13/2019	2	2.08	3.62	7.87	249.0	27.6	248.7	162	3.8
8/13/2019	2	3.15	3.41	7.76	254.1	27.6	248.9	162	4.0
8/13/2019	2	4.11	3.03	7.68	257.0	27.6	249.2	162	4.4
8/13/2019	2	5.07	2.80	7.62	259.8	27.5	249.6	162	4.7
8/13/2019	2	6.02	1.44	7.55	262.0	27.3	252.7	164	5.1
8/13/2019	3	0.59	6.54	8.03	417.7	28.0	258.9	168	10.7
8/13/2019	3	1.08	6.42	8.13	414.4	28.1	258.8	168	11.2
8/13/2019	3	2.19	6.40	8.17	411.1	28.1	258.8	168	11.1
8/13/2019	3	2.97	6.27	8.14	408.0	28.1	258.8	168	11.2
8/13/2019	4	0.25	7.13	8.25	299.8	28.3	263.1	171	7.1
8/13/2019	4	1.05	6.29	7.98	303.0	28.2	264.0	172	7.6
8/13/2019	4	2.10	5.37	7.75	307.0	28.0	264.8	172	10.0
8/13/2019	5	1.24	6.71	8.19	434.3	24.3	165.2	107	151.7
8/13/2019	5	1.27	5.06	8.05	436.6	24.3	165.0	107	153.9
8/13/2019	7	0.32	6.29	8.19	411.9	24.9	211.1	137	116.8
8/13/2019	7	0.34	6.19	8.04	410.6	25.0	212.7	138	98.3
8/13/2019	8	0.20	5.80	8.06	277.4	28.8	249.2	162	13.5
8/13/2019	8	1.06	5.19	7.96	273.6	28.7	249.2	162	13.4
8/13/2019	8	2.16	4.62	7.83	274.2	28.6	250.4	163	16.8
8/13/2019	RL MAR	0.00	3.56	7.76	220.4	28.5	249.8	162	3.1
8/13/2019	RL MAR	0.23	3.28	7.53	229.5	28.3	249.3	162	3.3
8/13/2019	RL MAR	0.32	2.80	7.15	252.7	27.8	249.2	162	3.3
8/13/2019	RL MAR	1.03	0.51	7.43	233.3	27.3	251.6	164	5.1
8/13/2019	RL MAR	1.08	1.62	7.10	254.3	27.4	249.3	162	3.8
8/13/2019	RL MAR	2.13	1.32	7.33	217.0	27.1	247.5	161	7.7
10/17/2019	1	0.20	9.45	8.33	109.8	16.7	258.0	168	8.3
10/17/2019	2	0.47	10.09	8.64	103.8	16.9	257.3	167	6.4
10/17/2019	2	3.08	8.62	8.44	110.7	16.5	257.4	167	7.3
10/17/2019	2	5.17	8.63	8.38	113.5	16.4	257.4	167	6.8

10/17/2019	3	1.05	10.25	8.86	109.2	14.1	263.0	171	8.4
10/17/2019	4	2.07	8.02	8.46	117.1	14.4	266.7	173	14.4
10/17/2019	5	0.14	6.92	8.01	122.6	11.3	414.8	270	11.9
10/17/2019	7	0.03	8.99	8.49	103.7	13.4	453.2	295	10.5
10/17/2019	8	1.11	10.89	9.12	97.8	15.0	264.9	172	12.8
10/17/2019	8	2.73	8.91	8.81	105.8	13.8	270.9	176	31.8
10/17/2019	RL MAR	0.08	9.50	8.62	107.1	17.1	257.9	168	7.3

APPENDIX B: LABORATORY DATA

ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

Customer Name: SLCOE **Date: 5/3/19**

Project Name: Rend Lake **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 4/9/19 **ARDL Report No.: 8470**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
REN-1	4/9/19	8470-01	NP Pesticides, Metals(1), Inorganics(2)
REN-2-0	4/9/19	8470-02	NP Pesticides, Inorganics(2)(3)
REN-2-5	4/9/19	8470-03	Metals(1), Inorganics(2)
REN-3	4/9/19	8470-04	NP Pesticides, Inorganics(2)(3)
REN-4	4/9/19	8470-05	NP Pesticides, Inorganics(2)(3)
REN-5	4/9/19	8470-06	NP Pesticides, Inorganics(2)
REN-7	4/9/19	8470-07	NP Pesticides, Inorganics(2)
REN-8	4/9/19	8470-08	NP Pesticides, Inorganics(2)(3)
REN-15-0	4/9/19	8470-09	NP Pesticides, Inorganics(2)(3)

(1) Including iron and manganese.
(2) Including ammonia, nitrate, orthophosphate, total phosphorus, TOC, TSS, and TVSS.
(3) Including chlorophyll-a and pheophytin-a.

The quality control data are summarized as follows:

NPPEST\SIM FRACTION – METHOD 8270

HOLDING TIME

Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION

The initial calibration passed criteria.

CONTINUING CALIBRATION

The continuing calibration verification (CCV) passed criteria for all analytes. The closing CCV passed criteria for all analytes.

PREPARATION BLANK

The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE

The LCS analyses met recovery criteria.

MATRIX SPIKE

The matrix spike and matrix spike duplicate met recovery criteria.

CASE NARRATIVE (Continued)

DUPLICATE

Duplicate analyses are reported as MS/MSD. RPD of the duplicate analyses met criteria.

INTERNAL STANDARD

All internal standard criteria were met.

SURROGATE

All surrogate recovery criteria were met.

INORGANIC FRACTION

TOC were analyzed by an accredited outside laboratory due to instrument status.

PREPARATION BLANK

Results of the preparation blanks were within acceptable limits.

LABORATORY CONTROL SAMPLE

Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE

MS/MSD were not performed for the TOC analysis. Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits.

DUPLICATE

All duplicate analyses are reported as MS/MSD except chlorophyll-a, pheophytin-a, TSS, and TVSS. RPD on all duplicate analyses were within control limits.

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates compound was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

REPORT ORGANIZATION

The data in this report appear by sample type (Field sample, preparation blank, laboratory control sample / spike blank, matrix spike /spike duplicate and sample duplicate). Within each sample type the data appear in the order that the analytical methods were discussed in this case narrative. Sample receipt information follows the analytical data.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

[redacted]

Sample & QC Results

Including as appropriate:
Field Sample Results
Batch QC
- Prep Blank
- LCS/Spike Blank

Matrix QC
- MS/MSD
- Sample Duplicate

ARDL Data Package 8470

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

Lab Report No: 008470 Report Date: 04/18/2019

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

Field ID:	REN-1	ARDL Lab No.:	008470-01
Desc/Location:	REND LAKE	Lab Filename:	E0411905
Sample Date:	04/09/2019	Received Date:	04/09/2019
Sample Time:	1000	Prep. Date:	04/10/2019
Matrix:	WATER	Analysis Date:	04/11/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11038
% 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
Triphenylphosphate	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: 008470 Report Date: 05/03/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008470-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 04/09/2019 Moisture: NA
Received: 04/09/2019 Sampling Time: 1000

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.984	MG/L	3010A	6010C	04/10/19	04/10/19	P7190
(a) Manganese	0.00400	0.00500		0.166	MG/L	3010A	6010C	04/10/19	04/10/19	P7190
Ammonia Nitrogen	0.0200	0.0300		0.0904	MG/L	NONE	350.1	NA	04/24/19	04244496
Nitrate as Nitrogen	0.0190	0.0200		0.073	MG/L	NONE	GREEN	NA	04/12/19	04154478
Phosphorus	0.00800	0.0100		0.138	MG/L	365.2	365.2	04/15/19	04/16/19	04184484
Phosphorus, -ortho	0.00800	0.0100		0.0265	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	4.0	4.00		10.4	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	4.0	4.00		4.0	MG/L	NONE	160.4	NA	04/11/19	04164483
Total Organic Carbon	0.500	1.00		5.4	MG/L	NONE	415.1	NA	04/26/19	05014505

(a) DOD and/or NELAC Accredited Analyte.

Sample 008470-01, Inorganic Analyses

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

Lab Report No: 008470 Report Date: 04/18/2019

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

Field ID:	REN-2-0	ARDL Lab No.:	008470-02
Desc/Location:	REND LAKE	Lab Filename:	E0411908
Sample Date:	04/09/2019	Received Date:	04/09/2019
Sample Time:	1040	Prep. Date:	04/10/2019
Matrix:	WATER	Analysis Date:	04/11/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11038
% 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
Triphenylphosphate	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: 008470 Report Date: 05/03/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008470-02
Field ID: REN-2-0
Received: 04/09/2019

Sampling Loc'n: REND LAKE
Sampling Date: 04/09/2019
Sampling Time: 1040

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	04/24/19	04244496
Chlorophyll-a, Correcte	1.0	1.00		24.1	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	04/12/19	04154478
Pheophytin-a	1.0	1.00		3.9	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Phosphorus	0.00800	0.0100		0.155	MG/L	365.2	365.2	04/15/19	04/16/19	04184484
Phosphorus, -ortho	0.00800	0.0100		0.021	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	2.0	2.00		10.8	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	2.0	2.00		4.4	MG/L	NONE	160.4	NA	04/11/19	04164483
Total Organic Carbon	0.500	1.00		5.2	MG/L	NONE	415.1	NA	04/26/19	05014505

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008470 Report Date: 05/03/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008470-03 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-5 Sampling Date: 04/09/2019 Moisture: NA
Received: 04/09/2019 Sampling Time: 1030

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		1.02	MG/L	3010A	6010C	04/10/19	04/10/19	P7190
(a) Manganese	0.00400	0.00500		0.137	MG/L	3010A	6010C	04/10/19	04/10/19	P7190
Ammonia Nitrogen	0.0200	0.0300		0.0628	MG/L	NONE	350.1	NA	04/24/19	04244496
Nitrate as Nitrogen	0.0190	0.0200		0.030	MG/L	NONE	GREEN	NA	04/12/19	04154478
Phosphorus	0.00800	0.0100		0.0342	MG/L	365.2	365.2	04/15/19	04/16/19	04184484
Phosphorus, -ortho	0.00800	0.0100		0.0265	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	2.0	2.00		11.2	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	2.0	2.00		4.0	MG/L	NONE	160.4	NA	04/11/19	04164483
Total Organic Carbon	0.500	1.00		5.2	MG/L	NONE	415.1	NA	04/26/19	05014505

(a) DOD and/or NELAC Accredited Analyte.

Sample 008470-03, Inorganic Analyses

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

Lab Report No: 008470 Report Date: 04/18/2019

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

Field ID:	REN-3	ARDL Lab No.:	008470-04
Desc/Location:	REND LAKE	Lab Filename:	E0411909
Sample Date:	04/09/2019	Received Date:	04/09/2019
Sample Time:	1140	Prep. Date:	04/10/2019
Matrix:	WATER	Analysis Date:	04/11/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11038
% 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
Triphenylphosphate	30-130	72%

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: 008470 Report Date: 05/03/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008470-04
Field ID: REN-3
Received: 04/09/2019

Sampling Loc'n: REND LAKE
Sampling Date: 04/09/2019
Sampling Time: 1140

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	0.0217	MG/L	NONE	350.1	NA	04/24/19	04244496
Chlorophyll-a, Correcte	1.0	1.00		43.6	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	04/12/19	04154478
Pheophytin-a	1.0	1.00		16.0	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Phosphorus	0.00800	0.0100		0.151	MG/L	365.2	365.2	04/15/19	04/16/19	04184484
Phosphorus, -ortho	0.00800	0.0100		0.0128	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	2.0	2.00		15.2	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	2.0	2.00		5.6	MG/L	NONE	160.4	NA	04/11/19	04164483
Total Organic Carbon	0.500	1.00		5.9	MG/L	NONE	415.1	NA	04/26/19	05014505

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

Lab Report No: 008470 Report Date: 04/18/2019

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

Field ID:	REN-4	ARDL Lab No.:	008470-05
Desc/Location:	REND LAKE	Lab Filename:	E0411910
Sample Date:	04/09/2019	Received Date:	04/09/2019
Sample Time:	1155	Prep. Date:	04/10/2019
Matrix:	WATER	Analysis Date:	04/11/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11038
% 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
Triphenylphosphate	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: 008470 Report Date: 05/03/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008470-05 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-4 Sampling Date: 04/09/2019 Moisture: NA
Received: 04/09/2019 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		0.0328	MG/L	NONE	350.1	NA	04/24/19	04244496
Chlorophyll-a, Correcte	1.0	1.00		59.9	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Nitrate as Nitrogen	0.0190	0.0200		0.037	MG/L	NONE	GREEN	NA	04/12/19	04154478
Pheophytin-a	1.0	1.00		10.5	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Phosphorus	0.00800	0.0100		0.186	MG/L	365.2	365.2	04/15/19	04/16/19	04184484
Phosphorus, -ortho	0.00800	0.0100		0.0183	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	4.0	4.00		17.6	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	4.0	4.00		6.0	MG/L	NONE	160.4	NA	04/11/19	04164483
Total Organic Carbon	0.500	1.00		6.2	MG/L	NONE	415.1	NA	04/26/19	05014505

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

Lab Report No: 008470 Report Date: 04/18/2019

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

Field ID:	REN-5	ARDL Lab No.:	008470-06
Desc/Location:	REND LAKE	Lab Filename:	E0411911
Sample Date:	04/09/2019	Received Date:	04/09/2019
Sample Time:	0930	Prep. Date:	04/10/2019
Matrix:	WATER	Analysis Date:	04/11/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11038
% 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	0.456		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
Triphenylphosphate	30-130	65%

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: 008470 Report Date: 05/03/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008470-06 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-5 Sampling Date: 04/09/2019 Moisture: NA
Received: 04/09/2019 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		0.0794	MG/L	NONE	350.1	NA	04/24/19	04244496
Nitrate as Nitrogen	0.0190	0.0200		0.16	MG/L	NONE	GREEN	NA	04/12/19	04154478
Phosphorus	0.00800	0.0100		0.441	MG/L	365.2	365.2	04/15/19	04/16/19	04184484
Phosphorus, -ortho	0.00800	0.0100		0.0375	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	4.67	4.67		96.3	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	4.67	4.67		9.81	MG/L	NONE	160.4	NA	04/11/19	04164483
Total Organic Carbon	0.500	1.00		9.7	MG/L	NONE	415.1	NA	04/27/19	05014505

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

Lab Report No: 008470 Report Date: 04/18/2019

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

Field ID:	REN-7	ARDL Lab No.:	008470-07
Desc/Location:	REND LAKE	Lab Filename:	E0411912
Sample Date:	04/09/2019	Received Date:	04/09/2019
Sample Time:	1325	Prep. Date:	04/10/2019
Matrix:	WATER	Analysis Date:	04/11/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11038
% 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
Triphenylphosphate	30-130	71%

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: 008470 Report Date: 05/03/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008470-07 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-7 Sampling Date: 04/09/2019 Moisture: NA
Received: 04/09/2019 Sampling Time: 1325

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.102	MG/L	NONE	350.1	NA	04/24/19	04244496
Nitrate as Nitrogen	0.0190	0.0200		0.212	MG/L	NONE	GREEN	NA	04/12/19	04154478
Phosphorus	0.00800	0.0100		0.272	MG/L	365.2	365.2	04/15/19	04/16/19	04184484
Phosphorus, -ortho	0.00800	0.0100		0.0183	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	4.0	4.00		40.8	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	4.0	4.00		4.8	MG/L	NONE	160.4	NA	04/11/19	04164483
Total Organic Carbon	0.500	1.00		8.3	MG/L	NONE	415.1	NA	04/27/19	05014505

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008470 Report Date: 04/18/2019

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

Field ID:	REN-8	ARDL Lab No.:	008470-08
Desc/Location:	REND LAKE	Lab Filename:	E0411913
Sample Date:	04/09/2019	Received Date:	04/09/2019
Sample Time:	1110	Prep. Date:	04/10/2019
Matrix:	WATER	Analysis Date:	04/11/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11038
% 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
Triphenylphosphate	30-130	69%

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: 008470 Report Date: 05/03/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008470-08 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-8 Sampling Date: 04/09/2019 Moisture: NA
Received: 04/09/2019 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		0.0362	MG/L	NONE	350.1	NA	04/24/19	04244496
Chlorophyll-a, Correcte	1.0	1.00		59.4	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Nitrate as Nitrogen	0.0190	0.0200		0.114	MG/L	NONE	GREEN	NA	04/12/19	04154478
Pheophytin-a	1.0	1.00		15.2	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Phosphorus	0.00800	0.0100		0.238	MG/L	365.2	365.2	04/15/19	04/16/19	04184484
Phosphorus, -ortho	0.00800	0.0100		0.0347	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	4.0	4.00		16.0	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	4.0	4.00		7.2	MG/L	NONE	160.4	NA	04/11/19	04164483
Total Organic Carbon	0.500	1.00		6.7	MG/L	NONE	415.1	NA	04/27/19	05014505

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008470 Report Date: 04/18/2019

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

Field ID:	REN-15-0	ARDL Lab No.:	008470-09
Desc/Location:	REND LAKE	Lab Filename:	E0411914
Sample Date:	04/09/2019	Received Date:	04/09/2019
Sample Time:	1210	Prep. Date:	04/10/2019
Matrix:	WATER	Analysis Date:	04/11/2019
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11038
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.250	0.250	ND		UG/L	1
Atrazine	0.250	0.250	0.288		UG/L	1
Metribuzin	0.250	0.250	ND		UG/L	1
Alachlor	0.250	0.250	ND		UG/L	1
Metolachlor	0.250	0.250	ND		UG/L	1
Chlorpyrifos	0.250	0.250	ND		UG/L	1
Cyanazine	0.250	0.250	ND		UG/L	1
Pendimethalin	0.250	0.250	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	77%

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: 008470 Report Date: 05/03/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008470-09
Field ID: REN-15-0
Received: 04/09/2019

Sampling Loc'n: REND LAKE
Sampling Date: 04/09/2019
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	J	0.0276	MG/L	NONE	350.1	NA	04/24/19	04244496
Chlorophyll-a, Correcte	1.0	1.00		61.4	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Nitrate as Nitrogen	0.0190	0.0200		0.054	MG/L	NONE	GREEN	NA	04/12/19	04154478
Pheophytin-a	1.0	1.00		10.0	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489
Phosphorus	0.00800	0.0100		0.216	MG/L	365.2	365.2	04/15/19	04/16/19	04184484
Phosphorus, -ortho	0.00800	0.0100		0.0183	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	4.0	4.00		17.6	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	4.0	4.00		6.0	MG/L	NONE	160.4	NA	04/11/19	04164483
Total Organic Carbon	0.500	1.00		6.1	MG/L	NONE	415.1	NA	04/27/19	05014505

(a) DOD and/or NELAC Accredited Analyte.

METHOD BLANK REPORT
ARDL, Inc. 400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008470 Report Date: 04/18/2019

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

Field ID:	NA	ARDL Lab No.:	008470-01B1
Desc/Location:	NA	Lab Filename:	E0411903
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	04/10/2019
Matrix:	QC Material	Analysis Date:	04/11/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11038
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	94%

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

(a) DOD-QSM Accredited Analyte.

BLANK SUMMARY REPORT

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

Lab Report No: 008470 Report Date: 05/03/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	ND	MG/L	3010A	6010C	04/10/19	04/10/19	P7190	008468-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	04/10/19	04/10/19	P7190	008468-01B1
Ammonia Nitrogen	0.020	0.030	ND	MG/L	NONE	350.1	NA	04/24/19	04244496	008470-01B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489	008470-02B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	04/12/19	04154478	008470-03B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	04/10/19	04/18/19	04194489	008470-02B1
Phosphorus	0.008	0.010	ND	MG/L	365.2	365.2	04/15/19	04/16/19	04184484	008470-01B1
Phosphorus, -ortho	0.008	0.010	ND	MG/L	NONE	365.2	NA	04/10/19	04114465	008470-01B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	04/11/19	04164482	008470-01B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	04/11/19	04164483	008470-01B1
Total Organic Carbon	0.50	1.0	ND	MG/L	NONE	415.1	NA	04/26/19	05014505	008470-01B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008470

BLANK SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008470 Report Date: 04/18/2019

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11038 Prep. Date: 04/10/2019
Amount Used: 1000 mL Level: LOW Analysis Date: 04/11/2019

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	3.24	4	81	--	--	--	30-130	--	--
Atrazine	3.03	4	76	--	--	--	30-130	--	--
Metribuzin	3.18	4	80	--	--	--	30-130	--	--
Alachlor	3.32	4	83	--	--	--	30-130	--	--
Metolachlor	3.47	4	87	--	--	--	30-130	--	--
Chlorpyrifos	3.1	4	78	--	--	--	30-130	--	--
Cyanazine	3.79	4	95	--	--	--	30-130	--	--
Pendimethalin	3.42	4	86	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	83.8	--	30-130

(a) DOD-QSM Accredited Analyte.

'*' indicates a recovery outside of standard limits.

Spike Blanks for 008470-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

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

Lab Report No: 008470 Report Date: 05/03/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	4.8	5.0	95	--	--	--	87-115	--	P7190	008468-01C1
(a) Manganese	0.75	0.75	100	--	--	--	90-114	--	P7190	008468-01C1
Ammonia Nitrogen	1.0	1.0	103	--	--	--	80-120	--	04244496	008470-01C1
Nitrate as Nitrogen	1.0	1.0	100	--	--	--	80-120	--	04154478	008470-03C1
Phosphorus	0.64	0.67	95	--	--	--	80-120	--	04184484	008470-01C1
Phosphorus, -ortho	0.098	0.10	98	--	--	--	80-120	--	04114465	008470-01C1
Total Organic Carbon	19.5	20.0	98	19.5	20.0	98	76-120	98	05014505	008470-01C1

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008470 Report Date: 04/18/2019

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Field ID:	REN-1	Prep. Date:	04/10/2019	ARDL Lab No.:	008470-01
Desc/Location:	REND LAKE	Amount Used:	900 mL	Lab Filename:	
Sample Date:	04/09/2019	% Moisture:	NA	Received Date:	04/09/2019
Sample Time:	1000	QC Batch:	B11038	Analysis Date:	04/11/2019
Matrix:	WATER	Level:	LOW		

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	2.66	4.44	59.8	2.6	4.44	58.5	30-130	2.1	30
Atrazine	ND	3.04	4.44	68.5	2.79	4.44	62.8	30-130	8.8	30
Metribuzin	ND	3.2	4.44	72	2.89	4.44	65	30-130	10.2	30
Alachlor	ND	3.29	4.44	74	3.11	4.44	70	30-130	5.6	30
Metolachlor	ND	3.42	4.44	77	3.31	4.44	74.5	30-130	3.3	30
Chlorpyrifos	ND	2.74	4.44	61.8	2.64	4.44	59.5	30-130	3.7	30
Cyanazine	ND	3.76	4.44	84.5	3.44	4.44	77.5	30-130	8.6	30
Pendimethalin	ND	2.94	4.44	66.3	2.87	4.44	64.5	30-130	2.7	30

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Triphenylphosphate	70	68	30-130

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008470-01, NP PESTICIDES (8270SIM-MOD)

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008470 Report Date: 05/03/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.98	2.0	1.0	98	2.0	1.0	100	87-115	1	20	P7190	008470-01MS
(a) Manganese	WATER	0.17	0.67	0.50	101	0.68	0.50	104	90-114	2	20	P7190	008470-01MS
Ammonia Nitrogen	WATER	0.090	2.2	2.0	105	2.1	2.0	101	75-125	3	20	04244496	008470-01MS
Nitrate as Nitrogen	WATER	0.030	0.84	1.0	81	0.81	1.0	78	75-125	3	20	04154478	008470-03MS
Phosphorus	WATER	0.14	0.95	0.83	98	1.0	0.83	106	75-125	8	20	04184484	008470-01MS
Phosphorus, -ortho	WATER	0.027	0.13	0.10	105	0.13	0.10	108	75-125	2	20	04114465	008470-01MS

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.

(a) DOD and/or NELAC Accredited Analyte.

Inorganic Matrix Spikes for 008470

SAMPLE DUPLICATE REPORT

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

Lab Report No: 008470 Report Date: 05/03/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	24.1	24.7	--	MG/CU.M.	2	--	04194489	008470-02D1
Pheophytin-a	3.9	4.1	--	MG/CU.M.	5	--	04194489	008470-02D1
Solids, Total Suspended	10.4	11.2	--	MG/L	7	--	04164482	008470-01D1
Solids, Volatile Suspend	4.0	4.0	--	MG/L	0	--	04164483	008470-01D1

(a) DOD and/or NELAC Accredited Analyte

[redacted]

Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

8470

ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) R. Archesky, B. Greenlaw

SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS	Chloro/Pheo	TOC, T-PO4	O-PO4	NO3-N, NH3-N	NP Pest	T.Fe; T.Mn	E. coli	MS/MSD					REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
Ren – 1	4/9/19	1000		X		X		X	X	X	X	X		X						X	
Ren – 2 – 0		1040		X		X	X	X	X	X	X									X	
Ren – 2 – 5		1030		X		X		X	X	X		X								X	
Ren – 3		1140		X		X	X	X	X	X	X									X	
Ren – 4		1155		X		X	X	X	X	X	X									X	
Ren – 5		~~1050~~ 0930		X		X		X	X	X	X									X	
Ren – 7		1325		X		X		X	X	X	X									X	
Ren – 8		1110		X		X	X	X	X	X	X									X	
Ren – 15- 0		1210		X		X	X	X	X	X	X									X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	REMARKS/SPECIAL INSTRUCTIONS:
	4/9/19	1331		
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	
	4/9/19	~~1331~~ 1350	dlw 4-9-19	
Received for Laboratory by: (Signature)	Date	Time	Shipping Ticket No.	
	4/9/19	1350		

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8470

Cooler # 1 of 2

Number of Coolers in Shipment: 2

Project: Rend Lake

Date Received: 4-9-19

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 4-9-19 (Signature) DS Cochrum

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: Courier

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... YES (NO)
5. Were custody papers sealed in a plastic bag? ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 0.4 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 4-10-19 (Signature) DS Cochrum

10. Describe type of packing in cooler: loose ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: all	Fraction:
Area #: Walkin	Area #:
By: dlc	By:
On: 4-10-19	On:

Chain-of-Custody # N/A

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8470 Cooler # 2 of 2

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 4-9-19

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 4-9-19 (Signature) DK Cochrum

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: Courier

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... YES (NO)
5. Were custody papers sealed in a plastic bag? ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO ✓ Observed Cooler Temp. 1.9 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 4-10-19 (Signature) DK Cochrum

10. Describe type of packing in cooler: loose ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: all	Fraction:
Area #: Walkin	Area #:
By: dlc	By:
On: 4-10-19	On:

Chain-of-Custody # N/A

ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

Customer Name: SLCOE **Date: 6/25/19**

Project Name: Rend Lake **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 5/22/19 **ARDL Report No.: 8480**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
REN-1	5/22/19	8480-01	NP Pesticides, Metals(1), Inorganics(2)
REN-2-0	5/22/19	8480-02	NP Pesticides, Inorganics(2)(3)
REN-2-5	5/22/19	8480-03	Metals(1), Inorganics(2)
REN-3	5/22/19	8480-04	NP Pesticides, Inorganics(2)(3)
REN-4	5/22/19	8480-05	NP Pesticides, Inorganics(2)(3)
REN-5	5/22/19	8480-06	NP Pesticides, Inorganics(2)
REN-7	5/22/19	8480-07	NP Pesticides, Inorganics(2)
REN-8	5/22/19	8480-08	NP Pesticides, Inorganics(2)(3)
REN-15-0	5/22/19	8480-09	NP Pesticides, Inorganics(2)(3)
REN-RL-MAR	5/22/19	8480-10	E. Coli

(1) Including iron and manganese.
(2) Including ammonia, nitrate, orthophosphate, total phosphorus, TOC, TSS, and TVSS.
(3) Including chlorophyll-a and pheophytin-a.

The quality control data are summarized as follows:

NP PESTICIDE FRACTION – METHOD 8270-SIM

HOLDING TIME
Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION
The initial calibration passed criteria.

CONTINUING CALIBRATION
The continuing calibration verification (CCV) passed criteria for all analytes. The closing CCV passed criteria for all analytes.

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

MATRIX SPIKE
The matrix spike and matrix spike duplicate met recovery criteria.

CASE NARRATIVE (Continued)

DUPLICATE
Duplicate analyses are reported as MS/MSD. RPD of the duplicate analyses met criteria.

INTERNAL STANDARD
All internal standard criteria were met.

SURROGATE
All surrogate recovery criteria were met.

INORGANIC FRACTION

TOC and nitrate-nitrite were analyzed by an accredited outside laboratory due to instrument status.

PREPARATION BLANK
Results of the preparation blanks were within acceptable limits.

LABORATORY CONTROL SAMPLE
Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE
Percent recovery of all matrix spikes and matrix spike duplicates.

DUPLICATE
All duplicate analyses are reported as MS/MSD except chlorophyll-a, pheophytin-a, TSS, and TVSS.
RPD on all duplicate analyses were within control limits, with the exception of TVSS (21% RPD), which was within ± the reporting limit and therefore acceptable.

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates compound was analyzed for but not detected.

REPORT ORGANIZATION

The data in this report appear by sample type (Field sample, preparation blank, laboratory control sample / spike blank, matrix spike /spike duplicate and sample duplicate). Within each sample type the data appear in the order that the analytical methods were discussed in this case narrative. Sample receipt information follows the analytical data.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

[redacted]

Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8480

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

Lab Report No: 008480 Report Date: 06/05/2019

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

Field ID:	REN-1	ARDL Lab No.:	008480-01
Desc/Location:	REND LAKE	Lab Filename:	E0530905
Sample Date:	05/22/2019	Received Date:	05/22/2019
Sample Time:	1306	Prep. Date:	05/28/2019
Matrix:	WATER	Analysis Date:	05/30/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11054
% 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	0.210		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
Triphenylphosphate	30-130	75%

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

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

Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008480-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 05/22/2019 Moisture: NA
Received: 05/22/2019 Sampling Time: 1306

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.963	MG/L	3010A	6010C	05/23/19	05/28/19	P7207
(a) Manganese	0.00400	0.00500		0.998	MG/L	3010A	6010C	05/23/19	05/28/19	P7207
Ammonia Nitrogen	0.0200	0.0300		0.0865	MG/L	NONE	350.1	NA	06/03/19	06054620
Nitrate as Nitrogen	0.0500	0.0500		0.44	MG/L	NONE	GREEN	NA	06/10/19	06144639
Phosphorus	0.00800	0.0100		0.154	MG/L	365.2	365.2	06/04/19	06/05/19	06074631
Phosphorus, -ortho	0.00800	0.0100		0.0719	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	2.50	2.50		9.5	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	2.50	2.50		ND	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	0.500	1.00		5.0	MG/L	NONE	415.1	NA	06/04/19	06114634

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008480 Report Date: 06/05/2019

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

Field ID:	REN-2-0	ARDL Lab No.:	008480-02
Desc/Location:	REND LAKE	Lab Filename:	E0530908
Sample Date:	05/22/2019	Received Date:	05/22/2019
Sample Time:	1121	Prep. Date:	05/28/2019
Matrix:	WATER	Analysis Date:	05/30/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11054
% 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	0.244		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
Triphenylphosphate	30-130	79%

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

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

Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008480-02 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-0 Sampling Date: 05/22/2019 Moisture: NA
Received: 05/22/2019 Sampling Time: 1121

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	06/03/19	06054620
Chlorophyll-a, Correcte	1.0	1.00		6.8	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Nitrate as Nitrogen	0.0500	0.0500		0.362	MG/L	NONE	GREEN	NA	06/10/19	06144639
Pheophytin-a	1.0	1.00		1.5	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Phosphorus	0.00800	0.0100		0.132	MG/L	365.2	365.2	06/04/19	06/05/19	06074631
Phosphorus, -ortho	0.00800	0.0100		0.085	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	2.0	2.00		6.2	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	2.0	2.00		ND	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	0.500	1.00		4.9	MG/L	NONE	415.1	NA	06/05/19	06114635

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008480-03
Field ID: REN-2-5
Received: 05/22/2019

Sampling Loc'n: REND LAKE
Sampling Date: 05/22/2019
Sampling Time: 1126

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.929	MG/L	3010A	6010C	05/23/19	05/28/19	P7207
(a) Manganese	0.00400	0.00500		0.977	MG/L	3010A	6010C	05/23/19	05/28/19	P7207
Ammonia Nitrogen	0.0200	0.0300		0.0697	MG/L	NONE	350.1	NA	06/03/19	06054620
Nitrate as Nitrogen	0.0500	0.0500		0.395	MG/L	NONE	GREEN	NA	06/10/19	06144639
Phosphorus	0.00800	0.0100		0.141	MG/L	365.2	365.2	06/04/19	06/05/19	06074631
Phosphorus, -ortho	0.00800	0.0100		0.0903	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	10.0	10.0		292	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	10.0	10.0		30.0	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	0.500	1.00		4.9	MG/L	NONE	415.1	NA	06/05/19	06114635

(a) DOD and/or NELAC Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008480 Report Date: 06/05/2019

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

Field ID:	REN-3	ARDL Lab No.:	008480-04
Desc/Location:	REND LAKE	Lab Filename:	E0530909
Sample Date:	05/22/2019	Received Date:	05/22/2019
Sample Time:	1006	Prep. Date:	05/28/2019
Matrix:	WATER	Analysis Date:	05/30/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11054
% 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	0.611		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	0.289		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
Triphenylphosphate	30-130	82%

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

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Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008480-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 05/22/2019 Moisture: NA
Received: 05/22/2019 Sampling Time: 1006

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.131	MG/L	NONE	350.1	NA	06/03/19	06054620
Chlorophyll-a, Correcte	1.0	1.00		7.8	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Nitrate as Nitrogen	0.0500	0.0500		0.262	MG/L	NONE	GREEN	NA	06/10/19	06144639
Pheophytin-a	1.0	1.00		2.0	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Phosphorus	0.00800	0.0100		0.172	MG/L	365.2	365.2	06/04/19	06/05/19	06074631
Phosphorus, -ortho	0.00800	0.0100		0.0745	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	1.54	1.54		10.3	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	1.54	1.54		2.15	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	0.500	1.00		5.3	MG/L	NONE	415.1	NA	06/05/19	06114635

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Mt. Vernon, Illinois 62864

Lab Report No: 008480 Report Date: 06/05/2019

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

Field ID:	REN-4	ARDL Lab No.:	008480-05
Desc/Location:	REND LAKE	Lab Filename:	E0530910
Sample Date:	05/22/2019	Received Date:	05/22/2019
Sample Time:	0935	Prep. Date:	05/28/2019
Matrix:	WATER	Analysis Date:	05/30/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11054
% 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	0.700		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	0.411		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
Triphenylphosphate	30-130	80%

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

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Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008480-05
Field ID: REN-4
Received: 05/22/2019

Sampling Loc'n: REND LAKE
Sampling Date: 05/22/2019
Sampling Time: 0935

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		0.114	MG/L	NONE	350.1	NA	06/03/19	06054620
Chlorophyll-a, Correcte	1.0	1.00		10.0	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Nitrate as Nitrogen	0.0500	0.0500		0.255	MG/L	NONE	GREEN	NA	06/10/19	06144639
Pheophytin-a	1.0	1.00		1.5	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Phosphorus	0.00800	0.0100		0.181	MG/L	365.2	365.2	06/04/19	06/05/19	06074631
Phosphorus, -ortho	0.00800	0.0100		0.0771	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	1.33	1.33		12.1	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	1.33	1.33		2.27	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	0.500	1.00		5.7	MG/L	NONE	415.1	NA	06/05/19	06114635

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Lab Report No: 008480 Report Date: 06/05/2019

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

Field ID:	REN-5	ARDL Lab No.:	008480-06
Desc/Location:	REND LAKE	Lab Filename:	E0530911
Sample Date:	05/22/2019	Received Date:	05/22/2019
Sample Time:	0840	Prep. Date:	05/28/2019
Matrix:	WATER	Analysis Date:	05/30/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11054
% 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	10.9		UG/L	1
Metribuzin	0.222	0.222	2.12		UG/L	1
Alachlor	0.222	0.222	ND		UG/L	1
Metolachlor	0.222	0.222	0.811		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
Triphenylphosphate	30-130	66%

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

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Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008480-06 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-5 Sampling Date: 05/22/2019 Moisture: NA
Received: 05/22/2019 Sampling Time: 0840

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.135	MG/L	NONE	350.1	NA	06/03/19	06054620
Nitrate as Nitrogen	0.0500	0.0500		0.302	MG/L	NONE	GREEN	NA	06/10/19	06144639
Phosphorus	0.00800	0.0100		0.812	MG/L	365.2	365.2	06/04/19	06/05/19	06074631
Phosphorus, -ortho	0.00800	0.0100		0.13	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	20.0	20.0		440	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	20.0	20.0		40.0	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	0.500	1.00		10.0	MG/L	NONE	415.1	NA	06/05/19	06114635

(a) DOD and/or NELAC Accredited Analyte.

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Lab Report No: 008480 Report Date: 06/05/2019

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

Field ID:	REN-7	ARDL Lab No.:	008480-07
Desc/Location:	REND LAKE	Lab Filename:	E0530912
Sample Date:	05/22/2019	Received Date:	05/22/2019
Sample Time:	1355	Prep. Date:	05/28/2019
Matrix:	WATER	Analysis Date:	05/30/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11054
% 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	1.30		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	0.360		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
Triphenylphosphate	30-130	84%

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

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Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008480-07
Field ID: REN-7
Received: 05/22/2019

Sampling Loc'n: REND LAKE
Sampling Date: 05/22/2019
Sampling Time: 1355

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		0.0309	MG/L	NONE	350.1	NA	06/03/19	06054620
Nitrate as Nitrogen	0.25	0.25		ND	MG/L	NONE	GREEN	NA	06/12/19	06144640
Phosphorus	0.00800	0.0100		0.356	MG/L	365.2	365.2	06/04/19	06/05/19	06074631
Phosphorus, -ortho	0.00800	0.0100		0.154	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	4.0	4.00		35.2	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	4.0	4.00		6.4	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	0.500	1.00		9.1	MG/L	NONE	415.1	NA	06/05/19	06114635

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Lab Report No: 008480 Report Date: 06/05/2019

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

Field ID:	REN-8	ARDL Lab No.:	008480-08
Desc/Location:	REND LAKE	Lab Filename:	E0530913
Sample Date:	05/22/2019	Received Date:	05/22/2019
Sample Time:	1156	Prep. Date:	05/28/2019
Matrix:	WATER	Analysis Date:	05/30/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11054
% 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
Triphenylphosphate	30-130	81%

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

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Mt. Vernon, Illinois 62864

Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008480-08
Field ID: REN-8
Received: 05/22/2019

Sampling Loc'n: REND LAKE
Sampling Date: 05/22/2019
Sampling Time: 1156

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		0.234	MG/L	NONE	350.1	NA	06/03/19	06054620
Chlorophyll-a, Correcte	1.0	1.00		20.9	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Nitrate as Nitrogen	0.25	0.25		ND	MG/L	NONE	GREEN	NA	06/12/19	06144640
Pheophytin-a	1.0	1.00		5.2	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Phosphorus	0.00800	0.0100		0.369	MG/L	365.2	365.2	06/04/19	06/05/19	06074631
Phosphorus, -ortho	0.00800	0.0100		0.162	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	2.50	2.50		24.3	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	2.50	2.50		4.5	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	0.500	1.00		7.3	MG/L	NONE	415.1	NA	06/05/19	06114635

(a) DOD and/or NELAC Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008480 Report Date: 06/05/2019

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

Field ID:	REN-15-0	ARDL Lab No.:	008480-09
Desc/Location:	REND LAKE	Lab Filename:	E0530914
Sample Date:	05/22/2019	Received Date:	05/22/2019
Sample Time:	0945	Prep. Date:	05/28/2019
Matrix:	WATER	Analysis Date:	05/30/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11054
% 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	0.667		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	0.400		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
Triphenylphosphate	30-130	74%

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

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Mt. Vernon, Illinois 62864

Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008480-09 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-15-0 Sampling Date: 05/22/2019 Moisture: NA
Received: 05/22/2019 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		0.142	MG/L	NONE	350.1	NA	06/03/19	06054620
Chlorophyll-a, Correcte	1.0	1.00		10.4	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Nitrate as Nitrogen	0.0500	0.0500		0.244	MG/L	NONE	GREEN	NA	06/10/19	06144641
Pheophytin-a	1.0	1.00		1.3	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Phosphorus	0.00800	0.0100		0.172	MG/L	365.2	365.2	06/04/19	06/05/19	06074631
Phosphorus, -ortho	0.00800	0.0100		0.0745	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	2.0	2.00		12.4	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	2.0	2.00		2.4	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	0.500	1.00		6.0	MG/L	NONE	415.1	NA	06/05/19	06114635

(a) DOD and/or NELAC Accredited Analyte.

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Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008480-10
Field ID: REN-RL-MAR
Received: 05/22/2019

Sampling Loc'n: REND LAKE
Sampling Date: 05/22/2019
Sampling Time: 1231

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		75.0	COL/100 ML	NONE	1604	NA	05/22/19	05244576

(a) DOD and/or NELAC Accredited Analyte.

METHOD BLANK REPORT

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

Lab Report No: 008480 Report Date: 06/05/2019

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

Field ID:	NA	ARDL Lab No.:	008480-01B1
Desc/Location:	NA	Lab Filename:	E0530903
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	05/28/2019
Matrix:	QC Material	Analysis Date:	05/30/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11054
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	84%

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

BLANK SUMMARY REPORT

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

Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Detect Limit	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.050	ND	MG/L	3010A	6010C	05/23/19	05/28/19	P7207	008478-03B1
(a) Manganese	0.005	ND	MG/L	3010A	6010C	05/23/19	05/28/19	P7207	008478-03B1
Ammonia Nitrogen	0.030	ND	MG/L	NONE	350.1	NA	06/03/19	06054620	008480-01B1
Chlorophyll-a, Corrected	1.0	ND	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616	008480-02B1
E. Coliform	1.0	ND	COL/100 ML	NONE	1604	NA	05/22/19	05244576	008480-10B1
Nitrate as Nitrogen	0.050	ND	MG/L	NONE	GREEN	NA	06/10/19	06144641	008480-09B1
Nitrate as Nitrogen	0.050	ND	MG/L	NONE	GREEN	NA	06/10/19	06144639	008477-02B1
Nitrate as Nitrogen	0.050	ND	MG/L	NONE	GREEN	NA	06/12/19	06144640	008476-02B1
Pheophytin-a	1.0	ND	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616	008480-02B1
Phosphorus	0.010	ND	MG/L	365.2	365.2	06/04/19	06/05/19	06074631	008479-03B1
Phosphorus, -ortho	0.010	ND	MG/L	NONE	365.2	NA	05/23/19	05304598	008480-01B1
Solids, Total Suspended	1.0	ND	MG/L	NONE	160.2	NA	05/23/19	05284580	008480-07B1
Solids, Volatile Suspended	1.0	ND	MG/L	NONE	160.4	NA	05/23/19	05284581	008480-07B1
Total Organic Carbon	1.0	ND	MG/L	NONE	415.1	NA	06/04/19	06114634	008479-01B1
Total Organic Carbon	1.0	ND	MG/L	NONE	415.1	NA	06/05/19	06114635	008480-04B1

Inorganic Method Blanks for 008480

BLANK SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008480 Report Date: 06/05/2019

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11054 Prep. Date: 05/28/2019
Amount Used: 1000 mL Level: LOW Analysis Date: 05/30/2019

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	2.8	4	70	--	--	--	30-130	--	--
Atrazine	2.46	4	62	--	--	--	30-130	--	--
Metribuzin	2.57	4	64	--	--	--	30-130	--	--
Alachlor	2.42	4	61	--	--	--	30-130	--	--
Metolachlor	2.78	4	70	--	--	--	30-130	--	--
Chlorpyrifos	2.47	4	62	--	--	--	30-130	--	--
Cyanazine	2.98	4	75	--	--	--	30-130	--	--
Pendimethalin	2.87	4	72	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	71	--	30-130

'*' indicates a recovery outside of standard limits.
Spike Blanks for 008480-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

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

Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	4.9	5.0	98	--	--	--	81-118	--	P7207	008478-03C1
(a) Manganese	0.76	0.75	102	--	--	--	84-114	--	P7207	008478-03C1
Ammonia Nitrogen	0.91	1.0	91	--	--	--	80-120	--	06054620	008480-01C1
Nitrate as Nitrogen	5.0	5.0	99	--	--	--	80-120	--	06144639	008477-02C1
Nitrate as Nitrogen	4.9	5.0	98	--	--	--	80-120	--	06144640	008476-02C1
Nitrate as Nitrogen	5.2	5.0	104	--	--	--	80-120	--	06144641	008480-09C1
Phosphorus	0.65	0.67	98	--	--	--	80-120	--	06074631	008479-03C1
Phosphorus, -ortho	0.10	0.10	101	--	--	--	80-120	--	05304598	008480-01C1
Total Organic Carbon	8.8	10.0	88	--	--	--	80-120	--	06114634	008479-01C1
Total Organic Carbon	9.2	10.0	92	--	--	--	80-120	--	06114635	008480-04C1

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

Inorganic LCS Results for 008480

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008480 Report Date: 06/05/2019

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Field ID: REN-1 Prep. Date: 05/28/2019 ARDL Lab No.: 008480-01
Desc/Location: REND LAKE Amount Used: 1000 mL Lab Filename:
Sample Date: 05/22/2019 % Moisture: NA Received Date: 05/22/2019
Sample Time: 1306 QC Batch: B11054 Analysis Date: 05/30/2019
Matrix: WATER Level: LOW

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	3.12	4	78	2.68	4	67	30-130	15.2	30
Atrazine	0.210	2.99	4	69.5	2.58	4	59.3	30-130	14.7	30
Metribuzin	ND	2.93	4	73.3	2.47	4	61.8	30-130	17	30
Alachlor	ND	2.7	4	67.5	2.26	4	56.5	30-130	17.7	30
Metolachlor	ND	3.22	4	80.5	2.8	4	70	30-130	14	30
Chlorpyrifos	ND	2.77	4	69.3	2.3	4	57.5	30-130	18.5	30
Cyanazine	ND	3.42	4	85.5	2.88	4	72	30-130	17.1	30
Pendimethalin	ND	3.31	4	82.8	2.76	4	69	30-130	18.1	30

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Triphenylphosphate	82	68	30-130

'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008480-01, NP PESTICIDES (8270SIM-MOD)

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.93	2.0	1.0	103	2.0	1.0	105	87-115	1	20	P7207	008480-03MS
(a) Manganese	WATER	0.98	1.5	0.50	100	1.5	0.50	103	90-114	1	20	P7207	008480-03MS
Ammonia Nitrogen	WATER	0.087	2.2	2.0	106	2.0	2.0	95	75-125	10	20	06054620	008480-01MS
Nitrate as Nitrogen	WATER	0.44	0.70	0.25	102	0.71	0.25	107	75-125	2	20	06144639	008480-01MS
Phosphorus	WATER	0.14	1.0	0.83	104	1.0	0.83	104	75-125	0	20	06074631	008480-03MS
Phosphorus, -ortho	WATER	0.072	0.17	0.10	103	0.18	0.10	106	75-125	2	20	05304598	008480-01MS
Total Organic Carbon	WATER	5.3	9.5	5.0	84	9.5	5.0	84	76-120	0	20	06114635	008480-04MS

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

Inorganic Matrix Spikes for 008480

SAMPLE DUPLICATE REPORT

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

Lab Report No: 008480 Report Date: 06/18/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	6.8	6.2	--	MG/CU.M.	9	--	06054616	008480-02D1
Pheophytin-a	1.5	1.7	--	MG/CU.M.	13	--	06054616	008480-02D1
Solids, Total Suspended	35.2	34.8	--	MG/L	1	--	05284580	008480-07D1
Solids, Volatile Suspend	6.4	5.2	--	MG/L	21*	--	05284581	008480-07D1

* indicates that agreement between duplicates is greater than 20%. See Case Narrative for exceptions.

Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL Data Package 8480

ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) T. Schepker, B. Rodgers, B. Greeling

SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS	Chloro/Pheo	TOC, T-PO4	O-PO4	NO3-N, NH3-N	NP Pest	T.Fe, T.Mn	E. coli	MS/MSD				REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
	5/22/2019																			
Ren – 1	5-22	1306		X		X		X	X	X	X	X		X					X	
Ren – 2 – 0	5-22	1121		X		X	X	X	X	X	X								X	
Ren – 2 – 5	5-22	1126		X		X		X	X	X		X							X	
Ren – 3	5-22	1006		X		X	X	X	X	X	X								X	
Ren – 4	5-22	935		X		X	X	X	X	X	X								X	
Ren – 5	5-22	840		X		X		X	X	X	X								X	
Ren – 7	5-22	1355		X		X		X	X	X	X								X	
Ren – 8	5-22	1156		X		X	X	X	X	X	X								X	
Ren – 15- 0	5-22	945		X		X	X	X	X	X	X								X	
Ren-RL-Mar	5-22	1231		X									X						X	

Relinquished by: (Signature)	Date 5-22	Time 2220	Received by: (Signature)
Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Received for Laboratory by: (Signature) ORC	Date 5-23	Time 1420	Shipping Ticket No.

REMARKS/SPECIAL INSTRUCTIONS:

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8480 Cooler # 1 of 2

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 5-22-19

A. PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 5-22-19 (Signature) TRC

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: courier

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where: — , Seal Date: — , Seal Name: —

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES ____ NO X Observed Cooler Temp. 0.2 C
   Correction factor 0.0 C

B. LOG-IN PHASE: Date samples were logged-in: 5.22.19 (Signature) TRC

10. Describe type of packing in cooler: Loose Ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: All	Fraction
Area #: walk-in	Area #
By: TRC	By
On: 5-22-19	On

Chain-of-Custody # NA

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8480 Cooler # 2 of 2

Number of Coolers in Shipment: 2

Project: Bend Lake Date Received: 5-22-19

A. PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 5-22-19 (Signature) TRC

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: courier

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? — , Seal Date: — , Seal Name: —

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (N/A)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES ____ NO X Observed Cooler Temp. 1.1 C
   Correction factor 0.0 C

B. LOG-IN PHASE: Date samples were logged-in: 5-22-19 (Signature) TRC

10. Describe type of packing in cooler: Loose Ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: All	Fraction:
Area #: walk-in	Area #:
By: TRC	By:
On: 5-22-19	On:

Chain-of-Custody # NA

ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

Customer Name: SLCOE **Date: 9/16/19**

Project Name: Rend Lake **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 8/13/19 **ARDL Report No.: 8508**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
REN-1	8/13/19	8508-01	NP Pesticides, Metals(1), Inorganics(2)
REN-2-0	8/13/19	8508-02	NP Pesticides, Inorganics(2)(3)
REN-2-5	8/13/19	8508-03	Metals(1), Inorganics(2)
REN-3	8/13/19	8508-04	NP Pesticides, Inorganics(2)(3)
REN-4	8/13/19	8508-05	NP Pesticides, Inorganics(2)(3)
REN-5	8/13/19	8508-06	NP Pesticides, Inorganics(2)
REN-7	8/13/19	8508-07	NP Pesticides, Inorganics(2)
REN-8	8/13/19	8508-08	NP Pesticides, Inorganics(2)(3)
REN-15-0	8/13/19	8508-09	NP Pesticides, Inorganics(2)(3)
REN-RL-MAR	8/13/19	8508-10	E. Coli

(1) Including iron and manganese.
(2) Including ammonia, nitrate, orthophosphate, total phosphorus, TOC, TSS, and TVSS.
(3) Including chlorophyll-a and pheophytin-a.

The quality control data are summarized as follows:

NP PESTICIDE FRACTION – METHOD 8270-SIM

HOLDING TIME
Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION
The initial calibration passed criteria.

CONTINUING CALIBRATION
The continuing calibration verification (CCV) passed criteria for all analytes. The closing CCV passed criteria for all analytes.

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

MATRIX SPIKE
The matrix spike and matrix spike duplicate met recovery criteria.

DUPLICATE
Duplicate analyses are reported as MS/MSD. RPD of the duplicate analyses met criteria.

CASE NARRATIVE (Continued)

INTERNAL STANDARD
All internal standard criteria were met.

SURROGATE
All surrogate recovery criteria were met.

INORGANIC FRACTION

Nitrate was analyzed via Method 300.0 by Ion Chromatography due to instrument status. Further, a non-preserved aliquot of sample had to be used therefore, holding times were exceeded for nitrate, the data is flagged appropriately.

TOC was analyzed by an accredited outside laboratory due to instrument status.

PREPARATION BLANK
Results of the preparation blanks were within acceptable limits.

LABORATORY CONTROL SAMPLE
Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE
Percent recovery of all matrix spikes and matrix spike duplicates, except 1of 2 for iron and manganese. The data is flagged appropriately with a 'J' qualifier in the associated sample.

DUPLICATE
All duplicate analyses are reported as MS/MSD except chlorophyll-a, pheophytin-a, TSS, and TVSS.
RPD on all duplicate analyses were within control limits.

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates compound was analyzed for but not detected.

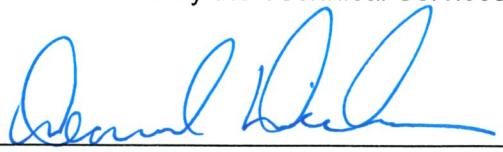
J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

X - Sample preparation and/or analysis was performed outside of holding time requirements.

REPORT ORGANIZATION

The data in this report appear by sample type (Field sample, preparation blank, laboratory control sample / spike blank, matrix spike /spike duplicate and sample duplicate). Within each sample type the data appear in the order that the analytical methods were discussed in this case narrative. Sample receipt information follows the analytical data.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.



Dean S. Dickerson
Technical Services Manager

Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8508

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

Lab Report No: 008508 Report Date: 08/21/2019

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

Field ID:	REN-1	ARDL Lab No.:	008508-01
Desc/Location:	REND LAKE	Lab Filename:	E0820905
Sample Date:	08/13/2019	Received Date:	08/13/2019
Sample Time:	1110	Prep. Date:	08/19/2019
Matrix:	WATER	Analysis Date:	08/20/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11081
% 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	0.890		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	0.380		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
Triphenylphosphate	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: 008508 Report Date: 09/13/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008508-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 08/13/2019 Moisture: NA
Received: 08/13/2019 Sampling Time: 1110

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500	J	0.273	MG/L	3010A	6010C	08/19/19	08/23/19	P7250
(a) Manganese	0.00400	0.00500	J	1.46	MG/L	3010A	6010C	08/19/19	08/23/19	P7250
Ammonia Nitrogen	0.0200	0.0300		0.478	MG/L	NONE	350.1	NA	08/19/19	08204811
Nitrate as Nitrogen	0.800	1.00	X	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
Phosphorus	0.00800	0.0100		0.264	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho	0.00800	0.0100		0.201	MG/L	NONE	365.2	NA	08/14/19	08204810
Solids, Total Suspended	6.67	6.67		8.67	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	6.67	6.67		ND	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	0.500	1.00		10.6	MG/L	NONE	415.1	NA	08/21/19	08294831

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-01, Inorganic Analyses

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

Lab Report No: 008508 Report Date: 08/21/2019

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

Field ID:	REN-2-0	ARDL Lab No.:	008508-02
Desc/Location:	REND LAKE	Lab Filename:	E0820908
Sample Date:	08/13/2019	Received Date:	08/13/2019
Sample Time:	1158	Prep. Date:	08/19/2019
Matrix:	WATER	Analysis Date:	08/20/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11081
% 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	0.760		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	0.330		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
Triphenylphosphate	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: 008508 Report Date: 09/13/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008508-02
Field ID: REN-2-0
Received: 08/13/2019

Sampling Loc'n: REND LAKE
Sampling Date: 08/13/2019
Sampling Time: 1158

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		0.173	MG/L	NONE	350.1	NA	08/19/19	08204811
Chlorophyll-a, Correcte	1.0	1.00		30.4	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Nitrate as Nitrogen	0.800	1.00	X	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
Pheophytin-a	1.0	1.00		6.8	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Phosphorus	0.00800	0.0100		0.161	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho	0.00800	0.0100		0.121	MG/L	NONE	365.2	NA	08/14/19	08204810
Solids, Total Suspended	4.0	4.00		5.2	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	4.0	4.00		4.0	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	0.500	1.00		11.7	MG/L	NONE	415.1	NA	08/21/19	08294831

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008508 Report Date: 09/13/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008508-03 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-5 Sampling Date: 08/13/2019 Moisture: NA
Received: 08/13/2019 Sampling Time: 1210

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		1.81	MG/L	3010A	6010C	08/19/19	08/23/19	P7250
(a) Manganese	0.00400	0.00500		2.55	MG/L	3010A	6010C	08/19/19	08/23/19	P7250
Ammonia Nitrogen	0.0200	0.0300		0.584	MG/L	NONE	350.1	NA	08/19/19	08204811
Nitrate as Nitrogen	0.800	1.00	X	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
Phosphorus	0.00800	0.0100		0.348	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho	0.00800	0.0100		0.239	MG/L	NONE	365.2	NA	08/14/19	08204810
Solids, Total Suspended	4.0	4.00		8.0	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	4.0	4.00		ND	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	0.500	1.00		11.9	MG/L	NONE	415.1	NA	08/21/19	08294831

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Mt. Vernon, Illinois 62864

Lab Report No: 008508 Report Date: 08/21/2019

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

Field ID:	REN-3	ARDL Lab No.:	008508-04
Desc/Location:	REND LAKE	Lab Filename:	E0820910
Sample Date:	08/13/2019	Received Date:	08/13/2019
Sample Time:	1020	Prep. Date:	08/19/2019
Matrix:	WATER	Analysis Date:	08/20/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11081
% 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	1.39		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	0.589		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
Triphenylphosphate	30-130	88%

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: 008508 Report Date: 09/13/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008508-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 08/13/2019 Moisture: NA
Received: 08/13/2019 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		0.0454	MG/L	NONE	350.1	NA	08/19/19	08204811
Chlorophyll-a, Correcte	1.0	1.00		45.4	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Nitrate as Nitrogen	0.800	1.00	X	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
Pheophytin-a	1.0	1.00		10.8	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Phosphorus	0.00800	0.0100		0.169	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho	0.00800	0.0100		0.0692	MG/L	NONE	365.2	NA	08/14/19	08204810
Solids, Total Suspended	4.0	4.00		16.0	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	4.0	4.00		6.0	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	0.500	1.00		15.3	MG/L	NONE	415.1	NA	08/21/19	08294831

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Lab Report No: 008508 Report Date: 08/21/2019

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

Field ID:	REN-4	ARDL Lab No.:	008508-05
Desc/Location:	REND LAKE	Lab Filename:	E0820911
Sample Date:	08/13/2019	Received Date:	08/13/2019
Sample Time:	1350	Prep. Date:	08/19/2019
Matrix:	WATER	Analysis Date:	08/20/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11081
% 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	1.29		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	0.611		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
Triphenylphosphate	30-130	78%

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: 008508 Report Date: 09/13/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008508-05 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-4 Sampling Date: 08/13/2019 Moisture: NA
Received: 08/13/2019 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		0.0302	MG/L	NONE	350.1	NA	08/19/19	08204811
Chlorophyll-a, Correcte	1.0	1.00		36.3	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Nitrate as Nitrogen	0.800	1.00	X	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
Pheophytin-a	1.0	1.00		8.2	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Phosphorus	0.00800	0.0100		0.153	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho	0.00800	0.0100		0.0744	MG/L	NONE	365.2	NA	08/14/19	08204810
Solids, Total Suspended	4.0	4.00		11.6	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	4.0	4.00		5.2	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	0.500	1.00		9.9	MG/L	NONE	415.1	NA	08/22/19	08294832

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Mt. Vernon, Illinois 62864

Lab Report No: 008508 Report Date: 08/21/2019

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

Field ID:	REN-5	ARDL Lab No.:	008508-06
Desc/Location:	REND LAKE	Lab Filename:	E0820912
Sample Date:	08/13/2019	Received Date:	08/13/2019
Sample Time:	0917	Prep. Date:	08/19/2019
Matrix:	WATER	Analysis Date:	08/20/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11081
% 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	1.94		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
Triphenylphosphate	30-130	86%

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: 008508 Report Date: 09/13/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008508-06 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-5 Sampling Date: 08/13/2019 Moisture: NA
Received: 08/13/2019 Sampling Time: 0917

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0678	MG/L	NONE	350.1	NA	08/19/19	08204811
Nitrate as Nitrogen	0.800	1.00	X	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
Phosphorus	0.00800	0.0100		0.527	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho	0.00800	0.0100		0.16	MG/L	NONE	365.2	NA	08/14/19	08204810
Solids, Total Suspended	10.0	10.0		183	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	10.0	10.0		15.0	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	1.0	2.00		12.4	MG/L	NONE	415.1	NA	08/23/19	08294832

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Lab Report No: 008508 Report Date: 08/21/2019

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

Field ID:	REN-7	ARDL Lab No.:	008508-07
Desc/Location:	REND LAKE	Lab Filename:	E0820913
Sample Date:	08/13/2019	Received Date:	08/13/2019
Sample Time:	1505	Prep. Date:	08/19/2019
Matrix:	WATER	Analysis Date:	08/20/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11081
% 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	1.13		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
Triphenylphosphate	30-130	73%

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: 008508 Report Date: 09/13/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008508-07 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-7 Sampling Date: 08/13/2019 Moisture: NA
Received: 08/13/2019 Sampling Time: 1505

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0996	MG/L	NONE	350.1	NA	08/19/19	08204811
Nitrate as Nitrogen	0.800	1.00	X	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
Phosphorus	0.00800	0.0100		0.455	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho	0.00800	0.0100		0.172	MG/L	NONE	365.2	NA	08/14/19	08204810
Solids, Total Suspended	10.0	10.0		ND	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	10.0	10.0		ND	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	1.0	2.00		13.2	MG/L	NONE	415.1	NA	08/23/19	08294832

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Mt. Vernon, Illinois 62864

Lab Report No: 008508 Report Date: 08/21/2019

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

Field ID:	REN-9	ARDL Lab No.:	008508-08
Desc/Location:	REND LAKE	Lab Filename:	E0820914
Sample Date:	08/13/2019	Received Date:	08/13/2019
Sample Time:	1235	Prep. Date:	08/19/2019
Matrix:	WATER	Analysis Date:	08/20/2019
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11081
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.250	0.250	ND		UG/L	1
Atrazine	0.250	0.250	1.10		UG/L	1
Metribuzin	0.250	0.250	ND		UG/L	1
Alachlor	0.250	0.250	ND		UG/L	1
Metolachlor	0.250	0.250	0.463		UG/L	1
Chlorpyrifos	0.250	0.250	ND		UG/L	1
Cyanazine	0.250	0.250	ND		UG/L	1
Pendimethalin	0.250	0.250	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	84%

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

(a) DOD-QSM Accredited Analyte.

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Lab Report No: 008508 Report Date: 09/13/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008508-08 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-9 Sampling Date: 08/13/2019 Moisture: NA
Received: 08/13/2019 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		0.117	MG/L	NONE	350.1	NA	08/19/19	08204811
Chlorophyll-a, Correcte	1.0	1.00		57.3	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Nitrate as Nitrogen	0.800	1.00	X	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
Pheophytin-a	1.0	1.00		16.6	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Phosphorus	0.00800	0.0100		0.24	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho	0.00800	0.0100		0.0563	MG/L	NONE	365.2	NA	08/14/19	08204810
Solids, Total Suspended	4.0	4.00		17.6	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	4.0	4.00		6.0	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	1.0	2.00		10.0	MG/L	NONE	415.1	NA	08/23/19	08294832

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Lab Report No: 008508 Report Date: 08/21/2019

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

Field ID:	REN-15-0	ARDL Lab No.:	008508-09
Desc/Location:	REND LAKE	Lab Filename:	E0820915
Sample Date:	08/13/2019	Received Date:	08/13/2019
Sample Time:	1410	Prep. Date:	08/19/2019
Matrix:	WATER	Analysis Date:	08/20/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11081
% 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	1.16		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	0.570		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
Triphenylphosphate	30-130	76%

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

(a) DOD-QSM Accredited Analyte.

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Lab Report No: 008508 Report Date: 09/13/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008508-09 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-15-0 Sampling Date: 08/13/2019 Moisture: NA
Received: 08/13/2019 Sampling Time: 1410

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0343	MG/L	NONE	350.1	NA	08/19/19	08204811
Chlorophyll-a, Correcte	1.0	1.00		35.4	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Nitrate as Nitrogen	0.800	1.00	X	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
Pheophytin-a	1.0	1.00		7.8	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
Phosphorus	0.00800	0.0100		0.149	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho	0.00800	0.0100		0.0692	MG/L	NONE	365.2	NA	08/14/19	08204810
Solids, Total Suspended	4.0	4.00		10.8	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	4.0	4.00		4.8	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	1.0	2.00		12.8	MG/L	NONE	415.1	NA	08/23/19	08294832

(a) DOD and/or NELAC Accredited Analyte.

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Lab Report No: 008508 Report Date: 09/13/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008508-10 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-RL-MAR Sampling Date: 08/13/2019 Moisture: NA
Received: 08/13/2019 Sampling Time: 1306

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		212	COL/100 ML	NONE	1604	NA	08/13/19	08154798

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METHOD BLANK REPORT

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

Lab Report No: 008508 Report Date: 08/21/2019

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

Field ID:	NA	ARDL Lab No.:	008508-01B1
Desc/Location:	NA	Lab Filename:	E0820903
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	08/19/2019
Matrix:	QC Material	Analysis Date:	08/20/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11081
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	101%

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

(a) DOD-QSM Accredited Analyte.

BLANK SUMMARY REPORT

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

Lab Report No: 008508 Report Date: 09/13/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	ND	MG/L	3010A	6010C	08/19/19	08/23/19	P7250	008508-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	08/19/19	08/23/19	P7250	008508-01B1
Ammonia Nitrogen	0.020	0.030	ND	MG/L	NONE	350.1	NA	08/19/19	08204811	008508-01B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847	008508-05B1
E. Coliform	1.0	1.0	ND	COL/100 ML	NONE	1604	NA	08/13/19	08154798	008508-10B1
Nitrate as Nitrogen	0.80	1.0	ND	MG/L	NONE	300.0	NA	09/09/19	09114863	008508-02B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847	008508-05B1
Phosphorus	0.008	0.010	ND	MG/L	365.2	365.2	08/27/19	08/28/19	08294840	008508-04B1
Phosphorus, -ortho	0.008	0.010	ND	MG/L	NONE	365.2	NA	08/14/19	08204810	008508-01B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	08/15/19	08204812	008508-01B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	08/15/19	08204813	008508-01B1
Total Organic Carbon	0.50	1.0	ND	MG/L	NONE	415.1	NA	08/21/19	08294831	008508-01B1
Total Organic Carbon	0.50	1.0	ND	MG/L	NONE	415.1	NA	08/22/19	08294832	008508-05B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008508

BLANK SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008508 Report Date: 08/21/2019

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11081 Prep. Date: 08/19/2019
Amount Used: 1000 mL Level: LOW Analysis Date: 08/20/2019

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	3.68	4	92	--	--	--	30-130	--	--
Atrazine	3.2	4	80	--	--	--	30-130	--	--
Metribuzin	3.19	4	80	--	--	--	30-130	--	--
Alachlor	3.18	4	80	--	--	--	30-130	--	--
Metolachlor	3.57	4	89	--	--	--	30-130	--	--
Chlorpyrifos	3.14	4	79	--	--	--	30-130	--	--
Cyanazine	3.99	4	100	--	--	--	30-130	--	--
Pendimethalin	3.75	4	94	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	92.5	--	30-130

(a) DOD-QSM Accredited Analyte.

'*' indicates a recovery outside of standard limits.

Spike Blanks for 008508-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

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

Lab Report No: 008508 Report Date: 09/13/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	4.8	5.0	96	--	--	--	87-115	--	P7250	008508-01C1
(a) Manganese	0.76	0.75	101	--	--	--	90-114	--	P7250	008508-01C1
Ammonia Nitrogen	1.0	1.0	100	--	--	--	80-120	--	08204811	008508-01C1
Nitrate as Nitrogen	13.0	14.0	93	--	--	--	80-120	--	09114863	008508-02C1
Phosphorus	0.60	0.67	90	--	--	--	80-120	--	08294840	008508-04C1
Phosphorus, -ortho	0.11	0.10	105	--	--	--	80-120	--	08204810	008508-01C1
Total Organic Carbon	56.4	52.6	107	--	--	--	76-120	--	08294831	008508-01C1
Total Organic Carbon	55.1	52.6	105	--	--	--	76-120	--	08294832	008508-05C1

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008508 Report Date: 08/21/2019

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Field ID:	REN-1	Prep. Date:	08/19/2019	ARDL Lab No.:	008508-01
Desc/Location:	REND LAKE	Amount Used:	1000 mL	Lab Filename:	
Sample Date:	08/13/2019	% Moisture:	NA	Received Date:	08/13/2019
Sample Time:	1110	QC Batch:	B11081	Analysis Date:	08/20/2019
Matrix:	WATER	Level:	LOW		

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	3.4	4	85	3.38	4	84.5	30-130	0.6	30
Atrazine	0.890	3.95	4	76.5	3.79	4	72.5	30-130	4.1	30
Metribuzin	ND	3.08	4	77	2.93	4	73.3	30-130	5	30
Alachlor	ND	2.95	4	73.8	2.88	4	72	30-130	2.4	30
Metolachlor	0.380	3.75	4	84.3	3.65	4	81.8	30-130	2.7	30
Chlorpyrifos	ND	2.88	4	72	2.83	4	70.8	30-130	1.8	30
Cyanazine	ND	3.74	4	93.5	3.61	4	90.3	30-130	3.5	30
Pendimethalin	ND	3.51	4	87.8	3.48	4	87	30-130	0.9	30

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Triphenylphosphate	87	89	30-130

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008508-01, NP PESTICIDES (8270SIM-MOD)

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008508 Report Date: 09/13/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.27	1.0	1.0	75 *	1.2	1.0	88	87-115	12	20	P7250	008508-01MS
(a) Manganese	WATER	1.5	1.7	0.50	52 *	2.0	0.50	105	90-114	14	20	P7250	008508-01MS
Ammonia Nitrogen	WATER	0.48	2.5	2.0	103	2.5	2.0	101	75-125	2	20	08204811	008508-01MS
Nitrate as Nitrogen	WATER	ND	7.5	8.0	94	7.4	8.0	93	75-125	1	20	09114863	008508-02MS
Phosphorus	WATER	0.17	0.93	0.83	91	0.94	0.83	93	75-125	1	20	08294840	008508-04MS
Phosphorus, -ortho	WATER	0.20	0.31	0.10	111	0.31	0.10	108	75-125	1	20	08204810	008508-01MS
Total Organic Carbon	WATER	9.9	14.6	5.0	94	14.7	5.0	96	76-120	1	20	08294832	008508-05MS

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.

(a) DOD and/or NELAC Accredited Analyte.

Inorganic Matrix Spikes for 008508

SAMPLE DUPLICATE REPORT

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

Lab Report No: 008508 Report Date: 09/13/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	36.3	36.3	--	MG/CU.M.	0	--	09034847	008508-05D1
Pheophytin-a	8.2	9.4	--	MG/CU.M.	14	--	09034847	008508-05D1
Solids, Total Suspended	8.7	9.3	--	MG/L	7	--	08204812	008508-01D1
Solids, Volatile Suspend	ND	0	--	MG/L	NC	--	08204813	008508-01D1

(a) DOD and/or NELAC Accredited Analyte

Sample Duplicates for 008508

[redacted]

Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

8508

ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake 8/13/19

SAMPLERS: (Signature) Grace Rodgers, Ben Greeling

	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS	Chloro/Pheo	TOC, T-PO4	O-PO4	NO3-N, NH3-N	NP Pest	T.Fe, T.Mn	E. coli	MS/MSD					REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
1	Ren – 1	8/13/19	1110		X		X		X	X	X	X	X		X						X	
2	Ren – 2 – 0		1158		X		X	X	X	X	X	X									X	
3	Ren – 2 – 5		1210		X		X		X	X	X		X								X	
4	Ren – 3		1020		X		X	X	X	X	X	X									X	
5	Ren – 4		1350		X		X	X	X	X	X	X									X	
6	Ren – 5		0917		X		X		X	X	X	X									X	
7	Ren – 7		1505		X		X		X	X	X	X									X	
8	Ren – 8		1235		X		X	X	X	X	X	X									X	
9	Ren – 15- 0		1410		X		X	X	X	X	X	X									X	
10	Ren-RL-Mar		1306		X									X							X	

Relinquished by: (Signature) Grace	Date 8/13/19	Time 1509	Received by: (Signature) Valerie Parkes	REMARKS/SPECIAL INSTRUCTIONS:
Relinquished by: (Signature) Valerie Parkes	Date 8/13/19	Time 1525	Received by: (Signature)	
Received for Laboratory by: (Signature)	Date 8/13/19	Time 1525	Shipping Ticket No.	

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8508 Cooler # 1 of 2

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 8-13-19

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 8-13-19 (Signature) DK Cockrum

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: Pauline

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO ✓ Observed Cooler Temp. 2.7 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 8-14-19 (Signature) DK Cockrum

10. Describe type of packing in cooler: loose ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: all	Fraction:
Area #: Wilkin	Area #:
By: dlc	By:
On: 8-14-19	On:

Chain-of-Custody # N/A

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COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8508 Cooler # 2 of 2

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 8-13-19

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 8-13-19 (Signature) DSLackrum

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: Courier

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO ✓ Observed Cooler Temp. 1.4 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 8-14-19 (Signature) DSLackrum

10. Describe type of packing in cooler: loose ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: all	Fraction:
Area #: Walkin	Area #:
By: dlc	By:
On: 8-14-19	On:

Chain-of-Custody # _____

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ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

Customer Name: SLCOE **Date: 11/7/19**

Project Name: Rend Lake **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 10/17/19 **ARDL Report No.: 8560**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
REN-1	10/17/19	8560-01	NP Pesticides, Metals(1), Inorganics(2)
REN-2-0	10/17/19	8560-02	NP Pesticides, Inorganics(2)(3)
REN-2-5	10/17/19	8560-03	Metals(1), Inorganics(2)
REN-3	10/17/19	8560-04	NP Pesticides, Inorganics(2)(3)
REN-4	10/17/19	8560-05	NP Pesticides, Inorganics(2)(3)
REN-5	10/17/19	8560-06	NP Pesticides, Inorganics(2)
REN-7	10/17/19	8560-07	NP Pesticides, Inorganics(2)
REN-8	10/17/19	8560-08	NP Pesticides, Inorganics(2)(3)
REN-15-0	10/17/19	8560-09	NP Pesticides, Inorganics(2)(3)
REN-RL-MAR	10/17/19	8560-10	E. Coli

(1) Including iron and manganese.
(2) Including ammonia, nitrate, orthophosphate, total phosphorus, TOC, TSS, and TVSS.
(3) Including chlorophyll-a and pheophytin-a.

The quality control data are summarized as follows:

NP PESTICIDE FRACTION – METHOD 8270-SIM

HOLDING TIME
Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION
The initial calibration passed criteria.

CONTINUING CALIBRATION
The continuing calibration verification (CCV) passed criteria for all analytes. The closing CCV passed criteria for all analytes.

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

MATRIX SPIKE
The matrix spike and matrix spike duplicate met recovery criteria.

DUPLICATE
Duplicate analyses are reported as MS/MSD. RPD of the duplicate analyses met criteria.

CASE NARRATIVE (Continued)

INTERNAL STANDARD
All internal standard criteria were met.

SURROGATE
All surrogate recovery criteria were met.

INORGANIC FRACTION

TOC was analyzed by an accredited outside laboratory due to instrument status.

PREPARATION BLANK
Results of the preparation blanks were within acceptable limits.

LABORATORY CONTROL SAMPLE
Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE
Percent recovery of all matrix spikes and matrix spike duplicates were within control limits.

DUPLICATE
All duplicate analyses are reported as MS/MSD except chlorophyll-a, pheophytin-a, TSS, and TVSS. RPD on all duplicate analyses were within control limits, except pheophytin-a. The data is flagged appropriately with a 'J' qualifier in the associated sample.

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

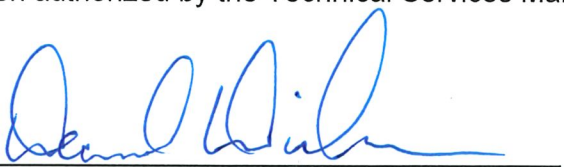
ND - Indicates compound was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

REPORT ORGANIZATION

The data in this report appear by sample type (Field sample, preparation blank, laboratory control sample / spike blank, matrix spike /spike duplicate and sample duplicate). Within each sample type the data appear in the order that the analytical methods were discussed in this case narrative. Sample receipt information follows the analytical data.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.



Dean S. Dickerson
Technical Services Manager

Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8560

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

Lab Report No: 008560 Report Date: 10/29/2019

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

Field ID:	REN-1	ARDL Lab No.:	008560-01
Desc/Location:	REND LAKE	Lab Filename:	E1028909
Sample Date:	10/17/2019	Received Date:	10/17/2019
Sample Time:	1013	Prep. Date:	10/22/2019
Matrix:	WATER	Analysis Date:	10/28/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11128
% 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	0.878		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
Triphenylphosphate	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: 008560 Report Date: 11/07/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008560-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 10/17/2019 Moisture: NA
Received: 10/17/2019 Sampling Time: 1013

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.415	MG/L	3010A	6010C	10/24/19	10/24/19	P7290B
(a) Manganese	0.00400	0.00500		0.324	MG/L	3010A	6010C	10/24/19	10/24/19	P7290B
Ammonia Nitrogen	0.0200	0.0300		0.0558	MG/L	NONE	350.1	NA	10/22/19	11015022
Nitrate as Nitrogen	0.0190	0.0200		0.082	MG/L	NONE	GREEN	NA	11/01/19	11065043
Phosphorus	0.00800	0.0100		0.18	MG/L	365.2	365.2	11/04/19	11/05/19	11065042
Phosphorus, -ortho	0.00800	0.0100		0.0754	MG/L	NONE	365.2	NA	10/18/19	11015023
Solids, Total Suspended	4.0	4.00		17.6	MG/L	NONE	160.2	NA	10/22/19	10245007
Solids, Volatile Suspen	1.0	1.0		5.2	MG/L	NONE	160.4	NA	10/22/19	10245008
Total Organic Carbon	0.500	1.00		5.5	MG/L	NONE	415.1	NA	10/28/19	TA3826

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008560 Report Date: 10/29/2019

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

Field ID:	REN-2-0	ARDL Lab No.:	008560-02
Desc/Location:	REND LAKE	Lab Filename:	E1028911
Sample Date:	10/17/2019	Received Date:	10/17/2019
Sample Time:	1055	Prep. Date:	10/22/2019
Matrix:	WATER	Analysis Date:	10/28/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11128
% 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	0.820		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
Triphenylphosphate	30-130	93%

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

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Mt. Vernon, Illinois 62864

Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008560-02 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-0 Sampling Date: 10/17/2019 Moisture: NA
Received: 10/17/2019 Sampling Time: 1055

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	J	0.0282	MG/L	NONE	350.1	NA	10/22/19	11015022
Chlorophyll-a, Correcte	1.0	1.00		40.9	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Nitrate as Nitrogen	0.0190	0.0200		0.049	MG/L	NONE	GREEN	NA	11/01/19	11065043
Pheophytin-a	1.0	1.00	J	15.7	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Phosphorus	0.00800	0.0100		0.168	MG/L	365.2	365.2	11/04/19	11/05/19	11065042
Phosphorus, -ortho	0.00800	0.0100		0.0754	MG/L	NONE	365.2	NA	10/18/19	11015023
Solids, Total Suspended	1.0	1.0		11.2	MG/L	NONE	160.2	NA	10/22/19	10245007
Solids, Volatile Suspen	1.0	1.0		5.2	MG/L	NONE	160.4	NA	10/22/19	10245008
Total Organic Carbon	0.500	1.00		5.6	MG/L	NONE	415.1	NA	10/28/19	TA3826

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Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008560-03 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-5 Sampling Date: 10/17/2019 Moisture: NA
Received: 10/17/2019 Sampling Time: 1045

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.307	MG/L	3010A	6010C	10/24/19	10/24/19	P7290B
(a) Manganese	0.00400	0.00500		0.267	MG/L	3010A	6010C	10/24/19	10/24/19	P7290B
Ammonia Nitrogen	0.0200	0.0300		0.0411	MG/L	NONE	350.1	NA	10/22/19	11015022
Nitrate as Nitrogen	0.0190	0.0200		0.073	MG/L	NONE	GREEN	NA	11/01/19	11065043
Phosphorus	0.00800	0.0100		0.322	MG/L	365.2	365.2	11/04/19	11/05/19	11065042
Phosphorus, -ortho	0.00800	0.0100		0.078	MG/L	NONE	365.2	NA	10/18/19	11015023
Solids, Total Suspended	1.0	1.0		15.2	MG/L	NONE	160.2	NA	10/22/19	10245007
Solids, Volatile Suspen	1.0	1.0		5.2	MG/L	NONE	160.4	NA	10/22/19	10245008
Total Organic Carbon	0.500	1.00		5.9	MG/L	NONE	415.1	NA	10/28/19	TA3826

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Lab Report No: 008560 Report Date: 10/29/2019

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

Field ID:	REN-3	ARDL Lab No.:	008560-04
Desc/Location:	REND LAKE	Lab Filename:	E1028912
Sample Date:	10/17/2019	Received Date:	10/17/2019
Sample Time:	1155	Prep. Date:	10/22/2019
Matrix:	WATER	Analysis Date:	10/28/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11128
% 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	0.900		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
Triphenylphosphate	30-130	93%

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

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Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008560-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 10/17/2019 Moisture: NA
Received: 10/17/2019 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		ND	MG/L	NONE	350.1	NA	10/22/19	11015022
Chlorophyll-a, Correcte	1.0	1.00		40.9	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	11/01/19	11065043
Pheophytin-a	1.0	1.00		7.4	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Phosphorus	0.00800	0.0100		0.138	MG/L	365.2	365.2	11/04/19	11/05/19	11065042
Phosphorus, -ortho	0.00800	0.0100		0.0314	MG/L	NONE	365.2	NA	10/18/19	11015023
Solids, Total Suspended	1.0	1.0		13.6	MG/L	NONE	160.2	NA	10/22/19	10245007
Solids, Volatile Suspen	1.0	1.0		6.8	MG/L	NONE	160.4	NA	10/22/19	10245008
Total Organic Carbon	0.500	1.00		6.4	MG/L	NONE	415.1	NA	10/28/19	TA3826

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Lab Report No: 008560 Report Date: 10/29/2019

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

Field ID:	REN-4	ARDL Lab No.:	008560-05
Desc/Location:	REND LAKE	Lab Filename:	E1028913
Sample Date:	10/17/2019	Received Date:	10/17/2019
Sample Time:	1231	Prep. Date:	10/22/2019
Matrix:	WATER	Analysis Date:	10/28/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11128
% 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	0.856		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
Triphenylphosphate	30-130	89%

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

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Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008560-05 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-4 Sampling Date: 10/17/2019 Moisture: NA
Received: 10/17/2019 Sampling Time: 1231

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0698	MG/L	NONE	350.1	NA	10/22/19	11015022
Chlorophyll-a, Correcte	1.0	1.00		53.6	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	11/01/19	11065043
Pheophytin-a	1.0	1.00		11.3	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Phosphorus	0.00800	0.0100		0.163	MG/L	365.2	365.2	11/04/19	11/05/19	11065042
Phosphorus, -ortho	0.00800	0.0100		0.0443	MG/L	NONE	365.2	NA	10/18/19	11015023
Solids, Total Suspended	1.0	1.0		14.4	MG/L	NONE	160.2	NA	10/22/19	10245007
Solids, Volatile Suspen	1.0	1.0		6.8	MG/L	NONE	160.4	NA	10/22/19	10245008
Total Organic Carbon	0.500	1.00		6.4	MG/L	NONE	415.1	NA	10/28/19	TA3826

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Lab Report No: 008560 Report Date: 10/29/2019

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

Field ID:	REN-5	ARDL Lab No.:	008560-06
Desc/Location:	REND LAKE	Lab Filename:	E1028914
Sample Date:	10/17/2019	Received Date:	10/17/2019
Sample Time:	0915	Prep. Date:	10/22/2019
Matrix:	WATER	Analysis Date:	10/28/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11128
% 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
Triphenylphosphate	30-130	88%

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

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Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008560-06 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-5 Sampling Date: 10/17/2019 Moisture: NA
Received: 10/17/2019 Sampling Time: 0915

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0946	MG/L	NONE	350.1	NA	10/22/19	11015022
Nitrate as Nitrogen	0.0190	0.0200		0.338	MG/L	NONE	GREEN	NA	11/01/19	11065043
Phosphorus	0.00800	0.0100		0.151	MG/L	365.2	365.2	11/04/19	11/05/19	11065042
Phosphorus, -ortho	0.00800	0.0100		0.078	MG/L	NONE	365.2	NA	10/18/19	11015023
Solids, Total Suspended	1.0	1.0		6.9	MG/L	NONE	160.2	NA	10/22/19	10245007
Solids, Volatile Suspen	1.0	1.0		ND	MG/L	NONE	160.4	NA	10/22/19	10245008
Total Organic Carbon	0.500	1.00		7.5	MG/L	NONE	415.1	NA	10/28/19	TA3826

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Lab Report No: 008560 Report Date: 10/29/2019

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

Field ID:	REN-7	ARDL Lab No.:	008560-07
Desc/Location:	REND LAKE	Lab Filename:	E1028915
Sample Date:	10/17/2019	Received Date:	10/17/2019
Sample Time:	1405	Prep. Date:	10/22/2019
Matrix:	WATER	Analysis Date:	10/28/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11128
% 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
Triphenylphosphate	30-130	72%

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

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Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008560-07 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-7 Sampling Date: 10/17/2019 Moisture: NA
Received: 10/17/2019 Sampling Time: 1405

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0709	MG/L	NONE	350.1	NA	10/22/19	11015022
Nitrate as Nitrogen	0.0190	0.0200		1.03	MG/L	NONE	GREEN	NA	11/01/19	11065043
Phosphorus	0.00800	0.0100		0.143	MG/L	365.2	365.2	11/04/19	11/05/19	11065042
Phosphorus, -ortho	0.00800	0.0100		0.0495	MG/L	NONE	365.2	NA	10/18/19	11015023
Solids, Total Suspended	1.0	1.0		15.6	MG/L	NONE	160.2	NA	10/22/19	10245007
Solids, Volatile Suspen	1.0	1.0		ND	MG/L	NONE	160.4	NA	10/22/19	10245008
Total Organic Carbon	0.500	1.00		6.5	MG/L	NONE	415.1	NA	10/28/19	TA3826

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Lab Report No: 008560 Report Date: 10/29/2019

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

Field ID:	REN-8	ARDL Lab No.:	008560-08
Desc/Location:	REND LAKE	Lab Filename:	E1028916
Sample Date:	10/17/2019	Received Date:	10/17/2019
Sample Time:	1130	Prep. Date:	10/22/2019
Matrix:	WATER	Analysis Date:	10/28/2019
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11128
% 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	0.811		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
Triphenylphosphate	30-130	77%

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

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Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008560-08 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-8 Sampling Date: 10/17/2019 Moisture: NA
Received: 10/17/2019 Sampling Time: 1130

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0437	MG/L	NONE	350.1	NA	10/22/19	11015022
Chlorophyll-a, Correcte	1.0	1.00		55.4	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	11/01/19	11065043
Pheophytin-a	1.0	1.00		10.1	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Phosphorus	0.00800	0.0100		0.168	MG/L	365.2	365.2	11/04/19	11/05/19	11065042
Phosphorus, -ortho	0.00800	0.0100		0.0107	MG/L	NONE	365.2	NA	10/18/19	11015023
Solids, Total Suspended	1.0	1.0		20.8	MG/L	NONE	160.2	NA	10/22/19	10245007
Solids, Volatile Suspen	1.0	1.0		9.2	MG/L	NONE	160.4	NA	10/22/19	10245008
Total Organic Carbon	0.500	1.00		6.9	MG/L	NONE	415.1	NA	10/28/19	TA3826

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Lab Report No: 008560 Report Date: 10/29/2019

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

Field ID:	REN-15-0	ARDL Lab No.:	008560-09
Desc/Location:	REND LAKE	Lab Filename:	E1028917
Sample Date:	10/17/2019	Received Date:	10/17/2019
Sample Time:	1147	Prep. Date:	10/22/2019
Matrix:	WATER	Analysis Date:	10/28/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11128
% 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	0.780		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
Triphenylphosphate	30-130	88%

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

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Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008560-09
Field ID: REN-15-0
Received: 10/17/2019

Sampling Loc'n: REND LAKE
Sampling Date: 10/17/2019
Sampling Time: 1147

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	10/22/19	11015022
Chlorophyll-a, Correcte	1.0	1.00		40.9	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	11/01/19	11065043
Pheophytin-a	1.0	1.00		8.7	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041
Phosphorus	0.00800	0.0100		0.143	MG/L	365.2	365.2	11/04/19	11/05/19	11065042
Phosphorus, -ortho	0.00800	0.0100		0.034	MG/L	NONE	365.2	NA	10/18/19	11015023
Solids, Total Suspended	1.0	1.0		13.2	MG/L	NONE	160.2	NA	10/22/19	10245007
Solids, Volatile Suspen	1.0	1.0		6.4	MG/L	NONE	160.4	NA	10/22/19	10245008
Total Organic Carbon	0.500	1.00		6.1	MG/L	NONE	415.1	NA	10/28/19	TA3826

(a) DOD and/or NELAC Accredited Analyte.

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Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008560-10 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-RL-MAR Sampling Date: 10/17/2019 Moisture: NA
Received: 10/17/2019 Sampling Time: ---

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		150	COL/100 ML	NONE	1604	NA	10/17/19	10214981

(a) DOD and/or NELAC Accredited Analyte.

METHOD BLANK REPORT

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

Lab Report No: 008560 Report Date: 10/29/2019

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

Field ID:	NA	ARDL Lab No.:	008560-01B1
Desc/Location:	NA	Lab Filename:	E1028906
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	10/22/2019
Matrix:	QC Material	Analysis Date:	10/28/2019
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11128
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	95%

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

(a) DOD-QSM Accredited Analyte.

BLANK SUMMARY REPORT

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

Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	ND	MG/L	3010A	6010C	10/24/19	10/24/19	P7290B	008557-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	10/24/19	10/24/19	P7290B	008557-01B1
Ammonia Nitrogen	0.020	0.030	ND	MG/L	NONE	350.1	NA	10/22/19	11015022	008560-01B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041	008560-02B1
E. Coliform	1.0	1.0	ND	COL/100 ML	NONE	1604	NA	10/17/19	10214981	008560-10B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	11/01/19	11065043	008560-02B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	10/18/19	11/04/19	11055041	008560-02B1
Phosphorus	0.008	0.010	ND	MG/L	365.2	365.2	11/04/19	11/05/19	11065042	008557-02B1
Phosphorus, -ortho	0.008	0.010	ND	MG/L	NONE	365.2	NA	10/18/19	11015023	008560-02B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	10/22/19	10245007	008560-01B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	10/22/19	10245008	008560-01B1
Total Organic Carbon	0.50	1.0	ND	MG/L	NONE	415.1	NA	10/28/19	TA3826	008557-05B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008560

BLANK SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008560 Report Date: 10/29/2019

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11128 Prep. Date: 10/22/2019
Amount Used: 1000 mL Level: LOW Analysis Date: 10/28/2019

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	3.31	4	83	2.56	4	64	30-130	25.6	30
Atrazine	3.11	4	78	2.4	4	60	30-130	25.8	30
Metribuzin	3.21	4	80	2.46	4	62	30-130	26.5	30
Alachlor	3.2	4	80	2.5	4	63	30-130	24.6	30
Metolachlor	3.45	4	86	2.67	4	67	30-130	25.5	30
Chlorpyrifos	3.18	4	80	2.46	4	62	30-130	25.5	30
Cyanazine	3.89	4	97	2.92	4	73	30-130	28.5	30
Pendimethalin	3.43	4	86	2.68	4	67	30-130	24.5	30

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	97.3	74.3	30-130

(a) DOD-QSM Accredited Analyte.

'*' indicates a recovery outside of standard limits.

Spike Blanks for 008560-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

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

Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	4.8	5.0	96	--	--	--	87-115	--	P7290B	008557-01C1
(a) Manganese	0.75	0.75	100	--	--	--	90-114	--	P7290B	008557-01C1
Ammonia Nitrogen	0.97	1.0	97	--	--	--	80-120	--	11015022	008560-01C1
Nitrate as Nitrogen	1.0	1.0	103	--	--	--	80-120	--	11065043	008560-02C1
Phosphorus	0.64	0.67	95	--	--	--	80-120	--	11065042	008557-02C1
Phosphorus, -ortho	0.10	0.10	101	--	--	--	80-120	--	11015023	008560-02C1
Total Organic Carbon	10.5	10.0	105	--	--	--	76-120	--	TA3826	008557-05C1

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008560 Report Date: 10/29/2019

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Field ID:	REN-1	Prep. Date:	10/22/2019	ARDL Lab No.:	008560-01
Desc/Location:	REND LAKE	Amount Used:	900 mL	Lab Filename:	
Sample Date:	10/17/2019	% Moisture:	NA	Received Date:	10/17/2019
Sample Time:	1013	QC Batch:	B11128	Analysis Date:	10/28/2019
Matrix:	WATER	Level:	LOW		

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	3.49	4.44	78.5	--	--	--	30-130	--	--
Atrazine	0.878	4.03	4.44	71	--	--	--	30-130	--	--
Metribuzin	ND	3.33	4.44	75	--	--	--	30-130	--	--
Alachlor	ND	3.23	4.44	72.8	--	--	--	30-130	--	--
Metolachlor	ND	3.77	4.44	84.8	--	--	--	30-130	--	--
Chlorpyrifos	ND	3.27	4.44	73.5	--	--	--	30-130	--	--
Cyanazine	ND	3.99	4.44	89.8	--	--	--	30-130	--	--
Pendimethalin	ND	3.56	4.44	80	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Triphenylphosphate	91	--	30-130

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008560-01, NP PESTICIDES (8270SIM-MOD)

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.42	1.4	1.0	97	1.4	1.0	96	87-115	0	20	P7290B	008560-01MS
(a) Manganese	WATER	0.32	0.83	0.50	101	0.82	0.50	100	90-114	1	20	P7290B	008560-01MS
Ammonia Nitrogen	WATER	0.056	2.0	2.0	98	2.1	2.0	100	75-125	3	20	11015022	008560-01MS
Nitrate as Nitrogen	WATER	0.049	0.84	1.0	79	0.84	1.0	79	75-125	0	20	11065043	008560-02MS
Phosphorus	WATER	0.14	0.94	0.83	97	0.95	0.83	98	75-125	1	20	11065042	008560-04MS
Phosphorus, -ortho	WATER	0.075	0.18	0.10	104	0.17	0.10	99	75-125	3	20	11015023	008560-02MS

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.

(a) DOD and/or NELAC Accredited Analyte.

Inorganic Matrix Spikes for 008560

SAMPLE DUPLICATE REPORT

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

Lab Report No: 008560 Report Date: 11/07/2019

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	40.9	45.4	--	MG/CU.M.	10	--	11055041	008560-02D1
Pheophytin-a	15.7	9.9	--	MG/CU.M.	45*	--	11055041	008560-02D1
Solids, Total Suspended	17.6	16.8	--	MG/L	5	--	10245007	008560-01D1
Solids, Volatile Suspend	5.2	4.8	--	MG/L	8	--	10245008	008560-01D1

* indicates that agreement between duplicates is greater than 20%. See Case Narrative for exceptions.
(a) DOD and/or NELAC Accredited Analyte

Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

8560

CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) Greeling, Ben; Rodgers, Grace

SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS	Chloro/Pheo	TOC, T-PO4	O-PO4	NO3-N, NH3-N	NP Pest	T.Fe; T.Mn	E. coli	MS/MSD				REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
Ren – 1	10/17/19	1013		x		X		X	X	X	[illegible]	X		X				lid to bottle broke GR 10/17/19	X	
Ren – 2 – 0		1055		x		X	X	X	X	X	X								X	
Ren – 2 – 5		1045		x		X		X	X	X		X							X	
Ren – 3		1155		x		X	X	X	X	X	X								X	
Ren – 4		1231		x		X	X	X	X	X	X								X	
Ren – 5		0915		x		X		X	X	X	X								X	
Ren – 7		1405		x		X		X	X	X	X								X	
Ren – 8		1130		x		X	X	X	X	X	X								X	
Ren – 15- 0		1147		x		X	X	X	X	X	X								X	
Ren-RL-Mar				x									X						X	

Relinquished by: (Signature)	Date 10/17/19	Time 1415	Received by: (Signature) Valerie Jenkins	REMARKS/SPECIAL INSTRUCTIONS:
Relinquished by: (Signature) Valerie Jenkins	Date 10/17/19	Time 1430	Received by: (Signature)	
Received for Laboratory by: (Signature)	Date 10/17/19	Time 1430	Shipping Ticket No.	

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8560 Cooler # 1 of 2

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 10-17-19

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 10-17-19 (Signature) DS Cochrum

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: courier

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 2.2 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 10-18-19 (Signature) DS Cochrum

10. Describe type of packing in cooler: loose ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: all	Fraction:
Area #: Walkin	Area #:
By: dlc	By:
On: 10-18-19	On:

Chain-of-Custody # N/A

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COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8560 Cooler # 2 of 2

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 10-17-19

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 10-17-19 (Signature) DLackrum

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: Courier

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 0.7 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 10-18-19 (Signature) DLackrum

10. Describe type of packing in cooler: loose ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: all	Fraction:
Area #: Walkin	Area #:
By: dlc	By:
On: 10-18-19	On:

Chain-of-Custody # N/A