# **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 1222 Spruce Street Saint Louis, MO 63103-2833

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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.
- 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.

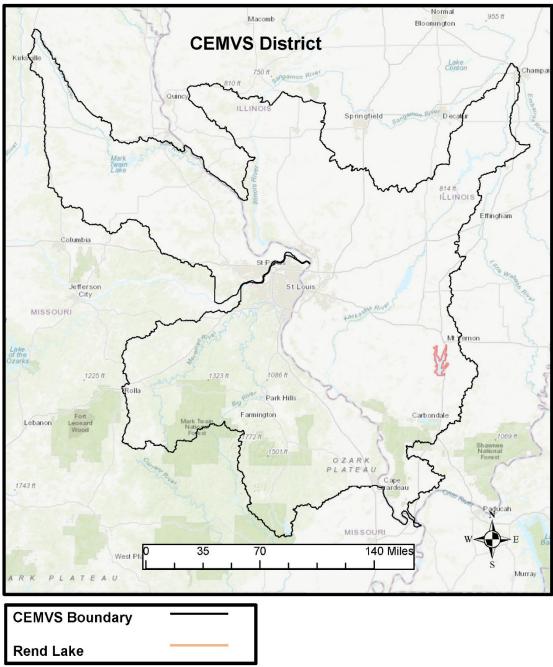


Figure 1. CEMVS District and Rend Lake

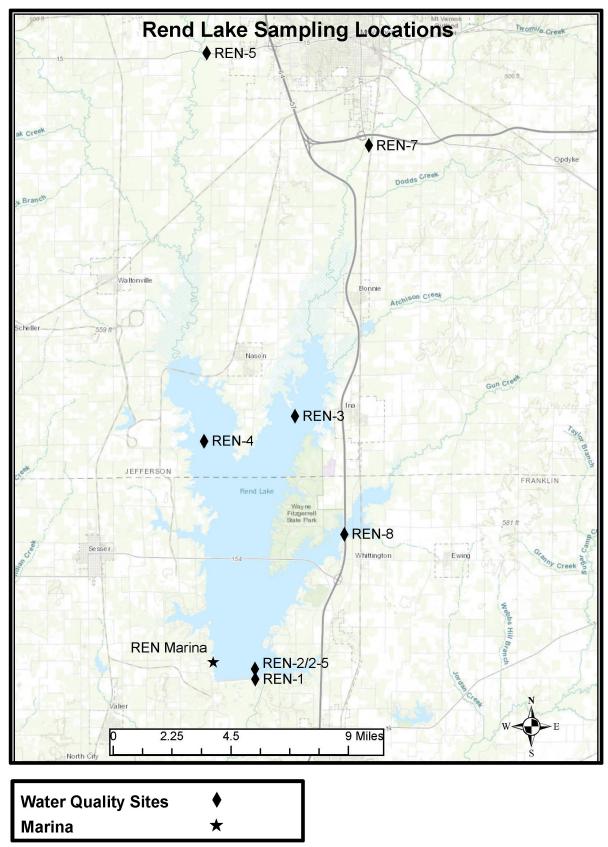


Figure 2. Water Quality (WQ) Sampling Locations in 2019 at Rend Lake

#### Sample Location Summary Table

Table 1. Sample Location	en cannary an			1000)
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 alway	s taken in the evact sa	me location		

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

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).

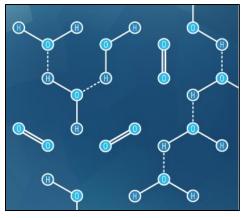
Internal checks are also used for field sampling. This includes adherence to operating procedures for data collection and periodic evaluation of sampling personnel. Field sampling equipment and multimeters are calibrated/serviced in accordance with factory recommendations.

#### 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<sub>2</sub>) that are not bonded to any other elements; thus, oxygen bonded in water (H<sub>2</sub>O) 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<sub>2</sub> + H<sub>2</sub>O (CH<sub>2</sub>O) + O<sub>2</sub>) from phytoplankton and aquatic vegetation. Additional factors influencing DO include temperature, pressure, and salinity.



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

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

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  $\geq$ 1mg/L, while most inland fish species require a minimum DO of 4mg/L. The DO water quality criteria for Illinois is  $\geq$ 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  $\mu$ S/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.

<u>Total Ammonia Nitrogen (TAN)</u> 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<sub>4</sub>-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.

**<u>Chlorophyll a (CHL a)</u>** 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.

<u>Pheophytin a (PHEO a)</u> 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.

<u>**Trophic Status</u>** 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:</u>

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 In 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

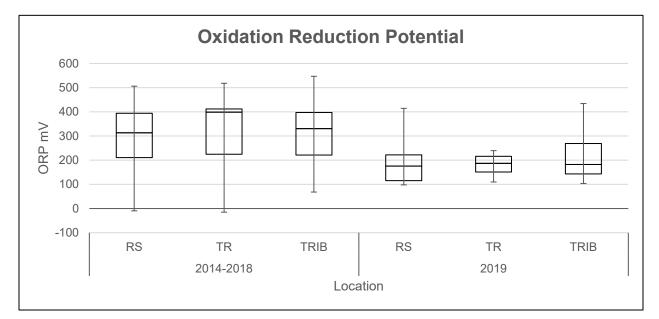
#### Laboratory Methods and Water Quality Criteria Summary Table

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

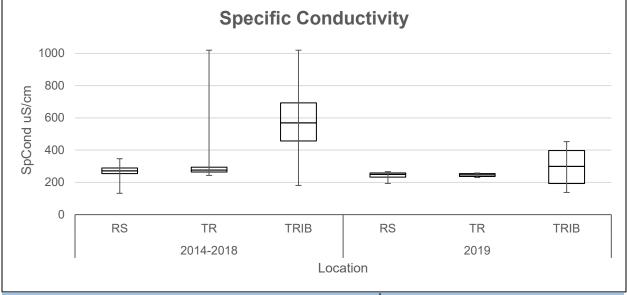
Metric	Abbreviation	Analysis Method	Water Quality Criteria	Source		
Alachlor		EPA Method 8270C	< 2ug/L PWS or <1100 ug/L: aquatic life	Illinois EPA		
Ammonia Nitrogen	NH₃	EPA Method 350.1	<15 mg/L	United States EPA		
Atrazine	Atrazine	EPA Method 8270C	9 ug/L: Chronic or 82 ug/L: Acute or 3 ug/L DWS	Illinois 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 <sup>3</sup> (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 <sub>3</sub>	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	рН	Multiparameter Meter	Range: 6.5 – 9.0pH	Illinois EPA		
Specific Conductivity	SpCond	Multiparameter Meter	500 uS/cm			
Temperature	Тетр	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	<u>Source</u>
Total Organic Carbon	тос	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	<pre>&lt; 1.1 ug/L: chronic or &lt; 26 ug/L acute (aquatic life)</pre>	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.

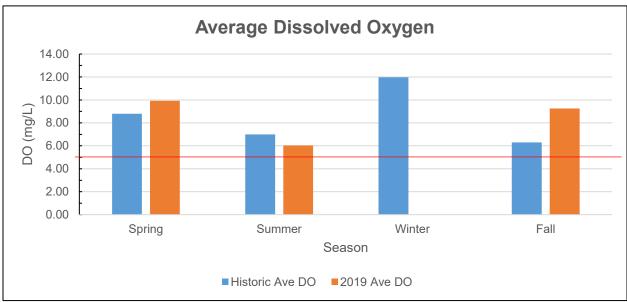


## RESULTS AND SUMMARY STATISTICS: WATER QUALITY



		<u>Histor</u>	rical Refere	ence 201	<u>4-2018</u>		<u>201</u>	<u>19</u>	
	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 of	loos not ackno	wledge a wat	or quality crite	ria for SnC	and ar OPP				

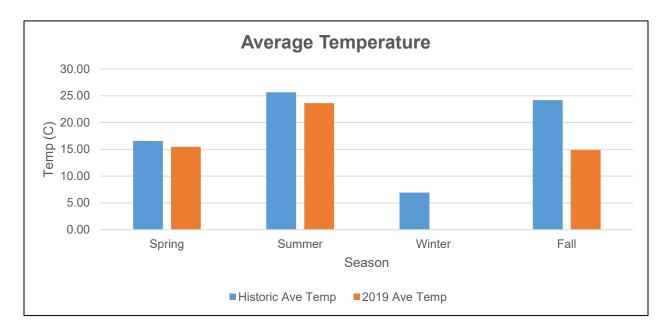
\*This report does not acknowledge a water quality criteria for SpCond or ORP.



Red line placed at the 5 mg/L level.

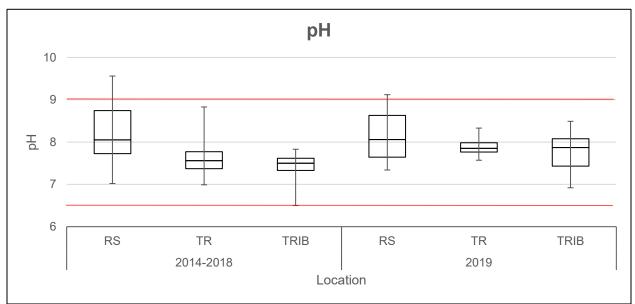
	H	istorical	Reference	2014-201	<u>8</u>		2	<u>2019</u>	
					CL				CL
Season	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)
Spring	RS	9.96	10.39	20	0.60	10.92	11.06	4	2.20
	TR	7.12	8.15	5	4.43	9.51	9.51	1	
	TRIB	7.82	8.30	8	1.64	8.11	8.11	2	4.19
Summer	RS	8.51	7.83	37	0.87	5.89	6.36	10	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.



	<u>H</u>	istorical	Reference	2014-201	8	<u>2019</u>			
					CL				CL
Season	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(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
Summ									
er	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				

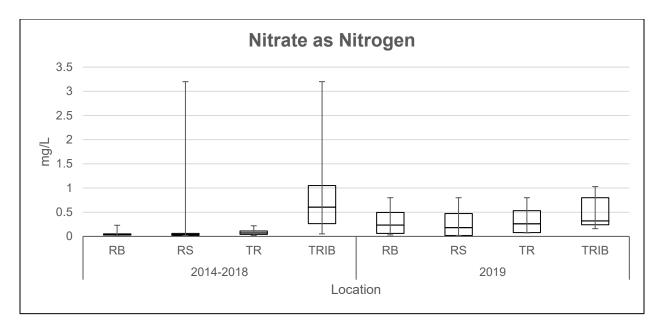
\* On August 13, 2019 the temperature at REN-8 slightly exceeded the 2.8°C rise above the historical seasonal average by 0.24°C. All ofther temperatures were within acceptable range of water quality criteria during 2019.

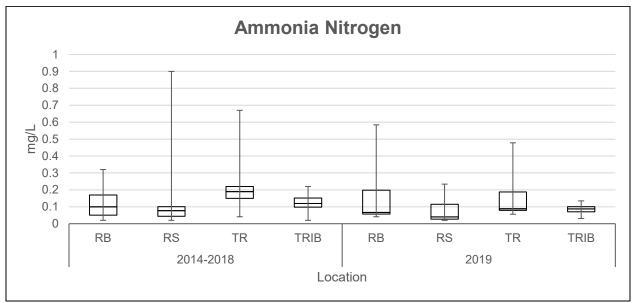


\*Red lines indicate the upper and lower water quality criteria standards (between 6.5 and 9).

		H	listorical R	eference 2	<u>2014-2018</u>			<u>2019</u>	
						CL			
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)
pН	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

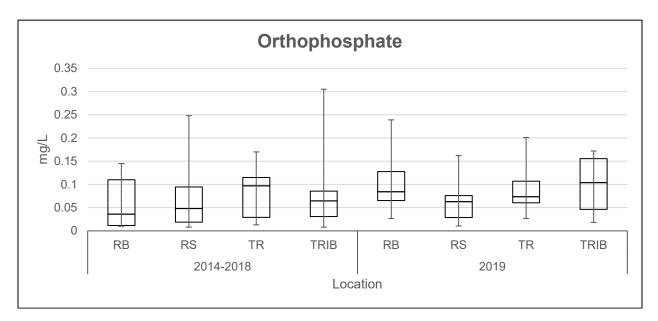
pH was recorded above 9 at REN-2 on April 9 as well as at REN-8 on October 17, 2019. All other readings were within water quality standards during 2019.

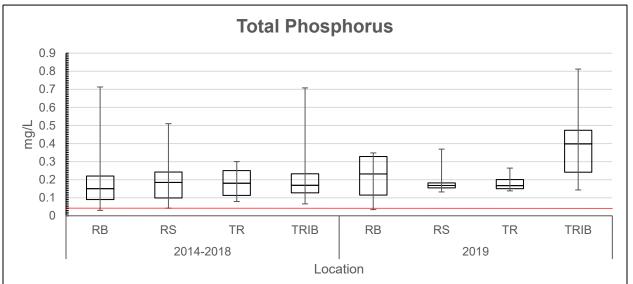




		Histo	orical Refe	rence 201	<u>4-2018</u>		4	201 <u>9</u>	
					CL				
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	CL (95.0%)
NO3N	RB	0.06	0.04	17	0.03	0.32	0.23	4	0.57
	RS	0.12	0.04	68	0.10	0.29	0.18	16	0.17
	TR	0.09	0.07	17	0.03	0.35	0.26	4	0.55
	TRIB	0.75	0.61	32	0.25	0.49	0.32	8	0.28
NH3N	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

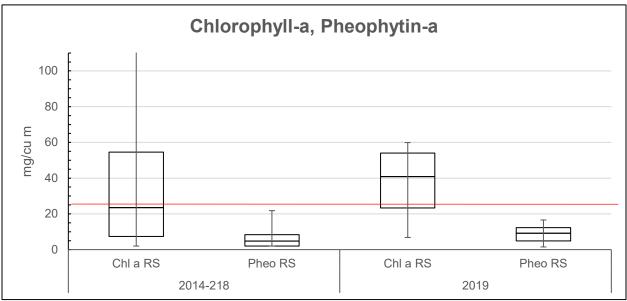
\*All observations of nitrate and ammonia nitrogen were within the water quality standard.





		Histo	orical Refe	rence 201	<u>4-2018</u>	<u>2019</u>			
					CL				CL
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(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

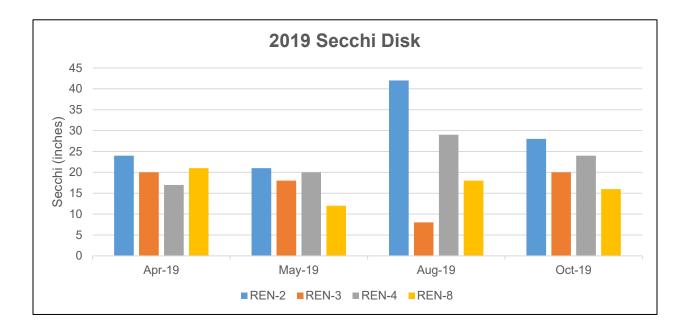
\*Total phosphorus exceeded the proposed criteria of 0.05 mg/L for all locations. This study does not acknowledge a water quality criteria for orthophosphate.

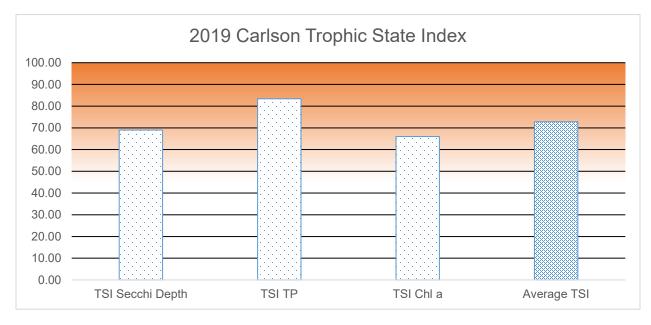


\*Red line indicates the water quality standard of 25 mg/cm<sup>3</sup>. See Carlson 1977.

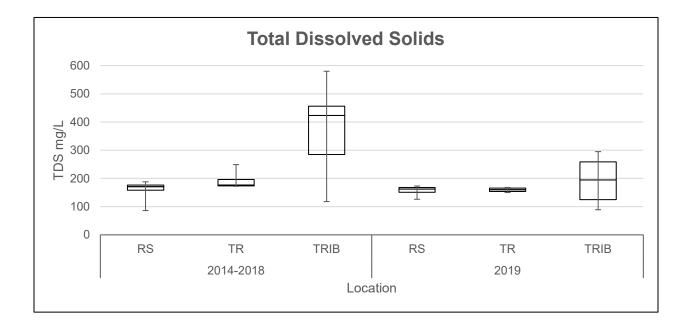
		Histo	rical Refere	ence 201	<u>4-2018</u>		<u>20</u>	<u>19</u>	
		CL(95.0							CL(95.0
	Location	Mean	Median	Count	%)	Mean	Median	Count	%)
Chl a	RS	36.38	23.50	68	8.24	37.04	40.90	16	9.88
Pheo a	RS	6.20	4.80	68	1.20	8.92	9.15	16	2.79

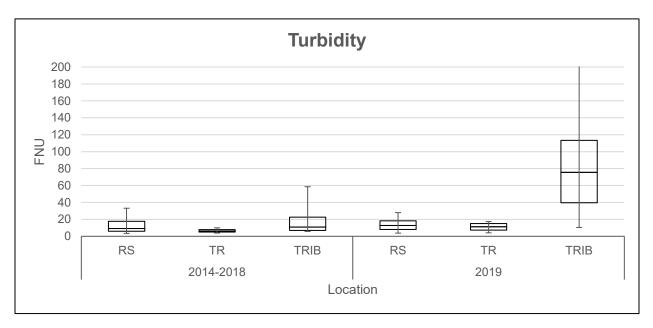
The proposed criteria for chlorophyll-a of 25mg/cm<sup>3</sup> was exceeded at all the lake sites at least one time in 2019. This study does not acknowledge a criteria for pheophytin.





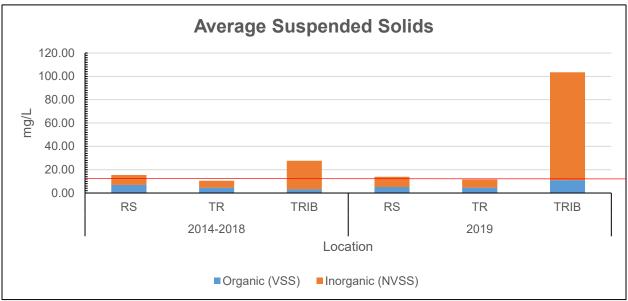
<40 = Oligotrophic \_\_\_\_ 40-60 = Mesotrophic \_\_\_\_ 60-70 = Eutrophic \_\_\_ >70 Hypereutrophic





		Histo	rical Refe	rence 20 <sup>°</sup>	<u>2019</u>				
					CL				CL
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(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

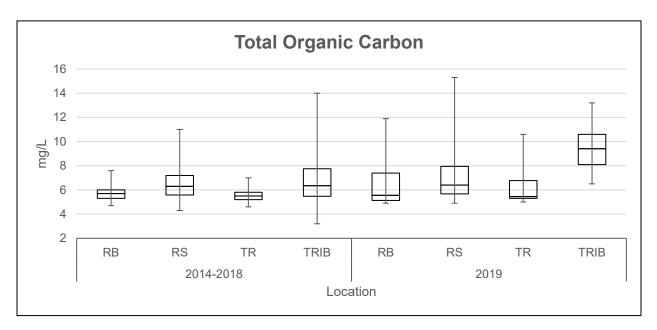
\* All observations of TDS were within the referenced water quality standard during 2019.



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

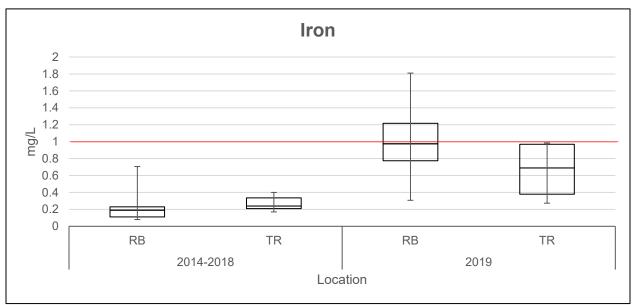
		Hist	orical Ref	erence 2	<u>014-2018</u>	<u>2019</u>			
	Location	Mean	Median	Count	CL(95.0%)	Mean	Median	Count	CL(95.0%)
TSS	RS	15.45	14.85	68	1.89	13.93	14.00	16	2.64
	TR	10.55	10.40	17	1.27	11.54	9.95	4	6.52
	TRIB	27.70	13.85	32	14.10	103.48	38.00	8	124.00
VSS	RS	6.97	6.64	68	0.81	5.21	5.40	16	1.05
	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.

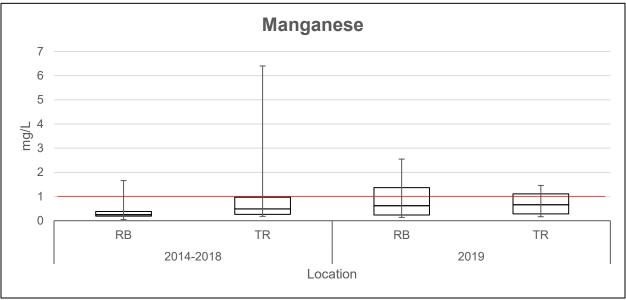


	<u>H</u>	istorical Re	eference 2	<u>2019</u>				
Location	Mean	Median	Count	CL(95.0%)	Mean	Median	Count	CL(95.0%)
RB	5.77	5.70	17	0.44	6.98	5.55	4	5.27
RS	6.39	6.30	68	0.29	7.46	6.40	16	1.52
TR	5.54	5.50	17	0.30	6.63	5.45	4	4.23
TRIB	6.76	6.35	32	0.80	9.59	9.40	8	1.92

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



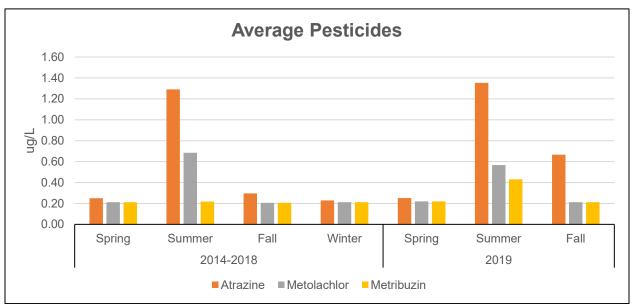
\*Red line indicates the water quality standard of 1 mg/L.



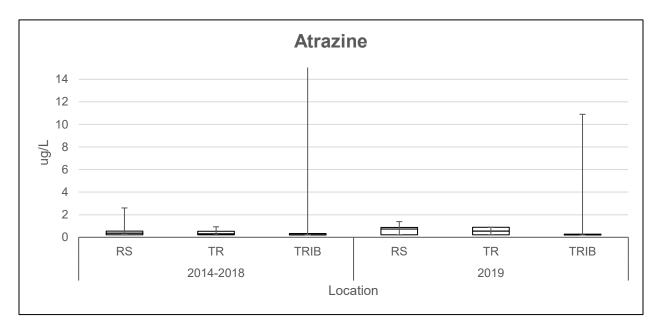
\*Red line indicates the water quality standard of 1 mg/L.

		Hist	torical Refe	erence 20	2019				
					CL(95.0%				CL(95.0%
	Location	Mean	Median	Count	)	Mean	Median	Count	)
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.

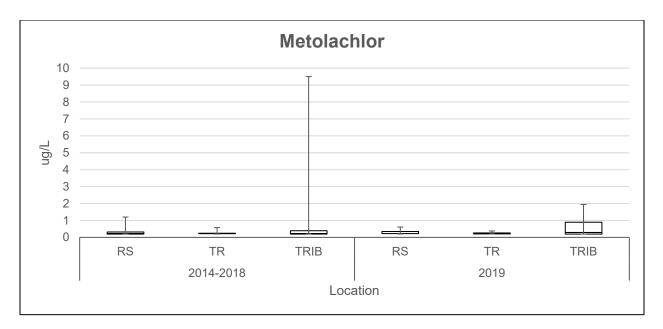


<sup>\*</sup>Of the eight pesticides tested, only the above three were reported above detection levels for the period 2014-2019.



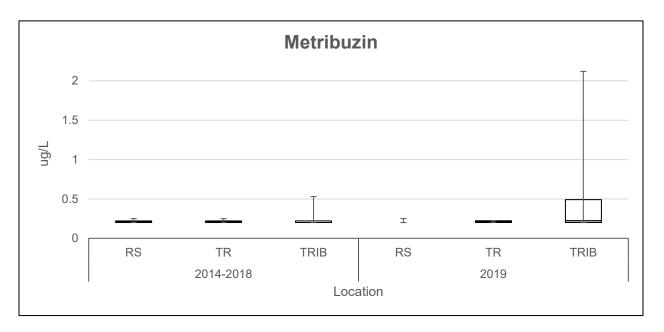
		Histo	rical Refe	rence 20	<u>14-2018</u>	<u>2019</u>				
					CL(95.0				CL(95.0	
	Location	Mean	Median	Count	%)	Mean	Median	Count	%)	
Atrazine	RS	0.50	0.36	68	0.11	0.66	0.73	16	0.21	
	TR	0.41	0.30	17	0.12	0.55	0.55	4	0.61	
	TRIB	1.69	0.22	32	2.12	1.58	0.21	8	3.15	
*Atrazina ava	aadad tha wat	or quality of	riteria once o	n May 22 2	010					

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



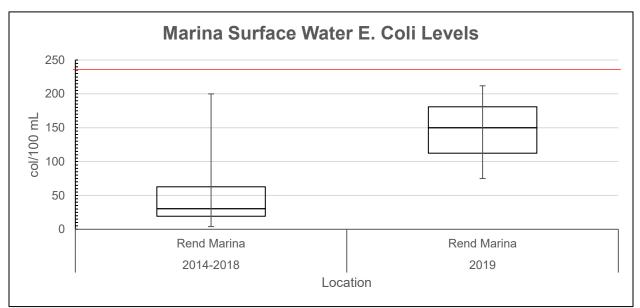
		Histo	orical Refe	erence 20	14-2018	<u>2019</u>				
		CL(95.0								
	Location	Mean	Median	Count	%)	Mean	Median	Count	%)	
Metolachlor	RS	0.32	0.22	68	0.05	0.30	0.22	16	0.07	
	TR	0.27	0.22	17	0.06	0.26	0.22	4	0.13	
	TRIB	0.88	0.22	32	0.67	0.63	0.29	8	0.53	
*Metolachlor did r	not exceed wa	ter avality	criteria in 20	10						

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



		Histo	orical Refe	<u>2019</u>					
	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.

	Histo		<u>2019</u>							
	CL									
Marina Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(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 M	iller	North Ma	arcum	Sandu	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 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<sup>3</sup> was exceeded at all the lake sampling locations at least once in 2019. The 2019 average CHL\_a level (37.04 mg/cm<sup>3</sup>) was not significantly different compared to the historical average (36.38 mg/cm<sup>3</sup>). CHL\_a is an indicator of the abundance of phytoplankton. Any water environment with a level recorded above 25 mg/cm<sup>3</sup> 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<sub>2</sub>) 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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- IEPA. (2018). <u>https://www2.illinois.gov/epa/topics/water-quality/watershed-management/tmdls/Pages/303d-list.aspx</u>

APPENDIX A: FIELD DATA

							Sp		
		Depth	DO			Temp	Cond	TDS	Turbidity
DATE	SITE	(m)	(mg/L)	рН	ORP	(°C)	(µS/cm)	(mg/L)	(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

	I . I		[						
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



400 Aviation Drive Mt. Vernon, IL 62864 618-244-3235

<u>www.ardlinc.com</u>

Date: 5/3/19

PO Box 1566

Lab Name: ARDL, Inc.

ARDL Report No.: 8470

# Customer Name: SLCOE

## Project Name: Rend Lake

Samples Received at ARDL: 4/9/19

# CASE NARRATIVE

<u>Customer</u>	Date	Lab ID	
<u>Sample No.</u>	<u>Collected</u>	<u>Number</u>	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.

"Test everything, keep the good" 1 Thes. 5:21

# Project Name: Rend Lake

### ARDL Report No.: 8470

## **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

Page 2 of 2

# Sample & QC Results

Including as appropriate: Field Sample Results Batch QC Prep Blank LCS/Spike Blank Matrix QC MS/MSD Sample Duplicate

Lab Report No: 008470

Report Date: 04/18/2019

Project Name:	REND LAKE		-	P PESTICII	DES (82'	70SIM-MC	D)
Project No.:		Analytical M					
NELAC Certi:	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-1		ARDL	Lab No.:	0084'	70-01	
Desc/Location:	REND LAKE		Lab F	ilename:	E041	1905	
Sample Date:	04/09/2019		Receiv	ved Date:	04/09	9/2019	
Sample Time:	1000	κ.	Prep.	Date:	04/10	0/2019	
Matrix:	WATER		Analy	sis Date:	04/1:	1/2019	
Amount Used:	900 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B1103	38	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.222	0.222	ND		UG/L	1
Atrazine		0.222	0.222	ND		UG/L	l
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 RECOV	ERIES:	Lim	its		Rei	sults	

SURROGATE RECOVERIES:	Limits	Results	
Triphenylphosphate	30-130	68%	
1			

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008470

Report Date: 05/03/2019

Project Name: REND LAKE Project No:	ы						N	Analysis: ELAC Certifie	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: 008470-01 Field ID: REN-1 Received: 04/09/2019	1 19	Sampling Sampling Sampling	ing Loc'n: pling Date: pling Time:		REND LAKE 04/09/2019 1000			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ГОД	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

-		1		: 04/18,			
5	REND LAKE	Ana	lysis: N	P PESTICII	DES (82	70SIM-MC	D)
Project No.:		Analytical M	ethod: 8	270C			
NELAC Certi	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-2-0		ARDL	Lab No.:	0084	70-02	• • • • • • • • • • • • • • • • • • •
Desc/Location:	REND LAKE		Lab F	ilename:	E041	1908	
Sample Date:	04/09/2019		Recei	ved Date:	04/0	9/2019	
Sample Time:	1040		Prep.	Date:	04/1	0/2019	
Matrix:	WATER		Analy	sis Date:	04/1	1/2019	
Amount Used:	900 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B1103	38	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilutior
Parameter		LOD	LOQ	Result	Flag	Units	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
URROGATE RECOV	ERIES:	Lim	its		Res	sults	

SURROGATE RECOVERIES:LimitsResultsTriphenylphosphate30-13064%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008470

05/03/2019 Report Date:

Project Name: Project No:	REND LAKE	ы						Z	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
ARDL No: Field ID: Received:	008470-02 REN-2-0 04/09/2019	2	Samp. Samr Samr	Sampling Loc'n: Sampling Date: Sampling Time:		REND LAKE 04/09/2019 1040			Matrix: Moisture:	: WATER : NA	
Analyte	te	LOD	ΓΟŐ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	ſen	0.0200	0.0300		QN	MG/L	NONE	350.1	NA	04/24/19 04244496	14244496
Chlorophyll-a, Correcte	Correcte	1.0	1.00		24.1	MG/CU.M.	1020H	10200H	04/10/19	04/18/19	04194489
Nitrate as Nitrogen	rogen	0.0190	0.0200		ΠN	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	rtho	0.00800	0.0100		0.021	MG/L	NONE	365.2	NA	04/10/19	04114465
Solids, Total Suspended	Suspended	2.0	2.00		10.8	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	le Suspen	2.0	2.00		4.4	MG/L	NONE	160.4	NA	04/11/10	04164483
Total Organic Carbon	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 008470-02, Inorganic Analyses

Report Date: 05/03/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Run Date Date Number	04/10/19 04/10/19 P7190 04/10/19 04/10/19 P7190 NA 04/24/19 04244496 NA 04/12/19 04154478 04/15/19 04/16/19 04114465 NA 04/11/19 04114465 NA 04/11/19 04164482 NA 04/11/19 04164483 NA 04/11/19 04164483
Repoi	Ar	Mc	Analysis F Method I	6010C 04/ 6010C 04/ 350.1 GREEN 365.2 04/ 365.2 04/ 365.2 160.4
			Prep Method	3010A 3010A NONE NONE 365.2 NONE NONE NONE
		AKE 2019	Units	1/9W NG/L MG/L MG/L MG/L MG/L MG/L MG/L
		Loc'n: REND LAKE Date: 04/09/2019 Time: 1030	Result	1.02 0.137 0.0628 0.030 0.0342 0.0342 0.0265 11.2 4.0 5.2
		Sampling Loc'n: Sampling Date: Sampling Time:	Flag	
		Sam San San	год	0.0500 0.00500 0.0300 0.0200 0.0100 0.0100 2.00 2.00
70		თ	LOD	0.0400 0.00400 0.0200 0.0190 0.00800 0.00800 2.0 2.0
Lab Report No: 008470	Project Name: REND LAKE Project No:	ARDL No: 008470-03 Field ID: REN-2-5 Received: 04/09/2019	Analyte	<ul> <li>(a) Iron</li> <li>(a) Manganese</li> <li>Ammonia Nitrogen</li> <li>Nitrate as Nitrogen</li> <li>Phosphorus</li> <li>Posphorus, -ortho</li> <li>Solids, Total Suspended</li> <li>Solids, Volatile Suspen</li> <li>Total Organic Carbon</li> </ul>

(a) DOD and/or NELAC Accredited Analyte.

Sample 008470-03, Inorganic Analyses

Lab Report No:	008470	Rep	ort Date	: 04/18/	2019		
Project Name:	REND LAKE	Ana	lysis: N	P PESTICII	DES (82	70SIM-MC	D)
Project No.:		Analytical M	lethod: 8	270C			
NELAC Certi	fied - IL100308	Prep M	lethod: 3	510C			
Field ID:	REN-3		ARDL	Lab No.:	0084	70-04	
Desc/Location:	REND LAKE		Lab F	ilename:	E041	1909	
Sample Date:	04/09/2019		Recei	ved Date:	04/0	9/2019	
Sample Time:	1140		Prep.	Date:	04/1	0/2019	
Matrix:	WATER		Analy	sis Date:	04/1	1/2019	
Amount Used:	900 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B110	38	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	FDTFC.	T.iw	nits		Re	sults	
Triphenylphosph			130			72%	
TT PHONY PHOSPH	acc	50	100			, , , ,	

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

(a) DOD-QSM Accredited Analyte.

4			and the second se							
Project Name: REND LAKE Project No:	E)						Z	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
ARDL No: 008470-04 Field ID: REN-3 Received: 04/09/2019		Sampling Samplin Samplin	רס רס ו		REND LAKE 04/09/2019 1140			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ГОQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen Chlorophyll-a, Correcte	0.0200 1.0	0.0300 1.00	Ŀ	0.0217 43.6	MG/CU.M.	NONE 10200H	350.1 10200H	NA 04/10/19	1	04244496 04194489
Nıtrate as Nıtrogen Pheophytin-a	0.190 1.0	0.0200 1.00		ND 16.0	MG/CU.M.	NONE 10200H	GREEN 10200H	NA 04/10/19	04/12/19 04/18/19	04194489 04194489
Phosphorus	0.00800	0.0100		0.151	MG/L	365.2	365.2	04/15/19		04184484 04134466
Phosphorus, -ortho Solids, Total Suspended	U.UU8UU 2.0	0.1100 2.00		U.U128 15.2	MG/L MG/L	NONE	305.2 160.2	NA NA	04/11/19	04164482 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

(a) DOD and/or NELAC Accredited Analyte.

Sample 008470-04, Inorganic Analyses

Lab Report No:	008470	Rep	ort Date	: 04/18/	2019		
Project Name:	REND LAKE	Ana	lysis: N	P PESTICII	ES (82	70SIM-MC	D)
Project No.:		Analytical M	ethod: 8	270C			
NELAC Certi	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-4		ARDL	Lab No.:	0084	70-05	
Desc/Location:	REND LAKE		Lab F	ilename:	E041	1910	
Sample Date:	04/09/2019		Recei	ved Date:	04/09	9/2019	
Sample Time:	1155		Prep.	Date:	04/10	0/2019	
Matrix:	WATER		Analy	sis Date:	04/1	1/2019	
Amount Used:	900 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B1103	38	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
		·····			Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Res	sults	
Friphenylphosph		30-1				51%	
Priori - Prioppin		50					

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

(a) DOD-QSM Accredited Analyte.

Sample 008470-05, NP PESTICIDES (8270SIM-MOD)

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

(a) DOD and/or NELAC Accredited Analyte.

Sample 008470-05, Inorganic Analyses

Page 1 of 1

Lab Report No: 008470

Report Date: 04/18/2019

Project Name: REND LAKE		-	P PESTICII	DES (82'	70SIM-MO	D)
Project No.:	Analytical M					
NELAC Certified - IL100308	Prep M	ethod: 3	510C			
Field ID: REN-5		ARDL 1	Lab No.:	0084	70-06	A
Desc/Location: REND LAKE		Lab F	ilename:	E041	1911	
Sample Date: 04/09/2019		Recei	ved Date:	04/09	9/2019	
Sample Time: 0930		Prep.	Date:	04/10	)/2019	
Matrix: WATER		Analy	sis Date:	04/13	1/2019	
Amount Used: 900 mL		Instr	ument ID:	AG5		
Final Volume: 1 mL		QC Ba	tch:	B1103	38	
% Moisture: NA		Level	:	LOW		
				Data		Dilution
Parameter	LOD	LOQ	Result	Flag	Units	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
URROGATE RECOVERIES:	Lim	its		Res	sults	·
'riphenylphosphate	30-				55%	

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

(a) DOD-QSM Accredited Analyte.

Lab Report No: 008470	3470						ц	Report Date:	: 05/03/2019	019
Project Name: REND LAKE Project No:	E							Analysis: ELAC Certifi	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: 008470-06 Field ID: REN-5 Received: 04/09/2019	)6 119	Sampling Samplin Samplin	יס יס	Loc'n: REND LAKE Date: 04/09/2019 Time: 0930	LAKE /2019			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ΓΟΟ	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		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	1 4.67	4.67		96.3	MG/L	NONE	160.2	NA	04/11/10	04164482
Solids, Volatile Suspen	1 4.67	4.67		9.81	MG/L	NONE	160.4	NA	04/11/10	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.

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(a) DOD and/or NELAC Accredited Analyte.

Sample 008470-06, Inorganic Analyses

Lab Report No: 008470

Report Date: 04/18/2019

Project Name:	REND LAKE		-	P PESTICII	DES (82	70SIM-MC	DD)
Project No.:		Analytical M					
NELAC Certi	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-7		ARDL	Lab No.:	0084	70-07	
Desc/Location:	REND LAKE		Lab F	ilename:	E041	1912	
Sample Date:	04/09/2019		Recei	ved Date:	04/0	9/2019	
Sample Time:	1325		Prep.	Date:	04/1	0/2019	
Matrix:	WATER		Analy	sis Date:	04/1	1/2019	
Amount Used:	1000 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B110	38	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	EDTEC.	. Lim			De	sults	
Triphenylphosph		. Lim 30-				SUICS 71%	
r - Thuen A Thuosbu	ale	30-	120			172	

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

(a) DOD-QSM Accredited Analyte.

Report Date: 05/03/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Run Date Date Number	NA 04/24/19 04244496 NA 04/12/19 04154478 04/15/19 04/16/19 04184484 NA 04/11/19 04114465 NA 04/11/19 04164482 NA 04/11/19 04164483 NA 04/27/19 05014505
Repoi	Ar NELAC	ЪМ	Analysis H Method I	350.1 GREEN 365.2 365.2 160.2 160.4 415.1
			Prep Method	NONE NONE 365.2 NONE NONE NONE NONE
		.AKE 2019	Units	1/9W F/SW WG/L WG/L MG/L MG/L
		Loc'n: REND LAKE Date: 04/09/2019 Time: 1325	Result	0.102 0.212 0.272 0.0183 40.8 4.8 8.3
		Sampling Loo Sampling Da Sampling T	Flag	
		San Sar Sar	ΓΟζ	0.0300 0.0200 0.0100 4.00 4.00 1.00
170	[2]	61	LOD	0.0200 0.0190 0.00800 0.00800 4.0 4.0
Lab Report No: 008470	Project Name: REND LAKE Project No:	ARDL No: 008470-07 Field ID: REN-7 Received: 04/09/2019	Analyte	Ammonia Nitrogen Nitrate as Nitrogen Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon

(a) DOD and/or NELAC Accredited Analyte.

Sample 008470-07, Inorganic Analyses

Lab Report No: 008470

Report Date: 04/18/2019

Project Name:	REND LAKE		-	P PESTICII	DES (82'	70SIM-MO	D)
Project No.:		Analytical M	ethod: 8	270C			
NELAC Certif	ied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-8		ARDL	Lab No.:	0084	70-08	
Desc/Location:	REND LAKE		Lab F	ilename:	E0413	1913	
Sample Date:	04/09/2019		Recei	ved Date:	04/09	9/2019	
Sample Time:	1110		Prep.	Date:	04/10	0/2019	
Matrix:	WATER		Analy	sis Date:	04/1	1/2019	
Amount Used:	900 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B1103	38	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOVI		Lim	ita		Re	sults	
Friphenylphospha		30-				69%	

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

(a) DOD-QSM Accredited Analyte.

Froject Name: KENU LAKE Project No:	J						4	Analysıs: ın NELAC Certified	и О I	ganıcs IL100308
ARDL No: 008470-08 Field ID: REN-8 Received: 04/09/2019	08 119	Sampling Samplin Samplin	ם מם א	Loc'n: REND LAKE Date: 04/09/201 Time: 1110	REND LAKE 04/09/2019 1110			Matrix: Moisture:	:: WATER :: NA	
Analyte	ГОД	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.	10200Н	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	14.0	4.00		16.0	MG/L	NONE	160.2	NA	04/11/19	04164482
Solids, Volatile Suspen	1 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.

Sample 008470-08, Inorganic Analyses

Lab Report No: 008470

Report Date: 04/18/2019

	REND LAKE		-	P PESTICID	ES (827	70SIM-MO	D)
Project No.:		Analytical Me					
NELAC Certi	fied - IL100308	Prep Me	thod: 3:	5100			
Field ID:	REN-15-0		ARDL I	Lab No.:	00847	70-09	
Desc/Location:	REND LAKE		Lab Fi	ilename:	E0411	1914	
Sample Date:	04/09/2019		Receiv	ved Date:	04/09	9/2019	
Sample Time:	1210		Prep.	Date:	04/10	0/2019	
Matrix:	WATER		Analys	sis Date:	04/11	1/2019	
Amount Used:	800 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B1103	38	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Limi	ts		Res	sults	······································
Triphenylphosph		30-1	30			77%	

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

(a) DOD-QSM Accredited Analyte.

Report Date: 05/03/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA
		REND LAKE 04/09/2019
		Sampling Loc'n: REND LAKE Sampling Date: 04/09/2019
Lab Report No: 008470	REND LAKE	008470-09 REN-15-0
Lab Report	Project Name: Project No:	ARDL No: 008470-09 Field ID: REN-15-0

Field ID: REN-15-0 Received: 04/09/2019	19	Samp Samp	Sampling De Sampling Ti	Date: 04/09 Time: 1210	04/09/2019 1210			Moisture:	: NA	
Analyte	LOD	год	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	ь	0.0276	MG/L	NONE	350.1	NA	04/24/19 04244496	04244496
Chlorophyll-a, Correcte	1.0	1.00		61.4	MG/CU.M.	10200H	10200H	04/10/19	04/18/19 04194489	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	04194489
Phosphorus	0.00800	0.0100		0.216	MG/L	365.2	365.2	04/15/19	04/16/19 04184484	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	05014505

(a) DOD and/or NELAC Accredited Analyte.

Sample 008470-09, Inorganic Analyses

#### 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	-	is: NP PEST	'ICIDES (82	270SIM-M	DD)
Project No.:	Analytical Metho				
NELAC Certified - IL100308	Prep Metho	od: 3510C			
Field ID: NA		ARDL Lab No	0.: 0084	170-01B1	
Desc/Location: NA	]	Lab Filenam	e: E043	11903	
Sample Date: NA	]	Received Da	te: NA		
Sample Time: NA		Prep. Date:	04/2	10/2019	
Matrix: QC Material	ž	Analysis Da	te: 04/1	11/2019	
Amount Used: 1000 mL	:	Instrument	ID: AG5		
Final Volume: 1 mL	(	QC Batch:	B11(	038	
% Moisture: NA	1	Level:	LOW		
				Data	
Parameter	LOD	LOQ	Result	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
URROGATE RECOVERIES:	Limits		Re	esults	
riphenylphosphate					

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

(a) DOD-QSM Accredited Analyte.

BLANK SUMMARY REPORT

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

Lab Report No: 008470

Report Date: 05/03/2019

Project Name: REND LAKE

NELAC Certified - IL100308

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

(a) DOD and/or NELAC Accredited Analyte Inorganic Method Blanks for 008470

	ARDL, INC.	INC.	BLAN 400	BLANK SPIKE/SPIKE DUPLICATE REPORT 400 Aviation Drive; P.O. Box 1566	PIKE DU Drive;	JPLICATE P.O. Bo	REPORT x 1566	Mt. Vernon,	rnon, IL	г 62864	
Lab Report No:	: 008470								Rep	Report Date:	04/18/2019
Project Name: Project No.:	REND LAKE		Anal	Analysis: NP PH	PESTICIDES	5 (8270SIM-MOD)	(dom-m	Analy	Analytical Method: Prep Method:	Method: 8270C Method: 3510C	00
h									4		
Matrix:	QC Material			QC Batch:	B11038	38		Prep. D	Date:	04/10/2019	6
Amount Used:	1000 mL			Level:	TOW			Analysi	Analysis Date:	04/11/2019	თ
			Spike	Spike	Spike	Duplicate	Duplicate	Duplicate	Recovery		RPD
	Parameter	ж	Result		% Rec	Result	Level	% Rec	Limits	RPD	Limit
τ.L.	Trifluralin		3.24	4	81		1	1	30-130	1	1
	Atrazine		3.03	4	76	1	1	1	30-130	3 2	8
1	Metribuzin		3.18	4	80	1	1	1	30-130	\$ 1	
	Alachlor		3.32	4	83	j I	1	1	30-130	1	1
M	Metolachlor		3.47	4	87	1	{	1	30-130	1	1
G	Chlorpyrifos		3.1	4	78	1	!	;	30-130	1	1
)	Cyanazine		3.79	4	95	;	;	1	30-130	1	1 1
Pei	Pendimethalin		3.42	4	86	-	;	:	30-130	1	;
	SURF	ROGATE RE	SURROGATE RECOVERIES:		Spike %R		Duplicate %R %	&R Limits			
	Trif	Triphenylphosphate	sphate		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)

Page 1 of 1

ARDL Report 8470 - Page 23 of 31

Lab Report No: 00847 Project Name: Analyte										
Project Name: Analyte	0								Report Date:	ite: 05/03/2019
	REND LAKE								NELAC Cer	Certified - IL100308
	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	1	1	ł	90-114	1	P7190	008468-01C1
Ammonia Nitrogen	1.0	1.0	103	ł			80-120		04244496	008470-01C1
Nitrate as Nitrogen	1.0	1.0	100	1	1	ł	80-120	ł	04154478	008470-03C1
Phosphorus	0.64	0.67	95		1		80-120	1	04184484	008470-01C1
Phosphorus, -ortho	0.098	0.10	98	1	1	1	80-120	1	04114465	008470-01C1
Total Organic Carbon	19.5	20.0	98	19.5	20.0	98	76-120	98	05014505	008470-01C1

,

Inorganic LCS Results for 008470

Lab Report No:	<b>ARDL, INC.</b> 008470	INC.	MATRIX 400 Avi	: SPIKE/SPIKE iation Drive.	•	DUPLICATE REPORT P.D. Box 1566	DRT 5 Mt.	Vernon,	t	<b>62864</b> Date: (	04/18/2019
Project Name: RE Project No.:	REND LAKE		Analysis:	AN	PESTICIDES (82	(8270SIM-MOD)		Analytical Method: Prep Method:	ical Method: Prep Method:	1: 8270C 1: 3510C	
Field ID: R: Desc/Location: R: Sample Date: 0. Sample Time: 1. Matrix: W	REN-1 REND LAKE 04/09/2019 1000 WATER		Prep. Amoun % Moi QC Ba Level	Prep. Date: Amount Used: % Moisture: QC Batch: Level:	04/10/2019 900 mL NA B11038 LOW	6	ARDL Lab Rece Anal	ARDL Lab No.: Lab Filename: Received Date: Analysis Date:		008470-01 04/09/2019 04/11/2019	
		Sample	SM	SM	SW	MSD	USM	USM	% Rec		RPD
Parameter	er	Result	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit
Trifluralin	lin	QN	2.66	4.44	59.8	2.6	4.44	58.5	30-130	2.1	30
Atrazine	ne	CIN	3.04	4.44	68.5	2.79	4.44	62.8	30-130	8.8	30
Metribuzin	zin	CIN	3.2	4.44	72	2.89	4.44	65	30-130	10.2	30
Alachlor	or	QN	3.29	4.44	74	3.11	4.44	70	30-130	5.6	30
Metolachlor	lor	CIN	3.42	4.44	77	3.31	4.44	74.5	30-130	3.3	30
Chlorpyrifos	ifos	CIN	2.74	4.44	61.8	2.64	4.44	59.5	30-130	3.7	30
Cyanazine	ne	UN	3.76	4.44	84.5	3.44	4.44	77.5	30-130	8.6	30
Pendimethalin	alin	UN	2.94	4.44	66.3	2.87	4.44	64.5	30-130	2.7	30
							-				
	SURR	SURROGATE RECOVERIES:	ERIES:		MS %R	MSD %R	%R Limits	s			

(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)

Page 1 of 1

30-130

68

70

Triphenylphosphate

	62864
MATRIX SPIKE/SPIKE DUPLICATE REPORT	400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL
	INC.
	ARDL,

Lab Report No: 008470

Report Date: 05/03/2019

NELAC Certified - IL100308	
REND LAKE	
Project Name:	

Inorganic Matrix Spikes for 008470

(a) DOD and/or NELAC Accredited Analyte.

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

	62864
	ΠL
	Vernon,
	Mt.
SAMPLE DUPLICATE REPORT	400 Aviation Drive; P.O. Box 1566
	INC.
	ARDL,

Lab Report No: 008470

Report Date: 05/03/2019

4

Project Name: REND LAKE

NELAC Certified - IL100308

QC Lab Number	008470-02D1	008470-02D1	008470-01D1	008470-01D1
Analytical Run	04194489	04194489	04164482	04164483
Mean (Smp,D1,D2)		1	I	1
Percent Diff	2	ம	7	0
Units	MG/CU.M.	MG/CU.M.	MG/L	MG/L
Second Duplicate	F	1	1	1
Sample First Conc'n Duplicate I	24.7	4.1	11.2	4.0
Sample Conc'n	24.1	о <b>.</b> с	10.4	4.0
Analyte	Chlorophyll-a, Corrected	Pheophytin-a	Solids, Total Suspended	Solids, Volatile Suspend

(a) DOD and/or NELAC Accredited Analyte Sample Duplicates for 008470

# Sample Receipt Information

Including as appropriate:

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

SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN PRESERVATION CHAIN OF CUSTODY RECORD ICED × × × × × × × × × SAMPLE LOCATION REMARKS OR REMARKS/SPECIAL INSTRUCTIONS: × × × × × × × × × × × (618) 244-1149 Fax X X × × × × × × × X X × × × × × × SSAL X × × × × × X × × Received by: (Signature) Received by: (Signature) × X × × × Prp-4-10 028, Shipping Ticket No. X X × × X × × × × (618) 244-3235 Phone NO. OF CONTAINERS GRAB × X X X Х Х Х Х Х COWP 000 1350 1030 1325 4/9/19 1600 Time 1 0201 1140 1155 Time Time TIME 0101 1331 (110 R. Archeski B. Come ling 4/9/19 r /4/19 4/9/19 Date DATE ARDL, Inc. Relinquished by: (Signature) Relinquished by: (Signature) SAMPLE NUMBER LE PURCHASE ORDER NO: a Churm SAMPLERS: (Signature) Received for Laborator Ren - 15-0  $\operatorname{Ren} - 2 - 0$ Ren - 2 - 5Rend Lake 1 Ren - 3Ren - 4Ren - 5Ren - 8Ren - 7Ren -PROJECT 14-20 (Sign ARDL Report 8470 -Page 29

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

8470

## COOLER RECEIPT REPORT ARDL, INC.

AR	DL #: <u>\$470</u>	Cooler #2		
		Number of Coolers in Shipment:	,	
Pro	ject: <u>Rend LAKE</u>	Date Received: <u>4-9-19</u>		
A.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 4 - 9	-19 (Signature) Dachre	m	J
1.	Did cooler come with a shipping slip (airbill, etc.)?			
	If YES, enter carrier name and airbill number here:	Caurie	N	
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	2
5.	Were custody papers sealed in a plastic bag?	YES	NO	,
6.	Were custody papers filled out properly (ink, signed, etc.)?		NO	N/A
7.	Were custody papers signed in appropriate place by ARDL personnel?	VES .	NO	N/A
8.	Was project identifiable from custody papers? If YES, enter project name at	the top of this form	NO	N/A
9.	Was a separate container provided for measuring temperature? YES	NO Observed Cooler Temp		•
•В.	LOG-IN PHASE: Date samples were logged-in: 24 - 10 - 19 (	Signature)	5,0	C
10.	Describe type of packing in cooler: <u>lease</u> , ice			
11.	Were all samples sealed in separate plastic bags?		NO	) n/a
12.	Did all containers arrive unbroken and were labels in good condition?	VES	NO	
13.	Were sample labels complete?	YES	NO	
14.	4. Did all sample labels agree with custody papers?			
15.	15. Were correct containers used for the tests indicated?			
16.	Was pH correct on preserved water samples?		NO	N/A
17.	Was a sufficient amount of sample sent for tests indicated?	YES	NO	
18.				
19.	Was the ARDL project coordinator notified of any deficiencies?	YES	NO	(N/A
	Comments and/or Corrective Action:	Sample Transfer		
		Fraction Fraction		
-		Area # Area #		
		Walkin		
		By By		
		Ualkin By By Dr On On 4-10-19		
		4-10-19		
1				

Chain-of-Custody # // /l

(By: Signature) Date:

M:\ADMIN\FORMS\COOLER RECEIPT REPORT.doc Rev. 02/22/17

### COOLER RECEIPT REPORT ARDL, INC.

AR	DL #: <u>\$470</u>	Cooler # <i>A</i> Number of Coolers in Shipment:	2		
Pro	Dject: Rend LAKE	Date Received: $4 - 9 - 19$			-
A.	<b>PRELIMINARY EXAMINATION PHASE:</b> Date cooler was opened: $\frac{4-9}{2}$	-19 (Signature) LA Lachre	im	2	
1.	Did cooler come with a shipping slip (airbill, etc.)?		_		
	If YES, enter carrier name and airbill number here:	Caurely			
2.	Were custody seals on outside of cooler?		es 🕥	10	N/A
	How many and where?,Seal Date:	"Seal Name:			
3.	Were custody seals unbroken and intact at the date and time of arrival?	Y	ES N	0	NA
4.	Did you screen samples for radioactivity using a Geiger Counter?	Y	es 🕅	0	
5.	Were custody papers sealed in a plastic bag?	YI	es N	0	
6.	Were custody papers filled out properly (ink, signed, etc.)?		ES N	ю	N/A
7.	Were custody papers signed in appropriate place by ARDL personnel?		ES' N	0	N/A
8.	Was project identifiable from custody papers? If YES, enter project name at t			0	N/A
9.	Was a separate container provided for measuring temperature? YES	NO Observed Cooler Temp	C		2
В.	LOG-IN PHASE: Date samples were logged-in: $\frac{4-10-19}{2}$ (S	P			
10.	Describe type of packing in cooler:	, lee			
11.	Were all samples sealed in separate plastic bags?	Y	ES N	0	N/A
12.	Did all containers arrive unbroken and were labels in good condition?	¥	ÊS N	0	
13.	Were sample labels complete?		S N	0	
14.	Did all sample labels agree with custody papers?		S NO	0	
15.	Were correct containers used for the tests indicated?		S NO	0	
16.	Was pH correct on preserved water samples?		ES N	ю	N/A
17.	Was a sufficient amount of sample sent for tests indicated?	£	ES' N	0	
18.	Were bubbles absent in VOA samples? If NO, list by sample #:	Y	ES N	0	N/A
19.	Was the ARDL project coordinator notified of any deficiencies?	Y	ES N	0 (	N/A
	Comments and/or Corrective Action:	Sample Transfer			
		Fraction Fraction			
		cb D D			
		Area #			
		Area # Area #			

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Date:

(By: Signature)

On

Chain-of-Custody # \_\_\_/

de

4-10-19

On



Environmental | Analytical | Management | Safety

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

<u>www.ardlinc.com</u>

Date: 6/25/19

Lab Name: ARDL, Inc.

ARDL Report No.: 8480

Samples Received at ARDL: 5/22/19

Customer Name: SLCOE

**Project Name: Rend Lake** 

### **CASE NARRATIVE**

<b>Customer</b>	Date	Lab ID	
<u>Sample No.</u>	<b>Collected</b>	<u>Number</u>	Analyses Requested
REN-1	5/22/19	8480-01	NP Pesticides, Metals(1), Inorganics(2)
<b>REN-2-0</b>	5/22/19	8480-02	NP Pesticides, Inorganics(2)(3)
<b>REN-2-5</b>	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)
<b>REN-RL-MAR</b>	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.

<u>PREPARATION BLANK</u> The blank met acceptance criteria.

<u>LABORATORY CONTROL SAMPLE</u> The LCS analyses met recovery criteria.

### MATRIX SPIKE

The matrix spike and matrix spike duplicate met recovery criteria.

"Test everything, keep the good" 1 Thes. 5:21

#### Project Name: Rend Lake

#### ARDL Report No.: 8480

### **CASE NARRATIVE (Continued)**

#### DUPLICATE

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

<u>INTERNAL STANDARD</u> 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

Page 2 of 2

ARDL Report 8480 - Page 2 of 32

# 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

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised May 14, 2019

Authorized By: DSD-QAO

Lab Report No:	008480	Repo	ort Date:	: 06/05/	2019		
Project Name:	REND LAKE		-	PESTICIE	DES (827	70SIM-MC	D)
Project No.:		Analytical M	ethod: 82	270C			
NELAC Certi:	fied - IL100308	Prep Me	ethod: 35	510C			
Field ID:	REN-1		ARDL 1	Lab No.:	00848	30-01	
Desc/Location:	REND LAKE		Lab F	ilename:	E053(	)905	
Sample Date:	05/22/2019		Receiv	ved Date:	,	2/2019	
Sample Time:	1306		Prep.	Date:	05/28	3/2019	
Matrix:	WATER		Analys	sis Date:	05/30	)/2019	
Amount Used:	1000 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B1109	54	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Re	sults	
Triphenylphosph		30-				75%	

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

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

Lab Report No: 008480

Report Date: 06/18/2019

Project Name: Project No:	REND LAKE	ы						N	Analysis: Inor NELAC Certified -	: Inorganics fied - IL1003	ganics IL100308
ARDL No: Field ID: Received:	008480-01 REN-1 05/22/2019	1	Samp Samj Samj	Sampling Loc'n: Sampling Date: Sampling Time:		REND LAKE 05/22/2019 1306			Matrix: Moisture:	: WATER : NA	
Analyte	t- e	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
<ul> <li>(a) Iron</li> <li>(a) Manganese Ammonia Nitrogen Nitrate as Nitrogen Phosphorus</li> <li>Posphorus, -ortho</li> <li>Solids, Total Suspended</li> <li>Solids, Volatile Suspen</li> </ul>	len rogen rtho Suspended le Suspen	0.0400 0.00400 0.0200 0.0500 0.00800 2.50 2.50	0.0500 0.00500 0.0300 0.0500 0.0100 2.50 2.50		0.963 0.998 0.0865 0.44 0.154 0.0719 9.5 ND	1/9W 1/9W 1/9W 1/9W 1/9W 1/9W 1/9W	3010A 3010A NONE NONE 365.2 NONE NONE NONE	6010C 6010C 350.1 GREEN 365.2 365.2 160.2 160.2	05/23/19 05/23/19 NA NA NA 06/04/19 NA NA	05/28/19 05/28/19 06/03/19 06/10/19 06/10/19 05/23/19 05/23/19 05/23/19	P7207 P7207 06054620 06144639 06074631 05304598 05284580 05284580
Total Organic Carbon	Carbon	0.500	1.00		5.0	MG/L	NONE	415.1	NA	06/04/19	06114634

(a) DOD and/or NELAC Accredited Analyte.

Sample 008480-01, Inorganic Analyses

Lab Report No: 008480

Report Date: 06/05/2019

Project Name: Project No.:	REND LAKE	Ana Analytical Me		P PESTICII 270C	DES (82	70SIM-MC	D)
	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-2-0		ARDL 1	Lab No.:	00848	80-02	
Desc/Location:	REND LAKE		Lab F:	ilename:	E0530	0908	
Sample Date:	05/22/2019		Receiv	ved Date:	05/22	2/2019	
Sample Time:	1121		Prep.	Date:	05/28	8/2019	
Matrix:	WATER		Analy	sis Date:	05/30	0/2019	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B110	54	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Rea	sults	

Triphenylphosphate30-13079%

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

Lab Report No: 008480Report Name: REND LAKEReport Date: 06/18/2019Project Name: REND LAKEProject Name: REND LAKEAnalysis: InorganicsProject No:Sampling Loc'n: REND LAKEAnalysis: InorganicsFroject No:Sampling Loc'n: REND LAKEAnalysis: InorganicsFreed ID:REN-2-0Sampling Loc'n: REND LAKEMatrix: WATERFreed ID:REN-2-0Sampling Time: 1121Matrix: WATERReceived:05/22/2019Sampling Time: 1121Matrix: WATERAnalyteLODLOQFlagResultAnalyteLODLOQFlagResultAnalyteLODLOQFlagResultAnalyteLODLOQFlagResultAnalyteLODLODNDMG/LAnanona Nitrogen0.02000.0300NDAndorephyll-a, Correcte0.00000.0300NDAntorephyll-a, Correcte1.001.5MG/LAnosphorus0.008000.01000.362Anosphorus0.008000.01000.362Anosphorus0.008000.01000.322/19Anosphorus0.008000.01000.322/19Anosphorus0.008000.01000.322/19Anosphorus0.008000.01000.322/19Anosphorus0.008000.01000.322/19Anosphorus0.008000.01000.322/19Anosphorus0.008000.01000.322/19Anosphorus0.008000.01000.322/19<		8(		Run Number	06054620 06054616 06144639 06054616 06074631 05304598 05284580 05284581 05284581
008480 LAKE Report Date: 06/18/: LAKE Analysis: Inorgan Analysis: Inorgan Analysis: Inorgan NELAC Certified - IL: 0-02 Sampling Loc'n: REND LAKE 0-02 Sampling Date: 05/22/2019 2019 Sampling Time: 1121 0-02 Sampling Time: 1121 121 Report Date: 06/03/19 122 Natrix: WATER 000500 0.0300 ND MG/L NONE Report Date Date 120 1.00 1.000 6.8 MG/CU.M. 10200H 05/23/19 06/03/19 1.0 1.00 0.0362 MG/L NONE GREEN NA 06/10/19 1.0 1.00 0.132 MG/L NONE GREEN NA 06/10/19 1.0 0.0080 0.0100 0.132 MG/L NONE 355.2 06/04/19 06/03/19 0.00800 0.0100 0.132 MG/L NONE 355.2 NA 06/10/19 1.0 1.00 1.000 0.0132 MG/L NONE 355.2 NA 05/23/19 0.00800 0.0100 0.0362 MG/L NONE 355.2 NA 05/23/19 0.00800 0.0100 0.0120 ND MG/L NONE 355.2 NA 05/23/19 0.00800 0.0100 0.0120 ND MG/L NONE 355.2 NA 05/23/19 0.000800 0.0100 0.0120 ND MG/L NONE 355.2 NA 05/23/19 0.000800 0.0100 0.0120 ND MG/L NONE 365.2 NA 05/23/19 0.000800 0.0100 0.0100 0.0120 ND MG/L NONE 365.2 NA 05/23/19 0.000800 0.0100 0.0100 0.0120 ND MG/L NONE 365.2 NA 05/23/19 0.000800 0.0100 0.0100 0.0120 ND MG/L NONE 365.2 NA 05/23/19 0.000800 0.0100 0.0100 0.0120 ND MG/L NONE 365.2 NA 05/23/19 0.000800 0.0100 0.00085 MG/L NONE 160.4 NA 05/23/19 0.0500 1.000 1.000 0.05/10 ND MG/L NONE 160.4 NA 05/23/19 0.0500 1.000 0.05/10 ND MG/L NONE 160.4 NA 05/23/19 0.0500 1.000 1.000 0.05/10 ND MG/L NONE 160.4 NA 05/23/19 0.0500 1.000 1.000 0.05/10 ND MG/L NONE 160.4 NA 05/23/19 0.0500 1.000 1.000 0.05/10 ND MG/L NONE 0.05/10 ND 05/23/19 0.0500 1.000 1.000 0.05/10 ND NG/L NONE 0.05/10 ND 05/23/19 0.0500 1.000 1.000 0.05/10 ND NG/L NONE 0.05/10 ND 05/23/19 0.0500 1.000 0.05/10 ND NG/L NONE 0.05/10 ND 05/23/19 0.0500 1.000 0.05/10 ND ND 05/23/19 0.0500 0.0500 0.05/10 ND 05/23/19 0.0500 0.0500 0.05/10 ND 05/23/19 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500 0.0500	2019	nics L0030		Nun	0605 06014 0614 0607 0607 0530 0528 0528 0528
008480 LAKE LAKE 0-02 Sampling Loc'n: REND LAKE 0-02 Sampling Loc'n: REND LAKE 0-02 Sampling Time: 1121 2019 Sampling Time: 1121 1121 1121 1121 1121 1100 LOQ Flag Result Units Method Method 1120 NONE 6.8 MG/L NONE 350.1 100 1.00 0.362 MG/L NONE GREEN 1.0 1.00 0.0362 MG/L NONE GREEN 1.0 1.00 0.132 MG/L NONE GREEN 1.0 1.00 0.0132 MG/L NONE GREEN 1.0 1.00 0.0132 MG/L NONE 365.2 1.0 2.00 ND MG/L NONE 160.2 0.500 1.00 1.00 4.9 MG/L NONE 160.2		: Inorgar fied - IL1		Analysis Date	
008480 LAKE LAKE 0-02 Sampling Loc'n: REND LAKE 0-02 Sampling Loc'n: REND LAKE 0-02 Sampling Time: 1121 2019 Sampling Time: 1121 1121 1121 1121 1121 1100 LOQ Flag Result Units Method Method 1120 NONE 6.8 MG/L NONE 350.1 100 1.00 0.362 MG/L NONE GREEN 1.0 1.00 0.0362 MG/L NONE GREEN 1.0 1.00 0.132 MG/L NONE GREEN 1.0 1.00 0.0132 MG/L NONE GREEN 1.0 1.00 0.0132 MG/L NONE 365.2 1.0 2.00 ND MG/L NONE 160.2 0.500 1.00 1.00 4.9 MG/L NONE 160.2	eport Date	Analysis ELAC Certi:	Matrix Moisture	Prep Date	NA 05/23/19 NA 05/23/19 05/04/19 NA NA NA NA
008480 LAKE LAKE 0-02 Sampling Loc'n: REND LAKE 0-02 Sampling Date: 05/22/2019 2019 Sampling Time: 1121 LOD LOQ Flag Result Units LOD 1.00 0.362 MG/L 0.0500 0.0500 0.362 MG/L 0.00800 0.0100 0.132 MG/L	Ř	N		Analysis Method	350.1 10200H GREEN 10200H 365.2 365.2 365.2 160.2 160.4 415.1
008480 LAKE LAKE 0-02 Sampling Loc'n: REND LA 00-02 Sampling Date: 05/22/2 2019 Sampling Time: 1121 121 LOD LOQ Flag Result 100 1.00 0.362 1.0 1.00 0.362 1.5 0.0500 0.0500 0.362 1.5 0.00800 0.0100 0.362 1.5 0.00800 0.0100 0.362 1.5 0.00800 0.0100 0.362 1.5 0.00800 0.0100 0.4.9 Pen 2.0 2.00 ND				Prep Method	NONE 10200H NONE 10200H 365.2 NONE NONE NONE NONE
008480 LAKE LAKE -0 2019 Sampling Loc'n: Sampling Date: /2019 LOQ Flag Resu LOD LOQ Flag Resu 0.0200 0.0300 ND cte 1.0 1.00 0.3 1.0 0.0500 0.0100 0.1 0.00800 0.0100 0.0 1.0 0.000800 0.0000 0.0000 0.0000 0.000 0.000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.0000 0.00000 0.00000 0.0000 0.00000 0.000000			LAKE 2/2019	Units	MG/L MG/CU.M. MG/CU.M. MG/L MG/L MG/L MG/L
008480 LAKE 0-02 S -0 /2019 /2019 LOD LOQ 0.0200 0.03 1.0 1.0 0.00800 0.01 0.00800 0.01 0.00800 0.01 0.00800 0.01 0.01 0.00800 0.01 0.01 0.00800 0.01 0.01 0.00800 0.01 0.01 0.01 0.00800 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.				Result	ND 6.8 0.362 1.5 0.132 0.085 6.2 ND 4.9
008480 LAKE 0-02 S -0 /2019 /2019 LOD LOQ 0.0200 0.03 1.0 1.0 0.00800 0.01 0.00800 0.01 0.00800 0.01 0.00800 0.01 0.01 0.00800 0.01 0.01 0.00800 0.01 0.01 0.00800 0.01 0.01 0.01 0.00800 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.			ling Loo pling Da pling Ta	Flag	
00848 LAKE -0 -0 /2019 ded 0 0			Samp Sam Sam	TOQ	0.0300 1.00 1.00 1.00 0.0100 0.0100 2.00 2.0
Lab Report No: 0084 roject Name: REND LAKE Project No: 008480-02 ARDL No: 008480-02 Field ID: REN-2-0 Received: 05/22/201 Analyte Analyte monia Nitrogen alorophyll-a, Correcte itrate as Nitrogen alorophytin-a nosphorus, -ortho olids, Total Suspended olids, Volatile Suspended	80		σ	LOD	0.0200 1.0 0.0500 1.0 0.00800 0.00800 0.00800 0.2.0 2.0 2.0 0.500
				Analyte	de cte pen

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Sample 008480-02, Inorganic Analyses

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Lab Report No: 008480

REND LAKE

Project Name: Project No:

Report Date: 06/18/2019

Analysis: Inorganics NELAC Certified - IL100308

ARDL No: 008480-03 Field ID: REN-2-5 Received: 05/22/2019	3 19	Sampl Samp Samp	Sampling Loc'n: Sampling Date: Sampling Time:		REND LAKE 05/22/2019 1126			Matrix: Moisture:	: WATER : NA	
Analyte	гор	Тор	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	06/10/10	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

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Sample 008480-03, Inorganic Analyses

Lab Report No:	008480	Rep	ort Date:	06/05/	2019		
Project Name: Project No.: NELAC Certi	REND LAKE fied - IL100308	Analytical M	-		ES (82 <sup>-</sup>	70SIM-MC	D)
Field ID: Desc/Location: Sample Date: Sample Time: Matrix: Amount Used: Final Volume: % Moisture:	REN-3 REND LAKE 05/22/2019 1006 WATER 900 mL 1 mL NA		Lab F: Receiv Prep. Analys	sis Date: ument ID: cch:	E0530 05/22 05/28	2/2019 8/2019 0/2019	
Parameter		LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin Atrazine Metribuzin Alachlor Metolachlor Chlorpyrifos Cyanazine Pendimethalin		0.222 0.222 0.222 0.222 0.222 0.222 0.222 0.222 0.222	0.222 0.222 0.222 0.222 0.222 0.222 0.222 0.222 0.222	ND 0.611 ND ND 0.289 ND ND ND		UG/L UG/L UG/L UG/L UG/L UG/L UG/L	1 1 1 1 1 1 1 1
SURROGATE RECOV Triphenylphosph			its 130			sults 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 Project No:	E)							Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
ARDL No: 008480-04 Field ID: REN-3 Received: 05/22/2019	)4 )19	Sampling Samplin Samplin	ו סס		REND LAKE 05/22/2019 1006			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ΓΟŎ	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	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 1.54	1.54		10.3	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	1 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

(a) DOD and/or NELAC Accredited Analyte.

Sample 008480-04, Inorganic Analyses

Lab Report No: 008480

Report Date: 06/05/2019

NELAC Certi:	fied - IL100308	Prep M	ethod: 35	5100			
Field ID:	REN-4		ARDL I	Lab No.:	00848	30-05	
Desc/Location:	REND LAKE		Lab F	ilename:	E0530	0910	
Sample Date:	05/22/2019		Receiv	ved Date:	05/22	2/2019	
Sample Time:	0935		Prep.	Date:	05/28	8/2019	
Matrix:	WATER		Analys	sis Date:	05/30	0/2019	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1105	54	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
······					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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

SokkogAle Recoveries.HimtesResultsTriphenylphosphate30–13080%

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: Project No:	REND LAKE	ы						Z	Analysis: Inor NELAC Certified -	: Inorganics fied - IL1003	ganics IL100308
ARDL No: Field ID: Received:	008480-05 REN-4 05/22/2019	5 19	Sampling Samplin Samplin	ן סיסי		REND LAKE 05/22/2019 0935			Matrix: Moisture:	: WATER : NA	
Analyte	te	LOD	ГОQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	ren (	0.0200	0.0300		0.114	MG/L	NONE	350.1	NA		06054620
Chlorophyll-a, Correcte	Correcte	1.0	1.00		10.0	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Nitrate as Nitrogen	rogen:	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	06054616
Phosphorus		0.00800	0.0100		0.181	MG/L	365.2	365.2	06/04/19	06/05/19 06074631	06074631
Phosphorus, -ortho	rtho	0.00800	0.0100		0.0771	MG/L	NONE	365.2	NA	05/23/19 05304598	5304598
Solids, Total Suspended	Suspended	1.33	1.33		12.1	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	.le Suspen	1.33	1.33		2.27	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	Carbon	0.500	1.00		5.7	MG/L	NONE	415.1	NA	06/05/19 06114635	06114635

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Sample 008480-05, Inorganic Analyses

Lab Report No: 008480

Report Date: 06/05/2019

Project Name: Project No.:	REND LAKE	Analytical M	ethod: 82		DES (82	70SIM-MC	D)
NELAC Certi	fied - IL100308	Prep Me	ethod: 3	510C			
Field ID:	REN-5		ARDL 1	Lab No.:	00848	80-06	
Desc/Location:	REND LAKE		Lab F:	ilename:	E0530	0911	
Sample Date:	05/22/2019		Receiv	ved Date:	05/22	2/2019	
Sample Time:	0840		Prep.	Date:	05/28	8/2019	
Matrix:	WATER		Analy	sis Date:	05/30	0/2019	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B110	54	
% Moisture:	NA		Level	:	LOW		
				A	Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	FRIES.	Lim	ite	анта — та 2.00.000 27.5600 - 100.000 - 100.000	Re	sults	

SURROGATE RECOVERIES:LimitsResultsTriphenylphosphate30-13066%

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

2019	nics 100308		Ru Numb
06/18/.	Inorga ied - IL	Matrix: WATER isture: NA	Analysis Date
Report Date: 06/18/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: Moisture:	Prep Date
Ř	NE		Prep Analysis Lethod Method
			Prep Method
		REND LAKE 05/22/2019 0840	Units
		: REND : 05/2: : 0840	Result
		Sampling Loc'n: REND LAKE Sampling Date: 05/22/201 Sampling Time: 0840	Flag Re
		Samp Sam Sam	год
3480	Œ	)6 )19	LOD
No: 008	REND LAKE	008480-06 REN-5 05/22/201	e
Lab Report No: 008480	Project Name: Project No:	ARDL No: 008480-06 Field ID: REN-5 Received: 05/22/2019	Analyte

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- IL100308

AKUL NO: UU8480-U0 Field ID: REN-5 Received: 05/22/2019	0 10	samp Samp Samp	sampling Loc'n: Sampling Date: Sampling Time:		KEND LAKE 05/22/2019 0840			Matrix: Moisture:	Matrix: WAIEK isture: NA	
Analyte	LOD	ГОД	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	06054620
Nitrate as Nitrogen	0.0500	0.0500		0.302	MG/L	NONE	GREEN	NA	06/10/19 06144639	06144639
Phosphorus	0.00800	0.0100		0.812	MG/L	365.2	365.2	06/04/19	06/05/19 06074631	06074631
Phosphorus, -ortho	0.00800	0.0100		0.13	MG/L	NONE	365.2	NA	05/23/19 05304598	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	06114635

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Sample 008480-06, Inorganic Analyses

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Lab Report No: 008480

Report Date: 06/05/2019

Project No.:	REND LAKE fied - IL100308	Analytical M	-		DES (827	70SIM-MO	D)
Field ID:	REN-7		ARDL	Lab No.:	00848	30-07	
Desc/Location:	REND LAKE		Lab F:	ilename:	E0530	0912	
Sample Date:	05/22/2019		Receiv	ved Date:	05/22	2/2019	
Sample Time:	1355		Prep.	Date:	05/28	3/2019	
Matrix:	WATER		Analys	sis Date:	05/30	0/2019	
Amount Used:	1000 mL		-	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1105	54	
% Moisture:	NA		Level	:	LOW		
		10100010222200000000000000000000000000			Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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
	EDIEC.	Lim			Po	sults	· · · · · · · · · · · · · · · · · · ·
SURROGATE RECOV		30-				suits 84%	
Iriphenylphosph	ate	30-	120			040	

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

Report Date: 06/18/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Prep Analysis Run Method Method Date Date Number	NONE 350.1 NA 06/03/19 06054620	NONE GREEN NA 06/12/19 06144640	.2 365.2 06/04/19 06/05/19 06074631	NONE 365.2 NA 05/23/19 05304598	NONE 160.2 NA 05/23/19 05284580	NONE 160.4 NA 05/23/19 05284581	NONE 415.1 NA 06/05/19 06114635
			Pr Met	NO	NON	365.2	ON	ON	ON	ON
		LAKE /2019	Units	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
		Loc'n: REND LAKE Date: 05/22/2019 Time: 1355	Result	0.0309	DN	0.356	0.154	35.2	6.4	9.1
		1 0 0	Flag							
		Sampling Samplin Samplin	LOQ	0.0300	0.25	0.0100	0.0100	4.00	4.00	1.00
80		6	LOD	0.0200	0.25	0.00800	0.00800	4.0	4.0	0.500
Lab Report No: 008480	Project Name: REND LAKE Project No:	ARDL No: 008480-07 Field ID: REN-7 Received: 05/22/2019	Analyte	Ammonia Nitrogen	Nitrate as Nitrogen		Phosphorus, -ortho	Solids, Total Suspended	Solids, Volatile Suspen	Total Organic Carbon

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Sample 008480-07, Inorganic Analyses

Page 1 of 1

.

Lab Report No: 008480

Report Date: 06/05/2019

Project Name: Project No.:	REND LAKE	An Analytical	alysis: NI Method: 8		DES (82	70SIM-MO	D)
-	fied - IL100308	-	Method: 3				
				- 1			
Field ID:	REN-8			Lab No.:		30-08	
Desc/Location:				ilename:	E0530		
Sample Date:	05/22/2019			ved Date:	•	2/2019	
Sample Time:	1156		-	Date:		3/2019	
Matrix:	WATER		-	sis Date:	-	0/2019	
Amount Used:	1000 mL			ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B110	54	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	PDTEC.	τ÷	mits		Po	sults	
			-130			81%	
Triphenylphosph	ale	30	-120			01.0	

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

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

Lab Report No: 008480

Report Date: 06/18/2019

Project Name: Project No:	REND LAKE	E						N	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
ARDL No: Field ID: Received:	008480-08 REN-8 05/22/2019	19 19	Sampling Samplir Samplir			REND LAKE 05/22/2019 1156			Matrix: Moisture:	: WATER : NA	
Analyte	ب <del>ر</del> ه	LOD	ГоÕ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	en	0.0200	0.0300		0.234	MG/L	NONE	350.1	NA	06/03/19 06054620	06054620
Chlorophyll-a, Correcte	Correcte	1.0	1.00		20.9	MG/CU.M.	10200H	10200H	05/23/19	06/03/19	06054616
Nitrate as Nitrogen	rogen		0.25		ND	MG/L	NONE	GREEN	NA	06/12/19	06144640
Pheophytin-a	1	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	rtho	0.00800	0.0100		0.162	MG/L	NONE	365.2	NA	05/23/19	05304598
Solids, Total Suspended	Suspended	1 2.50	2.50		24.3	MG/L	NONE	160.2	NA	05/23/19	05284580
Solids, Volatile Suspen	le Susper	1 2.50	2.50		4.5	MG/L	NONE	160.4	NA	05/23/19	05284581
Total Organic Carbon	Carbon	0.500	1.00		7.3	MG/L	NONE	415.1	NA	06/05/19	06114635

(a) DOD and/or NELAC Accredited Analyte.

Sample 008480-08, Inorganic Analyses

Lab Report No: 008480

Report Date: 06/05/2019

Project No.:	REND LAKE fied - IL100308	Analytical M			DES (82'	70SIM-MC	D)
Field ID:	REN-15-0		ARDL 1	Lab No.:	0084	80-09	
Desc/Location:	REND LAKE		Lab F:	ilename:	E053	0914	
Sample Date:	05/22/2019		Receiv	ved Date:	05/2	2/2019	
Sample Time:	0945		Prep.	Date:	05/2	8/2019	
Matrix:	WATER		Analy	sis Date:	05/3	0/2019	
Amount Used:	900 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B110	54	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin	0.000-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0	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
	PD TRC.	т !	i t a		De	sults	
SURROGATE RECOV		Lim	1115 130			SUICS 74%	
Triphenylphosph	ale	30-	130			140	

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

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

Lab Report No: 008480

Report Date: 06/18/2019

Project Name: REND LAKE Project No:	AKE						N	Analysis: ELAC Certifie	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: 008480-09 Field ID: REN-15-0 Received: 05/22/2019	-09 -0 2019	Sampling Samplin Samplin	1 0 0		REND LAKE 05/22/2019 0945			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ΓΟŎ	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	06054620
Chlorophyll-a, Correcte	te 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	ed 2.0	2.00		12.4	MG/L	NONE	160.2	NA	05/23/19 (	05284580
Solids, Volatile Suspen	en 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	06114635

(a) DOD and/or NELAC Accredited Analyte.

Sample 008480-09, Inorganic Analyses

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864	Report Date: 06/18/2019	Analysis: Inorganics NELAC Certified - IL100308	Sampling Loc'n: REND LAKE Matrix: WATER Sampling Date: 05/22/2019 Sampling Time: 1231	Prep Analysis Prep Analysis Run LOQ Flag Result Units Method Method Date Date Number	1.00 75.0 COL/100 ML NONE 1604 NA 05/22/19 05244576
	80		ي بر بر	LOD	1.0
	Lab Report No: 008480	Project Name: REND LAKE Project No:	ARDL No: 008480-10 Field ID: REN-RL-MAR Received: 05/22/2019	Analyte	E. Coliform

(a) DOD and/or NELAC Accredited Analyte.

Sample 008480-10, Inorganic Analyses

#### 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 No.:	REND LAKE fied - IL100308	Analytical Met	sis: NP PEST hod: 8270C hod: 3510C	ICIDES (82	270SIM-MC	)
Field ID:	NA		ARDL Lab No	.: 0084	80-01B1	
Desc/Location:	NA		Lab Filenam	e: E053	30903	
Sample Date:	NA		Received Da	te: NA		
Sample Time:	NA		Prep. Date:	05/2	28/2019	
Matrix:	QC Material		Analysis Da	te: 05/3	30/2019	
Amount Used:	1000 mL		Instrument	ID: AG5		
Final Volume:	1 mL		QC Batch:	B110	)54	
% Moisture:	NA		Level:	LOW		
		10 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100			Data	
Parameter		LOD	LOQ	Result	Flag	Units
Trifluralin		0.200	0.200	ND	4.000 C.000 C.0	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 RECOV	ERIES:	Limit	S	Re	esults	
Triphenylphosph	ate	30-13	0		84%	

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

Blank for Run B11054, NP PESTICIDES (8270SIM-MOD)

\_\_\_|

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

Lab Report No: 008480

REND LAKE

Project Name:

Report Date: 06/18/2019

IL100308
Certified -
NELAC C

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

Inorganic Method Blanks for 008480

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ARDL Report 8480 - Page 23 of 32

	ARDL, INC.	INC.	400 AT	~	Drive;	P.O.	BOX 1566	Mt. V	Mt. Vernon, IL		62864	
Lab Report No:	008480								щ	Report Date:		06/05/2019
Project Name: REND LAKE Project No.:	END LAKE		Anal	Analysis: NP PF	STICIDE	PESTICIDES (8270SIM-MOD	( dom-m	Ana	Analytical Method: 8270C Prep Method: 3510C	ical Method: Prep Method:	8270C 3510C	
Matrix: Q Amount Used: 1	QC Material 1000 mL			QC Batch: Level:	B11054 LOW	154		Prep. Analys	Prep. Date: Analysis Date:	05/28/2019 : 05/30/2019	2019	
		S	Spike	Spike	Spike	Duplicate	Duplicate	Duplicate	Recovery			RPD
Para	Parameter	Re	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD		Limit
Trifl	Trifluralin		2.8	4	70		•	-	30-130			
Atr	Atrazine	2	2.46	4	62	1	!	-	30-130	ł		-
Metr	Metribuzin	2	2.57	4	64	1		1	30-130	ł		{
Ala	Alachlor	2	2.42	4	61		ł	ł	30-130	1		1
Metol	Metolachlor	2	2.78	4	70	1	1	1	30-130	ł		-
Chlor	Chlorpyrifos	2	2.47	4	62	-	}	ł	30-130	1		an sk
Cyan	Cyanazine	2	2.98	4	75	!	1	ł	30-130	1		
Pendim	Pendimethalin	2	2.87	4	72	!		1	30-130	1		
	SURP	SURROGATE RECOVERIES:	OVERIES:		Spike %R		Duplicate %R %	%R Limits	I			
	Trip	Triphenylphosphate	iphate		71		-	30-130				

BLANK SPIKE/SPIKE DUPLICATE REPORT

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

	10 REND LAKE								Report Date: 0 NELAC Certified	Date: 06/18/2019 Certified - IL100308
Lab Report No: 008480	REND LAKE								NELAC Ce	1
Project Name:										
a tri la ca	LCS 1	LCS 1	LCS 1	LCS 2	LCS 2	LCS 2	% Rec	Mean	Analytical	QC Lab
אווטדערב	VESUIL	דשאשר	4 XGC	Tuesur	талат	A Rec	SJIMIU	4 XeC	Run	NUTIDEE
(a) Iron	4.9	5.0	98	*** ***	ł	ł	81-118	1	P7207	008478-03C1
(a) Manganese	0.76	0.75	102	ł	-	1	84-114	ł	P7207	008478-03C1
Ammonia Nitrogen	0.91	1.0	16	ł	1	1	80-120	ł	06054620	008480-01C1
Nitrate as Nitrogen	5.0	5.0	66	-	-	ł	80-120	1	06144639	008477-02C1
Nitrate as Nitrogen	4.9	5.0	98	1		1	80-120	1	06144640	008476-02C1
Nitrate as Nitrogen	5.2	5.0	104	!	1	1	80-120	ł	06144641	008480-09C1
Phosphorus	0.65	0.67	98	ł		ł	80-120	i	06074631	008479-03C1
Phosphorus, -ortho	0.10	0.10	101	ł	ł	}	80-120	ł	05304598	008480-01C1
Total Organic Carbon	8.8	10.0	88	ł	1	1	80-120	ł	06114634	008479-01C1
Total Organic Carbon	9.2	10.0	92	-	I 1	ł	80-120	1	06114635	008480-04C1
NOTE: Any values tabulated above marked with an	ated above ma	rked with		asterisk are outside of	e of acce	acceptable limits.	t t			

Results for 008480 רכמ Inorganic

<b>1</b> Lab Report No: 008480	<b>ARDL, INC.</b> 480	INC.	MATRIX SPIKE/SPIKE I 400 Aviation Drive;	SPIKE/SPIKE ation Drive	IKE DUPLI( ive; P.O.	DUPLICATE REPORT P.O. Box 1566		<b>Mt. Vernon, IL</b> Repor	, <b>IL 62864</b> Report Date:		06/05/2019
Project Name: REND LAKE Project No.:	LAKE		Analysis:	NP PESTJ	PESTICIDES (8270SIM-MOD)	70SIM-MOD)		Analytical Method: Prep Method:	ical Method: Prep Method:	d: 8270C d: 3510C	
: u	l LAKE		Prep. Amount	Prep. Date: Amount Used:	05/28/2019 1000 mL	6	AF Lē	ARDL Lab No.: Lab Filename:		008480-01	
Sample Date: 05/22 Sample Time: 1306 Matrix: WATER	05/22/2019 1306 WATER		% Mois QC Bat Level:	% Moisture: 2C Batch: Level:	NA B11054 LOW		Re Ar	Received Da Analysis Da	Date: 05/2 Date: 05/2	05/22/2019 05/30/2019	
		Sample	SM	WS	WS	MSD	MSD	MSD	\$ Rec		RPD
Parameter		Result	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit
Trifluralin		QN	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		UN	2.93	4	73.3	2.47	4	61.8	30-130	17	30
Alachlor		UN	2.7	4	67.5	2.26	4	56.5	30-130	17.7	30
Metolachlor		UN	3.22	4	80.5	2.8	4	70	30-130	14	30
Chlorpyrifos		DN	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		QN	3.31	4	82.8	2.76	4	69	30-130	18.1	30
	SURF	SURROGATE RECOVERIES:	ERIES:		MS &R	MSD &R	%R Limits	ts			
	1		· >=+		10 OF	No. NOL	THITT GO	C C			

'nc' indicates sample >4X spike level.

'\*' indicates a recovery outside of standard limits.

Matrix Spikes for 008480-01, NP PESTICIDES (8270SIM-MOD)

Page 1 of 1

30-130

68

82

Triphenylphosphate

ARDL Report 8480 - Page 26 of 32

	62864
	H
	Vernon,
REPORT	Mt.
DUPLICATE	P.O. Box 1566
MATRIX SPIKE/SPIKE	Aviation Drive; I
	C. 400
	ARDL, INC.

Lab Report No: 008480

Report Date: 06/18/2019

Project Name: REND LAKE

NELAC Certified - IL100308

	Sample	Sample	SM	SM	SM	MSD	MSD	MSD	% Rec		RPD		QC Lab
Analyte	Matrix	Result	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit	Run	Number
(a) Iron	WATER	0.93	2.0	1.0	103	2.0	1.0	105	87-115	ы	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

64	06/18/2019	ed - IL100308	QC Lab Number	008480-02D1 008480-02D1 008480-07D1 008480-07D1
on, IL 62864	Report Date:	NELAC Certified	Analytical Run	06054616 06054616 05284580 05284581
Mt. Vernon, IL	ц	4	Mean (Smp,D1,D2)	
TE REPORT Box 1566			Percent Diff	ο ξ τ ζ ο τ τ ζ
DUPLICAI ve; P.O.			Units	MG/CU.M. MG/L MG/L MG/L
SAMPLE DUPLICATE REPORT 400 Aviation Drive; P.O. Box 1566			Second Duplicate	
400 Avia			First Duplicate	6.2 34.8 5.2 5.2
INC.	0	LAKE	Sample Conc'n	35.2 6.4 6.4
ARDL, INC.	Lab Report No: 008480	Project Name: REND LAKE	Analyte	Chlorophyll-a, Corrected Pheophytin-a Solids, Total Suspended Solids, Volatile Suspend

Page 1 of 1

Sample Duplicates for 008480

\* 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	400 Av -3235 I	Phone	Drive, (61	Mt. 7 (8) 2-	ve, Mt. Vernon, IL 62 (618) 244-1149 Fax	1, IL ( 49 Fa	52864 x								ъ	IAIN	OF CI	CHAIN OF CUSTODY RECORD	ΟY R	ECO	RD
PROJECT Rend Lake						5															Hd	PRESERVATION	ATION
SAMPLERS: (Signature) Schopher, Budaers	(C. R.	elha		F CONTAIN	000000000000000000000000000000000000000	N	Jar	00-1		N-ELLA	- UM		0.0		~	$\sim$		N N T N	0/10		ICED	ADI CHE	SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
SAMPLE NUMBER DATE	DATE	THME	GKAB COMP	10 'ON	SS	Chin	201	0.P	VEON	No Les	Ter.	MISM E. C					SAM	REMARKAS OR PLE LOCA	KEMAKKS OR SAMPLE LOCATION	Z			
Ren – 1	S-22	1306	X		X		XX	X	X	X		X									X		
Ren – 2 – 0	5-22	1611	X		X	XX	XX	X	X												X		
Ren – 2 – 5	re-s		X		X	X	XX	X		X											X		
Ren – 3	5-22	1001	X		X	XX	XX	X	X												X		
Ren – 4	5-22	935	х		X	XX	XX	X	×												X		
Ren – 5		05%	X		X	X	XX	X	×												X		
Ren – 7	5-22	1355	Х		X	×	XX	X	×												X		
Ren – 8	Sudd	1156	Х		X	XX	XX	X	×												X		
Ren – 15- 0	SEJU	945	Х		X	XX	XX	X	X												Х		
Ren-RL-Mar	2-22	1251	Х								Х										Х		
Α																							
RDL																							
Re																							
Acelinquished by: (Signature) 8	S-22	Time		Received by: (Signature	: (Sign	lature		RE	MAF	KS/S	PECI	REMARKS/SPECIAL INSTRUCTIONS:	STRI	JCTIC	:SNC								
Belinquished by: (Signature)	Date	Time		Received by: (Signature)	: (Sign	lature		r															
Deceived for Laboratory by:	Date 5.30	Time 1420	Shipp	Shipping Ticket No.	cket No	·		1															
o gurchase order no: curchase order no:		1																					

COOLER RECEIPT REPORT ARDL, INC.

ARI	DL#: 8480	Cooler # <u>I of </u> Number of Coolers in Shipment: <u>2</u>				
Pro	ject: <u>Rend Lake</u>	Date Received: 5-22-19				
А.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened	-19 (Signature) YEC				
1.	Did cooler come with a shipping slip (airbill, etc.)?					
	If YES, enter carrier name and airbill number here: <u>COUP1</u>	er				
2.	Were custody seals on outside of cooler?	YES 🔞 N/A				
	How many and where?,Seal Date:,Seal Date:,	,Seal Name:				
3.	Were custody seals unbroken and intact at the date and time of arrival?					
4.	Did you screen samples for radioactivity using a Geiger Counter?					
5.	Were custody papers sealed in a plastic bag?	YES NO				
6.	Were custody papers filled out properly (ink, signed, etc.)?					
7.	Were custody papers signed in appropriate place by ARDL personnel?					
8.	Was project identifiable from custody papers? If YES, enter project name at t	the top of this form				
9.	Was a separate container provided for measuring temperature? YES					
B.	LOG-IN PHASE: Date samples were logged-in: 5-22.(9)	Correction factor <u>0,0</u>				
10.	Describe type of packing in cooler: Loose Ice					
11.	Were all samples sealed in separate plastic bags?	YES N/A				
12.	Did all containers arrive unbroken and were labels in good condition?	NO				
13.	Were sample labels complete?					
14.	Did all sample labels agree with custody papers?	NO				
15.	Were correct containers used for the tests indicated?	NO				
16.	16. Was pH correct on preserved water samples?					
17.	Was a sufficient amount of sample sent for tests indicated?	NO				
18.	Were bubbles absent in VOA samples? If NO, list by sample #:	YES NO (NA)				
19.	Was the ARDL project coordinator notified of any deficiencies?					
[	Comments and/or Corrective Action:	Sample Transfer				
		Fraction Fraction				
		Area # Area #				
		walk-in				
	`.	By TRC By				
		On 5-22-19 On				
		Chain-of-Custody #				
(В	y: Signature) Date:					

M:\ADMIN\FORMS\COOLER RECEIPT REPORT.doc Rev. 02/22/17

# COOLER RECEIPT REPORT ARDL, INC.

ARDL #:	Cooler # 2 2 Number of Coolers in Shipment: 2						
Project: Rend Lake	Date Received:						
A. <u>PRELIMINARY EXAMINATION PHASE</u> : Date cooler was opened: <u>5-3</u>							
1. Did cooler come with a shipping slip (airbill, etc.)?							
If YES, enter carrier name and airbill number here:							
2. Were custody seals on outside of cooler?	Yes 🔞 N/A						
How many and where?,Seal Date:,Seal Date:,	,Seal Name:						
3. Were custody seals unbroken and intact at the date and time of arrival?	YES NO						
4. Did you screen samples for radioactivity using a Geiger Counter?	NO						
5. Were custody papers sealed in a plastic bag?	YES NO						
6. Were custody papers filled out properly (ink, signed, etc.)?							
7. Were custody papers signed in appropriate place by ARDL personnel?							
8. Was project identifiable from custody papers? If YES, enter project name at	the top of this form						
9. Was a separate container provided for measuring temperature? YES	NO $\times$ Observed Cooler Temp. $1.1$ C Correction factor $0.0$ C						
B. LOG-IN PHASE: Date samples were logged-in: 5-72-19 (							
10. Describe type of packing in cooler: LOOSE Ice							
11. Were all samples sealed in separate plastic bags?							
12. Did all containers arrive unbroken and were labels in good condition?	NO NO						
13. Were sample labels complete?							
14. Did all sample labels agree with custody papers?							
15. Were correct containers used for the tests indicated?							
5. Was pH correct on preserved water samples?							
17. Was a sufficient amount of sample sent for tests indicated?	7. Was a sufficient amount of sample sent for tests indicated?						
18. Were bubbles absent in VOA samples? If NO, list by sample #:	YES NO NA						
19. Was the ARDL project coordinator notified of any deficiencies?	YES NO WA						
Comments and/or Corrective Action:	Sample Transfer						
	Fraction Fraction						
	Area # · Area #						
	walk-m						
	By TRC By						
	<sup>on</sup> 5-22-P						
	Chain-of-Custody #						
(By: Signature) Date:	· ·						

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ARDL Report 8480 - Page 32 of 32



Environmental | Analytical | Management | Safety

#### **Customer Name: SLCOE**

#### **Project Name: Rend Lake**

Samples Received at ARDL: 8/13/19

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

<u>www.ardlinc.com</u>

Date: 9/16/19

Lab Name: ARDL, Inc.

ARDL Report No.: 8508

#### CASE NARRATIVE

<u>Customer</u>	Date	Lab ID	
Sample No.	Collected	<u>Number</u>	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)
<b>REN-2-5</b>	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
			2.001

(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.

"Test everything, keep the good" 1 Thes. 5:21

# Project Name: Rend Lake

# ARDL Report No.: 8508

# **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 nonpreserved 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 1 of 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

Page 2 of 2

ARDL Report 8508 - Page 2 of 32



# 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

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised June 21, 2019

Authorized By: DSD-QAO

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 Dilution Data Parameter LOD LOQ Result Flaq Units 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 UG/L 1 ND Pendimethalin UG/L 0.200 0.200 ND 1 SURROGATE RECOVERIES: Limits Results

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

30-130

(a) DOD-QSM Accredited Analyte.

Triphenylphosphate

888

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

Lab Report No: 008508

Report Date: 09/13/2019

ARDL No: 008508-01 Field ID: REN-1 Received: 08/13/2019 Analyte LOD (a) Iron 0.0400 0	Sampli Sampl Sampl								
Analyte LOD 0.0400		Sampling Loc'n: Sampling Date: Sampling Time:	1: REND LAKE 9: 08/13/2019 9: 1110	KE 019			Matrix: Moisture:	: WATER : NA	
0.0400	ТОЎ	Flag R	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
	0.0500	л	0.273	MG/L	3010A	6010C	08/19/19	08/23/19	P7250
(a) Manganese 0.00400 0.	0.00500	Ŀ	1.46	MG/L	3010A	6010C	08/19/19	08/23/19	P7250
Ammonia Nitrogen 0.0200 C	0.0300		0.478	MG/L	NONE	350.1	NA	08/19/19	08204811
Nitrate as Nitrogen 0.800	1.00	×	ND	MG/L	NONE	300.0	NA	09/09/19 09114863	09114863
Phosphorus 0.00800 C	0.0100		0.264	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
Phosphorus, -ortho 0.00800 0	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		DN	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

Lab Report No: 008508

Report Date: 08/21/2019

Project Name: Project No.:	REND LAKE	Ana Analytical Me	-	PESTICI	DES (827	0SIM-MO	D)
-	fied - IL100308	_	ethod: 3				
NELAC CELCI	11ed - 11100308	гтер м		5100			
Field ID:	REN-2-0		ARDL 1	Lab No.:	00850	8-02	
Desc/Location:	REND LAKE		Lab F:	ilename:	E0820	908	
Sample Date:	08/13/2019		Receiv	ved Date:	08/13	/2019	
Sample Time:	1158		Prep.	Date:	08/19	/2019	
Matrix:	WATER		Analy	sis Date:	08/20	/2019	
Amount Used:	1000 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1108	1	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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	1
Triphenylphosphate	30-130	74%	ĺ
			_

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

(a) DOD-QSM Accredited Analyte.

Report Date: 09/13/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Prep Analysis Run Method Method Date Date Number	<ul> <li>NONE 350.1 NA 08/19/19 08204811</li> <li>10200H 10200H 08/14/19 08/26/19 09034847</li> <li>NONE 300.0 NA 09/09/19 09114863</li> <li>NONE 10200H 08/14/19 08/26/19 09034847</li> <li>365.2 365.2 08/27/19 08/26/19 08294840</li> <li>NONE 160.2 NA 08/15/19 08204812</li> <li>NONE 160.4 NA 08/15/19 08204813</li> </ul>
		REND LAKE 08/13/2019 1158	Units	MG/L MG/CU.M. MG/L MG/L MG/L MG/L MG/L
		Loc'n: g Date: g Time:	Result	0.173 30.4 ND 6.8 6.8 0.161 0.121 5.2 4.0
			Flag	×
		Sampling Samplin Samplin	LOQ	0.0300 1.00 1.00 1.00 0.0100 0.0100 4.00 4.0
508	80 00	6	LOD	0.0200 1.0 0.800 1.0 0.00800 0.00800 4.0 4.0 0.500
Lab Report No: 008508	Project Name: REND LAKE Project No:	ARDL No: 008508-02 Field ID: REN-2-0 Received: 08/13/2019	Analyte	Ammonia Nitrogen Chlorophyll-a, Correcte Nitrate as Nitrogen Pheophytin-a Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 711inois 62864

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-02, Inorganic Analyses

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

Lab Report No: 008508

Report Date: 09/13/2019

Project Name: REND Project No:	REND LAKE						N	Analysis: Inorganics NELAC Certified - IL100308	:: Inorganics fied - IL1003	ics 00308
ARDL No: 008508- Field ID: REN-2-5 Received: 08/13/2	008508-03 REN-2-5 08/13/2019	Sampling Samplin Samplin			REND LAKE 08/13/2019 1210			Matrix: Moisture:	:: WATER :: NA	
Analyte	LOD	ΓΟΟ	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	×	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	nded 4.0	4.00		8.0	MG/L	NONE	160.2	NA	08/15/19	08204812
Solids, Volatile Suspen	spen 4.0	4.00		DN	MG/L	NONE	160.4	NA	08/15/19	08204813
Total Organic Carbon	n 0.500	1.00		11.9	MG/L	NONE	415.1	NA	08/21/19	08294831

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-03, Inorganic Analyses

Lab Report No: 008508

Report Date: 08/21/2019

Project Name:	REND LAKE		-	P PESTICII	DES (82	70SIM-MC	D)
Project No.:	( ) TT 100000	Analytical M					
NELAC Certi:	fied - IL100308	Ртер М	ethod: 3	5100			
Field ID:	REN-3		ARDL 1	Lab No.:	00850	08-04	
Desc/Location:	REND LAKE		Lab F:	ilename:	E0820	0910	
Sample Date:	08/13/2019		Receiv	ved Date:	08/13	3/2019	
Sample Time:	1020		Prep.	Date:	08/19	9/2019	
Matrix:	WATER	•	Analy	sis Date:	08/20	0/2019	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B1108	81	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Re	sults	

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

30-130

(a) DOD-QSM Accredited Analyte.

Triphenylphosphate

888

Report Date: 09/13/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA
		REND LAKE 08/13/2019 1020
		Sampling Loc'n: REND LAKE Sampling Date: 08/13/201 Sampling Time: 1020
Lab Report No: 008508	REND LAKE	008508-04 REN-3 08/13/2019
Lab Report	Project Name: Project No:	ARDL No: 008508-04 Field ID: REN-3 Received: 08/13/2019

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

Received: 08/13/2019	6	Sam	pling T	Sampling Time: 1020						
And the A	CO 1	UC F	ל ה ב	+[::300	117 د + ندر	Prep Method	Analysis Method	Prep Date	Analysis	Run Nimber
אוומדערכ			Бот ч	NEAULC	OIITCS			רמ	המרפ	TOMINA
Ammonia Nitrogen	0.0200	0.0300		0.0454	MG/L	NONE	350.1	NA	08/19/19 08204811	08204811
Chlorophyll-a, Correcte	1.0	1.00		45.4	MG/CU.M.	10200H	10200H	08/14/19	08/26/19 09034847	09034847
Nitrate as Nitrogen	0.800	1.00	×	DN	MG/L	NONE	300.0	NA	09/09/19 09114863	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

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-04, Inorganic Analyses

Lab Report No: 008508

Report Date: 08/21/2019

Project Name:	REND LAKE	Ana	lysis: NI	P PESTICII	DES (82	70SIM-MC	D)
Project No.:		Analytical M	ethod: 82	270C			
NELAC Certi	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-4		ARDL	Lab No.:	0085	08-05	
Desc/Location:	REND LAKE		Lab F:	ilename:	E082	0911	
Sample Date:	08/13/2019		Receiv	ved Date:	08/1	3/2019	
Sample Time:	1350		Prep.	Date:	08/1	9/2019	
Matrix:	WATER		Analy	sis Date:	08/2	0/2019	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B110	81	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Re	sults	

		nobureo	
Triphenylphosphate	30-130	78%	
		1	

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

(a) DOD-QSM Accredited Analyte.

<pre>mpling Loc'n: REND LA ampling Loc'n: REND LA ampling Time: 08/13/2 ampling Time: 1350</pre>	Lab Report No: 008508							μ	Report Date:	:: 09/13/2019	019
508-05 Sampling Loc'n: REND LA Sampling Date: 08/13/2 Sampling Time: 1350 13/2019 LOQ Flag Result 13/2019 LOQ Flag Result 13/2010 0.0300 0.0302 cecte 1.0 1.00 X ND 1.00 X ND 1.00 0.0100 0.153 0.00800 0.0100 0.153 0.00800 0.0100 0.153 0.00800 0.0100 0.153 0.00800 0.0100 0.153 0.00800 0.0100 0.153 0.00800 0.0100 0.153 0.0500 1.00 9.00								Z	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
13/2019       Sampling Time: 1350         LOD       LOD       LOQ       Flag       Result         LOD       0.0200       0.0300       0.0302       0.0302         n       0.0200       0.0300       0.0302       36.3         n       0.800       1.00       X       ND         1       0       1.00       X       ND         1.0       1.00       X       ND         1.0       1.00       0.153       0.153         0.00800       0.0100       0.153       0.0744         ended       4.0       4.00       5.2         no       0.500       1.00       5.2			Samp1 Samp			LAKE 1/2019			Matrix: Moisture:	:: WATER :: NA	
LOD     LOQ     Flag     Result       100     1.00     1.00     0.0300     0.0302       100     1.00     1.00     36.3       100     1.00     1.00     36.3       100     1.00     1.00     36.3       100     1.00     1.00     36.3       100     0.800     1.00     36.3       100     1.00     0.0302     36.3       11.0     1.00     11.6     8.2       11.6     1.00     0.153     0.0744       11.6     1.00     111.6     5.2       11.6     1.00     1.00     5.2			Samp	ling T							
0.0200         0.0300         0.0302           cecte         1.0         1.00         36.3           1         0.800         1.00         36.3           1.0         1.00         X         ND           1.0         1.00         X         ND           0.800         1.00         X         ND           0.00800         0.0100         0.153           0.00800         0.0100         0.153           anded         4.0         4.00           1.00         1.00         5.2		DO DO	ГОД	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
cecte 1.0 1.00 X ND 1 0.800 1.00 X ND 1.0 1.00 X ND 0.00800 0.0100 0.153 0.00800 0.0100 0.153 ended 4.0 4.00 11.6 1.00 5.2 1.00 1 00 9 9 9		0200	0.0300		0.0302	MG/L	NONE	350.1	NA	08/19/19	08204811
1         0.800         1.00         X         ND           1.0         1.00         X         ND         8.2           0.00800         0.0100         0.153         0.153           0.00800         0.0100         0.153           anded         4.0         4.00         11.6           1.57         1.00         1.00         5.2	orrecte	0.	1.00		36.3	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
1.0 1.00 8.2 0.00800 0.0100 0.153 0.00800 0.0100 0.153 anded 4.0 4.00 11.6 ispen 4.0 7.00 5.2		800	1.00	×	ND	MG/L	NONE	300.0	NA	09/09/19	09114863
0.00800 0.0100 0.153 0.00800 0.0100 0.0744 anded 4.0 4.00 11.6 ispen 4.0 4.00 5.2	n-a 1	0.	1.00		8.2	MG/CU.M.	10200H	10200H	08/14/19	08/26/19	09034847
0.00800 0.0100 0.0744 ended 4.0 4.00 11.6 ispen 4.0 4.00 5.2		0800	0.0100		0.153	MG/L	365.2	365.2	08/27/19	08/28/19	08294840
4.0 4.00 11.6 4.0 4.00 5.2 0.500 1.00 9.9		0800	0.0100		0.0744	MG/L	NONE	365.2	NA	08/14/19	08204810
4.0 4.00 5.2 0.500 1.00 9.9		0.	4.00		11.6	MG/L	NONE	160.2	NA	08/15/19	08204812
0 500 1 00 9 9		0.	4.00		5.2	MG/L	NONE	160.4	NA	08/15/19	08204813
		500	1.00		6°6	MG/L	NONE	415.1	NA	08/22/19	08294832

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-05, Inorganic Analyses

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ARDL Report 8508 - Page 12 of 32

Lab Report No: 008508

Report Date: 08/21/2019

Project Name: Project No.:		Analytical M	ethod: 82				
NELAC Certi	fied - IL100308	Prep M	ethod: 35	510C			
Field ID:	REN-5		ARDL I	Lab No.:	00850	08-06	
Desc/Location:	REND LAKE		Lab Fi	lename:	E0820	)912	
Sample Date:	08/13/2019		Receiv	ved Date:		3/2019	
Sample Time:	0917		Prep.	Date:	08/19	9/2019	
Matrix:	WATER		Analys	sis Date:	08/20	)/2019	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B1108	31	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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.

019	ics 00308		Run
09/13/2	Inorgan ied - IL1	Matrix: WATER isture: NA	Analvsis
Report Date: 09/13/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: Moisture:	
Rep	NEL		Pren Analvsis Pren
			Pren
		REND LAKE 08/13/2019 0917	
		Sampling Loc'n: REND LAKE Sampling Date: 08/13/201 Sampling Time: 0917	
Lab Report No: 008508	REND LAKE	008508-06 REN-5 08/13/2019	
Lab Report	Project Name: Project No:	ARDL No: Field ID: Received:	

Analyte	LOD	ТОД	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	38204811
Nitrate as Nitrogen	0.800	1.00	×	DN	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

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-06, Inorganic Analyses

Lab Report No: 008508

Report Date: 08/21/2019

Project No.:	REND LAKE	Analytical M	ethod: 82		DES (82'	70SIM-MC	)D)
NELAC Certi:	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-7		ARDL 1	Lab No.:	0085	08-07	
Desc/Location:	REND LAKE		Lab F:	ilename:	E0820	0913	
Sample Date:	08/13/2019		Receiv	ved Date:	08/1	3/2019	
Sample Time:	1505		Prep.	Date:	08/1	9/2019	
Matrix:	WATER		Analys	sis Date:	08/2	0/2019	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B110	81	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Re	sults	

 Triphenylphosphate
 30-130
 73%

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

(a) DOD-QSM Accredited Analyte.

rt No: 008508 Report Date: 09/13/2019	: REND LAKE Analysis: Inorganics NELAC Certified - IL100308	008508-07 Sampling Loc'n:	: REN-7 Sampling Date: 08/13/2019 Moisture: NA : 08/13/2019 Sampling Time: 1505	Prep Analysis Prep Analysis Run	lyte LOD LOQ Flag Result Units Method Method Date Date Number	ogen 0.0200 0.0300 0.096 MG/L NONE 350.1 NA 08/19/19 08204811	0.800 1.00 X ND	0.00800 0.0100 0.455 MG/L 365.2 365.2 08/27/19 08/28/19 08294840	-ortho 0.00800 0.0100 0.172 MG/L NONE 365.2 NA 08/14/19 08204810	10.0 10.0 ND MG/L NONE 160.2	10.0 10.0 ND	c Carbon 1.0 2.00 13.2 MG/L NONE 415.1 NA 08/23/19 08294832	
Lab Report No: 0085	Project Name: REND LAKE Project No:	ARDL No: 008508-07	Field ID: REN-7 Received: 08/13/201		Analyte	Ammonia Nitrogen	Nitrate as Nitrogen	Phosphorus	Phosphorus, -ortho	Solids, Total Suspended	Solids, Volatile Suspen	Total Organic Carbon	

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-07, Inorganic Analyses

Lab Report No:	008508	Repo	ort Date	: 08/21,	/2019		
Project Name:	REND LAKE		-	P PESTICII	DES (827	70SIM-MC	DD)
Project No.:		Analytical Me					
NELAC Certi:	fied - IL100308	Prep Me	ethod: 3	510C			
Field ID:	REN-9		ARDL 1	Lab No.:	00850	08-08	
Desc/Location:	REND LAKE		Lab F:	ilename:	E0820	0914	
Sample Date:	08/13/2019		Receiv	ved Date:	08/13	3/2019	
Sample Time:	1235		Prep.	Date:	08/19	9/2019	
Matrix:	WATER		Analys	sis Date:	08/20	0/2019	
Amount Used:	800 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1108	31	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOVI	ERIES:	Lim	its		Res	sults	

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

30-130

(a) DOD-QSM Accredited Analyte.

Triphenylphosphate

84%

Lab Report No: 008508	08						щ	Report Date:	: 09/13/2019	019
Project Name: REND LAKE Project No:								Analysis: ELAC Certif:	Analysis: Inorganics NELAC Certified - IL100308	lcs 00308
ARDL No: 008508-08 Field ID: REN-9 Received: 08/13/2019	6	Sampl Samp Samp	Sampling Loc'n: Sampling Date: Sampling Time:		REND LAKE 08/13/2019 1235			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen Chlorophyll-a, Correcte Nitrate as Nitrogen Pheophytin-a Phosphorus Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon	$\begin{array}{c} 0.0200\\ 1.0\\ 0.800\\ 1.0\\ 0.00800\\ 0.00800\\ 4.0\\ 4.0\\ 1.0\end{array}$	0.0300 1.00 1.00 1.00 0.0100 4.00 4.00 2.00	×	0.117 57.3 ND 16.6 0.24 0.0563 17.6 6.0 10.0	MG/L MG/CU.M. MG/L MG/L MG/L MG/L MG/L	NONE 10200H NONE 10200H 365.2 NONE NONE NONE NONE	350.1 350.1 10200H 300.0 10200H 365.2 365.2 365.2 160.4 415.1	NA 08/14/19 NA 08/14/19 08/27/19 NA NA NA NA NA	08/19/19 08/26/19 08/26/19 08/28/19 08/15/19 08/15/19 08/15/19 08/23/19	08204811 09034847 09114863 09034847 08294840 08204810 08204810 08204812 08204813 08204813 08294832

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-08, Inorganic Analyses

08/21/2019

Lab Report No:	008508	Report Date:	08/21/201	.9
Project Name:	REND LAKE	Analysis: NP	PESTICIDES	(8270SIM-MOD)

Project No.:	KEND LAKE	Analytical	Mothod: 8		JES (02	/051M-MO	)
-	fied - IL100308		Method: 3				
NEEKC CEICI	1160 - 10100500	rreb	Method. J	5100			
Field ID:	REN-15-0		ARDL	Lab No.:	0085	08-09	
Desc/Location:	REND LAKE		Lab F	ilename:	E082	0915	
Sample Date:	08/13/2019		Recei	ved Date:	08/1	3/2019	
Sample Time:	1410		Prep.	Date:	08/1	9/2019	
Matrix:	WATER		Analy	sis Date:	08/2	0/2019	
Amount Used:	1000 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B110	81	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
	<u></u>				Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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%	İ

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

(a) DOD-QSM Accredited Analyte.

თ	s 308		Run Number	08204811 09234847 09114863 09034847 08294840 08204812 08204812 08204812 08204813
09/13/2019	Analysis: Inorganics NELAC Certified - IL100308	WATER NA	Analysis Date N	08/19/19 08 08/26/19 09 09/09/19 09 08/26/19 09 08/28/19 08 08/14/19 08 08/15/19 08 08/15/19 08
Report Date:	Analysis: ELAC Certifi	Matrix: Moisture:	Prep Date	NA 08/14/19 NA 08/14/19 08/27/19 NA NA NA NA
й	N		Analysis Method	350.1 10200H 300.0 10200H 365.2 365.2 365.2 160.2 160.4 415.1
			Prep Method	NONE 10200H NONE 10200H 365.2 NONE NONE NONE NONE
		REND LAKE 08/13/2019 1410	Units	MG/L MG/CU.M. MG/CU.M. MG/L MG/L MG/L MG/L MG/L
			Result	0.0343 35.4 ND 7.8 0.149 0.0692 10.8 4.8 12.8
		Sampling Loc'n: Sampling Date: Sampling Time:	Flag	×
		Sampl Samp Samp	LOQ	0.0300 1.00 1.00 1.00 0.0100 0.0100 4.00 4.0
08		σ	LOD	0.0200 1.0 0.800 1.0 0.00800 0.00800 4.0 4.0 1.0
Lab Report No: 008508	Project Name: REND LAKE Project No:	ARDL No: 008508-09 Field ID: REN-15-0 Received: 08/13/2019	Analyte	Ammonia Nitrogen Chlorophyll-a, Correcte Nitrate as Nitrogen Pheophytin-a Phosphorus Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon

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

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-09, Inorganic Analyses

Page 1 of 1

Box 1566 62864	Report Date: 09/13/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Prep Analysis Run Method Method Date Date Number	NONE 1604 NA 08/13/19 08154798	
ARDL, INC. 400 Aviation Drive; P.O. B Mt. Vernon, Illinois 6			Sampling Loc'n: REND LAKE Sampling Date: 08/13/2019 Sampling Time: 1306	LOQ Flag Result Units	1.00 212 COL/100 ML	
	Lab Report No: 008508	Project Name: REND LAKE Project No:	ARDL No: 008508-10 Field ID: REN-RL-MAR Received: 08/13/2019	Analyte LOD	E. Coliform 1.0	

(a) DOD and/or NELAC Accredited Analyte.

Sample 008508-10, Inorganic Analyses

# 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	Analysi	.s: NP PESI	CICIDES (82	270SIM-M	OD)
Project No.:		Analytical Metho	d: 8270C			
NELAC Certi	fied - IL100308	Prep Metho	od: 3510C			
Field ID:	NA	Z	ARDL Lab No	.: 0085	508-01B1	
Desc/Location:	NA	I	ab Filenan	ne: E082	20903	
Sample Date:	NA	F	Received Da	te: NA		
Sample Time:	NA	E	rep. Date:	08/1	L9/2019	
Matrix:	QC Material	I	Analysis Da	te: 08/2	20/2019	
Amount Used:	1000 mL	]	Instrument	ID: AG5		
Final Volume:	1 mL	Ç	QC Batch:	B110	)81	
% Moisture:	NA	I	evel:	LOW		
					Data	
Parameter		LOD	LOQ	Result	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 RECOV	ERIES:	Limits		Re	esults	
Triphenylphosph	ate	30-130		-	101%	

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

(a) DOD-QSM Accredited Analyte.

Blank for Run B11081, NP PESTICIDES (8270SIM-MOD)

Mt. Vernon, IL 400 Aviation Drive; P.O. Box 1566 BLANK SUMMARY REPORT ARDL, INC.

Lab Report No: 008508

REND LAKE

Project Name:

Report Date: 09/13/2019

62864

1	

NELAC Certified - IL100308

LOD 0.040 0.004 1.0 1.0 1.0 0.80 0.80 0.008 0.008 0.008 0.008 0.008	Blank		Prep	Analysis	Prep	Analysis		QC Lab
0.040 ese 0.004 trogen 0.020 n 1.0 Nitrogen 1.0 Nitrogen 0.80 -a 0.008 , -ortho 0.008	Result	Units	Method	Method	Date	Date	Run	Number
ese 0.004 trogen 0.020 n 1.0 n 1.0 Nitrogen 0.80 -a 1.0 0.008 o.008 v -ortho 0.008	50 ND	MG/L	3010A	6010C	08/19/19	08/23/19	P7250	008508-01B1
trogen 0.020 l-a, Corre 1.0 n 1.0 Nitrogen 0.80 -a 1.0 0.008 , -ortho 0.008 tal Suspen 1.0	05 ND	MG/L	3010A	6010C	08/19/19	08/23/19	P7250	008508-01B1
<pre>l-a, Corre 1.0 n n 1.0 Nitrogen 0.80 -a 1.0 0.008 , -ortho 0.008 tal Suspen 1.0</pre>	30 ND	MG/L	NONE	350.1	NA	08/19/19	08204811	008508-01B1
n 1.0 Nitrogen 0.80 -a 1.0 0.008 , -ortho 0.008 tal Suspen 1.0	ON 0	MG/CU.M.	10200H	10200H	08/14/19	08/26/19 (	09034847	008508-05B1
Nitrogen 0.80 -a 1.0 0.008 -ortho 0.008 tal Suspen 1.0	ON 0	COL/100 ML	NONE	1604	NA	08/13/19 (	08154798	008508-10B1
-a 1.0 0.008 -ortho 0.008 tal Suspen 1.0	ON 0	MG/L	NONE	300.0	NA	09/09/19	09114863	008508-02B1
0.008 -ortho 0.008 tal Suspen 1.0	DN 0	MG/CU.M.	10200H	10200H	08/14/19	08/26/19 (	09034847	008508-05B1
0.008 en 1.0	10 ND	MG/L	365.2	365.2	08/27/19	08/28/19 (	08294840	008508-04B1
1.0	10 ND	MG/L	NONE	365.2	NA	08/14/19 (	08204810	008508-01B1
	ON 0	MG/L	NONE	160.2	NA	08/15/19 (	08204812	008508-01B1
Solids, Volatile Sus 1.0 1.0	ON 0	MG/L	NONE	160.4	NA	08/15/19 (	08204813	008508-01B1
Total Organic Carbon 0.50 1.0	DN 0	MG/L	NONE	415.1	NA	08/21/19 (	08294831	008508-01B1
Total Organic Carbon 0.50 1.0	ON 0	MG/L	NONE	415.1	NA	08/22/19 (	08294832	008508-05B1

(a) DOD and/or NELAC Accredited Analyte Inorganic Method Blanks for 008508

	ARDL, INC.	INC.	BLANK 400 Av	5	PIKE DU Drive;	PLICATE P.O. BC	SPIKE/SPIKE DUPLICATE REPORT iation Drive; P.O. Box 1566	Mt. Ve	Vernon, IL	LL 62864	
Lab Report No: 00	008508								Re	Report Date:	08/21/2019
Project Name: REND Project No.:	REND LAKE		Anal	Analysis: NP PE	PESTICIDES	5 (8270SIM-MOD)	( dom-m	Anal	Analytical Method: Prep Method:	Method: 8270C Method: 3510C	000
Matrix: QC Amount Used: 100	QC Material 1000 mL			QC Batch: Level:	B11081 LOW	31		Prep. I Analys:	Prep. Date: Analysis Date:	08/19/2019 08/20/2019	6 6
Parameter		Spike Result	t e	Spike Level	Spike I * Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	lin	3.68			92			-	30-130		
Atrazine	ne	3.2	01	4	80	1		ł	30-130	1	!
Metribuzin	ızin	3.19	•	4	80	1	-	ł	30-130	1	
Alachlor	or	3.18	~	4	80	ł		ł	30-130	ł	1
Metolachlor	llor	3.57	~	4	89	{		1	30-130	1	E II
Chlorpyrifos	rifos	3.14		4	19	{	1		30-130		1
Cyanazine	ne	3.99		4	100	1	1	1	30-130	1	
Pendimethalin	alin	3.75	10	4	94	1	!	1	30-130	1	1
	SURR	SURROGATE RECOVERIES:	RIES:		Spike %R		Duplicate %R	%R Limits			
	Trip	Triphenylphosphate	ite		92.5			30-130			

(a) DOD-QSM Accredited Analyte.

'\*' indicates a recovery outside of standard limits. Spike Blanks for 008508-01, NP FESTICIDES (8270SIM-MOD)

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AI	ARDL, INC.	400 A1	400 Aviation Drive; P.O.	DELVE						
Lab Report No: 0	008508								Report Date:	ate: 09/13/2019
Project Name:	REND LAKE								NELAC Ce	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	1	1		87-115		P7250	008508-01C1
(a) Manganese	0.76	0.75	101		1	1	90-114		P7250	008508-01C1
Ammonia Nitrogen	1.0	1.0	100	1	1	1	80-120	1	08204811	008508-01C1
Nitrate as Nitrogen	13.0	14.0	93	ł	ł	ł	80-120	1	09114863	008508-02C1
Phosphorus	0.60	0.67	06	ł	1	1	80-120	ł	08294840	008508-04C1
Phosphorus, -ortho	0.11	0.10	105	ł	ł	}	80-120	1	08204810	008508-01C1
Total Organic Carbon	56.4	52.6	107	ł	ł	ł	76-120	1	08294831	008508-01C1
Total Organic Carbon	55.1	52.6	105	!	ł	1	76-120	1	08294832	008508-05C1
NOTE: Any values (a) DOD and/or N	NOTE: Any values tabulated above marked with an (a) DOD and/or NELAC Accredited Analyte	ırked with Ilyte		sk are outs	asterisk are outside of acceptable limits.	sptable li	imits.			

Page 1 of 1

Inorganic LCS Results for 008508

<b>f</b> Lab Report No: 008508	<b>ARDL, INC</b> .	INC.	MATRIX 400 Avi	SPIKE/Si iation Du	SPIKE/SPIKE DUPLICATE ation Drive; P.O. Box	ICATE REPORT . Box 1566		<b>Mt. Vernon, IL</b> Repor	<b>IL</b> Report	<b>62864</b> Date:	08/21/2019
Project Name: REND LAKE Project No.:	AKE		Analysi	is: NP PES	PESTICIDES (82	(8270SIM-MOD)	Į	Analytical Method: Prep Method:	ical Method: Prep Method:	d: 8270C d: 3510C	
Field ID: REN-1 Desc/Location: REND LAKE Sample Date: 08/13/2019	LAKE /2019		PP PP	Prep. Date: Amount Used: % Moisture:	08/19/2019 : 1000 mL NA	5	ARI Lak Rec	ARDL Lab No.: Lab Filename: Received Date:		008508-01 08/13/2019	
			L Q	QC Batch: Level:	B11081 LOW		Ana	Analysis Date:		08/20/2019	
		Sample	MS	W	WS	MSD	MSD	MSD	% Rec		RPD
Parameter		Result	Result	t Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit
Trifluralin		QN	3.4	4	85	3.38	4	84.5 3	30-130	0.6	30
Atrazine		0.890	3.95	5 4	76.5	3.79	4	72.5 3	30-130	4.1	30
Metribuzin		DN	3.08	3 4	77	2.93	4	73.3 3	30-130	ъ	30
Alachlor		ND	2.95	5 4	73.8	2.88	4	72 3	30-130	2.4	30
Metolachlor		0.380	3.75	5 4	84.3	3.65	4	81.8 3	30-130	2.7	30
Chlorpyrifos		<b>UN</b>	2.88	3 4	72	2.83	ቅ	70.8 3	30-130	1.8	30
Cyanazine		UN	3.74	4	93.5	3.61	4	90.3 3	30-130	3.5	30
Pendimethalin		CIN	3.51	4	87.8	3.48	4	87 3	30-130	6.0	30
	SURR	SURROGATE RECOVERIES:	ERIES:		MS &R	MSD &R	%R Limits	N			
								,			

(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)

Page l of l

•

30-130

89

87

Triphenylphosphate

ARDL Report 8508 - Page 26 of 32

	62864
	Ц
_	Vernon,
<b>REPORT</b>	Mt.
DUPLICATE	Box 1566
MATRIX SPIKE/SPIKE DU	00 Aviation Drive; P.O.
	INC. 4
	ARDL,

Lab Report No: 008508

Report Date: 09/13/2019

REND LAKE Project Name:

NELAC Certified - IL100308

	e Cume S	Samole	SM	S M	Š	USW	USW	USM	ዱ ርር ርር		RPD		OC Lab
Analyte	Matrix	Result	Result	Level	% Rec	Result	Level	* Rec	Limits	RPD	Limit	Run	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	7	20	08204811	008508-01MS
Nitrate as Nitrogen	WATER	UN	7.5	8.0	94	7.4	8.0	63	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	6.9	14.6	5.0	94	14.7	5.0	96	76-120	ч	20	08294832	008508-05MS

Inorganic Matrix Spikes for 008508

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative. (a) DOD and/or NELAC Accredited Analyte.

, IL 62864	Report Date: 09/13/2019	NELAC Certified - IL100308	Analytical QC Lab Run Number	09034847 008508-05D1 09034847 008508-05D1 08204812 008508-01D1 08204813 008508-01D1 08204813 008508-01D1
Mt. Vernon, IL	Rej	NEJ	Mean Aı (Smp,D1,D2)	
LE REPORT Box 1566			Percent Diff (	N 4 4 0
SAMPLE DUPLICATE REPORT Lation Drive; P.O. Box 1566			Units	MG/CU.M. MG/L MG/L
SAMPLE ation Dri			Second Duplicate	
400 Avia			First Duplicate	с с с с с с с с с с с с с с с с с с с
INC.	œ	LAKE	Sample Conc'n	36.3 8.7 ND ND
ARDL, INC.	Lab Report No: 008508	Project Name: REND	Analyte	Chlorophyll-a, Corrected Pheophytin-a Solids, Total Suspended Solids, Volatile Suspend

(a) DOD and/or NELAC Accredited Analyte Sample Duplicates for 008508

# Sample Receipt Information

Including as appropriate:

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

ARDL Data Package 8508

Authorized By: DSD-QAO

8058

ARDL, Inc. <sup>P.</sup>	P.O. Box 1566, 400 Aviation Drive, Mt. (618) 244-3235 Phone (618)	Box 1566, 400 Aviation (618) 244-3235 Phone	ion D.	rive, l (61		ve, Mt. Vernon, IL 62864 (618) 244-1149 Fax	, IL 6 9 Fax	2864									0	CHAI	IN OF	CHAIN OF CUSTODY RECORD	λдо	REC	ORD	
PROJECT Rend Lake $\frac{7}{15}$	5	542						$\left[ \right]$														PRESE	PRESERVATION	Z
SAMPLERS: (Signature) Orece Referre Con	Scelar?		SONTAINE		SSAL	PO J-1 DO J-1 SSAJ		CHN	N-C	- UM			$\searrow$	$\searrow$	$\sim$	$\overline{}$					dubi	ICED	SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN	A LIE
	IIME	COMP COMP		SS	20145	30		NEN	00/20/20/20/20/20/20/20/20/20/20/20/20/2	SNISM SINSW SI	NISA				$\sim$		SA	REMARKS OR SAMPLE LOCATION	REMARKS OR PLE LOCAT	NOIT				
-) Ren - 1 8/3/19	0111 51	X	~	X	X	X	X	X	X	X					-						~	X		Γ
2 Ren – 2 – 0	1158	x	n	XX	X	×	X	X														X		
3 Rén – 2 – 5	0151	X	~	X	X	X	X		X						-							X		
y Ren – 3	ara	X	~	X X	X	X	X	X													n l	X		
s Ren – 4	135/)	X	~	X X	X	X	X	X													r	X		
k Ren – 5	€1.60	X	~	X	X	X	X	X													ri I	X		
A Ren – 7	1505	X	$\sim$	X	X	X	X	X													n	X		
2 Ren – 8	1235	x	Ś	X X	X	X	X	X													n	X		
A Ren – 15-0	1410	Х	X	X X	X	Х	X	Х													n	X		
Ren-RL-Mar	1306	X								X												X		
																	1							
AF																							- {	
RDL			_							-					$\neg$									
Rep				_											_									
Behnquished by: (Signature) Date	9 1509	Received by: (Signature	ed by: (	Sign	(and	200	RE	MAR	KS/SF	REMARKS/SPECIAL INSTRUCTIONS:	LIN	TRU	CTIO	NS:										
Prelinquished By: (Spenature) Date	0	Receiv		(Signature	uture)	2 Avenue and a second																		
Sived for Laboratory by. D		Shipping Ticket No.	Tick	et No																				
o b 55 PURCHASE ORDER NO:																								]

# COOLER RECEIPT REPORT ARDL, INC.

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ARDI	L#: <u>8509</u>	Coc	oler # <u>/ ィノ ス</u> nber of Coolers in Shi		9	
Proje	ect: Rend LAKE		e Received: $8 - 13$		5	-
	PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 9-1				1-11	
	Did cooler come with a shipping slip (airbill, etc.)?					
1. L				5	~	
	If YES, enter carrier name and airbill number here:				-	 
2. V	Nere custody seals on outside of cooler?					N/A
	How many and where?,Seal Date					
	Nere custody seals unbroken and intact at the date and time of arrival?					NA
	Did you screen samples for radioactivity using a Geiger Counter?				NO	
	Nere custody papers sealed in a plastic bag?				NO	
	Nere custody papers filled out properly (ink, signed, etc.)?				NO	N/A
7. V	Nere custody papers signed in appropriate place by ARDL personnel?			¥ES	NO	N/A
8. V	Nas project identifiable from custody papers? If YES, enter project name a	at the top	o of this form		NO	N/A
9. V	Was a separate container provided for measuring temperature? YES	NO_	Coler Te	mp. <u>2, 7</u> prrection factor	C C C	C
В. <u>I</u>	LOG-IN PHASE: Date samples were logged-in: 8 - 14 - 19	_(Signat	ture) Dr Cale	kum	0.0	
10. E	Describe type of packing in cooler: <u>loase</u> ice					
11. V	Were all samples sealed in separate plastic bags?			YES	NO	N/A
12. [	Did all containers arrive unbroken and were labels in good condition?				NO	
13. V	Were sample labels complete?			YES	NO	
14. E	Did all sample labels agree with custody papers?				NO	
15. N	Were correct containers used for the tests indicated?				NO	
16. \	Was pH correct on preserved water samples?			ÝES	) NO	N/A
17. ۱	Was a sufficient amount of sample sent for tests indicated?			ÝES	> 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:		Sample	e Transfer		]
			Fraction	Fraction		
		-	all_	Area #		<u> </u>
	,		leralkin	,		
			Area # $\frac{WRlRin}{By}$ $\frac{Rlc}{9}$ $\frac{Rlc}{9}$	Ву		
		_	On	On		
			8-14-19			
					1	
		-	Chain-of-Custody #	# <u>//</u> _	N	
(B)	/: Signature) Date:					

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COOLER	R RECEIP	T REPORT
	ARDL, IN	С.

.

ARDL #:	Cooler # <u>2 of 2</u> Number of Coolers in Shipment: <u>2</u>
Project: <u>Rend LAKe</u>	Date Received: 8 - 13 - 19
A. PRELIMINARY EXAMINATION PHASE: Date cooler was opened:	13-19 (Signature) Stackrum
1. Did cooler come with a shipping slip (airbill, etc.)?	
If YES, enter carrier name and airbill number here:	100 May
<ol> <li>Were custody seals on outside of cooler?</li> </ol>	
How many and where?,Seal Da	
6. Were custody papers filled out properly (ink, signed, etc.)?	
7. Were custody papers signed in appropriate place by ARDL personnel?	
8. Was project identifiable from custody papers? If YES, enter project name	
9. Was a separate container provided for measuring temperature? YES_	NO Observed Cooler TempC Correction factorC
B. LOG-IN PHASE: Date samples were logged-in: 8 - 14 - 19	(Signature) A.M. Lachterm
10. Describe type of packing in cooler: Liense ite	
11. Were all samples sealed in separate plastic bags?	
12. Did all containers arrive unbroken and were labels in good condition?	VES NO
13. Were sample labels complete?	
14. Did all sample labels agree with custody papers?	
15. Were correct containers used for the tests indicated?	WES NO
16. Was pH correct on preserved water samples?	
17. Was a sufficient amount of sample sent for tests indicated?	
18. Were bubbles absent in VOA samples? If NO, list by sample #:	YES NO (1
19. Was the ARDL project coordinator notified of any deficiencies?	
Comments and/or Corrective Action:	Sample Transfer
	Fraction Fraction
	Area # Area #
	Alea# Alea#
	Ву Ву
	On On
	Area # Area # <i>Walkin</i> By By <i>Cle</i> On <i>S</i> -14-19 On
	L
	Chain-of-Custody #
(By: Signature) Date:	

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Environmental | Analytical | Management | Safety

# **Customer Name: SLCOE**

# **Project Name: Rend Lake**

Samples Received at ARDL: 10/17/19

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

<u>www.ardlinc.com</u>

Date: 11/7/19

Lab Name: ARDL, Inc.

ARDL Report No.: 8560

# CASE NARRATIVE

<u>Customer</u>	Date	Lab ID	
<u>Sample No.</u>	<u>Collected</u>	<u>Number</u>	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)
<b>REN-RL-MAR</b>	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.

"Test everything, keep the good" 1 Thes. 5:21

# Project Name: Rend Lake

# ARDL Report No.: 8560

# **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

Page 2 of 2

# 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

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Authorized By: DSD-QAO

ARDL Report 8560 - Page 3 of 32

Lab Report No: 008560

Report Date: 10/29/2019

Project Name: REND LAKE Project No.: NELAC Certified - IL10	Analytical Method:	8270C	S (8270SIM-MO	D)
Field ID: REN-1	ARDL	Lab No.:	008560-01	
Desc/Location: REND LAKE	Lab	Filename:	E1028909	
Sample Date: 10/17/2019	Rece	ived Date:	10/17/2019	
Sample Time: 1013	Prep	. Date:	10/22/2019	
Matrix: WATER	Anal	ysis Date:	10/28/2019	
Amount Used: 900 mL	Inst	rument ID:	AG5	
Final Volume: 1 mL	QC B	atch:	B11128	
% Moisture: NA	Leve	1:	LOW	
			Data	Dilution
Parameter	LOD LOQ	Result	Flag Units	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.

Lab Report No: 008560

Report Date: 11/07/2019

Project Name: REND LAKE Project No:	E						N	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
ARDL No: 008560-01 Field ID: REN-1 Received: 10/17/2019	1	Samp] Samr Samr	Sampling Loc'n: Sampling Date: Sampling Time:		REND LAKE 10/17/2019 1013			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	Γοδ	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	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.

Sample 008560-01, Inorganic Analyses

Lab Report No: 008560

Report Date: 10/29/2019

Project Name:	REND LAKE			PESTICI	DES (827	/OSIM-MO	D)
Project No.:		Analytical M					
NELAC Certi	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-2-0		ARDL 1	Lab No.:	00856	60-02	
Desc/Location:	REND LAKE		Lab F:	ilename:	E1028	3911	
Sample Date:	10/17/2019		Receiv	ved Date:	10/17	7/2019	
Sample Time:	1055		Prep.	Date:	10/22	2/2019	
Matrix:	WATER		Analy	sis Date:	10/28	3/2019	
Amount Used:	1000 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1112	28	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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.

(a) DOD-QSM Accredited Analyte.

HAN REPUTE NU: UU0300										)   )
Project Name: REND LAKE Project No:	ы						2	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
ARDL No: 008560-02 Field ID: REN-2-0 Received: 10/17/2019	19	Sampl Samp Samp	Sampling Loc'n: Sampling Date: Sampling Time:		REND LAKE 10/17/2019 1055			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300	ں ا	0.0282	MG/L		350.1	NA		11015022
Chlorophyll-a, Correcte	C	1.00		40.9	MG/CU.M.	10200H	10200H	10/18/19 MM	11/04/19	11055041 11065043
NILLALE AS NILLOGEN Pheophytin-a	0.13U	U.UZUU 1.00	Ŀ	0.043 15.7	MG/CU.M.		10200H	NA 10/18/19		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

(a) DOD and/or NELAC Accredited Analyte.

Sample 008560-02, Inorganic Analyses

Report Date: 11/07/2019	Analysis: Inorganics NELAC Certified - IL100308	ng Loc'n: REND LAKE Matrix: WATER ing Date: 10/17/2019 ing Time: 1045	Flag Result Units Method Method Date Date Number	0.307       MG/L       3010A       6010C       10/24/19       10/24/19       P7290B         0.267       MG/L       3010A       6010C       10/24/19       10/24/19       P7290B         0.267       MG/L       3010A       6010C       10/24/19       10/24/19       P7290B         0.0411       MG/L       NONE       350.1       NA       10/22/19       11015022         0.073       MG/L       NONE       GREEN       NA       11/01/19       11065043         0.322       MG/L       NONE       365.2       365.2       11/04/19       11065043         0.322       MG/L       NONE       365.2       11/04/19       11065042       11065043         15.2       MG/L       NONE       160.2       NA       10/18/19       11065043         15.2       MG/L       NONE       160.2       NA       10/22/19       1015023         15.2       MG/L       NONE       160.4       NA       10/22/19       10245007         5.2       MG/L       NONE       160.4       NA       10/22/19       10245007
		Sampling Loc'n: RE Sampling Date: 10 Sampling Time: 10	LOQ Flag Result	0.0500 0.00500 0.0300 0.0300 0.0411 0.0411 0.0411 0.0411 0.0411 0.0411 0.0411 0.0750 0.0750 0.0750 0.0750 0.0750 0.0750 0.0750 0.0750 0.0750 0.0750000000000
008560	LKE	-03 	LOD	0.0400 0.00400 0.0200 0.0190 0.00800 1.0 1.0
Lab Report No: 00	Project Name: REND LAKE Project No:	ARDL No: 008560-03 Field ID: REN-2-5 Received: 10/17/2019	Analyte	<ul> <li>(a) Iron</li> <li>(a) Manganese</li> <li>Ammonia Nitrogen</li> <li>Antrogen</li> <li>Nitrate as Nitrogen</li> <li>Phosphorus</li> <li>Phosphorus, -ortho</li> <li>Solids, Total Suspended</li> <li>Solids, Volatile Suspended</li> </ul>

(a) DOD and/or NELAC Accredited Analyte.

Sample 008560-03, Inorganic Analyses

Lab Report No: 008560

Report Date: 10/29/2019

Project Name:	REND LAKE		-	P PESTICII	DES (82	70SIM-MC	D)
Project No.:		Analytical M					
NELAC Certi	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-3		ARDL	Lab No.:	0085	60-04	
Desc/Location:	REND LAKE		Lab F:	ilename:	E102	8912	
Sample Date:	10/17/2019		Receiv	ved Date:	10/1	7/2019	
Sample Time:	1155		Prep.	Date:	10/2	2/2019	
Matrix:	WATER		Analy	sis Date:	10/2	8/2019	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B111	28	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Re	sults	

		Reparted	I
Triphenylphosphate	30-130	93%	
		~~~~~	

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

(a) DOD-QSM Accredited Analyte.

		4	400 Avi Mt.	Aviation Drive; tt. Vernon, Illi	P.O. nois	Box 1566 62864	Q			
Lab Report No: 008560	60						Ц	Report Date:	: 11/07/2019	019
Project Name: REND LAKE Project No:							N	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
ARDL No: 008560-04 Field ID: REN-3 Received: 10/17/2019	6	Samplin Sampli Sampli	н Б ц б ц б ц		REND LAKE 10/17/2019 1155			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ГОД	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen Chlorophyll-a, Correcte	0.0200 1.0	0.0300 1.00		ND 40.9	MG/L MG/CU.M.	NONE 10200H	350.1 10200H	NA 10/18/19		11015022 11055041
Nitrate as Nitrogen Pheophytin-a	0.0190 1.0	0.0200 1.00		ND 7.4	MG/L MG/CU.M.	NONE 10200H	GREEN 10200H	NA 10/18/19	11/01/19 11/04/19	11065043 11055041
Phosphorus Phosphorus, -ortho	0.00800 0.00800	0.0100 0.0100		0.138 0.0314	MG/L MG/L	365.2 NONE	365.2 365.2	11/04/19 NA	11/05/19 10/18/19	11065042 11015023
Solids, Total Suspended Solids, Volatile Suspen	1.0	1.0		13.6 6.8	MG/L MG/L	NONE	160.2 160.4	NA NA	10/22/19 10/22/19	10245007 10245008
Total Organic Carbon	0.500	1.00		6.4	MG/L	NONE	415.1	NA		TA3826

ARDL, INC.

(a) DOD and/or NELAC Accredited Analyte.

Sample 008560-04, Inorganic Analyses

Page 1 of 1

Lab Report No: 008560

Report Date: 10/29/2019

Project No.:	REND LAKE	Analytical Me	ethod: 82		DES (827	70SIM-MO	D)
NELAC Certi:	fied - IL100308	Prep Me	ethod: 3	5100			
Field ID:	REN-4		ARDL 1	Lab No.:	00856	60-05	
Desc/Location:	REND LAKE		Lab F:	ilename:	E1028	3913	
Sample Date:	10/17/2019		Receiv	ved Date:	10/17	7/2019	
Sample Time:	1231		Prep.	Date:	10/22	2/2019	
Matrix:	WATER		Analy	sis Date:	10/28	3/2019	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	ch:	B1112	28	
% Moisture:	NA		Level	:	LOW		
				n norman a final de la companya de l	Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Rea	sults	

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

30-130

(a) DOD-QSM Accredited Analyte.

Triphenylphosphate

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89%

ARDL, INC:400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IIIInois 62864Lab Report No:008560Project Name: REND IAKEReport Date: 11/07/2019Project Name: REND IAKEReport Date: 10/07/2019Project No:Sampling Loc'n: REND LAKEProject No:Sampling Loc'n: REND LAKERED No:008560-05Sampling Loc'n: REND LAKEMatysisRED No:O08560-05Report Date: 10/17/2019Sampling Toc'n: REND LAKERED No:O08560-05RED No:008560-05Received: 10/17/2019Sampling Toc'n: REND LAKERED No:008560-05Received: 10/17/2019Sampling Toc'n: REND LAKERED No:008560-05Received: 10/17/2019Sampling Toc'n: REND LAKEReceived: 10/17/2019NGC/LReceived: 10/17/2019NGC/L
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(a) DOD and/or NELAC Accredited Analyte.

Sample 008560-05, Inorganic Analyses

Lab Report No: 008560

Report Date: 10/29/2019

URROGATE RECOV	ERIES:	Lim	its		Rea	sults	
						- 	
Pendimethalin		0.200	0.200	ND		UG/L	1
Cyanazine		0.200	0.200	ND		UG/L	1
Chlorpyrifos		0.200	0.200	ND		UG/L	1
Metolachlor		0.200	0.200	ND		UG/L	1
Alachlor		0.200	0.200	ND		UG/L	1
Metribuzin		0.200	0.200	ND		UG/L	1
Atrazine		0.200	0.200	ND		UG/L	1
Trifluralin		0.200	0.200	ND		UG/L	1
Parameter		LOD	LOQ	Result	Flag	Units	Factor
					Data		Dilution
% Moisture:	NA		Level	:	LOW		
Final Volume:	1 mL		QC Bat		B1112	28	
Amount Used:	1000 mL			ument ID:	AG5	20	
Matrix:	WATER		-	sis Date:		3/2019	
<b>L</b>	0915		-	Date:		2/2019	
Sample Date:	10/17/2019			ved Date:		7/2019	
Desc/Location:				ilename:	E1028		
Field ID:	REN-5			Lab No.:		60-06	
5	fied - IL100308	-	ethod: 3				
Project Name: Project No.:	REND LAKE	Analytical M	-	PESTICII	02	/ 00111 110	,

Triphenylphosphate 30-130 Surrogate recoveries marked with '\*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

Page 1 of 1

888

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

Lab Report No: 008560

Report Date: 11/07/2019

Project Name: REND LAKE Project No:	E						Ν	Analysis: ELAC Certifi(	Analysis: Inorganics NELAC Certified - IL100308	.cs 10308
ARDL No: 008560-06 Field ID: REN-5 Received: 10/17/2019	6	Samplin Sampli Sampli	Sampling Loc'n: Sampling Date: Sampling Time:	1: REND LAKE 10/17/2019 1: 0915	AKE 2019			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	F LOQ	Flag R	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen Nitrate as Nitrogen Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon	0.0200 0.0190 0.00800 1.0 1.0 0.500	0.0300 0.0200 0.0100 1.0 1.0 1.0	0	0.0946 0.338 0.151 0.078 6.9 ND 7.5	1/9M 1/9M 1/9M 1/9M 1/9M 1/9M	NONE NONE 365.2 NONE NONE NONE NONE	350.1 GREEN 365.2 365.2 160.2 160.4 415.1	NA NA NA NA NA NA NA NA NA	10/22/19 11015022 11/01/19 11065043 11/05/19 11065042 10/18/19 11015023 10/22/19 10245007 10/22/19 10245008 10/22/19 10245008	11015022 11065043 11065042 11015023 10245007 10245008 TA3826

(a) DOD and/or NELAC Accredited Analyte.

Sample 008560-06, Inorganic Analyses

Lab Report No: 008560

Report Date: 10/29/2019

Project No.:	REND LAKE	Analytical M	ethod: 82		)ES (827	70SIM-MC	D)
NELAC Certi	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-7		ARDL	Lab No.:	00850	60-07	
Desc/Location:	REND LAKE		Lab F	ilename:	E1028	8915	
Sample Date:	10/17/2019		Receiv	ved Date:	10/1	7/2019	
Sample Time:	1405		Prep.	Date:	10/22	2/2019	
Matrix:	WATER		Analy	sis Date:	10/28	8/2019	
Amount Used:	1000 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1112	28	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Rea	sults	
Triphenylphosph	ate	30-	130			72%	

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008560

Report Date: 11/07/2019

Project Name: REND LAKE Project No:	Ы						Ν	Analysis: ELAC Certifie	Analysis: Inorganics NELAC Certified - IL100308	.cs )0308
ARDL No: 008560-07 Field ID: REN-7 Received: 10/17/2019	19	Sampl Samp Samp	Sampling Loc'n: Sampling Date: Sampling Time:	'n: REND LAKE te: 10/17/2019 ne: 1405	.AKE /2019			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ГОД	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen Nitrate as Nitrogen Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon	0.0200 0.0190 0.00800 1.0 1.0 0.500	0.0300 0.0200 0.0100 0.0100 1.0 1.0		0.0709 1.03 0.143 0.0495 15.6 ND 6.5	1/5W 1/5W 1/5W 1/5W 1/5W 1/5W 1/5W	NONE NONE 365.2 NONE NONE NONE NONE	350.1 GREEN 365.2 365.2 160.2 160.4 415.1	NA NA NA NA NA NA NA NA	10/22/19 11/01/19 11/05/19 10/18/19 10/22/19 10/22/19 10/22/19	11015022 11065043 11065042 11015023 10245007 10245008 TA3826

(a) DOD and/or NELAC Accredited Analyte.

Sample 008560-07, Inorganic Analyses

Lab Report No: 008560

Report Date: 10/29/2019

Project Name:	REND LAKE		-	P PESTICII	DES (82	70SIM-MC	D)
Project No.:	cl )	Analytical M					
NELAC Certi	fied - IL100308	Prep M	ethod: 3	510C			
Field ID:	REN-8		ARDL 1	Lab No.:	0085	60-08	
Desc/Location:	REND LAKE		Lab F	ilename:	E1028	8916	
Sample Date:	10/17/2019		Recei	ved Date:	10/1	7/2019	
Sample Time:	1130		Prep.	Date:	10/2:	2/2019	
Matrix:	WATER		Analy	sis Date:	10/2	8/2019	
Amount Used:	900 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B111:	28	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
			***************************************		Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its	······································	Rea	sults	

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

30-130

(a) DOD-QSM Accredited Analyte.

Triphenylphosphate

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778

(a) DOD and/or NELAC Accredited Analyte.

Sample 008560-08, Inorganic Analyses

Lab Report No: 008560

Report Date: 10/29/2019

Project No.:	REND LAKE fied - IL100308	Analytical Me			DES (827	0SIM-MO	D)
Field ID:	REN-15-0		ARDL	Lab No.:	00856	0-09	
Desc/Location:				ilename:			
Sample Date:	10/17/2019			ved Date:		/2019	
Sample Time:	1147			Date:		/2019	
Matrix:	WATER		-	sis Date:		/2019	
Amount Used:	1000 mL		-	ument ID:	AG5	,	
Final Volume:	1 mL		QC Bat	tch:	B1112	8	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
				-	Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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.

(a) DOD-QSM Accredited Analyte.

C. P.O. Box 1566 ois 62864	Report Date: 11/07/2019	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Prep Analysis Run .ts Method Method Date Date Number	<ul> <li>LI NONE 350.1 NA 10/22/19 11015022</li> <li>U.M. 10200H 10200H 10/18/19 11/04/19 11055041</li> <li>LU.M. 10200H 10200H 10/18/19 11/01/19 11065043</li> <li>LU.M. 10200H 10200H 10/18/19 11/04/19 11055041</li> <li>LU.M. 10200H 10200H 10/18/19 11/05/19 11065042</li> <li>LU.M. NONE 365.2 NA 10/18/19 11015023</li> <li>LU.NONE 160.2 NA 10/22/19 10245007</li> <li>LU NONE 160.4 NA 10/22/19 10245007</li> <li>LU NONE 160.4 NA 10/22/19 10245008</li> <li>LU NONE 160.4 NA 10/28/19 12045008</li> </ul>
ARDL, INC. Aviation Drive; P.O. Box 19 Mt. Vernon, Illinois 62864			REND LAKE 10/17/2019 1147	Prep Result Units Metho	ND     MG/L     NONE       40.9     MG/CU.M.     10200       ND     MG/CU.M.     10200       8.7     MG/CU.M.     10200       0.143     MG/L     NONE       13.2     MG/L     NONE       6.1     MG/L     NONE       6.1     MG/L     NONE
400 Aviat Mt. V	Sampling Loc'n: Sampling Date: Sampling Time:	LOQ Flag Re	0.0300 1.00 0.0200 0.0100 0.0100 1.00 1.00 1		
	No: 008560	REND LAKE	008560-09 REN-15-0 10/17/2019	LOD	en 0.0200 Correcte 1.0 rogen 0.0190 1.0 0.00800 rtho 0.00800 Suspended 1.0 Le Suspen 1.0 Carbon 0.500
	Lab Report No	Project Name: RE Project No:	ARDL No: 00 Field ID: RF Received: 10	Analyte	Ammonia Nitrogen Chlorophyll-a, Correcte Nitrate as Nitrogen Pheophytin-a Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon

(a) DOD and/or NELAC Accredited Analyte.

Sample 008560-09, Inorganic Analyses

	Report Date: 11/07/2019	Analysis: Inorganics NELAC Certified - IL100308
ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864		
	No: 008560	REND LAKE

Lab Report

Project Name:

Project No:								[N]	ELAC Certi	NELAC Certified - IL100308	00308
ARDL No: 008560-10 Field ID: REN-RL-MAR Received: 10/17/2019	008560-10 REN-RL-MAR 10/17/2019		Samp Sam Sam	Sampling Loc'n: REND LAKE Sampling Date: 10/17/201 Sampling Time:	c'n: REN ate: 10/ ime:	ampling Loc'n: REND LAKE Sampling Date: 10/17/2019 Sampling Time:			Matrix: Moisture:	Matrix: WATER isture: NA	
Analyte		LOD	ГОД	Flag	Flag Result	Units	Prep Method	Prep Analysis Method Method	Prep Date	Analysis Date	Run Number
E. Coliform		1.0	1.00		150	COL/100 ML NONE	NONE	1604	NA	10/17/19 10214981	10214981

(a) DOD and/or NELAC Accredited Analyte.

Sample 008560-10, Inorganic Analyses

#### 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	-	sis: NP PEST	CICIDES (8	270SIM-M	OD)
Project No.:	Analytical Met				
NELAC Certified - IL100308	Prep Met	hod: 3510C			
Field ID: NA		ARDL Lab No	.: 008	560-01B1	
Desc/Location: NA		Lab Filenam	ne: E10	28906	
Sample Date: NA		Received Da	te: NA		
Sample Time: NA		Prep. Date:	10/	22/2019	
Matrix: QC Material		Analysis Da	te: 10/	28/2019	
Amount Used: 1000 mL		Instrument	ID: AG5		
Final Volume: 1 mL		QC Batch:	B11	128	
% Moisture: NA		Level:	LOW		
				Data	
Parameter	LOD	LOQ	Result	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:	Limit	g	R	esults	
Iriphenylphosphate	30-13			95%	

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

(a) DOD-QSM Accredited Analyte.

Blank for Run B11128, NP PESTICIDES (8270SIM-MOD)

Mt. Vernon, IL 400 Aviation Drive; P.O. Box 1566 BLANK SUMMARY REPORT ARDL, INC.

Lab Report No: 008560

Report Date: 11/07/2019

62864

[4]
IND LAKE
REND
Name:
Project N

NELAC Certified - IL100308

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

(a) DOD and/or NELAC Accredited Analyte Inorganic Method Blanks for 008560

	ARDL, INC.	400 A	>	Drive;	DUPLICAT	SPIKE/SPIKE DUPLICATE REPORT iation Drive; P.O. Box 1566		Mt. Vernon, IL	IL 62864	Ţ	
Lab Report No: 008560								Re	Report Date:	: 10/29/2019	
Project Name: REND LAKE Project No.:		Anal	Analysis: NP	PESTICID	PESTICIDES (8270SIM-MOD)	(DOM-MI	Anal	Analytical M Prep M	Method: 82 Method: 35	8270C 3510C	
Matrix: QC Material Amount Used: 1000 mL			QC Batch: Level:	: B11128 LOW	128		Prep. Dat Analysis	Date: is Date:	10/22/2019 10/28/2019	19	
	S.	Spike	Spike	Spike	Duplicate	Duplicate	Duplicate	Recovery		RPD	
Parameter	Re	Result	Level	% Rec	Result	Level	% Rec	Limíts	RPD	Limit	
Trifluralin	e	3.31	4	83	2.56	4	64	30-130	25.6	30	
Atrazine	ε	3.11	4	78	2.4	4	60	30-130	25.8	30	
Metribuzin	ę	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	e	3.45	4	86	2.67	4	67	30-130	25.5	30	
Chlorpyrifos	e	3.18	4	80	2.46	4	62	30-130	25.5	30	
Cyanazine	e	3.89	ষ	97	2.92	4	73	30-130	28.5	30	
Pendimethalin	ε. Γ	3.43	4	86	2.68	4	67	30-130	24.5	30	
SURRO	SURROGATE RECOVERIES:	DVERIES:		Spike %R		Duplicate %R	%R Limits				
Triph	Triphenylphosphate	ohate		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)

Page 1 of 1

ARDL Report 8560 - Page 24 of 32

LABORATORY CONTROL SAMPLE REPORT riation Drive; P.O. Box 1566 Mt. Vernon, IL 62864	Report Date: 11/07/2019	NELAC Certified - IL100308	ICS     ICS     Rec     Mean     Analytical     OC Iab       Level     % Rec     Limits     % Rec     Run     Number         87-115     % Rec     Run     Number         87-290B     008557-01C1        90-114      P7290B     008567-01C1        80-120      11015022     008560-02C1        80-120      11065043     008560-02C1        80-120      11015023     008560-02C1        80-120      11015023     008557-03C1        80-120      11015023     008557-03C1        80-120      11015023     008557-03C1         76-120      11015023     008557-03C1	asterisk are outside of acceptable limits.	
LABORATORY CON 400 Aviation Drive;			LCS 1 LCS 1 Level % Rec 5.0 96 0.75 100 1.0 97 1.0 103 0.67 95 0.10 101 10.0 105		
JL, INC.	008560	REND LAKE	LCS 1 Result 4.8 0.75 0.97 1.0 0.64 0.10 10.5	abulated above ma AC Accredited Ana	
ARDL,	Lab Report No: 008	Project Name:	Analyte (a) Iron (a) Manganese Ammonia Nitrogen Mitrate as Nitrogen Phosphorus, -ortho Total Organic Carbon	NOTE: Any values tabulated above marked with an (a) DOD and/or NELAC Accredited Analyte	

<b>ARDL, INC.</b> Lab Report No: 008560	INC.	MATRIX SPIKE 400 Aviation	PIKE/SP] tion Dri	SPIKE/SPIKE DUPLICATE ation Drive; P.O. Box	CATE REPORT Box 1566		<b>Mt. Vernon, IL</b> Repoi	H		10/29/2019
Project Name: REND LAKE Project No.:		Analysis:	NP	PESTICIDES (82)	(8270SIM-MOD)		Analytical Prep	ical Method: Prep Method:	l: 8270C l: 3510C	
Field ID: REN-1 Desc/Location: REND LAKE Sample Date: 10/17/2019 Sample Time: 1013 Matrix: WATER		Prep. Amount & Mois QC Bat Level:	Prep. Date: Amount Used: % Moisture: QC Batch: Level:	10/22/2019 900 mL NA B11128 LOW	D	AI La Ar Ar	ARDL Lab No.: Lab Filename: Received Date Analysis Date		008560-01 10/17/2019 10/28/2019	
	Sample	MS	SM	MS	MSD	MSD	MSD	% Rec		RPD
Parameter	Result	Result	Level	% Rec	Result L	Level	% Rec	Limits	RPD	Limit
Trifluralin	QN	3.49	4.44	78.5	1		-	30-130		1
Atrazine	0.878	4.03	4.44	71	1	1	ł	30-130	1	1
Metribuzin	DN	3.33	4.44	75		{	1	30-130	1	1
Alachlor	UN	3.23	4.44	72.8	ł	ļ	ł	30-130	ł	!
Metolachlor	DN	3.77	4.44	84.8	1		1	30-130	-	l 1
Chlorpyrifos	UN	3.27	4.44	73.5	1		1	30-130	ł	-
Cyanazine	ND	3.99	4.44	89.8	ł	1		30-130	ł	
Pendimethalin	QN	3.56	4.44	80	1	ł	1	30-130	1	{

%R Limits 30-130

MSD &R --

MS &R 91

SURROGATE RECOVERIES:

Triphenylphosphate

'nc' indicates sample >4X spike level.

(a) DOD-QSM Accredited Analyte.

'\*' indicates a recovery outside of standard limits.

Matrix Spikes for 008560-01, NP PESTICIDES (8270SIM-MOD)

	62864
MATRIX SPIKE/SPIKE DUPLICATE REPORT	400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL
	INC.
	ARDL,

Lab Report No: 008560

REND LAKE

Project Name:

Report Date: 11/07/2019

NELAC Certified - IL100308

Real	MS Result 2 1.4	MS					1				1-1-00
		Level	% Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	kPU Limit	Run	QC Lab Number
		1.0	97	1.4	1.0	96	87-115	0	20	P7290B	008560-01MS
WATER 0.32	2 0.83	0.50	101	0.82	0.50	100	90-114	н	20	P7290B	008560-01MS
WATER 0.056	5 2.0	2.0	98	2.1	2.0	100	75-125	m	20	11015022	008560-01MS
WATER 0.049	0	1.0	79	0.84	1.0	79	75-125	0	20	11065043	008560-02MS
WATER 0.14	10.94	0.83	97	0.95	0.83	98	75-125	r-t	20	11065042	008560-04MS
WATER 0.075	0.18	0.10	104	0.17	0.10	66	75-125	ო	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

364	11/07/2019	ed - IL100308	QC Lab Number	008560-02D1	008560-02D1	008560-01D1	008560-01D1
10n, IL 62864	Report Date:	NELAC Certified	Analytical Run	11055041	11055041	10245007	10245008
r 5 Mt. Vernon, IL			Mean (Smp,D1,D2)	<b>1</b>			!
LE REPOR Box 156(			Percent Diff	10	45*	Ŋ	ω
PLICAT P.O.			Units	MG/CU.M.	MG/CU.M.	MG/L	MG/L
SAMPLE DUE 400 Aviation Drive;			Second Duplicate		1	1	1
400 Avia			First Duplicate	45.4	6.6	16.8	4.8
INC.	0	LAKE	Sample Conc'n	40.9	15.7	17.6	5.2
ARDL, INC.	Lab Report No: 008560	Project Name: REND LAKE	Analyte	Chlorophyll-a, Corrected	·H	Solids, Total Suspended	Solids, Volatile Suspend

\* indicates that agreement between duplicates is greater than 20%. See Case Narrative for exceptions.
 (a) DOD and/or NELAC Accredited Analyte
 Sample Duplicates for 008560

## ala Martina ang

# Sample Receipt Information

Including as appropriate:

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

### ARDL Data Package 8560

Authorized By: DSD-QAO

ARDL, Inc. PROJECT Rend Lake		P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864 (618) 244-3235 Phone (618) 244-1149 Fax	400 Avia -3235 Ph	I stion I stion I	)rive, (61	ve, Mt. V (618) 24	ernon, 4-114	'ernon, IL 62 44-1149 Fax	864		8560	0						СНА	AIN OF	CHAIN OF CUSTODY RECORD	DY R	RECORD	SD NOT
SAMPLERS: (Signature) Greeking, Ben Podgers, Grace	6			SONTAINE	Devel Devel SSAL	SA	OBY L	PO C	THE	ISE N-EHN							$\sim$				ICED		SPECIFY CHEMICALS ADDED AND FINAL PH IF KNOWN
SAMPLE NUMBER	DATE	TIME	GRAB COMP		ssi	40145	38	Sal	N-CON	1.05	SNISN NSNISN	SINI-CI-						RI	REMARKS OR SAMPLE LOCATION	NOIL			
Ren – 1	Plft1]01	1013	×		X	X	X	×	E.	×	X			-		[d	to bo	bottle broke		PPE1/01 23	A X		
Ren – 2 – 0	-	1055	×		XX	X	X	X	X												X		
Ren – 2 – 5		1045	×		X	X	X	X		X											X		
<i>↓</i> Ren – 3		1155	×		X X	X	×	X	X						-						X		
5 Ren – 4		1251	x		X X	X	Х	X	X												X		
		0915	x		X	X	X	X	X												X		
7 Ren – 7		1405	х		X	X	X	X	X												X		
Ren – 8	_	1130	х		XX	X	Х	Х	Χ	_											X		
Ren – 15- 0		N47	×		XX	X	X	X	X												X		
O Ren-RL-Mar	-		х							X											X		
				-																			
Af																							
RDF																							
Rep																							
A Relinquished by: (Signature)	Date 10/13/19	Time	Received by: (Stanature)	ved by:	(Sham	nature)	1	REN	<b>AARK</b>	REMARKS/SPECIAL INSTRUCTIONS:	CIAL	INST	RUC	LION	ï								
Brelinquished by: (Signature)	in/12/K	7 11/20	LL.	ed by:		E L	CMA																
BREEVED for aboratory by:	VI N	Time / 730	Shipping Ticket No.	Ig Ticl	ket No																		
5 PURCHASE ORDER NO:	-																						

(J) J)

<b>COO</b>	LEF	<u>R R</u>	EC	EIP	T R	EPC	<u>PRT</u>
		AR	DL	., IN	<u>C.</u>		

ARE	DL#:	Cooler # $1 a_{1} 2$ Number of Coolers in Ship	- 1		
		Number of Coolers in Ship	oment: <u> </u>		-
-	ect: <u>Rend LAKE</u>	Date Received: 10-1			
Α.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 10 -	<u>17-19 (</u> Signature)	echre	m	/
1.	Did cooler come with a shipping slip (airbill, etc.)?		YES	(NO)	
	If YES, enter carrier name and airbill number here:		Jaurier	/	
2.	Were custody seals on outside of cooler?				N/A
	How many and where?,Seal Da	te:,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?			NO	N/A
8.	Was project identifiable from custody papers? If YES, enter project name	e at the top of this form		NO	N/A
9.	Was a separate container provided for measuring temperature? YES_				с
В.	LOG-IN PHASE: Date samples were logged-in: 10-18-19	_(Signature)_A_e_k	um		
10.	Describe type of packing in cooler:		N		
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?			> NO	
13.	Were sample labels complete?			NO	
14.	Did all sample labels agree with custody papers?		YES	NO	
15.	Were correct containers used for the tests indicated?		ES	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:		Transfer		
		Fraction	Fraction		
		Area #	Area #		
		Walkin			
		Ву	Ву		
		On Cele	On		
		10-18-19			
		Chain-of-Custody #	NIA		

M:\ADMIN\FORMS\COOLER RECEIPT REPORT.doc Rev. 02/22/17

Date:

(By: Signature)

COOL	.ER	RE(	CEI	PT	REP	ORT
	<u>A</u>	RD	L, I	NC	4	

ARI	DL #: <u>8560</u>	Cooler # $2 \sqrt{2}$ Number of Coolers in Shipr	- ment: 2		
Pro	ject: <u>Rend Lake</u>	Date Received: <u>10 - 11</u>			
A.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 10 -1	<u>7-19 (</u> Signature) / Ka	chriem	<u>ر</u>	
1.	Did cooler come with a shipping slip (airbill, etc.)?				フ
	If YES, enter carrier name and airbill number here:	(ac	wier		
2.	Were custody seals on outside of cooler?			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?		ÝES	NO	
5.	Were custody papers sealed in a plastic bag?		YES	NO?	
6.	Were custody papers filled out properly (ink, signed, etc.)?			NO	N/A
7.	Were custody papers signed in appropriate place by ARDL personnel?			NO	N/A
8.	Was project identifiable from custody papers? If YES, enter project name at	the top of this form		NO	N/A
9.	Was a separate container provided for measuring temperature? YES	NO Observed Cooler Tem	p. <u>0, 7</u>	0	•
В.	LOG-IN PHASE: Date samples were logged-in: 10-18-19 (	Signature) <u>h Hackter</u>	m		C
10.	Describe type of packing in cooler:				
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?			NO	
15.	Were correct containers used for the tests indicated?			NO	
16.	Was pH correct on preserved water samples?			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:	Sample			
		Fraction	Fraction		
		All Area #	Area #		
		Walkin			
		By	Ву		
		By $dlc$ On $10-18-19$	On		

Chain-of-Custody # ///A

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Date:

(By: Signature)