2020 Water Quality Report

U.S. Army Corps of Engineers
Saint Louis District

Carlyle Lake Water Quality Conditions: 1971-2020

June 2021

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Prepared for

United States Army Corps of Engineers
Saint Louis District
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EXECUTIVE SUMMARY

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

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

The National Water Quality Inventory Report to Congress (305(b) report) is the primary vehicle for informing law makers and the public about general water quality conditions in the United States. This document characterizes our water quality, identifies widespread water quality problems of national significance and describes various programs implemented to restore and protect our waters. Currently the Illinois Environmental Protection Agency (IEPA, 2018) has listed Carlyle Lake as impaired for total suspended solids, total phosphorous, and mercury while the Kaskaskia River upstream from the Lake is impaired for dissolved oxygen, Atrazine, and mercury. The lists of sources for these impairments are contaminated sediments, crop production, and unknown sources. The entire Kaskaskia watershed is impaired by the above parameters as well as many others.

Water quality sampling in 2020 revealed the following concerns at Carlyle Lake: bacteria, iron, pH, dissolved oxygen, temperature, Atrazine, and total phosphorus.

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INTRODUCTION

The Carlyle Lake watershed encompasses approximately 1,663 square miles and includes all or portions of Bond, Clinton, Effingham, Fayette, Marion, Shelby, and Montgomery counties. The watershed includes the Kaskaskia River between Carlyle Lake Dam and Lake Shelbyville Dam and major tributaries of the Kaskaskia River, including: Big, Richland, Robinson, Becks, Ramsey, Old Hickory, and Hurricane Creeks (respectively) and the East Fork Kaskaskia River. Agriculture is the predominant land use within the watershed. Currently, 82% of the land is used for agricultural purposes. Of that 82%, 63% is cropland and 19% grassland. Since 1978, the number of farms has decreased by 25% and the acreage tilled has decreased by only 6%. Corn and soybeans are important to the region, but producers also grow 25% of the entire state's crop of wheat. Livestock production, including dairy, swine, poultry and beef cattle is a significant industry, especially in Clinton, Randolph and Washington Counties.

Carlyle Lake is located in south central Illinois at river mile 94.2 on the Kaskaskia River, upstream from its confluence with the Mississippi River and about one-half mile upstream from the town of Carlyle, Illinois. Carlyle is located in Clinton County, approximately 50 miles east of St. Louis, Missouri. Carlyle Lake is the largest man-made lake in the state and is approximately 12 miles long and 1-3 miles wide and has approximately 24,710 acres of water surface at summer pool elevation 445.0 feet NGVD (National Geodetic Vertical Datum). There are 88 miles of shoreline and approximately 12,800 acres of public land associated with the project. The lake is situated in gently rolling land with alluvial valleys with moderately low relief. The lake provides outdoor recreation opportunities for over 2.5 million visitors annually, which generates over $80 million in visitor spending within 30- miles of the Lake. There are 41 recreation areas that include: 424 picnic sites, 726 campsites, 670 marina slips, 24 boat ramps, and 25 miles of hiking trails. The CEMVS manages and operates two large reservoirs on the Kaskaskia River, Lake Shelbyville and Carlyle Lake, as well as the 36 mile long navigable channel and lock and dam at the Kaskaskia River Project.

Carlyle Lake is managed and operated by the CEMVS for the authorized purposes of flood risk management, navigation, water supply, water quality, fish and wildlife conservation, and recreation. The lake serves as a heavy recreational usage lake. The land surrounding the lake is used predominately for agriculture. Surrounding communities have existing industrial/commercial operations and residents which discharge wastewater into municipal wastewater treatment plants that ultimately discharge treated water into the Kaskaskia River basin. Agricultural runoff and municipal wastewater treatment facilities are the primary potential source of pollution into the Carlyle 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 Kaskaskia River and Carlyle 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 Kaskaskia River and Carlyle Lake. The WQMP addresses surface water quality management issues and adheres to the guidance and requirements specified by Clean Water Act (CWA), as well as the self-imposed Engineering Regulation (ER) 1110-2-8154, "Water Quality and Environmental Management for USACE Civil Works Projects" (USACE, 2018). Water quality monitoring is implemented to fulfill five primary objectives that drive the CEMVS WQMP:

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

This report is intended to document and assess water quality conditions occurring at Carlyle Lake. The report describes conditions observed in 2020, as well as baseline data collected from 1971-2019. Data are available upon request.

CARLYLE LAKE WQMP COVERAGE

The WQMP for Carlyle Lake includes water samples taken at the following locations: major tributaries (CAR-13 and CAR-12), main body of the lake (CAR-4, CAR-2, and the marinas), and just downstream of the dam (CAR-1). See figure 1 and Table 1 for a site map and site coordinates.

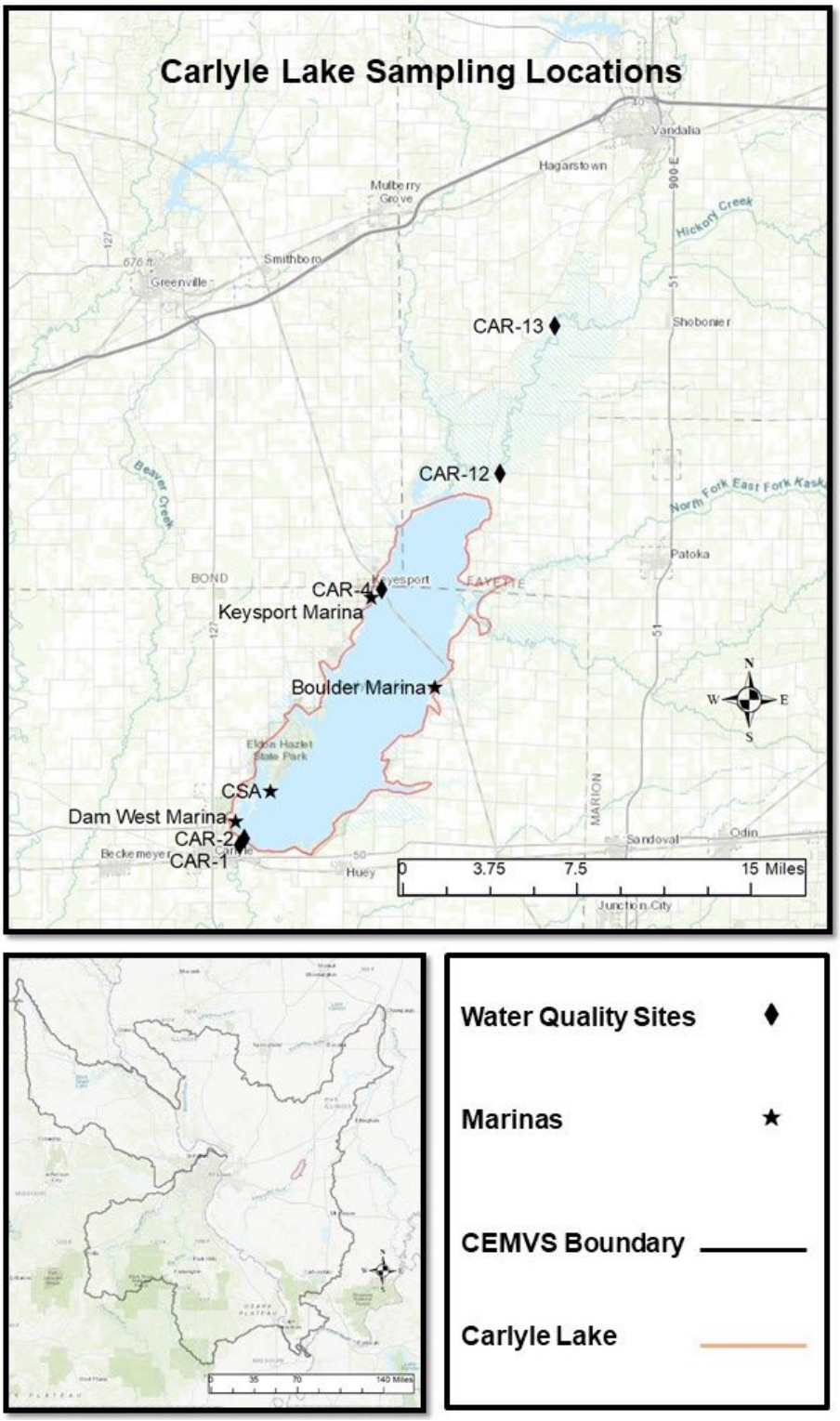


Figure 1. Water Quality (WQ) Sampling Locations in 2019 at Carlyle Lake

Sample Location Summary Table

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

Sample Location Type	Abbreviation	Site Name	Latitude	Longitude
Major Tributary	TRIB	CAR-13	38.868961	-89.159605
	TRIB	CAR-12	38.868961	-89.193475
Main Reservoir Surface	RS	CAR-2	38.619492	-89.352747
	RS	CAR-4	38.740632	-89.267266
	RS	CAR-BL	38.693092	-89.234040
	RS	CAR-DW	38.627955	-89.358246
	RS	CAR-KP	38.736930	-89.273674
	RS	CAR-CSA	38.642647	-89.336805
Reservoir Benthic	RB	CAR-2-10	38.619492	-89.352747
Tail Race (below dam)	TR	CAR-1	38.616240	-89.355828

Samples at Marinas are not always taken in the exact same location. *BL=Boulder Marina, DW=Dam West Marina, KP=Keyesport Marina, CSA=Carlyle Sailing Association.*

METHODS AND ANALYSIS: WATER QUALITY

Data Collection and Historical Reference Data

During 2020, water quality samples were collected and analyzed for 10 locations during four separate sampling events (n=40; Table 1). One duplicate sample was also collected during each sampling event for quality control purposes. Samples were collected from the upper one meter of the water column, preserved, and transported to the Applied Research and Development Laboratory (ARDL) in Mount Vernon, Illinois for analysis.

For the purpose of this report, historical reference data refers to water quality data collected during the previous years ranging as far back as 1974 (parameter dependent) at Carlyle Lake. Historical reference data are intended to represent the current condition of Carlyle Lake.

Statistical Summary and Comparison to Applicable Water Quality Standards

Statistical analyses were performed on water quality monitoring data collected for 10 locations, and classified as TRIB (n= 2), RS (n=2), RB (n=1), and TR (n=1). For comparison, statistical analyses were also performed on historical water quality monitoring data and, although some sampling locations may have been removed, they were classified in the same manner. Descriptive statistics were calculated to describe central tendencies and corresponding 95% confidence levels for the 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 Carlyle Lake has 6 samples and one duplicate).

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

Water Quality Parameters and Criteria

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

Temperature (Temp) is important because it controls several aspects of water quality. Colder water holds more dissolved oxygen which is required by aquatic organisms. Plants grow more rapidly and use more oxygen in warmer water. Decomposition of organic matter which uses oxygen is accelerated in warmer water. Temperature can also determine the availability of toxic compounds such as ammonia. Since aquatic organisms are cold blooded, water temperature regulates their metabolism and ability to survive. The number and kinds of organisms that are found in streams or lakes is directly related to temperature. Certain organisms require a specific temperature range, such as Salmonids, which require water temperatures below 20°C. Water temperature criteria for warm water bodies in Illinois is within 2.8°C of the seasonal norm.

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

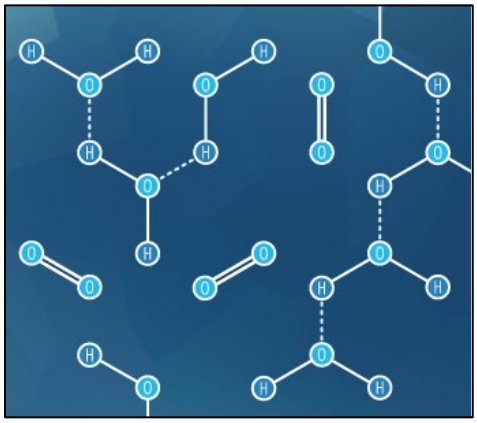


Figure 1: Dissolved oxygen (O_2) vs oxygen bonded in water (H_2O).

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

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

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

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

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

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

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

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

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

Total Suspended Solids (TSS) concentrations, which cause the photosynthetic activity to be reduced by more than 10% from the seasonably established norm, can have a detrimental effect on aquatic life. Soil particles, organic material, and other debris comprise suspended solids in the water column. **Turbidity (FNU)** measurements are inverse to suspended solid measurements. As TSS increases, the FNU or water transparency decreases. Total suspended solids can be an important indicator of the type and degree of FNU. Total Suspended Solids measurements represent a combination of **Volatile Suspended Solids (VSS)**, which consist of organic material, and **Nonvolatile Suspended Solids (NVSS)**, which is comprised of inorganic mineral particles in the water. In order to more accurately determine the types and amounts of suspended solids, VSS are analyzed. Volatile suspended solid concentration represents the organic portion of the total suspended solids. Organic material often includes plankton, and additional plant and animal debris present in water. Total VSS indicates the presence of organics in suspension; and, therefore, show additional demand levels of oxygen. Illinois does not currently have a standard criteria for TSS, 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 Kaskaskia River flows. This study considers one insecticide and seven herbicides. Atrazine and Alachlor herbicides are commonly used agricultural chemicals which can be readily transported by rainfall runoff. Both compounds are suspected of causing cancer; and therefore, were monitored for the protection of human and aquatic health. Herbicides which are pesticides used to kill vegetation are the most widely used and sampled. Two of the most widely used herbicides are Atrazine and Alachlor. Atrazine is a preemergence or postemergence herbicide use to control broadleaf weeds and annual grasses. Atrazine is most commonly detected in ground and surface water due to its wide use, and its ability to persist in soil and move in water. Alachlor is a Restricted Use Pesticide (RUP) due to the potential to contaminate groundwater. The water quality standards for the pesticides sampled are located in Table 2.

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

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

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

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

Total Phosphorus (TP) is analyzed as phosphorus, and has been monitored due to the potential for uptake by nuisance algae. Levels of phosphate can indicate the potential for rapid growth of algae (algae bloom) which can cause serious oxygen depletion during the algae decay process. Phosphorous is typically the limiting nutrient in a water body; therefore, any addition of phosphorous to the ecosystem stimulates the growth of plants and algae. Phosphorous is delivered to lakes and streams by way of runoff from

agricultural fields and urban environments. Other sources of phosphorous are anaerobic decomposition of organic matter, leaking sewer systems, and point source pollution. The general standard for phosphorous in lake water is 0.05 mg/L. Dissolved phosphorous, also called **Orthophosphate (PO_4-P)** is generally found in much smaller concentrations than total phosphorous, and is readily available for algal uptake. Orthophosphate concentrations in a water body vary widely over short periods of time as plants take it up and release it.

Chlorophyll a (CHL_a) is a measure of the amount of algae growing in a waterbody, and therefore can be used to classify trophic status. Although algae are a natural part of freshwater ecosystems, too much algae can cause aesthetic problems such as green scums and bad odors, and can result in decreased levels of DO.

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

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

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

where ln indicates the Natural Logarithm

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

TSI	Trophic Condition
0-40	Oligotrophic
40-50	Mesotrophic
50-70	Eutrophic
70-100	Hypereutrophic

Laboratory Methods and Water Quality Criteria Summary Table

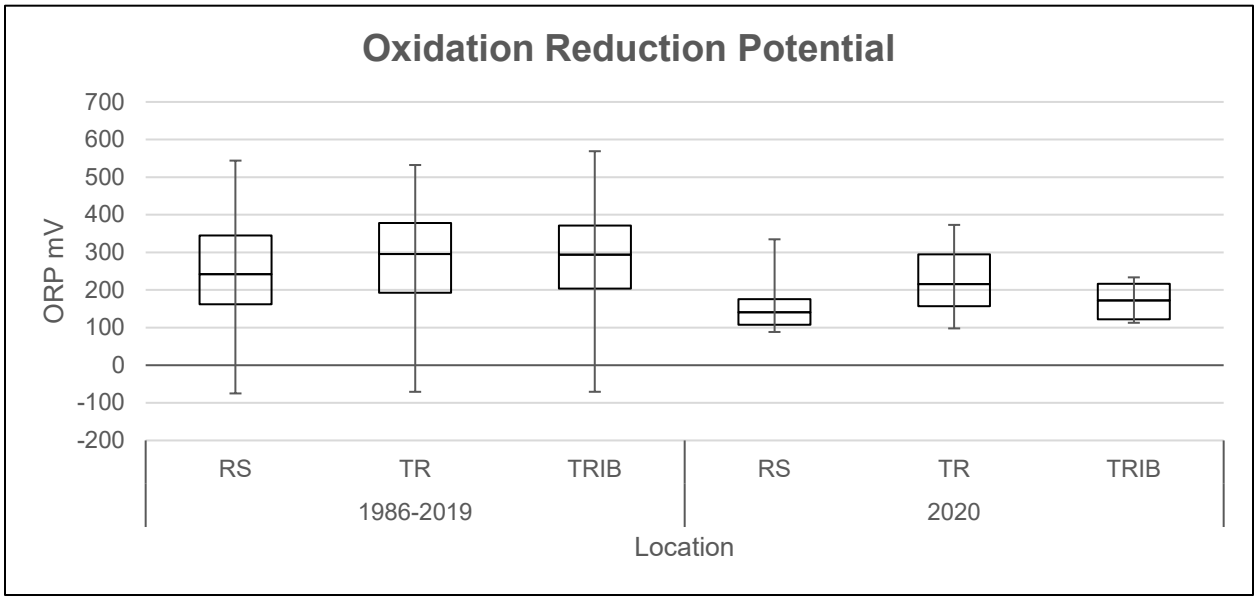
Table 2: Metrics, Methods, and Water Quality Criteria Used for Evaluating Water Quality

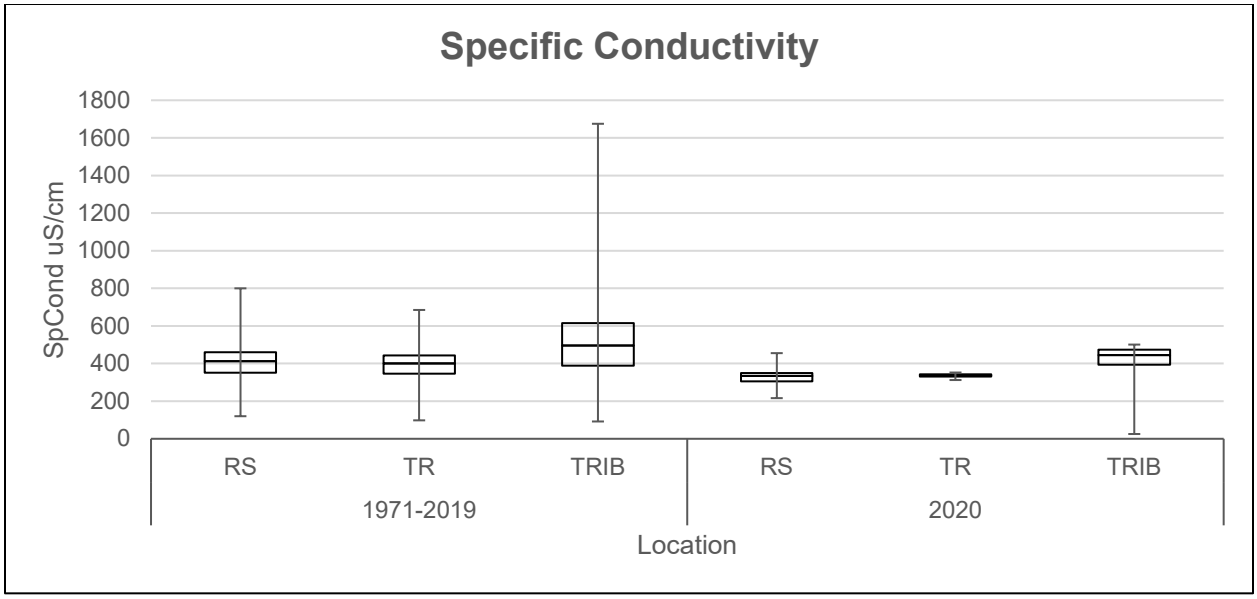
Metric	Abbreviation	Analysis Method	Water Quality Criteria	Source
Alachlor		EPA Method 8270C	< 2µg/L PWS or <1100 µg/L: aquatic life	Illinois EPA
Ammonia Nitrogen	NH_3	EPA Method 350.1	<15 mg/L	United States EPA
Atrazine	Atrazine	EPA Method 8270C	9 µg/L: Chronic or 82 µg/L: Acute or 3 µg/L DWS	Illinois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

Metric	Abbreviation	Analysis Method	Water Quality Criteria	Source
Total Organic Carbon	TOC	EPA Method 415.1	-----	-----
Total Iron	TFe	EPA Method 6010C	< 1 mg/L	Illinois EPA
Total Phosphorus	TP	EPA Method 365.2	Less than 0.05 mg/L	Illinois EPA
Total Suspended Solids	TSS	EPA Method 160.2	-----	Illinois EPA
Trifluralin		EPA Method 8270C	< 1.1 µg/L: chronic or < 26 µg/L acute (aquatic life)	Illinois EPA
Turbidity	Turb	Multiparameter Meter	-----	-----
Volatile Suspended Solids	VSS	EPA Method 160.4	-----	-----

**1 mg/L is equivalent to 1 drop in two bathtubs and 1 ug/L is equivalent to 1 drop in an Olympic size swimming pool. PWS is public water supply. DWS is drinking water standard.*

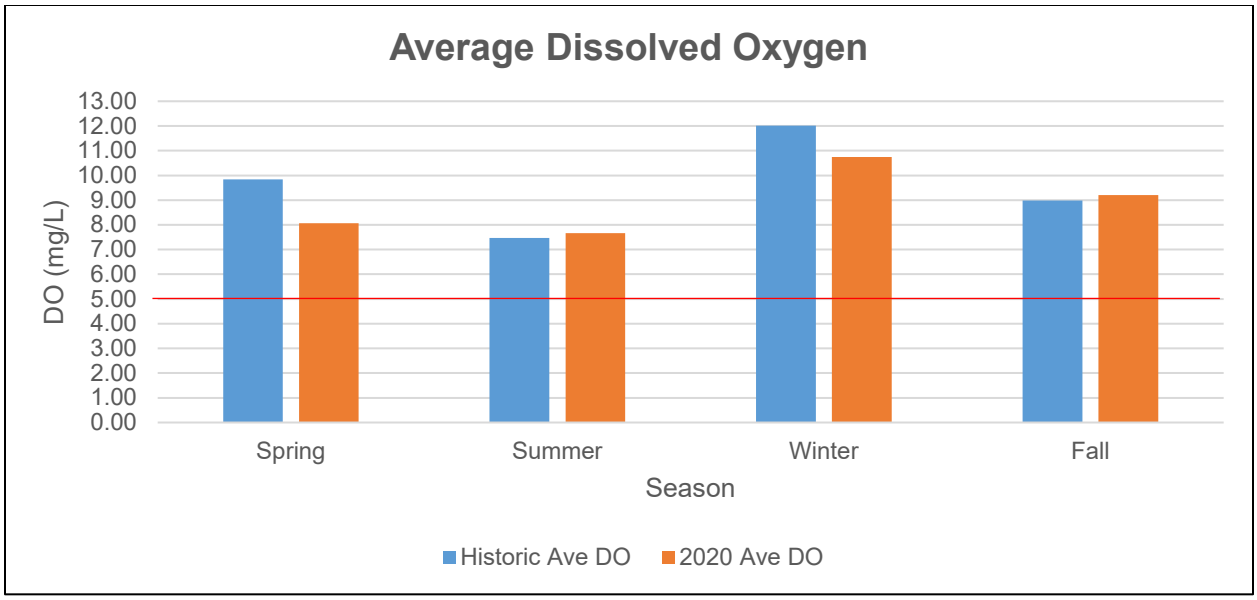
RESULTS AND SUMMARY STATISTICS: WATER QUALITY





		Historical Reference 1971-2019				2020			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
SpCond	RS	409.71	413.00	615	7.40	330.87	334.15	22	26.59
	TR	398.40	400.00	244	10.14	335.33	338.30	4	26.52
	TRIB	520.66	496.00	597	18.42	386.67	444.55	8	134.95
ORP	RS	247.81	242.00	261	14.87	160.06	141.10	16	37.80
	TR	284.29	296.00	129	21.17	228.93	215.80	3	342.98
	TRIB	282.73	293.55	166	19.17	171.33	172.35	6	58.55

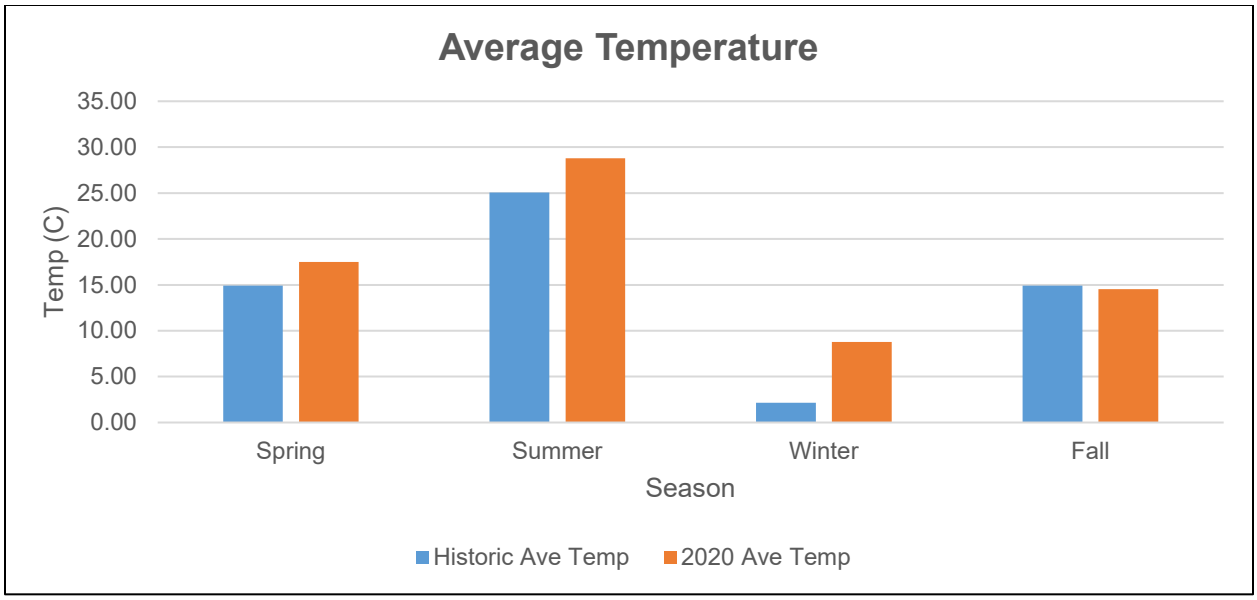
**This report does not acknowledge a water quality criteria for SpCond or ORP.*



Red line placed at the 5 mg/L level.

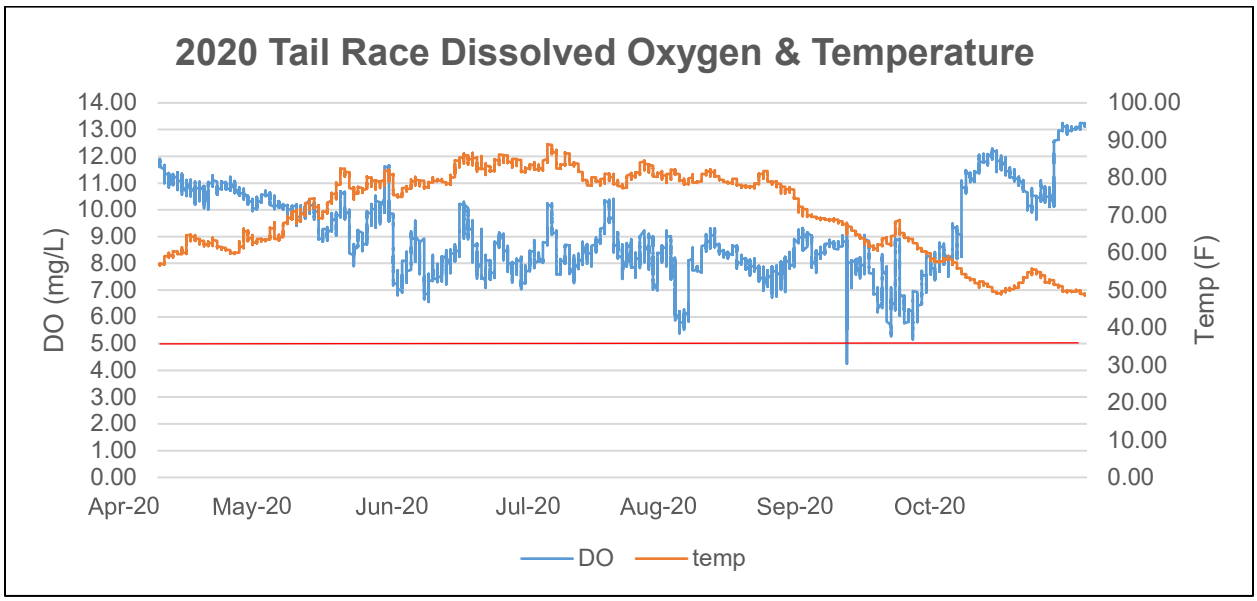
		Historical Reference 1972-2019				2020			
Season	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Spring	RS	10.27	10.30	153	0.39	8.12	7.87	5	1.26
	TR	10.09	10.05	68	0.58	10.10	10.10	1	
	TRIB	9.31	9.00	154	0.39	6.94	6.94	2	5.40
Summer	RS	7.61	7.30	277	0.27	7.80	8.27	6	3.42
	TR	8.00	8.20	107	0.34	7.52	7.52	1	
	TRIB	7.04	6.89	230	0.27	7.33	7.33	2	2.16
Winter	RS	12.31	12.20	61	0.71	10.19	10.60	5	1.88
	TR	13.46	13.70	22	0.93	13.05	13.05	1	
	TRIB	11.53	11.85	106	0.46	10.99	10.99	2	2.54
Fall	RS	9.25	9.30	117	0.40	10.09	10.12	6	0.83
	TR	9.83	10.20	43	0.62	7.13	7.13	1	
	TRIB	8.31	8.70	96	0.48	7.59	7.59	2	5.59

** On July 29 2020 DO was recorded at 2.51 mg/L at Boulder Marina. All other observations met the Illinois state standard.*



		Historical Reference 1972-2019				2020			
Season	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Spring	RS	15.58	16.85	156	0.91	17.74	17.90	5	0.57
	TR	15.52	16.92	70	1.25	17.20	17.20	1	
	TRIB	14.01	15.00	159	0.83	16.95	16.95	2	3.18
Summer	RS	25.90	26.00	278	0.32	29.18	29.05	6	0.67
	TR	25.51	26.00	109	0.44	28.90	28.90	1	
	TRIB	23.89	23.83	236	0.39	27.50	27.50	2	7.62
Fall	RS	15.77	17.00	120	0.94	14.63	14.20	6	0.97
	TR	16.09	18.15	44	1.51	14.40	14.40	1	
	TRIB	13.38	14.00	99	1.12	14.25	14.25	2	1.91
Winter	RS	2.25	1.00	63	0.68	9.18	9.56	5	1.29
	TR	2.81	2.00	23	1.13	7.78	7.78	1	
	TRIB	1.96	1.00	109	0.51	8.19	8.19	2	3.88

**There were multiple observations in which the 2020 values exceeded the 2.8C rise above the historical mean values.*

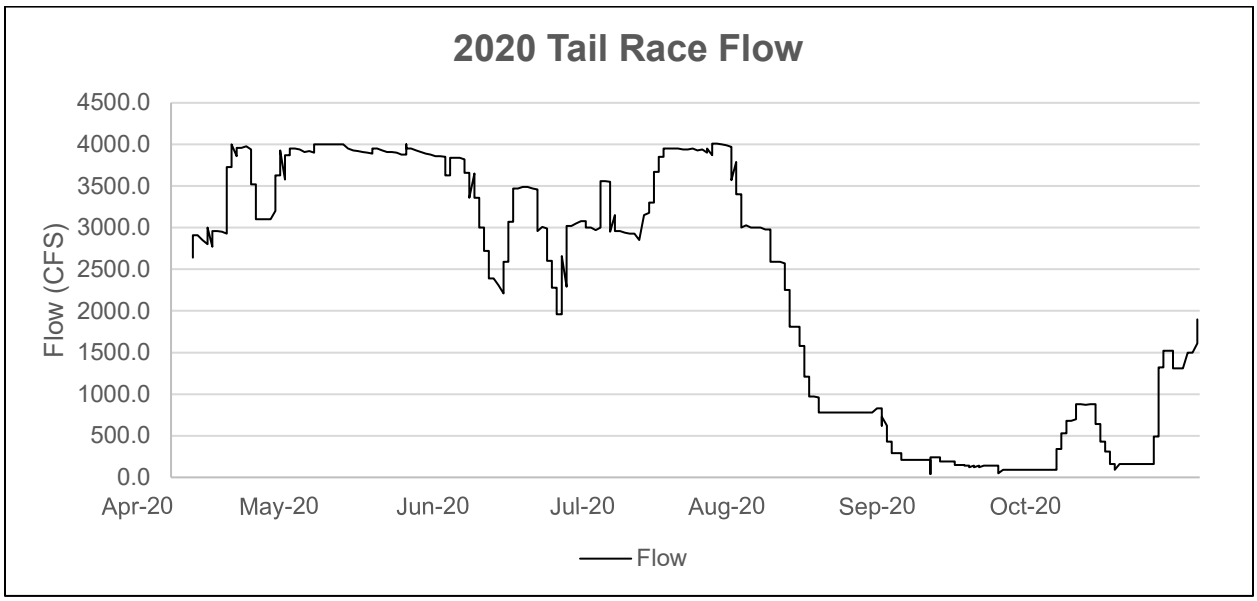


Data recorded by multi-parameter sonde at tail race. 30 minute data shown. Red line placed at the 5 mg/L level. DO was recorded between 4-5 mg/L briefly on September 30 2020. All other observations were greater than 5 mg/L during 2020.

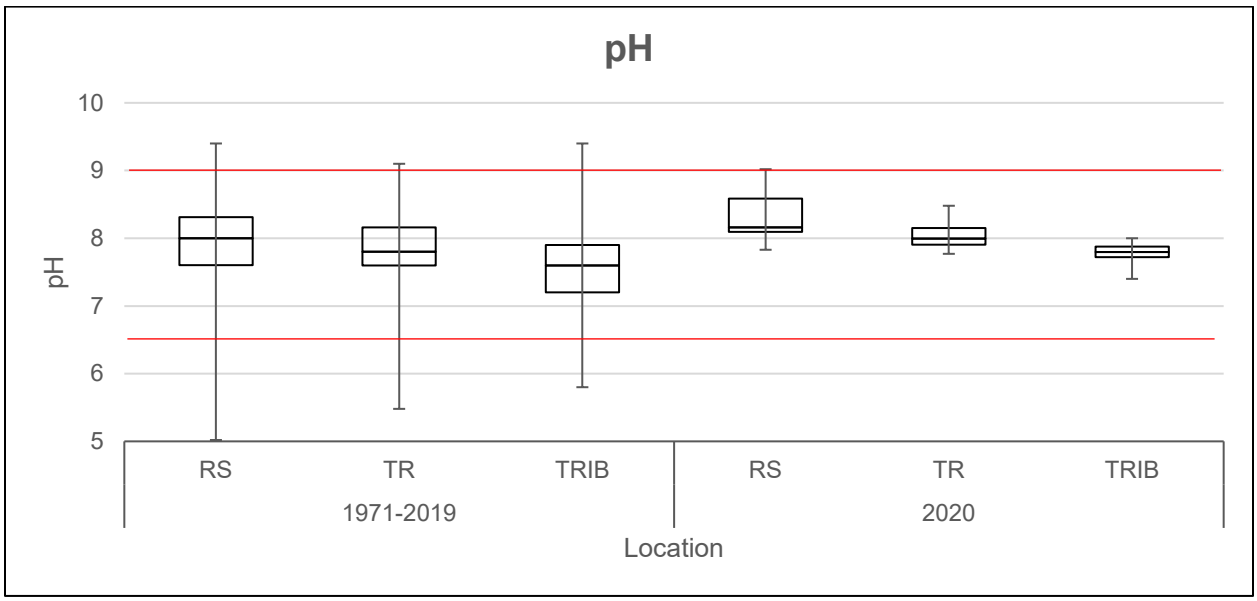
2020 Tail Race Continuous Temperature and DO

Parameter	Season	Mean	Median	Count	CL (95.0%)
DO	Spring	10.6	10.6	3297	0.015
	Summer	8.4	8.3	10272	0.017
	Fall	9.5	8.8	6690	0.051
Temp	Spring	17.5	17.3	3297	0.071
	Summer	26.7	26.5	10272	0.034
	Fall	15.1	14.6	6690	0.106

Historical tail race continuous data not included in this report.



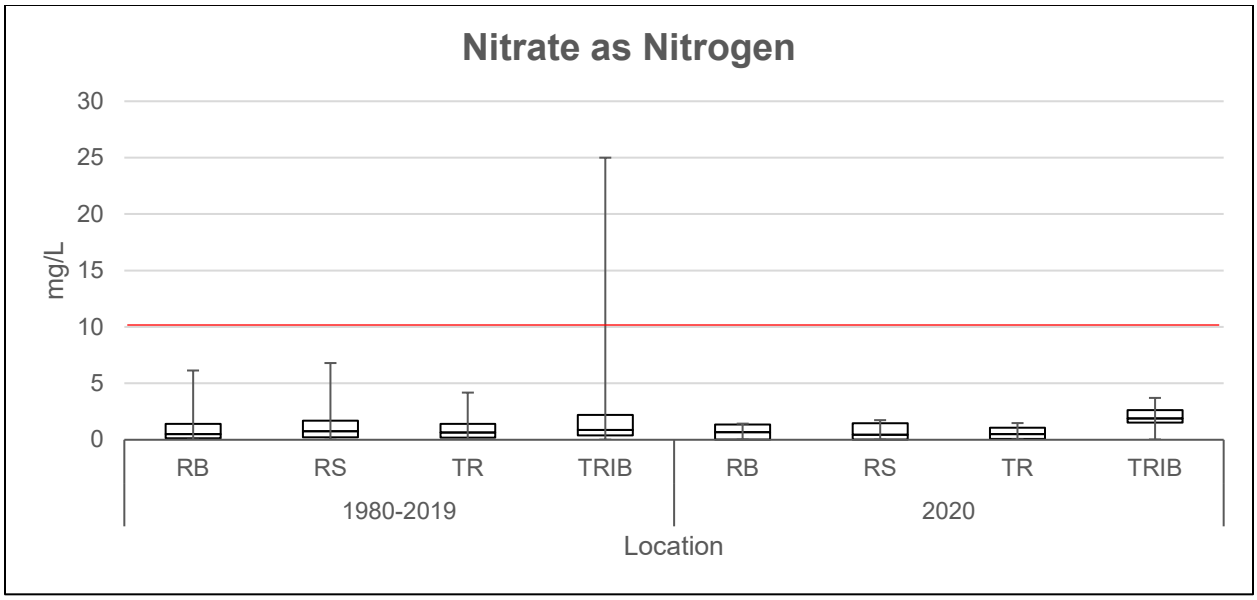
Revised daily flow data as reviewed by the USACE water management office.



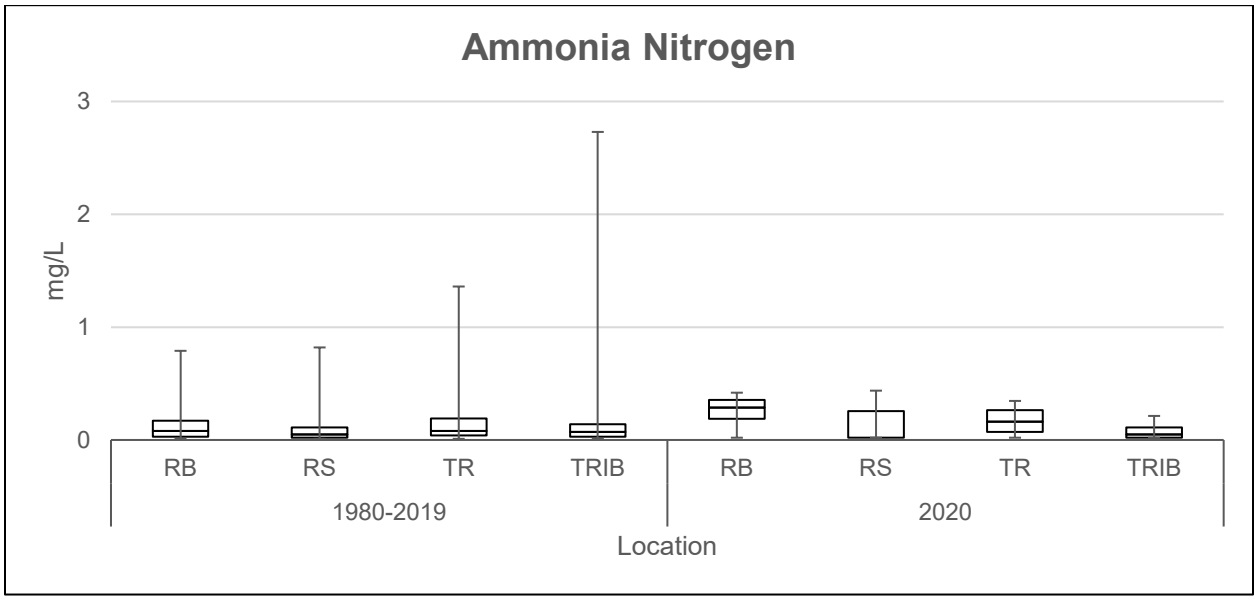
**Red lines indicate the upper and lower water quality criteria standards (9 and 6.5).*

		Historical Reference 1971-2019				2020			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
pH	RS	7.98	8.00	611	0.04	8.31	8.16	22	0.16
	TR	7.87	7.90	243	0.07	8.06	8.00	4	0.48
	TRIB	7.55	7.60	590	0.04	7.77	7.80	8	0.16

**pH was recorded above 9 at CSA on July 29 2020. All other readings were within water quality standards during 2020.*

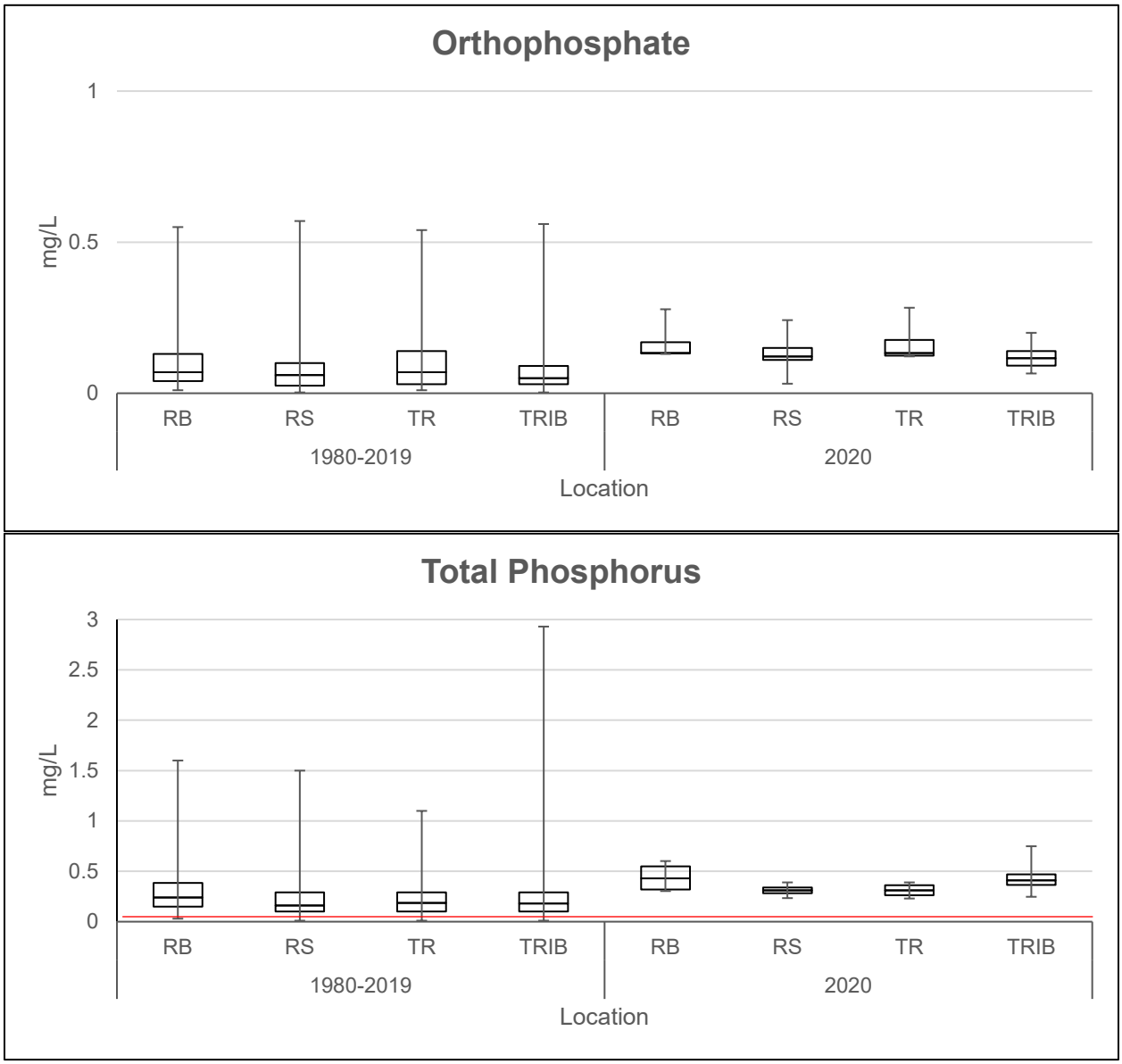


Red line indicates the water quality criteria standard (10 mg/L).



		Historical Reference 1980-2019				2020			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
NO3N	RB	0.90	0.51	233	0.13	0.70	0.68	4	1.25
	RS	1.12	0.75	597	0.09	0.72	0.46	8	0.66
	TR	0.91	0.63	242	0.11	0.63	0.50	4	1.12
	TRIB	1.63	0.88	590	0.16	1.89	1.88	8	0.99
NH3N	RB	0.12	0.08	228	0.02	0.25	0.29	4	0.27
	RS	0.08	0.05	492	0.01	0.13	0.02	8	0.14
	TR	0.13	0.08	208	0.02	0.17	0.16	4	0.23
	TRIB	0.12	0.07	409	0.02	0.08	0.05	8	0.07

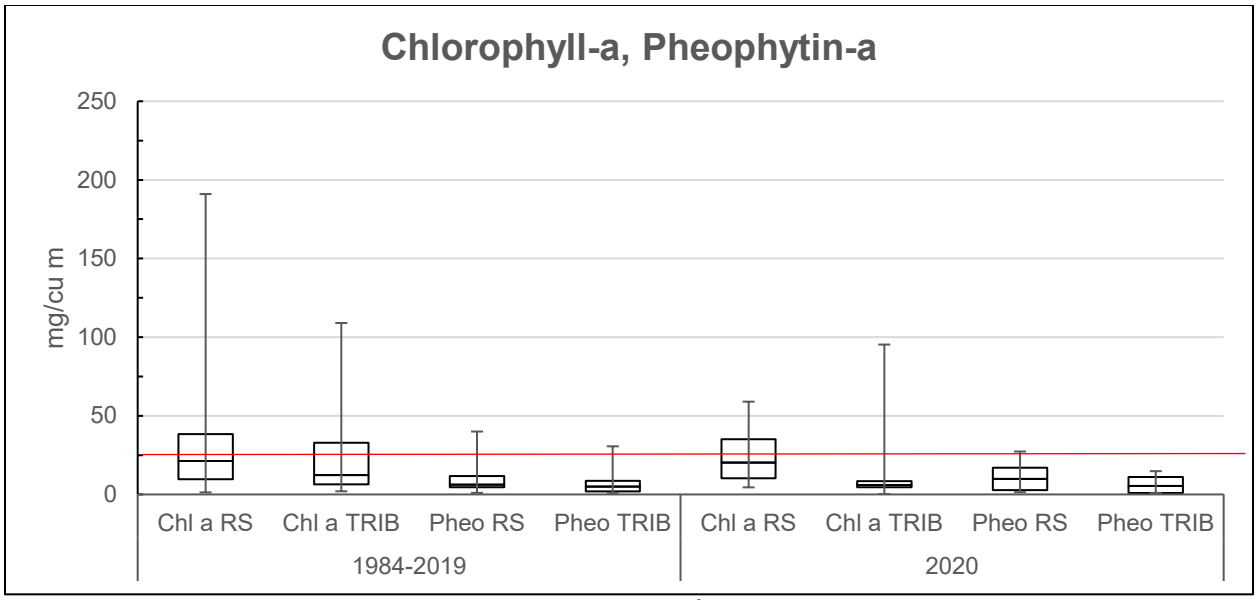
**All observations of nitrate and ammonia nitrogen were within the water quality standard.*



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

		Historical Reference 1980-2019				2020			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Ortho	RB	0.10	0.07	233	0.01	0.17	0.13	4	0.12
	RS	0.08	0.06	592	0.01	0.13	0.12	8	0.05
	TR	0.10	0.07	239	0.01	0.17	0.13	4	0.12
	TRIB	0.07	0.05	590	0.01	0.12	0.12	8	0.04
TP	RB	0.32	0.24	234	0.03	0.44	0.43	4	0.24
	RS	0.22	0.16	604	0.01	0.31	0.31	8	0.04
	TR	0.22	0.19	242	0.02	0.31	0.31	4	0.12
	TRIB	0.23	0.18	601	0.02	0.44	0.41	8	0.13

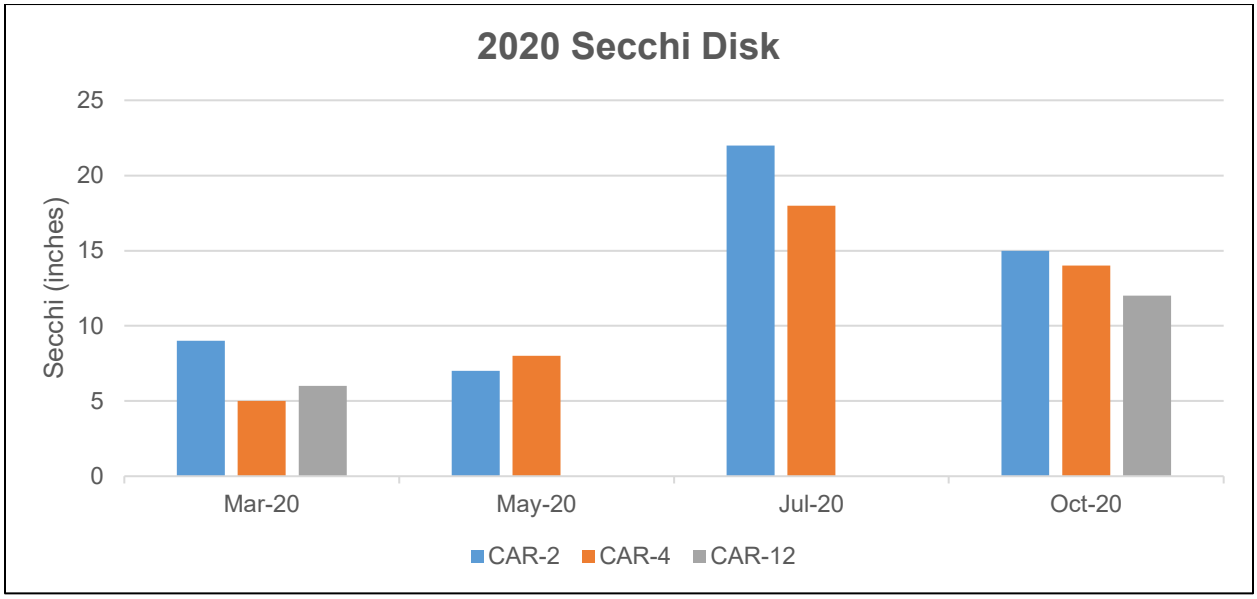
**Total phosphorus exceeded the proposed criteria of 0.05 mg/L for all locations. This study does not acknowledge a water quality criteria for orthophosphate.*

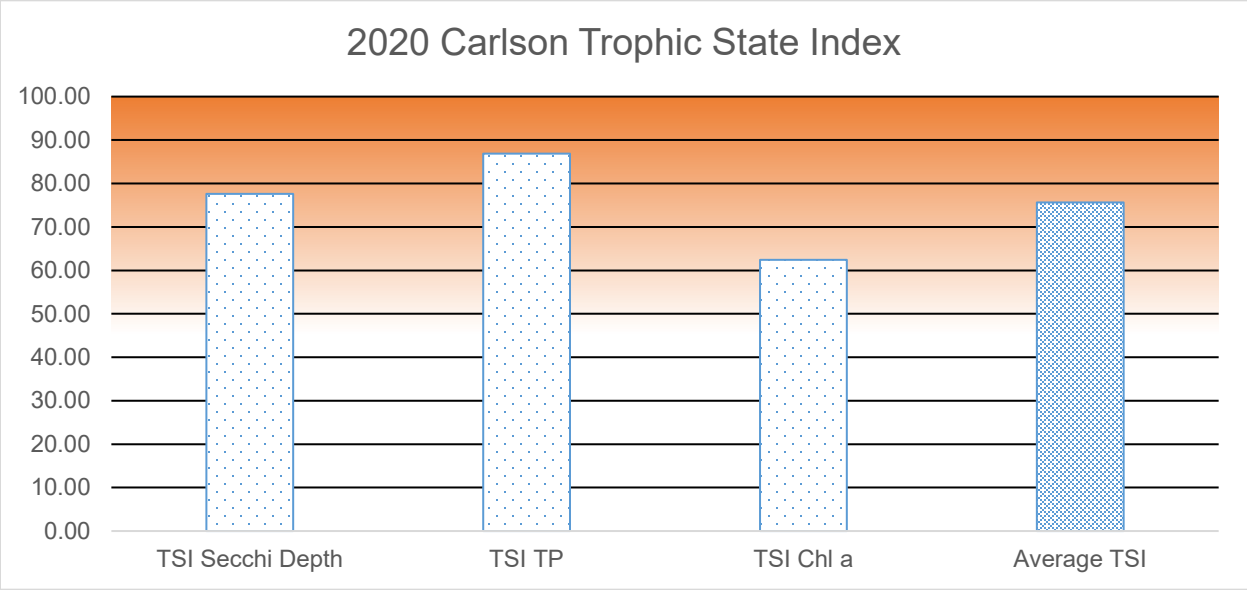


**Red line approximately indicates the water quality standard of 25 mg/cm^3. See Carlson 1977.*

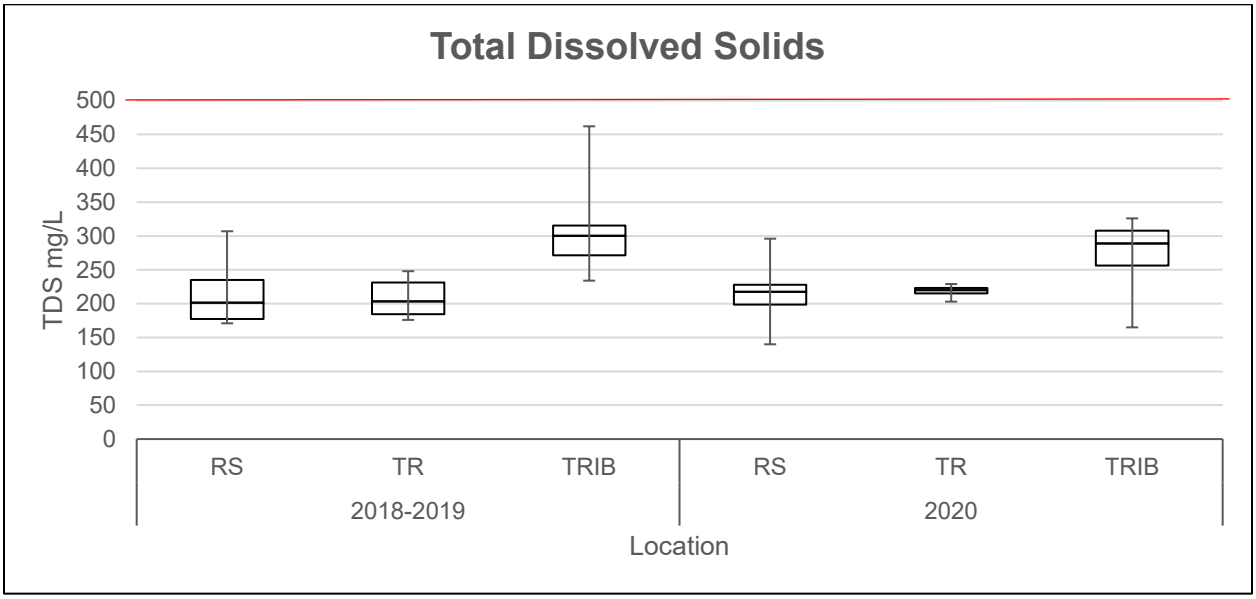
		Historical Reference 1984-2019				2020			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Chl a	RS	29.99	21.25	266	3.49	25.64	20.15	8	17.20
	TRIB	24.21	12.40	59	6.78	22.92	6.10	5	50.38
Pheo a	RS	8.48	6.30	220	0.87	11.16	9.90	8	8.26
	TRIB	6.89	5.00	54	1.72	6.65	5.40	4	10.88

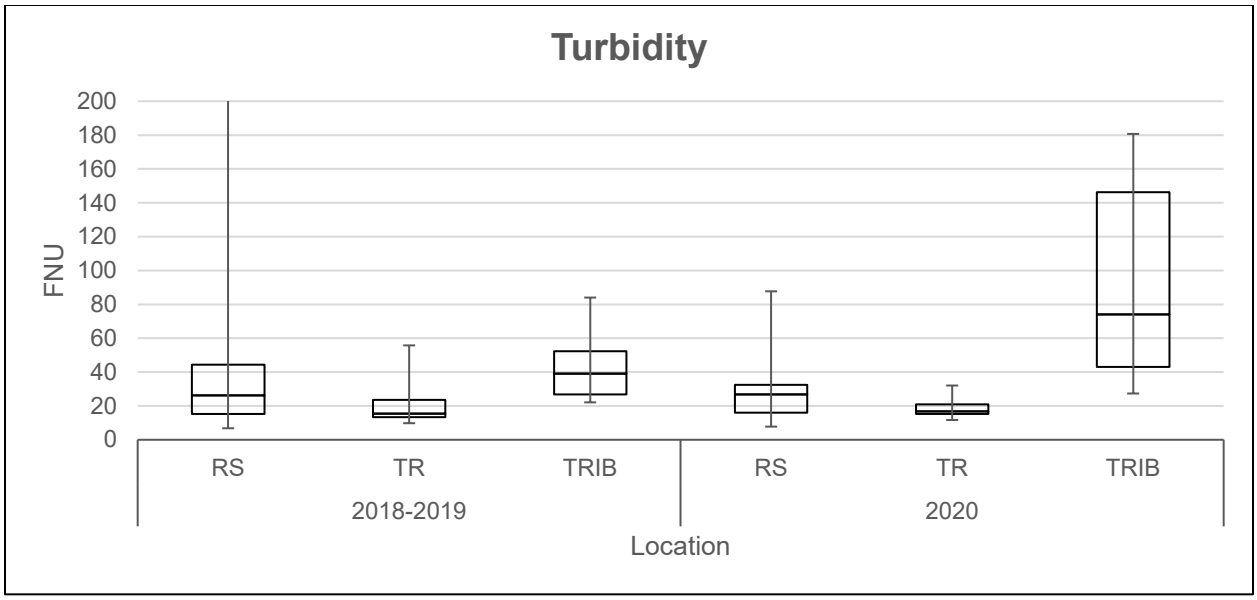
**The proposed criteria for chlorophyll-a of 25mg/cm^3 was exceeded at the lake sites in May and October. This study does not acknowledge a criteria for pheophytin.*





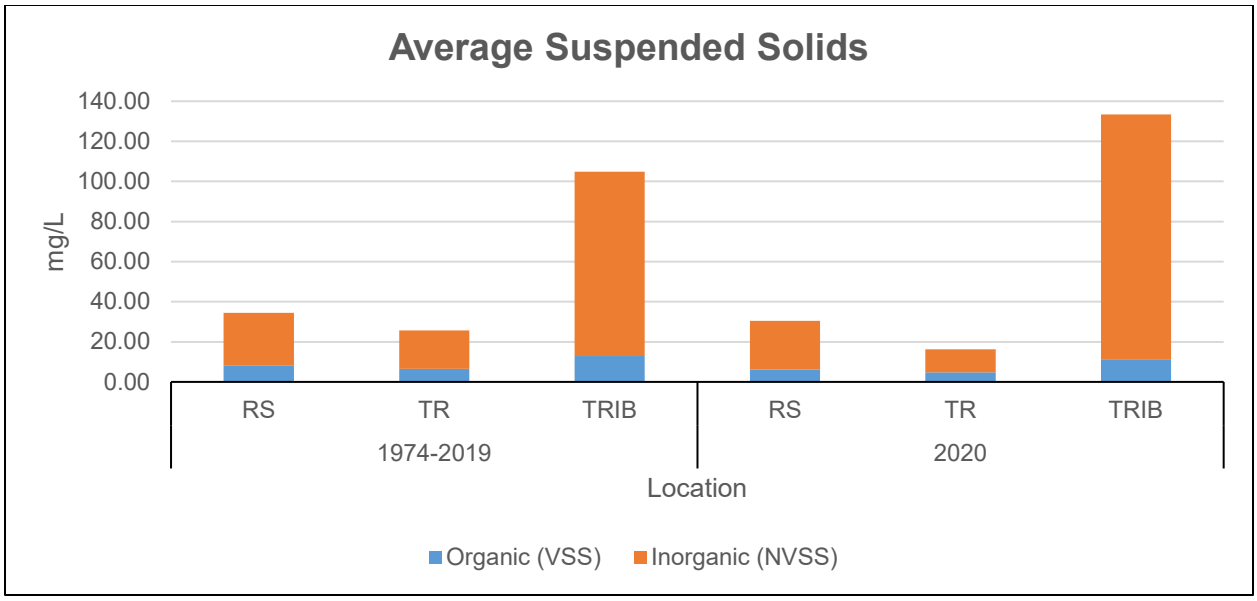
<40 = Oligotrophic __ 40-50 = Mesotrophic __ 50-70 = Eutrophic __ >70 Hypereutrophic





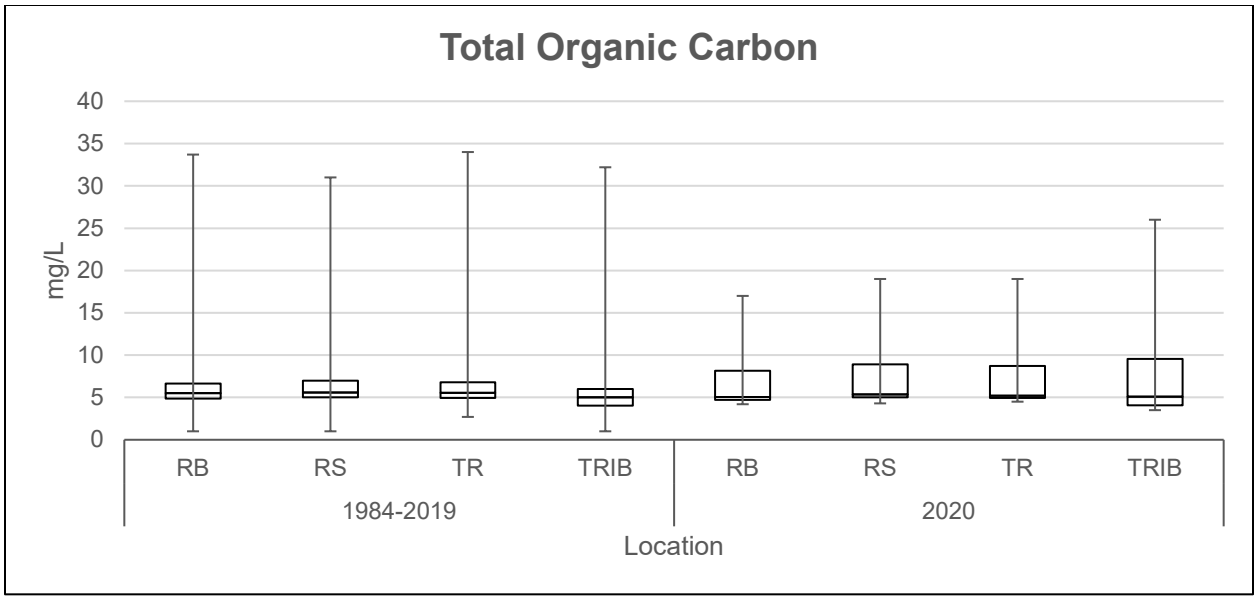
		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
FNU	RS	48.45	26.25	33	26.30	29.29	26.82	22	8.42
	TR	21.61	15.49	8	12.82	19.31	16.75	4	14.05
	TRIB	42.99	38.99	16	10.30	92.87	73.99	8	51.91
TDS	RS	210.47	201.50	34	13.19	215.09	217.50	22	17.31
	TR	208.25	203.50	8	23.91	218.00	220.00	4	17.33
	TRIB	309.69	300.50	16	34.80	270.00	289.00	8	51.59

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



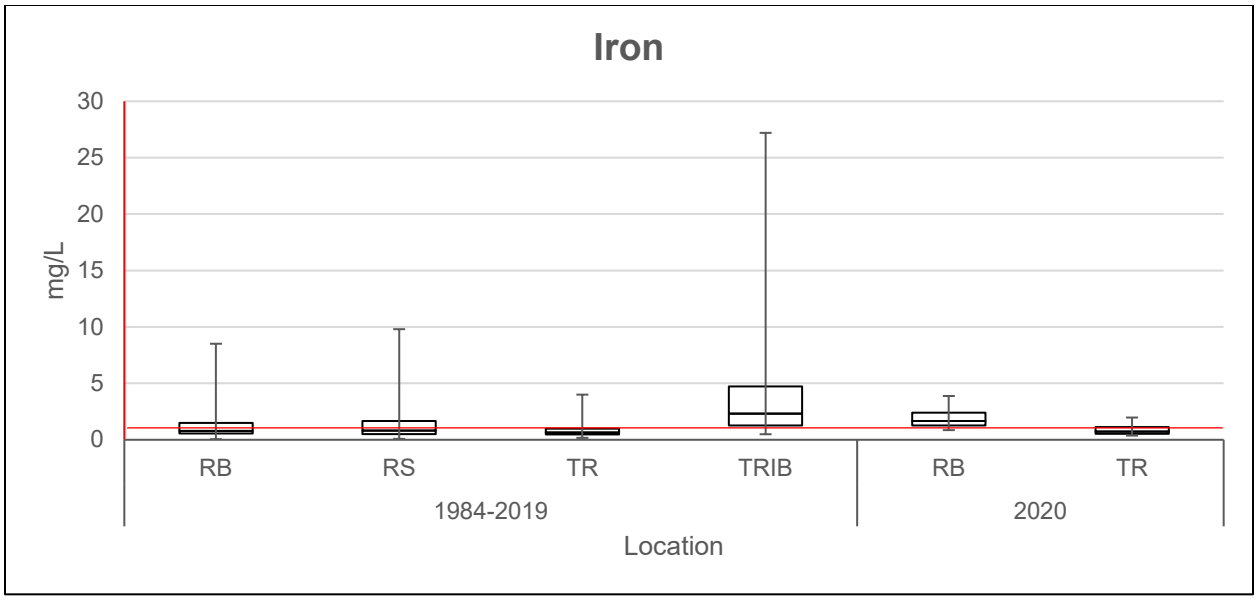
		Historical Reference 1974-2019				2020			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
TSS	RS	34.41	25.00	505	2.85	30.51	19.30	8	20.54
	TR	25.58	21.00	210	2.72	16.20	16.40	4	10.00
	TRIB	104.84	62.00	421	13.02	133.50	94.50	8	101.99
VSS	RS	8.30	7.00	502	0.59	6.18	6.60	8	1.77
	TR	6.56	5.00	208	0.68	4.70	4.40	4	1.50
	TRIB	12.86	8.80	421	1.26	11.23	10.00	8	5.60
NVSS	RS	26.16	17.00	505	2.53	24.33	15.23	8	19.47
	TR	19.09	15.03	210	2.37	11.50	11.00	4	10.42
	TRIB	91.98	51.00	421	11.93	122.27	84.50	8	96.64

**The solids data measured in 2020 were comparable to the historical data with the exception of TSS being greater in the tributaries. There is no numeric standard for solids.*

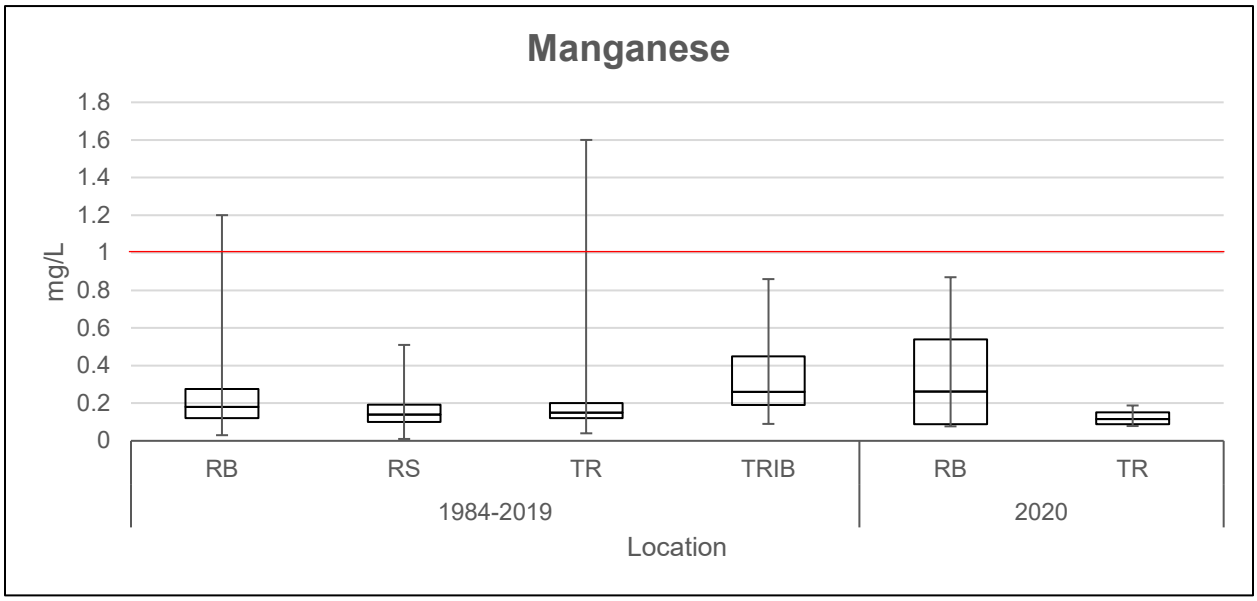


	Historical Reference 1984-2019				2020			
Location	Mean	Median	Count	CL(95.0%)	Mean	Median	Count	CL(95.0%)
RB	6.54	5.50	176	0.60	7.83	5.05	4	9.76
RS	6.48	5.60	302	0.38	8.48	5.35	8	5.19
TR	6.57	5.55	142	0.61	8.48	5.20	4	11.18
TRIB	5.97	5.00	194	0.56	9.15	5.10	8	7.10

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



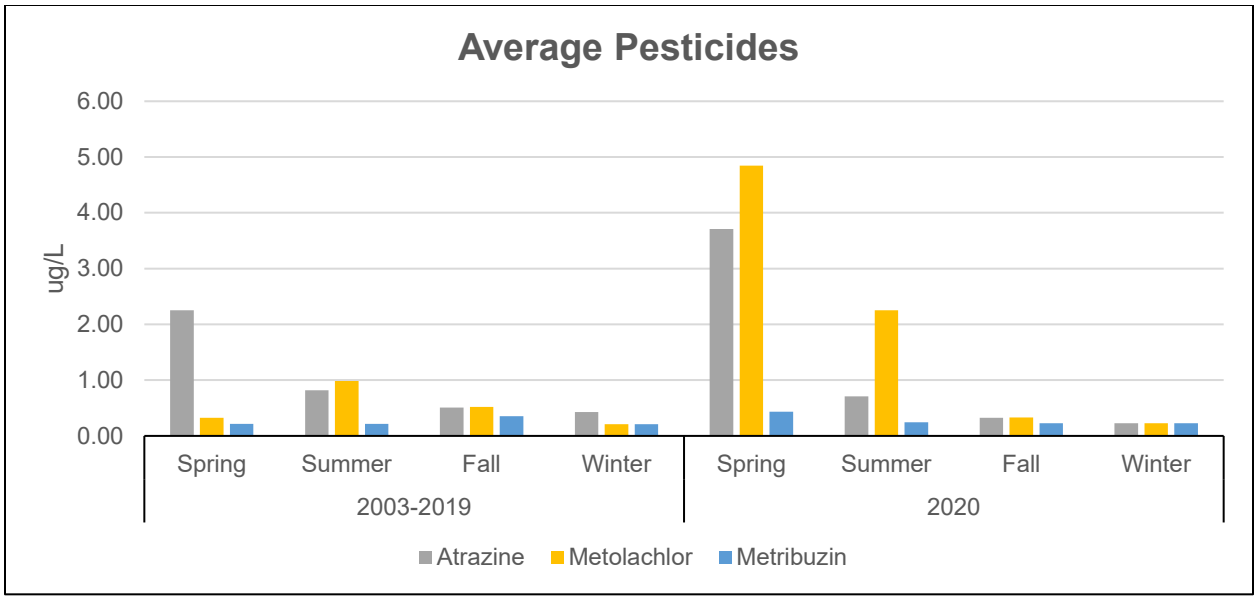
**Red line indicates the water quality standard of 1 mg/L.*



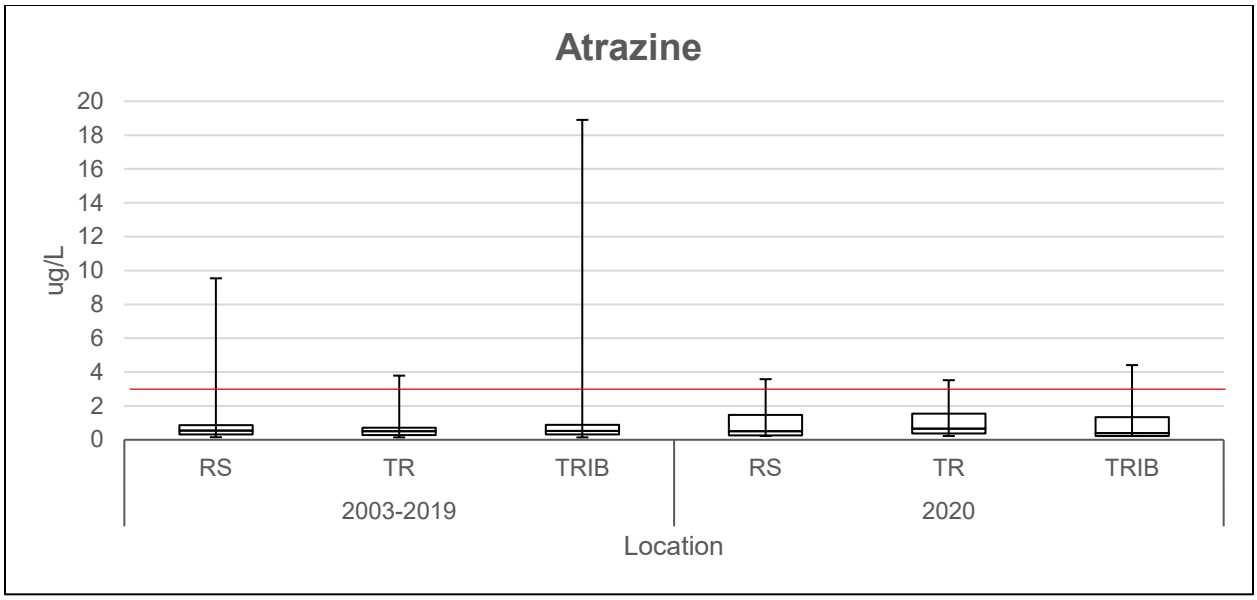
**Red line indicates the water quality standard of 1 mg/L.*

		Historical Reference 2014-2018				2019			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Iron	RB	1.21	0.79	174	0.17	2.02	1.67	4	2.10
	TR	0.88	0.65	143	0.12	0.95	0.72	4	1.13
Mang	RB	0.23	0.18	174	0.03	0.37	0.26	4	0.59
	TR	0.19	0.15	141	0.03	0.12	0.12	4	0.08

**In 2020 iron exceeded the standard of 1 mg/L near the lake bottom in front of the dam twice and once in the tail race. Manganese did not exceed the criterion.*

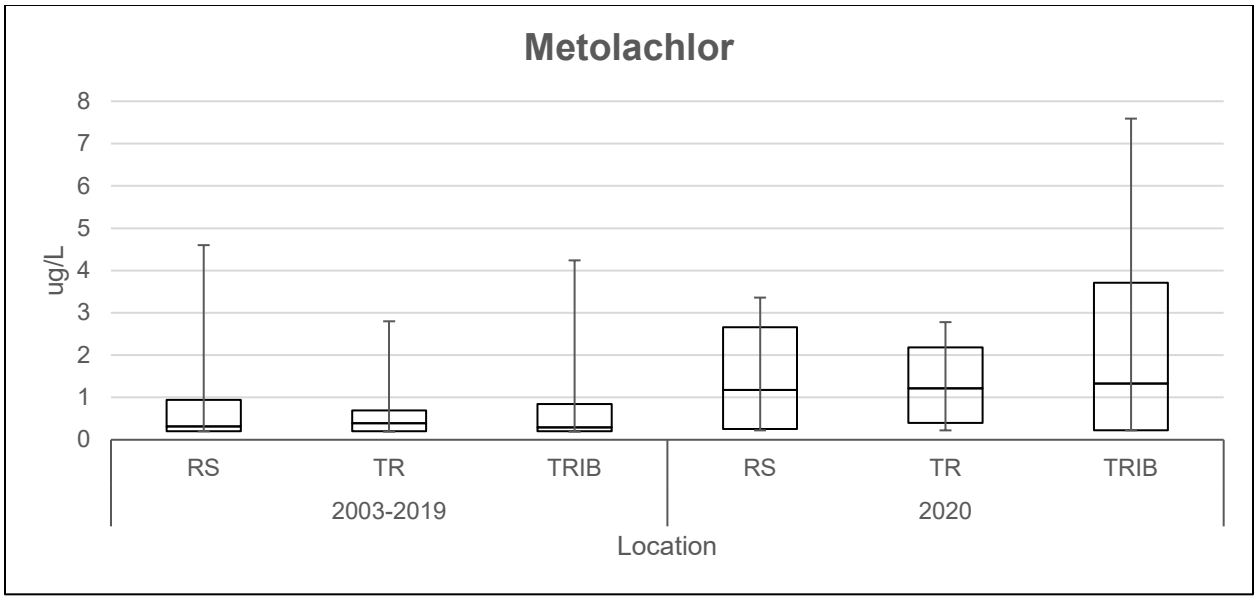


**Of the eight pesticides tested, only the above three were reported above detection levels for the period 2003-2020.*



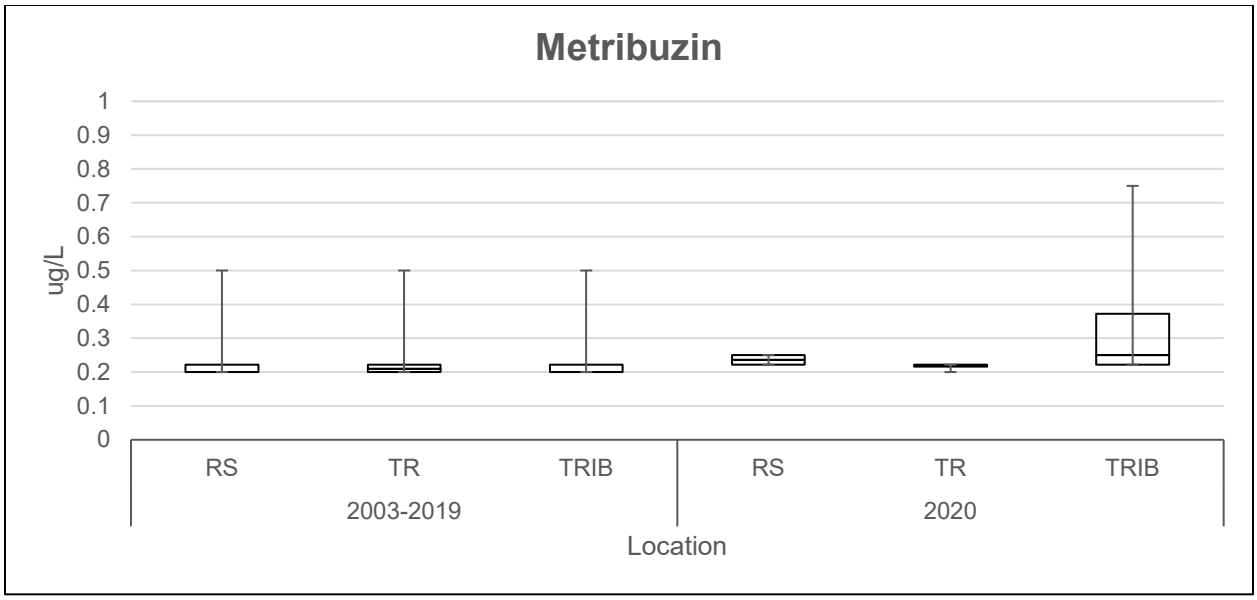
		Historical Reference 2003-2019				2020			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Atrazine	RS	0.93	0.54	112	0.25	1.19	0.50	8	1.19
	TR	0.66	0.50	56	0.17	1.26	0.66	4	2.43
	TRIB	1.67	0.53	108	0.68	1.26	0.40	8	1.45

**Atrazine was measured above the DWS criterion of 3 ug/L at all sites on May 20 2020.*



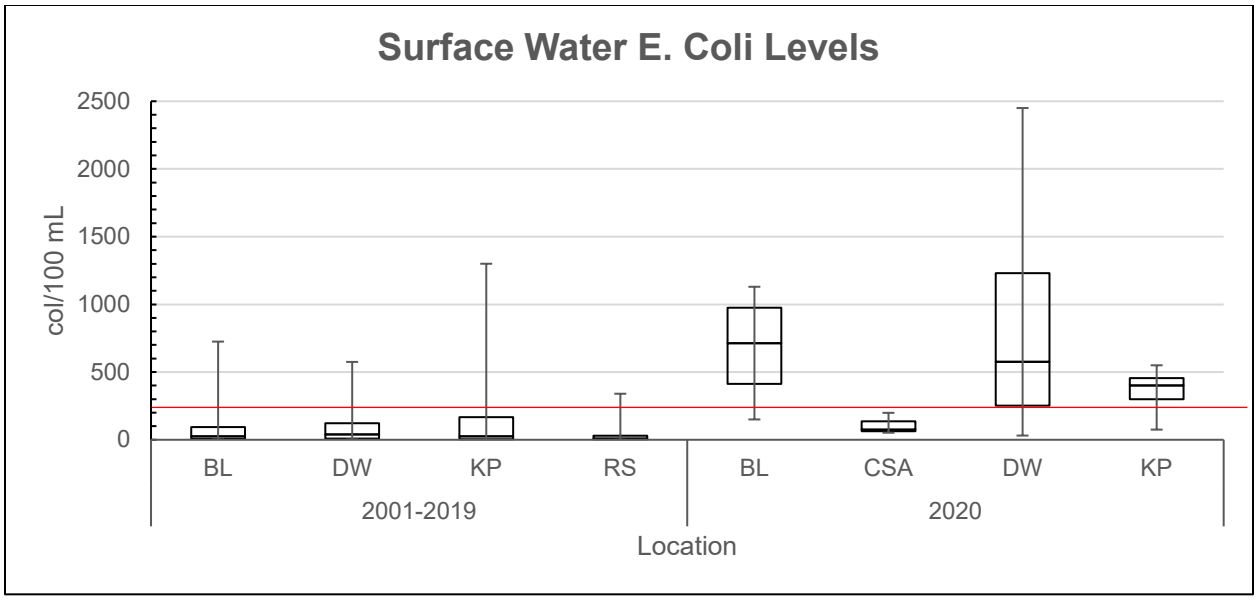
	Historical Reference 2003-2019					2020			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Metolachlor	RS	0.78	0.31	74	0.22	1.50	1.18	8	1.13
	TR	0.69	0.39	37	0.25	1.36	1.22	4	1.95
	TRIB	0.74	0.29	70	0.22	2.61	1.33	8	2.68

**Metolachlor did not exceed water quality criteria in 2020.*



		Historical Reference 2003-2019				2020			
	Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Metribuzin	RS	0.22	0.20	74	0.01	0.24	0.24	8	0.01
	TR	0.22	0.21	37	0.02	0.22	0.22	4	0.02
	TRIB	0.22	0.20	70	0.01	0.36	0.25	8	0.20

**Metribuzin did not exceed water quality criteria in 2020.*



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

	Historical Reference 2001-2019				2020			
Marina Location	Mean	Median	Count	CL (95.0%)	Mean	Median	Count	CL (95.0%)
Boulder	99.83	25	42	57.08	676.25	712.5	4	697.10
Dam West	88.76	40	42	41.14	907.75	575.0	4	1717.16
Keyesport	139.90	25	42	77.61	356.25	400.0	4	320.52
Carlyle Sailing Association					108.67	75.00	3	196.42
RS	36.87	8	30	26.32				

**Marina bacteria levels exceeded the reference water quality criterion at all locations except CSA in 2020.*

2019 Swimming Beach Bacteria Levels (E. Coli / 100mL)										
	Keyesport		Harbor Light		Dam West		McNair		Coles Creek	
	East	West	East	West	North	South	North	South	North	South
5/6/2020	25	45	144	145	40	29	60	55	51	42
5/13/2020	36	50	130	133	43	47	70	55	85	68
5/20/2020	55	51	115	122	65	50	45	33	65	105
5/27/2020	105	102	120	110	45	42	65	60	95	90
6/3/2020	200	180	150	141	120	88	50	45	105	91
6/10/2020	88	79	158	145	45	41	150	110	58	52
6/17/2020	75	75	165	145	55	45	116	94	98	91
6/24/2020	100	90	150	135	75	55	40	40	120	114
7/1/2020	123	110	176	151	96	88	71	60	126	91
7/8/2020	128	89	110	105	160	141	180	150	146	142
7/15/2020	95	105	225	204	120	114	143	120	150	435
7/22/2020	115	108	185	154	105	92	133	112	165	140
7/29/2020	46	41	110	97	75	66	50	41	44	32
8/5/2020	74	58	171	161	84	80	97	78	89	91
8/12/2020	101	79	174	145	87	74	75	69	120	98
8/19/2020	71	88	152	132	75	55	56	40	144	132
8/26/2020	71	87	174	185	54	65	56	77	110	124
9/2/2020	74	58	171	161	84	80	97	78	89	91
9/9/2020	101	79	174	145	87	74	75	69	120	98
9/16/2020	71	88	152	132	75	55	56	40	144	132
9/23/2020	71	87	174	185	54	65	56	77	110	124
9/30/2020	110	91	145	155	60	64	51	68	91	112

**Beach bacteria levels exceeded the reference water quality criterion once in July at Coles Creek South.*

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 2020 did not deviate far from conditions observed during the reference period (1971-2019). Nevertheless, concerns regarding bacteria, TP, iron, pH, DO, temperature, and Atrazine were evident. In addition, CHL_a and subsequent TSI levels were indicative of a hyper eutrophic system.

E. Coliform levels were observed above the swimming standard of 235 E. Coli per 100/mL (single sample) three out of the four sampling events for Boulder, Dam West, and Keyesport Marinas. Bacteria levels can be highly variable and high levels may not necessarily be representative of the entire system. There were precipitation events of approximately one inch or greater before each of these high samples were taken which may contribute to higher bacteria levels. Conversely, bacteria levels observed within the Carlyle Sailing Association waters were well under the standard. E. Coliform levels are monitored for the protection of human health as it relates to full body contact of recreational waters. Given that 2020 high bacteria levels in the Marinas are not swimming areas, there is a lower risk to humans. Long term bacteria monitoring and analyses will be important to assess changes over time. Swimming beaches at Carlyle Lake are also monitored for bacteria by the Lake Project staff. During 2020 the state standard was exceeded once at Coles Creek swimming beach at the south location with a result of 435 E. Coli per 100 mg/L.

Surface TP levels have surpassed the 0.05 mg/L criterion for several years. In 2020 the TP criterion was exceeded at all locations with a mean concentration across all sites of 0.36 mg/L. This is 38% greater than the historical mean of 0.23 mg/L, but similar to the 2019 mean of 0.37 mg/L. The mean NO3-N concentration in 2020 (1.17 mg/L) was comparable with the historic mean (1.29 mg/L) and did not exceed the criterion of 10 mg/L in 2020 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.

Living organisms require trace amounts of metals, excessive levels can be harmful. TFe exceeded the criterion of 1 mg/L three times at the bottom reservoir location in front of the dam and once in the tailrace in 2020. Comparably, there are multiple times TFe was high historically (1984-2019) at the same locations. The 2020 TFe mean concentrations were slightly greater (RB: 2.02 mg/L, TR: 0.95) than the historical means (RB: 1.21 mg/L, TR 0.88 mg/L). 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 spillway will be oxidized in a short period of time.

Potential of hydrogen (pH) is a measure of how acidic or basic water is. The pH of water varies considerably beyond the local level. Natural variation in bedrock and soil composition through which water moves has been reported as one of the most influential factors. Additional factors include decomposition of organic materials, acidity of local precipitation, discharge of effluents and chemicals, and mining operations. Most freshwater streams and rivers have a natural pH ranging from 6 to 8. As pH approaches 5 (acidic), less tolerant fish and aquatic invertebrate assemblages may be extirpated, and a pH below 4.5 would be without most desired aquatic life. Conversely, when pH exceeds 9.5 (alkaline), aquatic fish and invertebrate begins to rapidly decrease and beyond 10, fish become extirpated. In 2020, one of 34 measurements of pH exceeded the water quality standard (6.5-9). On July 29 2020, a pH of 9.02 was recorded at the Carlyle Sailing Association location. Since 1972, there have been multiple events pH was greater than nine. The 2020 mean pH of 8.15 is slightly greater than the historic value of 7.78.

In 2020 all 34 discrete observations of DO were within the state guidelines with one exception at Boulder Marina. On July 29 2020, DO was recorded at 2.51 mg/L in the Boulder Marina waters. Since 1972, there have been 22 measurements observed in the summer in which DO was below 5 mg/L. DO was measured at the tail race in 15-minute intervals from April 27 through November 24 2020. On September 30 DO was recorded between 4-5 mg/L for a brief time. All other measurements of DO were greater than the standard. It is not abnormal during warm air and water temperatures to experience low DO. DO has an inverse relationship with temperature. As temperature increases, the ability of water to contain DO decreases, therefore the DO concentration decreases. Water temperature measurements made during 2020 indicate it was a very warm year. This finding assumes that the historical reference 1971-2019 is the normal seasonal temperature. In a comparison of 2020 mean temperatures to historical mean temperatures, the water quality standard of <2.8°C was exceeded during the spring, summer, and winter. Discrete 2020 temperature readings exceeded the reference historical means multiple times during the spring, summer, and winter by as much as 3.16, 5.10, and 8.05°C respectively.

Pesticides are commonly used throughout much of the agricultural landscape that the Kaskaskia River flows. Of the eight pesticides tested, only Atrazine, Metolachlor, and Metribuzin were detected between 2003 and 2020. Of those three, only Atrazine was found to exceed the criteria. In 2020 the Atrazine drinking water standard (3 ug/L) was exceeded on May 20 at all locations with concentrations ranging from 3.35 - 4.41 ug/L. Atrazine levels were recorded over the standard multiple times in the lake and tributaries historically. The 2020 Atrazine mean (1.22 ug/L) is comparable to the historic Atrazine average (1.16 ug/L). Atrazine is a commonly used agricultural chemical which can be readily transported by rainfall runoff. Atrazine is suspected of causing cancer; and therefore, is 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.

Although there is not a state criterion for CHL_a the proposed standard of 25 mg/cm^3 was exceeded at both lake sites and one tributary site in 2020. The 2020 combined (lake and tributary) CHL_a mean concentration of 24.59 mg/cm^3 was less than the historical mean of 28.9 mg/cm^3. CHL_a is an indicator of the abundance of phytoplankton. Any water environment with a level recorded above 25 mg/cm^3 is considered to be eutrophic (nutrient enrichment increases algal and plant growth and negative effects). The 2020 TSI level, an average of the individual trophic state indexes for secchi depth, CHL_a, and TP, for Carlyle Lake is 75.64. Carlyle 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 over time.

Total suspended solids can affect water quality by increasing temperature through the absorption of sunlight by suspended particles in the water column, and consequently reduce DO. TSS are also strongly correlated with water clarity and the presence of Macrophytes. Though there are no numeric water quality standards for total solids, Carlyle Lake is listed as impaired by TSS. The 2020 TSS mean concentrations in the lake (30.5 mg/L) and tail race (16.2 mg/L) were lower than the historical means (lake: 34.4 mg/L, tail race: 25.6 mg/L). However, the 2020 TSS tributary mean concentration was greater (133.5 mg/L) than the historical tributary mean (104.8 mg/L).

All remaining parameters evaluated during the 2020 water quality monitoring effort were within designated criteria or within historical reference norms.

MONITORING PROGRAM RECOMMENDATIONS

The IEPA currently has listed Carlyle Lake as impaired for total suspended solids, total phosphorous, and mercury while the Kaskaskia River upstream from the Lake is impaired for dissolved oxygen, Atrazine, and mercury. The lists of sources for these impairments are contaminated sediments, crop production, and unknown sources. At present the only tributary being sampled by CEMVS is the Kaskaskia River. IEPA also has the following listed as impaired: Hurricane Creek, North Fork Kaskaskia, and East Fork Kaskaskia. It is recommended to add these three tributaries as well as mercury in the lake to the routine sampling plan to increase the dataset and improve our ability to assess the water quality condition of Carlyle Lake.

In accordance with EM-1110-2-1201, sediment samples should be taken to monitor and assess potential impacts to aquatic and human health. Sediment sampling and analyses occurred at Carlyle 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 hyper-eutrophic status of Carlyle Lake it is recommended that Nitrite (NO_2) and Total Khejdahl Nitrogen (TKN) be added to the monitoring program if possible. Doing so would allow CEMVS to evaluate Total Nitrogen (TN), which is a strong indicator of trophic status.

Given the above-mentioned high bacteria levels observed at the Marinas in 2020, it is recommended to add routine bacteria sampling to the tributary (CAR-12, CAR-13, and any additional tributaries). This would be useful in capturing a larger picture of bacteria coming into the lake. It may also be useful to execute a review of all NPDES permits and other potential contributors to high bacteria levels in the marinas.

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APPENDIX A: FIELD DATA

Date	Location	Depth (m)	Temp (°C)	ORP (mV)	Sp Cond (µS/cm)	pH	ODO (% Sat)	ODO (mg/L)	TDS (mg/L)	Turbidity (FNU)	Secchi (in)
3/10/2020	CAR-1	0.82	7.78	215.8	337.3	7.95	109.7	13.05	219	32.05	
3/10/2020	CAR-12	0.92	7.89	214.1	500.7	7.99	94.4	11.19	325	45.76	6
3/10/2020	CAR-12	2.01	7.94	211.1	499.3	7.97	94.3	11.17	325	44.35	
3/10/2020	CAR-12	3.21	7.94	208.3	498.1	7.95	94	11.13	324	43.99	
3/10/2020	CAR-12	4.25	7.94	207.2	498	7.94	93.9	11.12	324	45.74	
3/10/2020	CAR-13	0.99	8.50	130.6	464	8	92.3	10.79	302	96.22	
3/10/2020	CAR-2	1.11	7.67	161.7	341.7	7.97	96.6	11.52	222	31.34	9
3/10/2020	CAR-2	1.00	7.67	164.5	342	7.97	96.5	11.51	222	32.47	
3/10/2020	CAR-2	2.08	7.72	168	345.5	7.96	96.4	11.48	225	30.96	
3/10/2020	CAR-2	3.20	7.72	168.3	346.1	7.97	96.3	11.46	225	31.65	
3/10/2020	CAR-2	4.16	7.72	168.6	345.3	7.97	96.2	11.46	224	31.94	
3/10/2020	CAR-2	4.93	7.72	156.6	344.5	7.97	96	11.45	224	31.55	
3/10/2020	CAR-4	0.85	9.56	151	403	8.14	96.6	11	262	57.8	5
3/10/2020	CAR-4	2.25	9.56	149.3	403.2	8.21	96.4	10.98	262	57.6	
3/10/2020	CAR-4	3.31	9.56	149.6	403.3	8.23	96.5	10.98	262	57.63	
3/10/2020	CAR-4	4.27	9.61	151.3	403.7	8.22	96.5	10.98	262	55.78	
3/10/2020	CAR-4	3.92	9.67	152.6	403.4	8.22	96.4	10.96	262	58.55	
3/10/2020	CAR-4	4.30	9.50	155.6	402.6	8.19	98.2	11.19	262	66.36	
3/10/2020	CAR-4	4.91	9.56	152.1	404.2	8.2	95.9	10.93	263	61.75	
3/10/2020	CAR-4	6.57	9.56	152.9	403.8	8.22	95.6	10.9	262	64.1	
3/10/2020	CAR-BL-MAR	1.58	10.39	154.9	251.8	7.91	68.2	7.62	164	87.72	
3/10/2020	CAR-DW-MAR	1.00	8.67	163.8	321.7	7.96	87.8	10.22	209	33.96	
3/10/2020	CAR-DW-MAR	2.05	8.67	162.2	321.7	7.94	86.7	10.09	209	39.65	
3/10/2020	CAR-KP-MAR	0.95	9.61	129.4	455.4	8.09	93.2	10.6	296	64.37	
5/20/2020	CAR-1	0.81	17.20	373.1	352.3	8.04	105.1	10.1	229	16.33	
5/20/2020	CAR-12	0.83	17.20	233.6	253.8	7.61	67.7	6.51	165	167.12	
5/20/2020	CAR-13	0.65	16.70	216.8	281.6	7.77	76	7.38	183	135.83	
5/20/2020	CAR-2	1.14	17.30	334.8	350.4	8.13	81.9	7.87	228	14.46	7
5/20/2020	CAR-2	2.02	17.20	333.9	350.3	8.16	81.2	7.81	228	14.81	
5/20/2020	CAR-2	3.21	17.20	333.4	350.3	8.12	80.1	7.71	228	15.15	

Date	Location	Depth (m)	Temp (°C)	ORP (mV)	Sp Cond (µS/cm)	pH	ODO (% Sat)	ODO (mg/L)	TDS (mg/L)	Turbidity (FNU)	Secchi (in)
5/20/2020	CAR-2	4.20	17.10	332.7	350.4	8.1	79.6	7.66	228	15.45	
5/20/2020	CAR-2	5.24	17.10	331.9	350.5	8.1	79.2	7.63	228	15.83	
5/20/2020	CAR-2	6.11	17.10	330.1	350.7	8.1	78.7	7.58	228	16.73	
5/20/2020	CAR-4	1.08	18.20	270.9	427.5	8.72	97.6	9.2	278	32.37	8
5/20/2020	CAR-4	2.06	18.10	270.6	449.9	8.58	94.4	8.9	292	29.45	
5/20/2020	CAR-4	3.21	18.20	266	422.2	8.73	96.8	9.12	274	34.43	
5/20/2020	CAR-4	4.22	18.10	265.9	434.2	8.69	95.8	9.03	282	32.34	
5/20/2020	CAR-4	5.22	18.10	266.3	447.8	8.6	93.4	8.81	291	31.55	
5/20/2020	CAR-4	5.25	18.10	266.7	453.3	8.53	91.9	8.67	295	32.51	
5/20/2020	CAR-4	6.12	18.10	265.3	441.6	8.57	92.1	8.69	287	34.49	
5/20/2020	CAR-BL-MAR	2.77	17.70	127.1	376.1	8.3	67.6	6.44	244	109.37	
5/20/2020	CAR-BL-MAR	0.99	17.90	88.4	352	8.24	72.1	6.84	229	17.27	
5/20/2020	CAR-DW-MAR	0.10	17.20	291.8	349.9	8.17	79.2	7.61	227	13.75	
5/20/2020	CAR-DW-MAR	2.30	16.90	291.5	352.6	8.09	67	6.48	229	15.09	
5/20/2020	CAR-DW-MAR	3.23	16.70	258.9	356	7.97	59	5.73	231	160.06	
5/20/2020	CAR-KP-MAR	2.40	18.10	220.2	415.2	8.66	90.8	8.57	270	303.69	
5/20/2020	CAR-KP-MAR	1.03	18.10	216.5	414.9	8.74	96.5	9.1	270	28.82	
7/29/2020	CAR-1	0.76	28.90	97.9	339.3	8.48	97.8	7.52	221	11.68	
7/29/2020	CAR-12	1.24	26.90	119.7	450.5	7.8	89.8	7.16	293	34.71	
7/29/2020	CAR-13	0.00	28.10	112.8	438.6	7.84	96.1	7.5	285	51.75	
7/29/2020	CAR-2	1.13	28.80	108.2	334.8	8.58	82.5	6.36	218	7.76	22
7/29/2020	CAR-2	2.12	28.50	114.9	339	8.3	52.8	4.09	220	8.62	
7/29/2020	CAR-2	3.22	28.40	127	341.5	7.95	38.8	3.02	222	10.22	
7/29/2020	CAR-2	4.00	28.30	131.4	343.5	7.79	27.1	2.11	223	11.41	
7/29/2020	CAR-2	5.19	28.10	134.5	345.6	7.7	19.6	1.53	225	13.72	
7/29/2020	CAR-4	1.22	28.70	97.5	216.1	8.84	117	9.05	140	35.39	18
7/29/2020	CAR-4	2.31	28.50	103	216.8	8.78	109.8	8.52	141	38.45	
7/29/2020	CAR-4	3.08	28.50	106.8	217.5	8.73	105.5	8.19	141	43.38	
7/29/2020	CAR-4	4.21	28.30	118.3	220.6	8.47	83.7	6.51	143	42.73	
7/29/2020	CAR-4	5.14	28.10	125.9	224.2	8.09	57.1	4.46	146	52.28	

Date	Location	Depth (m)	Temp (°C)	ORP (mV)	Sp Cond (µS/cm)	pH	ODO (% Sat)	ODO (mg/L)	TDS (mg/L)	Turbidity (FNU)	Secchi (in)
7/29/2020	CAR-BL-MAR	1.21	28.50	131.2	287.8	7.83	32.4	2.51	187	26.87	
7/29/2020	CAR-CSA	0.88	30.20	105.9	321.1	9.02	163.8	12.33	209	11.41	
7/29/2020	CAR-DW-MAR	1.12	29.60	110.7	339.3	8.59	102	7.75	221	12.12	
7/29/2020	CAR-KP-MAR	0.71	29.30	104.4	216.7	8.84	114.7	8.78	141	23.73	
10/22/2020	CAR-1	1.28	14.40		312.4	7.77	69.8	7.13	203	17.16	
10/22/2020	CAR-12	1.16	14.10		500.9	7.79	78.1	8.03	326	27.34	12
10/22/2020	CAR-12	3.62	14.00		501	7.78	78.2	8.04	326	23.88	
10/22/2020	CAR-12	6.75	14.00		499.7	7.77	76.9	7.92	325	30.41	
10/22/2020	CAR-13	0.96	14.40		431.7	7.4	70.1	7.15	281	180.71	
10/22/2020	CAR-2	1.07	14.20		308.3	8.24	94.6	9.7	200	15.53	15
10/22/2020	CAR-2	2.16	14.20		308.3	8.2	93.9	9.62	200	17.36	
10/22/2020	CAR-2	3.05	14.20		308.3	8.2	93.9	9.63	200	17.08	
10/22/2020	CAR-2	4.20	14.20		308.4	8.18	93.2	9.55	200	17.81	
10/22/2020	CAR-2	5.32	14.20		308.5	8.14	92.8	9.51	201	25.53	
10/22/2020	CAR-2	6.11	14.20		308.7	8.11	92.5	9.49	201	20.6	
10/22/2020	CAR-2	7.20	14.20		308.7	8.09	92.5	9.48	201	21.71	
10/22/2020	CAR-2	7.96	14.20		308.7	8.08	92.3	9.46	201	21.65	
10/22/2020	CAR-4	1.12	14.00		336.9	7.97	108.2	11.15	219	26.77	14
10/22/2020	CAR-4	2.08	13.70		343.6	7.92	97.9	10.15	223	28.86	
10/22/2020	CAR-4	3.03	13.10		351	7.8	91.2	9.58	228	35.27	
10/22/2020	CAR-4	3.66	13.00		351.3	7.73	89.3	9.39	228	52.61	
10/22/2020	CAR-BL-MAR	0.00	16.40		303.7	8.1	101.1	9.87	197	29.64	
10/22/2020	CAR-CSA	1.45	14.90		307.5	8.45	105.1	10.6	200	23.06	
10/22/2020	CAR-DW-MAR	1.09	14.20		304.8	8.12	86.4	8.87	198	20.02	
10/22/2020	CAR-DW-MAR	2.04	14.10		303.6	8.03	83.6	8.59	197	22.96	
10/22/2020	CAR-KP-MAR	0.82	14.10		333.5	8.15	101	10.37	217	29.15	

APPENDIX B: LABORATORY DATA

ARDL Inc.
Environmental | Analytical | Management | Safety

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

Customer Name: SLCOE **Date: 4/2/20**

Project Name: Carlyle Lake/Kaskaskia River **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 3/10/20 **ARDL Report No.: 8587**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
CAR-1	3/10/20	8587-01	NP Pesticides, Metals(1), Inorganics(2)
CAR-2-0	3/10/20	8587-02	NP Pesticides, Inorganics(2)(3)
CAR-2-10	3/10/20	8587-03	Metals(1), Inorganics(2)
CAR-4	3/10/20	8587-04	NP Pesticides, Inorganics(2)(3)
CAR-13	3/10/20	8587-05	NP Pesticides, Inorganics(2)
CAR-12	3/10/20	8587-06	NP Pesticides, Inorganics(2)(3)
CAR-15	3/10/20	8587-07	NP Pesticides, Inorganics(2)(3)
CAR-KP-Marina	3/10/20	8587-08	E. Coli
CAR-DW-Marina	3/10/20	8587-09	E. Coli
CAR-BL-Marina	3/10/20	8587-10	E. Coli
KAS-1	3/10/20	8587-11	Inorganics(2)(3)(4), E. Coli
KAS-2	3/10/20	8587-12	Inorganics(2)(3)(4), 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.
(4) Including nitrite and TKN.

The quality control data are summarized as follows:

PESTICIDE FRACTION

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.

CASE NARRATIVE (Continued)

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.

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, except for iron which is greater than the LOQ, however less than 10% of the lowest concentration sample therefore acceptable. The data is flagged appropriately with a 'B' qualifier in the associated samples.

LABORATORY CONTROL SAMPLE

Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE

Percent recoveries of all matrix spikes and matrix spike duplicates were within the control limits, except 2 of 2 for iron. The parent sample has been flagged appropriately with a 'J' qualifier.

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 parameter 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.

B - This flag is used when the analyte is found in the blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

CASE NARRATIVE (Continued)

REPORT ORGANIZATION

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

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

Dean S. Dickerson
Technical Services Manager

Sample & QC Results

Including as appropriate:

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

ARDL Data Package 8587

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

Lab Report No: 008587 Report Date: 03/31/2020

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

Field ID:	CAR-1	ARDL Lab No.:	008587-01
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0330005
Sample Date:	03/10/2020	Received Date:	03/10/2020
Sample Time:	1130	Prep. Date:	03/12/2020
Matrix:	WATER	Analysis Date:	03/30/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11185
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	69%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-01 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-1 Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1130

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500	JB	1.97	MG/L	3010A	6010C	03/16/20	03/23/20	P7347
(a) Manganese	0.00400	0.00500		0.0926	MG/L	3010A	6010C	03/16/20	03/23/20	P7347
Ammonia Nitrogen	0.0200	0.0300		0.346	MG/L	NONE	350.1	NA	03/30/20	03305161
Nitrate as Nitrogen	0.0190	0.0200		1.48	MG/L	NONE	GREEN	NA	03/11/20	03195144
Phosphorus	0.00800	0.0100		0.351	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.125	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	4.0	4.00		22.8	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	4.0	4.00		ND	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	03/18/20	03235151

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008587 Report Date: 03/31/2020

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

Field ID:	CAR-2-0	ARDL Lab No.:	008587-02
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0330008
Sample Date:	03/10/2020	Received Date:	03/10/2020
Sample Time:	1210	Prep. Date:	03/12/2020
Matrix:	WATER	Analysis Date:	03/30/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11185
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	76%

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

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Mt. Vernon, Illinois 62864

Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-02 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-2-0 Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1210

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.437	MG/L	NONE	350.1	NA	03/30/20	03305161
Chlorophyll-a, Correcte	1.0	1.00		4.5	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Nitrate as Nitrogen	0.0380	0.0400		1.74	MG/L	NONE	GREEN	NA	03/11/20	03195144
Pheophytin-a	1.0	1.00		3.1	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus	0.00800	0.0100		0.312	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.138	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	2.50	2.50		22.0	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	2.50	2.50		2.75	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		4.3	MG/L	NONE	415.1	NA	03/18/20	03235151

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Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-03 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-2-10 Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1210

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500	B	1.92	MG/L	3010A	6010C	03/16/20	03/23/20	P7347
(a) Manganese	0.00400	0.00500		0.0929	MG/L	3010A	6010C	03/16/20	03/23/20	P7347
Ammonia Nitrogen	0.0200	0.0300		0.332	MG/L	NONE	350.1	NA	03/30/20	03305161
Nitrate as Nitrogen	0.0190	0.0200		1.43	MG/L	NONE	GREEN	NA	03/11/20	03195144
Phosphorus	0.00800	0.0100		0.325	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.133	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	4.0	4.00		28.0	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	4.0	4.00		ND	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		4.2	MG/L	NONE	415.1	NA	03/18/20	03235151

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Mt. Vernon, Illinois 62864

Lab Report No: 008587 Report Date: 03/31/2020

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

Field ID:	CAR-4	ARDL Lab No.:	008587-04
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0330009
Sample Date:	03/10/2020	Received Date:	03/10/2020
Sample Time:	1315	Prep. Date:	03/12/2020
Matrix:	WATER	Analysis Date:	03/30/2020
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11185
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	80%

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

(a) DOD-QSM Accredited Analyte.

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Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-04 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-4 Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1315

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.254	MG/L	NONE	350.1	NA	03/30/20	03305161
Chlorophyll-a, Correcte	1.0	1.00		11.3	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Nitrate as Nitrogen	0.0190	0.0200		1.65	MG/L	NONE	GREEN	NA	03/11/20	03195144
Pheophytin-a	1.0	1.00		4.5	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus	0.00800	0.0100		0.342	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.187	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	6.67	6.67		76.0	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	6.67	6.67		8.0	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		4.8	MG/L	NONE	415.1	NA	03/18/20	03235151

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Lab Report No: 008587 Report Date: 03/31/2020

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

Field ID:	CAR-13	ARDL Lab No.:	008587-05
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0330010
Sample Date:	03/10/2020	Received Date:	03/10/2020
Sample Time:	1520	Prep. Date:	03/12/2020
Matrix:	WATER	Analysis Date:	03/30/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11185
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	76%

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

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Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-05 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-13 Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1520

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.191	MG/L	NONE	350.1	NA	03/30/20	03305161
Nitrate as Nitrogen	0.0380	0.0400		2.62	MG/L	NONE	GREEN	NA	03/11/20	03195144
Phosphorus	0.00800	0.0100		0.429	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.20	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	6.67	6.67		221	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	6.67	6.67		14.7	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		4.7	MG/L	NONE	415.1	NA	03/18/20	03235151

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Lab Report No: 008587 Report Date: 03/31/2020

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

Field ID:	CAR-12	ARDL Lab No.:	008587-06
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0330011
Sample Date:	03/10/2020	Received Date:	03/10/2020
Sample Time:	1430	Prep. Date:	03/12/2020
Matrix:	WATER	Analysis Date:	03/30/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11185
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	86%

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

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Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008587-06
Field ID: CAR-12
Received: 03/10/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 03/10/2020
Sampling Time: 1430

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.213	MG/L	NONE	350.1	NA	03/30/20	03305161
Chlorophyll-a, Correcte	1.0	1.00		6.1	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Nitrate as Nitrogen	0.0950	0.100		3.71	MG/L	NONE	GREEN	NA	03/11/20	03195144
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus	0.00800	0.0100		0.451	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.122	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	4.0	4.00		104	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	4.0	4.00		6.8	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		3.5	MG/L	NONE	415.1	NA	03/18/20	03235151

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Lab Report No: 008587 Report Date: 03/31/2020

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

Field ID:	CAR-15	ARDL Lab No.:	008587-07
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0330012
Sample Date:	03/10/2020	Received Date:	03/10/2020
Sample Time:	1045	Prep. Date:	03/12/2020
Matrix:	WATER	Analysis Date:	03/30/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11185
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	81%

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

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Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-07 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-15 Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1045

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.192	MG/L	NONE	350.1	NA	03/30/20	03305161
Chlorophyll-a, Correcte	1.0	1.00		6.8	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Nitrate as Nitrogen	0.0950	0.100		3.72	MG/L	NONE	GREEN	NA	03/11/20	03195144
Pheophytin-a	1.0	1.00		1.9	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus	0.00800	0.0100		0.455	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.128	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	4.0	4.00		104	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	4.0	4.00		6.4	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		3.6	MG/L	NONE	415.1	NA	03/18/20	03235151

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Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-08 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-KP-MARINA Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1330

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		425	COL/100 ML	NONE	1604	NA	03/10/20	03165129

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Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-09 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-DW-MARINA Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1220

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		825	COL/100 ML	NONE	1604	NA	03/10/20	03165129

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Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-10 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-BL-MARINA Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1550

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		925	COL/100 ML	NONE	1604	NA	03/10/20	03165129

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Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-11 Sampling Loc'n: KASKASKIA RIVER Matrix: WATER
Field ID: KAS-1 Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 8200

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.157	MG/L	NONE	350.1	NA	03/30/20	03305161
Chlorophyll-a, Correcte	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
E. Coliform	1.0	1.00		150	COL/100 ML	NONE	1604	NA	03/10/20	03165129
Kjeldahl Nitrogen	0.190	0.200		1.37	MG/L	351.2	351.2	03/16/20	03/17/20	03195139
Nitrate as Nitrogen	0.0190	0.0200		1.29	MG/L	NONE	GREEN	NA	03/11/20	03195144
Nitrite as Nitrogen	0.0200	0.0200		0.022	MG/L	NONE	354.1	NA	03/11/20	03165131
Pheophytin-a	1.0	1.00		1.8	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus	0.00800	0.0100		0.394	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.12	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	6.67	6.67		68.7	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	6.67	6.67		ND	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	03/18/20	03235151

(a) DOD and/or NELAC Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008587-12 Sampling Loc'n: KASKASKIA RIVER Matrix: WATER
Field ID: KAS-2 Sampling Date: 03/10/2020 Moisture: NA
Received: 03/10/2020 Sampling Time: 1000

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.166	MG/L	NONE	350.1	NA	03/30/20	03305161
Chlorophyll-a, Correcte	1.0	1.00		9.1	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
E. Coliform	1.0	1.00		600	COL/100 ML	NONE	1604	NA	03/10/20	03165129
Kjeldahl Nitrogen	0.190	0.200		1.1	MG/L	351.2	351.2	03/16/20	03/17/20	03195139
Nitrate as Nitrogen	0.0190	0.0200		1.34	MG/L	NONE	GREEN	NA	03/11/20	03195144
Nitrite as Nitrogen	0.0200	0.0200		0.023	MG/L	NONE	354.1	NA	03/11/20	03165131
Pheophytin-a	1.0	1.00		1.6	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus	0.00800	0.0100		0.386	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.143	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	4.0	4.00		65.6	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	4.0	4.00		4.4	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		4.6	MG/L	NONE	415.1	NA	03/18/20	03235151

(a) DOD and/or NELAC Accredited Analyte.

METHOD BLANK REPORT

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

Lab Report No: 008587 Report Date: 03/31/2020

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

Field ID:	NA	ARDL Lab No.:	008587-01B1
Desc/Location:	NA	Lab Filename:	E0330003
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	03/12/2020
Matrix:	QC Material	Analysis Date:	03/30/2020
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11185
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	98%

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

(a) DOD-QSM Accredited Analyte.

BLANK SUMMARY REPORT

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

Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	0.083	MG/L	3010A	6010C	03/16/20	03/23/20	P7347	008587-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	03/16/20	03/23/20	P7347	008587-01B1
Ammonia Nitrogen	0.020	0.030	ND	MG/L	NONE	350.1	NA	03/30/20	03305161	008587-01B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156	008587-07B1
E. Coliform	1.0	1.0	ND	COL/100 ML	NONE	1604	NA	03/10/20	03165129	008587-08B1
Kjeldahl Nitrogen	0.19	0.20	ND	MG/L	351.2	351.2	03/16/20	03/17/20	03195139	008587-12B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	03/11/20	03195144	008587-02B1
Nitrite as Nitrogen	0.020	0.020	ND	MG/L	NONE	354.1	NA	03/11/20	03165131	008587-11B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156	008587-07B1
Phosphorus	0.008	0.010	ND	MG/L	365.2	365.2	03/18/20	03/20/20	03235153	008586-01B1
Phosphorus, -ortho	0.008	0.010	ND	MG/L	NONE	365.2	NA	03/12/20	03165130	008587-03B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	03/16/20	03195137	008587-03B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	03/16/20	03195138	008587-03B1
Total Organic Carbon	0.50	1.0	ND	MG/L	NONE	415.1	NA	03/18/20	03235151	008587-01B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008587

BLANK SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008587 Report Date: 03/31/2020

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

Matrix: QC Material QC Batch: B11185 Prep. Date: 03/12/2020
Amount Used: 1000 mL Level: LOW Analysis Date: 03/30/2020

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	3.23	4	81	--	--	--	30-130	--	--
Atrazine	3.39	4	85	--	--	--	30-130	--	--
Metribuzin	2.99	4	75	--	--	--	30-130	--	--
Alachlor	3.43	4	86	--	--	--	30-130	--	--
Metolachlor	3.51	4	88	--	--	--	30-130	--	--
Chlorpyrifos	3.59	4	90	--	--	--	30-130	--	--
Cyanazine	3.76	4	94	--	--	--	30-130	--	--
Pendimethalin	3.07	4	77	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	94	--	30-130

(a) DOD-QSM Accredited Analyte.
'*' indicates a recovery outside of standard limits.
Spike Blanks for 008587-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

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

Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	4.7	5.0	94	--	--	--	87-115	--	P7347	008587-01C1
(a) Manganese	0.74	0.75	99	--	--	--	90-114	--	P7347	008587-01C1
Ammonia Nitrogen	1.0	1.0	100	--	--	--	80-120	--	03305161	008587-01C1
Kjeldahl Nitrogen	1.1	1.0	107	--	--	--	80-120	--	03195139	008587-12C1
Nitrate as Nitrogen	0.98	1.0	98	--	--	--	80-120	--	03195144	008587-02C1
Nitrite as Nitrogen	0.99	1.0	99	--	--	--	80-120	--	03165131	008587-11C1
Phosphorus	0.67	0.67	100	--	--	--	80-120	--	03235153	008586-01C1
Phosphorus, -ortho	0.097	0.10	97	--	--	--	80-120	--	03165130	008587-03C1
Total Organic Carbon	17.4	20.0	87	--	--	--	76-120	--	03235151	008587-01C1

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

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008587 Report Date: 03/31/2020

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

Field ID:	CAR-1	Prep. Date:	03/12/2020	ARDL Lab No.:	008587-01
Desc/Location:	CARLYLE LAKE	Amount Used:	900 mL	Lab Filename:	
Sample Date:	03/10/2020	% Moisture:	NA	Received Date:	03/10/2020
Sample Time:	1130	QC Batch:	B11185	Analysis Date:	03/30/2020
Matrix:	WATER	Level:	LOW		

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	2.84	4.44	64	2.86	4.44	64.3	30-130	0.4	30
Atrazine	ND	3.24	4.44	73	2.99	4.44	67.3	30-130	8.2	30
Metribuzin	ND	2.91	4.44	65.5	2.63	4.44	59.3	30-130	10	30
Alachlor	ND	3.16	4.44	71	3	4.44	67.5	30-130	5.1	30
Metolachlor	ND	3.38	4.44	76	3.21	4.44	72.3	30-130	5.1	30
Chlorpyrifos	ND	3.26	4.44	73.3	3.19	4.44	71.8	30-130	2.1	30
Cyanazine	ND	3.64	4.44	82	3.07	4.44	69	30-130	17.2	30
Pendimethalin	ND	2.71	4.44	61	2.72	4.44	61.3	30-130	0.4	30

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Triphenylphosphate	75	73	30-130

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008587-01, NP PESTICIDES (8270SIM-MOD)

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

Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	2.0	2.8	1.0	85 *	2.8	1.0	85 *	87-115	0	20	P7347	008587-01MS
(a) Manganese	WATER	0.093	0.60	0.50	101	0.60	0.50	102	90-114	1	20	P7347	008587-01MS
Ammonia Nitrogen	WATER	0.35	2.4	2.0	103	2.3	2.0	100	75-125	3	20	03305161	008587-01MS
Kjeldahl Nitrogen	WATER	1.1	2.0	0.80	115	2.0	0.80	108	75-125	3	20	03195139	008587-12MS
Nitrate as Nitrogen	WATER	1.7	2.7	1.0	97	2.7	1.0	94	75-125	1	20	03195144	008587-02MS
Phosphorus	WATER	0.31	1.2	0.83	112	1.2	0.83	105	75-125	5	20	03235153	008587-02MS
Phosphorus, -ortho	WATER	0.13	0.25	0.10	113	0.24	0.10	110	75-125	1	20	03165130	008587-03MS
Total Organic Carbon	WATER	4.5	9.1	5.0	91	9.1	5.0	92	76-120	0	20	03235151	008587-01MS

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

(a) DOD and/or NELAC Accredited Analyte.

SAMPLE DUPLICATE REPORT

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

Lab Report No: 008587 Report Date: 03/30/2020

Project Name: CARLYLE LAKE/KASKASKIA RIVER NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	6.8	5.7	--	MG/CU.M.	18	--	03245156	008587-07D1
Pheophytin-a	1.9	0	--	MG/CU.M.	0	--	03245156	008587-07D1
Solids, Total Suspended	28.0	29.2	--	MG/L	4	--	03195137	008587-03D1
Solids, Volatile Suspend	ND	0	--	MG/L	NC	--	03195138	008587-03D1

(a) DOD and/or NELAC Accredited Analyte

Sample Receipt Information

Including as appropriate:

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

ARDL Data Package 8587

ARDL, Inc.

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

8587

CHAIN OF CUSTODY RECORD

PROJECT: Carlyle Lake

SAMPLERS: (Signature) T Schepker & B Greeling

SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS	Chloro/Pheo	* TOC; T-PO4	O-PO4	*NO3-N, NH3-N	NP Pest	#T. Fe; T. Mn	E. coli	MS/MSD	*NO2-N	TKN DCB 03/11/2020	REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
CAR– 1	3/10	1130		x		X		X	X	X	X	X		X				X	
CAR – 2 – 0	3/10	1210		x		X	X	X	X	X	X							X	
CAR – 2 – 10	3/10	1210		x		X		X	X	X		X						X	
CAR – 4	3/10	1315		x		X	X	X	X	X	X							X	
CAR – 13	3/10	1520		x		X		X	X	X	X							X	
CAR – 12	3/10	1430		x		X	X	X	X	X	X							X	
CAR – 15	3/10	1045		x		X	X	X	X	X	X							X	
CAR – KP – Marina	3/10	1330		x									X					X	
CAR – DW – Marina	3/10	1220		x									X					X	
CAR – BL – Marina	3/10	1550		x									X					X	
KAS-1	3/10	820		x		X	X	X	X	X			X		X	X		X	
KAS-2	3/10	1000		x		X	X	X	X	X			X		X	X		X	

	Date	Time		
Relinquished by: (Signature)	3-10-20	1620	Received by: (Signature)	REMARKS/SPECIAL INSTRUCTIONS:
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	*Preserved with H_2SO_4 #Preserved with HNO_3
Received for Laboratory by: (Signature)	Date 3/10/20	Time 1620	Shipping Ticket No.	

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8587 Cooler # #2

Project: Klamath Lake & Klamath River Number of Coolers in Shipment: 2 of 2

Date Received: 3/10/20

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 3/10/20 (Signature) DLS

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)
   If YES, enter carrier name and airbill number here: ARDL Courier
2. Were custody seals on outside of cooler? ..... YES NO (N/A)
   How many and where? _____, Seal Date: _____, Seal Name: _____
3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES_____ NO X (Ambient) Observed Cooler Temp. 0.9 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 03/11/20 (Signature) DCB

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

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

Sample Transfer	
Fraction: All	Fraction
Area #: Walk-In	Area #
By: DCB	By
On: 03/11/20	On

Chain-of-Custody # _____

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COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8587

Cooler # —

Number of Coolers in Shipment: 1 of 2

Project: Carlyle Hts Q

Date Received: 3/10/20

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 3/10/20 (Signature) AM

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

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

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

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

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO X (Ambient) Observed Cooler Temp. 0.5 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 03/11/20 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice, bagged Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

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

Sample Transfer	
Fraction: All	Fraction
Area #: Walk-In	Area #
By: DCB	By
On: 03/11/2020	On

Chain-of-Custody # _____

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ARDL Inc.
Environmental | Analytical | Management | Safety

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

Customer Name: SLCOE **Date: 6/15/20**

Project Name: Carlyle Lake/Kaskaskia River **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 5/20/20 **ARDL Report No.: 8613**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
CAR-1	5/20/20	8213-01	NP Pesticides, Metals(1), Inorganics(2)
CAR-2-0	5/20/20	8213-02	NP Pesticides, Inorganics(2)(3)
CAR-2-10	5/20/20	8213-03	Metals(1), Inorganics(2)
CAR-4	5/20/20	8213-04	NP Pesticides, Inorganics(2)(3)
CAR-13	5/20/20	8213-05	NP Pesticides, Inorganics(2)
CAR-12	5/20/20	8213-06	NP Pesticides, Inorganics(2)(3)
CAR-15	5/20/20	8213-07	NP Pesticides, Inorganics(2)(3)
CAR-KP-Marina	5/20/20	8213-08	E. Coli
CAR-DW-Marina	5/20/20	8213-09	E. Coli
CAR-BL-Marina	5/20/20	8213-10	E. Coli
KAS-1	5/20/20	8213-11	E. Coli , Inorganics(2)(3)(4)
KAS-2	5/20/20	8213-12	E. Coli , Inorganics(2)(3)(4)
CAR-CSA	5/20/20	8213-13	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.
(4) Including Nitrite and TKN.

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.

CASE NARRATIVE (Continued)

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.

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
Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits, except 2 of 2 for nitrate. The parent sample has been flagged appropriately with a 'J' qualifier.

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:

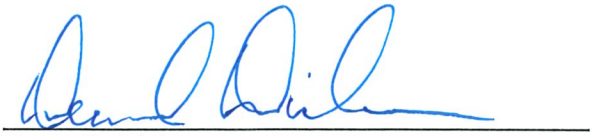
ND - Indicates parameter was analyzed for but not detected.

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

REPORT ORGANIZATION

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

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



Dean S. Dickerson
Technical Services Manager

Sample & QC Results

Including as appropriate:

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

ARDL Data Package 8613

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

Lab Report No: 008613 Report Date: 06/02/2020

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

Field ID:	CAR-1	ARDL Lab No.:	008613-01
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0528005
Sample Date:	05/20/2020	Received Date:	05/20/2020
Sample Time:	0845	Prep. Date:	05/22/2020
Matrix:	WATER	Analysis Date:	05/28/2020
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11218
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	3.52		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	2.78		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	87%

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

(a) DOD-QSM Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-01
Field ID: CAR-1
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 0845

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.859	MG/L	3010A	6010C	05/22/20	05/28/20	P7370
(a) Manganese	0.00400	0.00500		0.0787	MG/L	3010A	6010C	05/22/20	05/28/20	P7370
Ammonia Nitrogen	0.0200	0.0300		0.238	MG/L	NONE	350.1	NA	05/28/20	05295328
Nitrate as Nitrogen	0.0190	0.0200		0.928	MG/L	NONE	GREEN	NA	05/22/20	05225296
Phosphorus	0.00800	0.0100		0.23	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.122	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	4.0	4.00		9.2	MG/L	NONE	160.2	NA	05/21/20	05265300
Solids, Volatile Suspen	4.0	4.00		ND	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		5.1	MG/L	NONE	415.1	NA	05/23/20	06125373

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Sample 008613-01, Inorganic Analyses

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 008613 Report Date: 06/02/2020

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

Field ID:	CAR-2-0	ARDL Lab No.:	008613-02
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0528008
Sample Date:	05/20/2020	Received Date:	05/20/2020
Sample Time:	1000	Prep. Date:	05/22/2020
Matrix:	WATER	Analysis Date:	05/28/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11218
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	3.58		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	2.97		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	85%

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

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Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-02
Field ID: CAR-2-0
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 1000

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.256	MG/L	NONE	350.1	NA	05/28/20	05295328
Chlorophyll-a, Correcte	1.0	1.00		7.4	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Nitrate as Nitrogen	0.0190	0.0200		0.897	MG/L	NONE	GREEN	NA	05/22/20	05225296
Pheophytin-a	1.0	1.00		1.4	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Phosphorus	0.00800	0.0100		0.234	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.115	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	5.0	5.00		8.0	MG/L	NONE	160.2	NA	05/21/20	05265300
Solids, Volatile Suspen	5.0	5.00		ND	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		5.2	MG/L	NONE	415.1	NA	05/23/20	06125373

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Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-03
Field ID: CAR-2-10
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 1020

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.854	MG/L	3010A	6010C	05/22/20	05/28/20	P7370
(a) Manganese	0.00400	0.00500		0.0770	MG/L	3010A	6010C	05/22/20	05/28/20	P7370
Ammonia Nitrogen	0.0200	0.0300		0.242	MG/L	NONE	350.1	NA	05/28/20	05295328
Nitrate as Nitrogen	0.0380	0.0400	J	1.34	MG/L	NONE	GREEN	NA	05/26/20	05225296
Phosphorus	0.00800	0.0100		0.304	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.133	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	10.0	10.0		137	MG/L	NONE	160.2	NA	05/21/20	05265300
Solids, Volatile Suspen	10.0	10.0		16.0	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		5.2	MG/L	NONE	415.1	NA	05/23/20	06125373

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Sample 008613-03, Inorganic Analyses

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 008613 Report Date: 06/02/2020

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

Field ID:	CAR-4	ARDL Lab No.:	008613-04
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0528009
Sample Date:	05/20/2020	Received Date:	05/20/2020
Sample Time:	1145	Prep. Date:	05/22/2020
Matrix:	WATER	Analysis Date:	05/28/2020
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11218
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.250	0.250	ND		UG/L	1
Atrazine	0.250	0.250	3.35		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	3.36		UG/L	1
Chlorpyrifos	0.250	0.250	ND		UG/L	1
Cyanazine	0.250	0.250	ND		UG/L	1
Pendimethalin	0.250	0.250	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	104%

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

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Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-04
Field ID: CAR-4
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 1145

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	05/28/20	05295328
Chlorophyll-a, Correcte	1.0	1.00		29.0	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Nitrate as Nitrogen	0.0190	0.0200		1.42	MG/L	NONE	GREEN	NA	05/22/20	05225296
Pheophytin-a	1.0	1.00		1.5	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Phosphorus	0.00800	0.0100		0.291	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.0316	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	5.0	5.00		56.5	MG/L	NONE	160.2	NA	05/21/20	05265300
Solids, Volatile Suspen	5.0	5.00		8.5	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		5.1	MG/L	NONE	415.1	NA	05/23/20	06125373

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Lab Report No: 008613 Report Date: 06/02/2020

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

Field ID:	CAR-13	ARDL Lab No.:	008613-05
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0528010
Sample Date:	05/20/2020	Received Date:	05/20/2020
Sample Time:	1400	Prep. Date:	05/22/2020
Matrix:	WATER	Analysis Date:	05/28/2020
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11218
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	3.68		UG/L	1
Metribuzin	0.200	0.200	0.740		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	7.54		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	81%

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

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Lab Report No: 008613 Report Date: 06/12/2020

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

ARDL No: 008613-05 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-13 Sampling Date: 05/20/2020 Moisture: NA
Received: 05/20/2020 Sampling Time: 1400

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.083	MG/L	NONE	350.1	NA	05/28/20	05295328
Nitrate as Nitrogen	0.0380	0.0400		2.64	MG/L	NONE	GREEN	NA	05/26/20	05225296
Phosphorus	0.00800	0.0100		0.377	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.11	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	10.0	10.0		93.0	MG/L	NONE	160.2	NA	05/21/20	05265300
Solids, Volatile Suspen	10.0	10.0		10.0	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		5.5	MG/L	NONE	415.1	NA	05/23/20	06125373

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Mt. Vernon, Illinois 62864

Lab Report No: 008613 Report Date: 06/02/2020

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

Field ID:	CAR-12	ARDL Lab No.:	008613-06
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0528011
Sample Date:	05/20/2020	Received Date:	05/20/2020
Sample Time:	1430	Prep. Date:	05/22/2020
Matrix:	WATER	Analysis Date:	05/28/2020
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11218
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	4.41		UG/L	1
Metribuzin	0.200	0.200	0.750		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	7.59		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	87%

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

(a) DOD-QSM Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-06
Field ID: CAR-12
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 1430

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0769	MG/L	NONE	350.1	NA	05/28/20	05295328
Chlorophyll-a, Correcte	1.0	1.00		4.5	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Nitrate as Nitrogen	0.0190	0.0200		1.84	MG/L	NONE	GREEN	NA	05/22/20	05225296
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Phosphorus	0.00800	0.0100		0.528	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.133	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	10.0	10.0		96.0	MG/L	NONE	160.2	NA	05/21/20	05265300
Solids, Volatile Suspen	10.0	10.0		ND	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		6.4	MG/L	NONE	415.1	NA	05/23/20	06125373

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Sample 008613-06, Inorganic Analyses

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

Lab Report No: 008613 Report Date: 06/02/2020

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

Field ID:	CAR-15	ARDL Lab No.:	008613-07
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0528012
Sample Date:	05/20/2020	Received Date:	05/20/2020
Sample Time:	1215	Prep. Date:	05/22/2020
Matrix:	WATER	Analysis Date:	05/28/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11218
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	2.18		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	2.29		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.

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Lab Report No: 008613 Report Date: 06/12/2020

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

ARDL No: 008613-07 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-15 Sampling Date: 05/20/2020 Moisture: NA
Received: 05/20/2020 Sampling Time: 1215

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	05/28/20	05295328
Chlorophyll-a, Correcte	1.0	1.00		12.0	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Nitrate as Nitrogen	0.0190	0.0200		1.41	MG/L	NONE	GREEN	NA	05/22/20	05225296
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Phosphorus	0.00800	0.0100		0.295	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.0291	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	6.67	6.67		56.7	MG/L	NONE	160.2	NA	05/21/20	05265300
Solids, Volatile Suspen	6.67	6.67		6.67	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		4.6	MG/L	NONE	415.1	NA	05/23/20	06125373

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Mt. Vernon, Illinois 62864

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-08
Field ID: CAR-KP-MARINA
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 1200

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		550	COL/100 ML	NONE	1604	NA	05/20/20	05265297

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Mt. Vernon, Illinois 62864

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-09
Field ID: CAR-DW-MARINA
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 1040

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		325	COL/100 ML	NONE	1604	NA	05/20/20	05265297

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Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-10
Field ID: CAR-BL-MARINA
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 1230

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		500	COL/100 ML	NONE	1604	NA	05/20/20	05265297

(a) DOD and/or NELAC Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-11
Field ID: KAS-1
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 0750

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.19	MG/L	NONE	350.1	NA	05/28/20	05295328
Chlorophyll-a, Correcte	1.0	1.00		4.5	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
E. Coliform	1.0	1.00		1330	COL/100 ML	NONE	1604	NA	05/20/20	05265297
Kjeldahl Nitrogen	0.190	0.200		1.28	MG/L	351.2	351.2	06/01/20	06/02/20	06035345
Nitrate as Nitrogen	0.0380	0.0400		2.16	MG/L	NONE	GREEN	NA	05/26/20	05225296
Nitrite as Nitrogen	0.0200	0.0200		0.099	MG/L	NONE	354.1	NA	05/21/20	05295330
Pheophytin-a	1.0	1.00		1.0	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Phosphorus	0.00800	0.0100		0.446	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.20	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	6.67	6.67		62.0	MG/L	NONE	160.2	NA	05/21/20	05265300
Solids, Volatile Suspen	6.67	6.67		ND	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		6.9	MG/L	NONE	415.1	NA	05/23/20	06125373

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-11, Inorganic Analyses

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

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-12
Field ID: KAS-2
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 1030

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.189	MG/L	NONE	350.1	NA	05/28/20	05295328
Chlorophyll-a, Correcte	1.0	1.00		3.6	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
E. Coliform	1.0	1.00		3300	COL/100 ML	NONE	1604	NA	05/20/20	05265297
Kjeldahl Nitrogen	0.190	0.200		1.15	MG/L	351.2	351.2	06/01/20	06/02/20	06035345
Nitrate as Nitrogen	0.0380	0.0400		2.35	MG/L	NONE	GREEN	NA	05/26/20	05225296
Nitrite as Nitrogen	0.0200	0.0200		0.115	MG/L	NONE	354.1	NA	05/21/20	05295330
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Phosphorus	0.00800	0.0100		0.77	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.25	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	6.67	6.67		128	MG/L	NONE	160.2	NA	05/21/20	05265300
Solids, Volatile Suspen	6.67	6.67		9.33	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		7.4	MG/L	NONE	415.1	NA	05/23/20	06125373

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-12, Inorganic Analyses

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

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008613-13
Field ID: CAR-CSA
Received: 05/20/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 05/20/2020
Sampling Time: 1600

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		75.0	COL/100 ML	NONE	1604	NA	05/20/20	05265297

(a) DOD and/or NELAC Accredited Analyte.

METHOD BLANK REPORT

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

Lab Report No: 008613 Report Date: 06/02/2020

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

Field ID:	NA	ARDL Lab No.:	008613-01B1
Desc/Location:	NA	Lab Filename:	E0528003
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	05/22/2020
Matrix:	QC Material	Analysis Date:	05/28/2020
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11218
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	98%

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

(a) DOD-QSM Accredited Analyte.

BLANK SUMMARY REPORT

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

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Arsenic	0.002	0.003	ND	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
(a) Cadmium	0.0008	0.002	ND	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
(a) Lead	0.002	0.003	ND	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
(a) Zinc	0.004	0.005	ND	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
Ammonia Nitrogen	0.020	0.030	ND	MG/L	NONE	350.1	NA	05/28/20	05295328	008613-01B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306	008613-02B1
E. Coliform	1.0	1.0	ND	COL/100 ML	NONE	1604	NA	05/20/20	05265297	008613-08B1
Kjeldahl Nitrogen	0.19	0.20	ND	MG/L	351.2	351.2	06/01/20	06/02/20	06035345	008608-01B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	05/26/20	05225296	008613-03B1
Nitrite as Nitrogen	0.020	0.020	ND	MG/L	NONE	354.1	NA	05/21/20	05295330	008613-11B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306	008613-02B1
Phosphorus	0.008	0.010	ND	MG/L	365.2	365.2	06/02/20	06/02/20	06035343	008613-01B1
Phosphorus, -ortho	0.008	0.010	ND	MG/L	NONE	365.2	NA	05/21/20	05225295	008613-03B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	05/21/20	05265300	008613-04B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	05/21/20	05265301	008613-04B1
Total Organic Carbon	0.50	1.0	ND	MG/L	NONE	415.1	NA	05/23/20	06125373	008613-01B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008613

BLANK SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008613 Report Date: 06/02/2020

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

Matrix: QC Material QC Batch: B11218 Prep. Date: 05/22/2020
Amount Used: 1000 mL Level: LOW Analysis Date: 05/28/2020

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	3.28	4	82	--	--	--	30-130	--	--
Atrazine	3.72	4	93	--	--	--	30-130	--	--
Metribuzin	3.41	4	85	--	--	--	30-130	--	--
Alachlor	2.32	4	58	--	--	--	30-130	--	--
Metolachlor	3.77	4	94	--	--	--	30-130	--	--
Chlorpyrifos	3.06	4	77	--	--	--	30-130	--	--
Cyanazine	3.94	4	99	--	--	--	30-130	--	--
Pendimethalin	3.39	4	85	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	89.8	--	30-130

(a) DOD-QSM Accredited Analyte.

'*' indicates a recovery outside of standard limits.

Spike Blanks for 008613-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

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

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Arsenic	1.0	1.0	103	--	--	--	87-113	--	P7370	008612-09C1
(a) Cadmium	0.51	0.50	101	--	--	--	88-113	--	P7370	008612-09C1
(a) Lead	0.48	0.50	97	--	--	--	86-113	--	P7370	008612-09C1
(a) Manganese	0.78	0.75	104	--	--	--	90-114	--	P7370	008612-09C1
(a) Zinc	1.0	1.0	104	--	--	--	87-115	--	P7370	008612-09C1
Ammonia Nitrogen	1.0	1.0	100	--	--	--	80-120	--	05295328	008613-01C1
Kjeldahl Nitrogen	1	1.0	100	--	--	--	80-120	--	06035345	008608-01C1
Nitrate as Nitrogen	1.0	1.0	102	--	--	--	80-120	--	05225296	008613-03C1
Nitrite as Nitrogen	0.99	1.0	99	--	--	--	80-120	--	05295330	008613-11C1
Phosphorus	0.68	0.67	103	--	--	--	80-120	--	06035343	008613-01C1
Phosphorus, -ortho	0.094	0.10	94	--	--	--	80-120	--	05225295	008613-03C1
Total Organic Carbon	18.7	20.0	94	--	--	--	76-120	--	06125373	008613-01C1

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

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008613 Report Date: 06/02/2020

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

Field ID:	CAR-1	Prep. Date:	05/22/2020	ARDL Lab No.:	008613-01
Desc/Location:	CARLYLE LAKE	Amount Used:	1000 mL	Lab Filename:	
Sample Date:	05/20/2020	% Moisture:	NA	Received Date:	05/20/2020
Sample Time:	0845	QC Batch:	B11218	Analysis Date:	05/28/2020
Matrix:	WATER	Level:	LOW		

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	3.5	4	87.5	3.39	4	84.8	30-130	3.2	30
Atrazine	3.52	7.2	4	92	7.25	4	93.3	30-130	0.7	30
Metribuzin	ND	3.67	4	91.8	3.79	4	94.8	30-130	3.2	30
Alachlor	ND	2.23	4	55.8	2.26	4	56.5	30-130	1.3	30
Metolachlor	2.78	6.54	4	94	6.48	4	92.5	30-130	0.9	30
Chlorpyrifos	ND	3.04	4	76	3.03	4	75.8	30-130	0.3	30
Cyanazine	ND	4.17	4	104.3	4.69	4	117.3	30-130	11.7	30
Pendimethalin	ND	3.56	4	89	3.53	4	88.3	30-130	0.8	30

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Triphenylphosphate	93	88	30-130

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008613-01, NP PESTICIDES (8270SIM-MOD)

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

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.86	1.9	1.0	105	1.9	1.0	103	87-115	1	20	P7370	008613-01MS
(a) Manganese	WATER	0.079	0.60	0.50	105	0.60	0.50	104	90-114	1	20	P7370	008613-01MS
Ammonia Nitrogen	WATER	0.24	2.3	2.0	103	2.4	2.0	109	75-125	5	20	05295328	008613-01MS
Kjeldahl Nitrogen	WATER	1.3	2.1	0.80	103	2.1	0.80	100	75-125	1	20	06035345	008613-11MS
Nitrate as Nitrogen	WATER	1.3	1.9	1.0	57 *	2.0	1.0	68 *	75-125	5	20	05225296	008613-03MS
Phosphorus	WATER	0.23	1.1	0.83	105	1.2	0.83	111	75-125	5	20	06035343	008613-01MS
Phosphorus, -ortho	WATER	0.13	0.22	0.10	90	0.24	0.10	110	75-125	9	20	05225295	008613-03MS
Total Organic Carbon	WATER	5.1	10.5	5.0	108	10.4	5.0	106	76-120	1	20	06125373	008613-01MS

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

Inorganic Matrix Spikes for 008613

SAMPLE DUPLICATE REPORT

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

Lab Report No: 008613 Report Date: 06/12/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	7.4	6.2	--	MG/CU.M.	18	--	05275306	008613-02D1
Pheophytin-a	1.4	1.7	--	MG/CU.M.	19	--	05275306	008613-02D1
Solids, Total Suspended	56.5	64.0	--	MG/L	12	--	05265300	008613-04D1
Solids, Volatile Suspend	8.5	9.0	--	MG/L	6	--	05265301	008613-04D1

(a) DOD and/or NELAC Accredited Analyte

Sample Duplicates for 008613

Sample Receipt Information

Including as appropriate:

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

ARDL Data Package 8613

ARDL, Inc.

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

CHAIN OF CUSTODY RECORD

PROJECT: Carlyle Lake

SAMPLERS: (Signature) Ben Greeling / Andy Patton / Travis Schenker

	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS	Chloro/Pheo	* TOC; T-PO4	O-PO4	*NO3-N, NH3-N	NP Post	#T. Fe; T. Mn	E. coli	MS/MSD	*NO2-N TKN Deb 05/26/2020		REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
1	CAR– 1	5/20/2020	0845		X		X		X	X	X	X	X		X				X	
2	CAR – 2 – 0		1000		X		X	X	X	X	X	X							X	
3	CAR – 2 – 10		1020		X		X		X	X	X		X						X	
4	CAR – 4		1145		X		X	X	X	X	X	X							X	
5	CAR – 13		1400		X		X		X	X	X	X							X	
6	CAR – 12		1430		X		X	X	X	X	X	X							X	
7	CAR – 15		1405		X		X	X	X	X	X	X							X	
8	CAR – KP – Marina		1200		X									X					X	
9	CAR – DW – Marina		1040		X									X					X	
10	CAR – BL – Marina		1230		X									X					X	
11	KAS-1		0850		X		X	X	X	X	X			X		X	X		Bottle Denotes RM01	X	
12	KAS-2		1030		X		X	X	X	X	X			X		X	X		" RM36	X	
13	CAR-CSA		1600		X									X						X	

Relinquished by: (Signature)	Date 5/20/20	Time 1615	Received by: (Signature) Valerie Jenkins
Relinquished by: (Signature) Valerie Jenkins	Date 5/20/20	Time 1720	Received by: (Signature)
Received for Laboratory by: (Signature) Walter Brenneman	Date 05/20/2020	Time 1720	Shipping Ticket No.

REMARKS/SPECIAL INSTRUCTIONS:

*Preserved with H_2SO_4
#Preserved with HNO_3

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8613 Cooler # Blue (1 of 3)

Number of Coolers in Shipment: 3

Project: Carlyle Lake Date Received: 05/20/2020

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened 05/20/2020 (Signature) DCB

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

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

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

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

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES_____ NO ✓ Observed Cooler Temp. -0.9 Ambient
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 05/21/2020 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

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

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 05/21/2020	On:

Chain-of-Custody # _____

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

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8613

Cooler # Red 1 (2of3)

Number of Coolers in Shipment: 3

Project: Carlyle Lake

Date Received: 05/20/2020

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 05/20/2020 (Signature) DCB

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

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

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

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

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES_____ NO✓ Observed Cooler Temp. 1.1 C Ambient
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 05/21/2020 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? See Chain ..... YES (NO)

14. Did all sample labels agree with custody papers? See Chain ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
River Markers Missing from chain, but are on the bottles.
(By: Signature) Date:

Sample Transfer	
Fraction: All	Fraction
Area #: Walk-In	Area #
By: DCB	By
On: 05/20/2020	On

Chain-of-Custody # _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8613 Cooler # Red 2 (3 of 3)

Number of Coolers in Shipment: 3

Project: Carlyle Lake Date Received: 05/20/2020

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 05/20/2020 (Signature) DCB

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

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

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

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

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES ____ NO ✓ Observed Cooler Temp. 0.8 C Ambient
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 05/21/2020 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: ____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

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

Sample Transfer	
Fraction: All	Fraction
Area #: Walk-In	Area #
By: DCB	By
On: 05/21/2020	On

Chain-of-Custody # ____

ARDL Inc.
Environmental | Analytical | Management | Safety

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

Customer Name: SLCOE **Date: 9/11/20**

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

Samples Received at ARDL: 7/29/20 **ARDL Report No.: 8633**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
CAR-1	7/29/20	8633-01	NP Pesticides, Metals(1), Inorganics(2)
CAR-2-0	7/29/20	8633-02	NP Pesticides, Inorganics(2)(3)
CAR-2-10	7/29/20	8633-03	Metals(1), Inorganics(2)
CAR-4	7/29/20	8633-04	NP Pesticides, Inorganics(2)(3)
CAR-13	7/29/20	8633-05	NP Pesticides, Inorganics(2)
CAR-12	7/29/20	8633-06	NP Pesticides, Inorganics(2)(3)
CAR-15	7/29/20	8633-07	NP Pesticides, Inorganics(2)(3)
CAR-KP-MARINA	7/29/20	8633-08	E Coli
CAR-DW-MARINA	7/29/20	8633-09	E Coli
CAR-BL-MARINA	7/29/20	8633-10	E Coli
CAR-CSA-MARINA	7/29/20	8633-11	E Coli

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

The quality control data are summarized as follows:

NP PESTICIDE FRACTION – METHOD 8270-SIM

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

INITIAL CALIBRATION
The initial calibration passed criteria.

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

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

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

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

CASE NARRATIVE (Continued)

INTERNAL STANDARD
All internal standard criteria were met.

SURROGATE
All surrogate recovery criteria were met.

INORGANIC FRACTION

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

PREPARATION BLANK
Results of the preparation blanks were all undetected, except for TOC. The data is flagged appropriately with a 'B' qualifier for the associated samples.

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

MATRIX SPIKE
Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits, except 2 of 2 for nitrate. The parent sample has been flagged appropriately with a 'J' qualifier.

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 parent sample has been flagged appropriately with a 'J' qualifier.

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

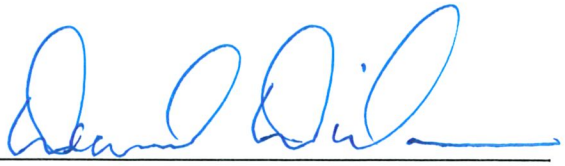
J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

B - This flag is used when the analyte is found in the blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

REPORT ORGANIZATION

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

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



Dean S. Dickerson
Technical Services Manager

Sample & QC Results

Including as appropriate:

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

ARDL Data Package 8633

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

Lab Report No: 008633 Report Date: 08/05/2020

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

Field ID:	CAR-1	ARDL Lab No.:	008633-01
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0804005
Sample Date:	07/29/2020	Received Date:	07/29/2020
Sample Time:	0920	Prep. Date:	07/31/2020
Matrix:	WATER	Analysis Date:	08/04/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11252
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	0.878		UG/L	1
Metribuzin	0.222	0.222	ND		UG/L	1
Alachlor	0.222	0.222	ND		UG/L	1
Metolachlor	0.222	0.222	1.98		UG/L	1
Chlorpyrifos	0.222	0.222	ND		UG/L	1
Cyanazine	0.222	0.222	ND		UG/L	1
Pendimethalin	0.222	0.222	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	80%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008633-01
Field ID: CAR-1
Received: 07/29/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 07/29/2020
Sampling Time: 0920

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.370	MG/L	3010A	6010C	08/03/20	08/03/20	P7401
(a) Manganese	0.00400	0.00500		0.188	MG/L	3010A	6010C	08/03/20	08/03/20	P7401
Ammonia Nitrogen	0.0200	0.0300		0.087	MG/L	NONE	350.1	NA	08/05/20	08115458
Nitrate as Nitrogen	0.0190	0.0200		0.079	MG/L	NONE	GREEN	NA	08/05/20	08135462
Phosphorus	0.00800	0.0100		0.39	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	0.00800	0.0100		0.283	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	2.50	2.50		12.8	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	2.50	2.50		6.0	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	0.500	1.00	B	5.3	MG/L	NONE	415.1	NA	08/06/20	08135481

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 08/05/2020

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

Field ID:	CAR-2-0	ARDL Lab No.:	008633-02
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0804008
Sample Date:	07/29/2020	Received Date:	07/29/2020
Sample Time:	1110	Prep. Date:	07/31/2020
Matrix:	WATER	Analysis Date:	08/04/2020
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11252
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.250	0.250	ND		UG/L	1
Atrazine	0.250	0.250	0.838		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	1.88		UG/L	1
Chlorpyrifos	0.250	0.250	ND		UG/L	1
Cyanazine	0.250	0.250	ND		UG/L	1
Pendimethalin	0.250	0.250	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	70%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008633-02
Field ID: CAR-2-0
Received: 07/29/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 07/29/2020
Sampling Time: 1110

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	08/05/20	08115458
Chlorophyll-a, Correcte	1.0	1.00		22.7	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Nitrate as Nitrogen	0.0190	0.0200	J	ND	MG/L	NONE	GREEN	NA	08/05/20	08135462
Pheophytin-a	1.0	1.00		20.5	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Phosphorus	0.00800	0.0100		0.338	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	0.00800	0.0100		0.242	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	2.0	2.00		10.6	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	2.0	2.00		7.4	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	0.500	1.00	B	5.5	MG/L	NONE	415.1	NA	08/06/20	08135481

(a) DOD and/or NELAC Accredited Analyte.

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Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008633-03
Field ID: CAR-2-10
Received: 07/29/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 07/29/2020
Sampling Time: 1130

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		1.41	MG/L	3010A	6010C	08/03/20	08/03/20	P7401
(a) Manganese	0.00400	0.00500		0.870	MG/L	3010A	6010C	08/03/20	08/03/20	P7401
Ammonia Nitrogen	0.0200	0.0300		0.419	MG/L	NONE	350.1	NA	08/05/20	08115458
Nitrate as Nitrogen	0.0190	0.0200		0.027	MG/L	NONE	GREEN	NA	08/05/20	08135462
Phosphorus	0.00800	0.0100		0.533	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	0.00800	0.0100		0.278	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	2.0	2.00		25.2	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	2.0	2.00		6.4	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	0.500	1.00	B	4.9	MG/L	NONE	415.1	NA	08/06/20	08135481

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 08/05/2020

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

Field ID:	CAR-4	ARDL Lab No.:	008633-04
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0804009
Sample Date:	07/29/2020	Received Date:	07/29/2020
Sample Time:	1315	Prep. Date:	07/31/2020
Matrix:	WATER	Analysis Date:	08/04/2020
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11252
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.250	0.250	ND		UG/L	1
Atrazine	0.250	0.250	0.563		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	2.56		UG/L	1
Chlorpyrifos	0.250	0.250	ND		UG/L	1
Cyanazine	0.250	0.250	ND		UG/L	1
Pendimethalin	0.250	0.250	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	74%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008633-04
Field ID: CAR-4
Received: 07/29/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 07/29/2020
Sampling Time: 1315

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	08/05/20	08115458
Chlorophyll-a, Correcte	1.0	1.00		17.6	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	08/05/20	08135462
Pheophytin-a	1.0	1.00	J	27.3	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Phosphorus	0.00800	0.0100		0.312	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	0.00800	0.0100		0.112	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	2.0	2.00		16.6	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	2.0	2.00		5.8	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	0.500	1.00	B	5.9	MG/L	NONE	415.1	NA	08/06/20	08135481

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 08/05/2020

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

Field ID:	CAR-13	ARDL Lab No.:	008633-05
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0804010
Sample Date:	07/29/2020	Received Date:	07/29/2020
Sample Time:	1500	Prep. Date:	07/31/2020
Matrix:	WATER	Analysis Date:	08/04/2020
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11252
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.250	0.250	ND		UG/L	1
Atrazine	0.250	0.250	0.563		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	2.41		UG/L	1
Chlorpyrifos	0.250	0.250	ND		UG/L	1
Cyanazine	0.250	0.250	ND		UG/L	1
Pendimethalin	0.250	0.250	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	86%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

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

ARDL No: 008633-05 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-13 Sampling Date: 07/29/2020 Moisture: NA
Received: 07/29/2020 Sampling Time: 1500

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	08/05/20	08115458
Nitrate as Nitrogen	0.0190	0.0200		1.88	MG/L	NONE	GREEN	NA	08/05/20	08135462
Phosphorus	0.00800	0.0100		0.325	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	0.00800	0.0100		0.0654	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	2.0	2.00		31.4	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	2.0	2.00		4.8	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	0.500	1.00	B	4.0	MG/L	NONE	415.1	NA	08/06/20	08135481

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 08/05/2020

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

Field ID:	CAR-12	ARDL Lab No.:	008633-06
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0804011
Sample Date:	07/29/2020	Received Date:	07/29/2020
Sample Time:	1420	Prep. Date:	07/31/2020
Matrix:	WATER	Analysis Date:	08/04/2020
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11252
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.250	0.250	ND		UG/L	1
Atrazine	0.250	0.250	0.550		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	2.43		UG/L	1
Chlorpyrifos	0.250	0.250	ND		UG/L	1
Cyanazine	0.250	0.250	ND		UG/L	1
Pendimethalin	0.250	0.250	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	83%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

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

ARDL No: 008633-06 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-12 Sampling Date: 07/29/2020 Moisture: NA
Received: 07/29/2020 Sampling Time: 1420

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	08/05/20	08115458
Chlorophyll-a, Correcte	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Nitrate as Nitrogen	0.0190	0.0200		1.88	MG/L	NONE	GREEN	NA	08/05/20	08135462
Pheophytin-a	1.0	1.00		9.8	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Phosphorus	0.00800	0.0100		0.247	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	0.00800	0.0100		0.068	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	2.44	2.44		65.6	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	2.44	2.44		6.83	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	0.500	1.00	B	4.1	MG/L	NONE	415.1	NA	08/06/20	08135481

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 08/05/2020

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

Field ID:	CAR-15	ARDL Lab No.:	008633-07
Desc/Location:	CARLYLE LAKE	Lab Filename:	E0804012
Sample Date:	07/29/2020	Received Date:	07/29/2020
Sample Time:	1330	Prep. Date:	07/31/2020
Matrix:	WATER	Analysis Date:	08/04/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11252
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	0.522		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	2.37		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	75%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008633-07
Field ID: CAR-15
Received: 07/29/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 07/29/2020
Sampling Time: 1330

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	08/05/20	08115458
Chlorophyll-a, Correcte	1.0	1.00		23.8	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	08/05/20	08135462
Pheophytin-a	1.0	1.00		19.1	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Phosphorus	0.00800	0.0100		0.325	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	0.00800	0.0100		0.112	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	2.86	2.86		23.7	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	2.86	2.86		8.0	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	0.500	1.00	B	5.7	MG/L	NONE	415.1	NA	08/06/20	08135481

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008633-08
Field ID: CAR-KP MARINA
Received: 07/29/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 07/29/2020
Sampling Time: 1320

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		75.0	COL/100 ML	NONE	1604	NA	07/29/20	07315434

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008633-09
Field ID: CAR-DW MARINA
Received: 07/29/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 07/29/2020
Sampling Time: 1157

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		31.0	COL/100 ML	NONE	1604	NA	07/29/20	07315434

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

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

ARDL No: 008633-10 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-BL MARINA Sampling Date: 07/29/2020 Moisture: NA
Received: 07/29/2020 Sampling Time: 1530

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		150	COL/100 ML	NONE	1604	NA	07/29/20	07315434

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008633-11
Field ID: CAR-CSA MARINA
Received: 07/29/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 07/29/2020
Sampling Time: 1143

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		52.0	COL/100 ML	NONE	1604	NA	07/29/20	07315434

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008633 Report Date: 08/05/2020

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

Field ID:	NA	ARDL Lab No.:	008633-01B1
Desc/Location:	NA	Lab Filename:	E0804003
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	07/31/2020
Matrix:	QC Material	Analysis Date:	08/04/2020
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11252
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	87%

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

(a) DOD-QSM Accredited Analyte.

BLANK SUMMARY REPORT

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	ND	MG/L	3010A	6010C	08/03/20	08/03/20	P7401	008633-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	08/03/20	08/03/20	P7401	008633-01B1
Ammonia Nitrogen	0.020	0.030	ND	MG/L	NONE	350.1	NA	08/05/20	08115458	008633-01B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470	008633-04B1
E. Coliform	1.0	1.0	ND	COL/100 ML	NONE	1604	NA	07/29/20	07315434	008633-08B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	08/05/20	08135462	008633-02B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470	008633-04B1
Phosphorus	0.008	0.010	ND	MG/L	365.2	365.2	08/17/20	08/18/20	08195493	008632-01B1
Phosphorus, -ortho	0.008	0.010	ND	MG/L	NONE	365.2	NA	07/30/20	07305429	008633-04B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	07/30/20	08045437	008632-01B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	07/30/20	08045438	008632-01B1
Total Organic Carbon	0.50	1.0	0.84	MG/L	NONE	415.1	NA	08/05/20	08135481	008632-02B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008633

BLANK SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008633 Report Date: 08/05/2020

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

Matrix: QC Material QC Batch: B11252 Prep. Date: 07/31/2020
Amount Used: 1000 mL Level: LOW Analysis Date: 08/04/2020

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	3.22	4	81	--	--	--	30-130	--	--
Atrazine	3.13	4	78	--	--	--	30-130	--	--
Metribuzin	3.11	4	78	--	--	--	30-130	--	--
Alachlor	3.23	4	81	--	--	--	30-130	--	--
Metolachlor	3.34	4	84	--	--	--	30-130	--	--
Chlorpyrifos	3.31	4	83	--	--	--	30-130	--	--
Cyanazine	3.34	4	84	--	--	--	30-130	--	--
Pendimethalin	3.33	4	83	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	81	--	30-130

(a) DOD-QSM Accredited Analyte.

'*' indicates a recovery outside of standard limits.

Spike Blanks for 008633-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	5.2	5.0	104	--	--	--	87-115	--	P7401	008633-01C1
(a) Manganese	0.81	0.75	108	--	--	--	90-114	--	P7401	008633-01C1
Ammonia Nitrogen	1.0	1.0	104	--	--	--	80-120	--	08115458	008633-01C1
Nitrate as Nitrogen	0.93	1.0	93	--	--	--	80-120	--	08135462	008633-02C1
Phosphorus	0.67	0.67	101	--	--	--	80-120	--	08195493	008632-01C1
Phosphorus, -ortho	0.10	0.10	102	--	--	--	80-120	--	07305429	008633-04C1
Total Organic Carbon	20.0	20.0	100	--	--	--	76-120	--	08135481	008632-02C1

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

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008633 Report Date: 08/05/2020

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

Field ID:	CAR-1	Prep. Date:	07/31/2020	ARDL Lab No.:	008633-01
Desc/Location:	CARLYLE LAKE	Amount Used:	900 mL	Lab Filename:	
Sample Date:	07/29/2020	% Moisture:	NA	Received Date:	07/29/2020
Sample Time:	0920	QC Batch:	B11252	Analysis Date:	08/04/2020
Matrix:	WATER	Level:	LOW		

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	3.64	4.44	82	3.72	4.44	83.8	30-130	2.1	30
Atrazine	0.878	4.52	4.44	82	4.46	4.44	80.5	30-130	1.5	30
Metribuzin	ND	3.73	4.44	84	3.7	4.44	83.3	30-130	0.9	30
Alachlor	ND	3.5	4.44	78.8	3.6	4.44	81	30-130	2.8	30
Metolachlor	1.98	5.4	4.44	77	5.52	4.44	79.8	30-130	2.2	30
Chlorpyrifos	ND	3.57	4.44	80.3	3.61	4.44	81.3	30-130	1.2	30
Cyanazine	ND	3.87	4.44	87	3.82	4.44	86	30-130	1.2	30
Pendimethalin	ND	3.98	4.44	89.5	3.91	4.44	88	30-130	1.7	30

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

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008633-01, NP PESTICIDES (8270SIM-MOD)

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.37	1.5	1.0	108	1.5	1.0	112	87-115	2	20	P7401	008633-01MS
(a) Manganese	WATER	0.19	0.72	0.50	107	0.72	0.50	106	90-114	1	20	P7401	008633-01MS
Ammonia Nitrogen	WATER	0.087	1.9	2.0	92	1.9	2.0	90	75-125	2	20	08115458	008633-01MS
Nitrate as Nitrogen	WATER	ND	0.72	1.0	72 *	0.73	1.0	73 *	75-125	2	20	08135462	008633-02MS
Phosphorus	WATER	0.34	1.2	0.83	100	1.2	0.83	101	75-125	1	20	08195493	008633-02MS
Phosphorus, -ortho	WATER	0.11	0.22	0.10	111	0.22	0.10	105	75-125	3	20	07305429	008633-04MS

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 008633

SAMPLE DUPLICATE REPORT

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

Lab Report No: 008633 Report Date: 09/03/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	17.6	16.5	--	MG/CU.M.	6	--	08135470	008633-04D1
Pheophytin-a	27.3	20.1	--	MG/CU.M.	30*	--	08135470	008633-04D1
Solids, Total Suspended	16.6	18.0	--	MG/L	8	--	08045437	008633-04D1
Solids, Volatile Suspend	5.8	6.4	--	MG/L	10	--	08045438	008633-04D1

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

Sample Receipt Information

Including as appropriate:

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

ARDL Data Package 8633

8633

ARDL, Inc.

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

CHAIN OF CUSTODY RECORD

PROJECT: Carlyle Lake

SAMPLERS: (Signature) Ben Greeling, Munira Durakovic

	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS	Chloro/Pheo	* TOC, T-PO4	O-PO4	*NO3-N, NH3-N	NP Pest	#T. Fe; T. Mn	E. coli	MS/MSD	*NO2-N			REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
1	CAR– 1	7/29/20	0920		X		X		X	X	X	X	X		X					X	
2	CAR – 2 – 0		1110		X		X	X	X	X	X	X								X	
3	CAR – 2 – 10		1130		X		X		X	X	X		X							X	
4	CAR – 4		1315		X		X	X	X	X	X	X								X	
5	CAR – 13		1500		X		X		X	X	X	X								X	
6	CAR – 12		1420		X		X	X	X	X	X	X								X	
7	CAR – 15		1330		X		X	X	X	X	X	X								X	
8	CAR – KP – Marina		1300		X									X						X	
9	CAR – DW – Marina		1157		X									X						X	
10	CAR – BL – Marina		1530		X									X						X	
11	CAR – CSA - Marina		1143		X									X						X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Ben	7/29/20	1606	Valerie Jenkins
Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Valerie Jenkins	7/29/20	1708	
Received for Laboratory by: (Signature)	Date	Time	Shipping Ticket No.
Dalton Brenneman	07/29/20	1708	

REMARKS/SPECIAL INSTRUCTIONS:

*Preserved with H_2SO_4
#Preserved with HNO_3

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8633

Cooler # 1 Blue (1 of ~~3~~ 2) 07/29/2020 DCB

Number of Coolers in Shipment: ~~3~~ 2 07/29/2020 DCB

Project: Carlyle Lake

Date Received: 07/29/2020

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 07/29/2020 (Signature) DCB

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

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

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

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

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form. ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES ✓ NO ____ Observed Cooler Temp. 3.4 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 07/29/2020 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

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

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 07/29/2020	On:

Chain-of-Custody # _____

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COOLER RECEIPT REPORT
ARDL, INC.

2 07/29/2020 DCB

ARDL #: 8633

Cooler # 2 Blue (2 of ~~3~~ 2) 07/29/2020 DCB

Number of Coolers in Shipment: ~~3~~ 2

Project: Carlyle Lake

Date Received: 07/29/2020

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 07/29/2020 (Signature) DCB

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

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

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

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

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form. ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES ✓ NO ____ Observed Cooler Temp. 1.4 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 07/29/2020 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

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

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 07/29/2020	On:

Chain-of-Custody # _____

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ARDL Inc.
Environmental | Analytical | Management | Safety

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

Customer Name: SLCOE **Date: 11/24/20**

Project Name: Carlyle Lake/Kaskaskia River **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 10/22/20 **ARDL Report No.: 8670**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
CAR-1	10/22/20	8670-01	NP Pesticides, Metals(1), Inorganics(2)
CAR-2-0	10/22/20	8670-02	NP Pesticides, Inorganics(2)(3)
CAR-2-10	10/22/20	8670-03	Metals(1), Inorganics(2)
CAR-4	10/22/20	8670-04	NP Pesticides, Inorganics(2)(3)
CAR-13	10/22/20	8670-05	NP Pesticides, Inorganics(2)
CAR-12	10/22/20	8670-06	NP Pesticides, Inorganics(2)(3)
CAR-15	10/22/20	8670-07	NP Pesticides, Inorganics(2)(3)
CAR-KP-Marina	10/22/20	8670-08	E Coli
CAR-DW-Marina	10/22/20	8670-09	E Coli
CAR-BL-Marina	10/22/20	8670-10	E Coli
CAR-CSA-Marina	10/22/20	8670-11	E Coli
KAS-1	10/22/20	8670-12	E. Coli, Inorganics(2)(3)(4)
KAS-2	10/22/20	8670-13	E. Coli, Inorganics(2)(3)(4)

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

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
Trifluralin was 22.4% high and pendamethalin was 22.2% high in the CCV. The closing CCV passed criteria for all analytes. No trifluralin or pendamethalin was detected in any field sample.

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

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

CASE NARRATIVE (Continued)

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

INTERNAL STANDARD
All internal standard criteria were met.

SURROGATE
All surrogate recovery criteria were met.

INORGANIC FRACTION

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

PREPARATION BLANK
Results of the preparation blanks were undetected.

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

MATRIX SPIKE
Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits, except 2 of 2 for TOC. The parent sample has been flagged appropriately with a 'J' qualifier.

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 parent sample has been flagged appropriately with a 'J' qualifier.

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

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

REPORT ORGANIZATION

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

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

Dean S. Dickerson
Technical Services Manager

Sample & QC Results

Including as appropriate:

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

ARDL Data Package 8670

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

Lab Report No: 008670 Report Date: 10/30/2020

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

Field ID:	CAR-1	ARDL Lab No.:	008670-01
Desc/Location:	CARLYLE LAKE	Lab Filename:	E1028016
Sample Date:	10/22/2020	Received Date:	10/22/2020
Sample Time:	1045	Prep. Date:	10/27/2020
Matrix:	WATER	Analysis Date:	10/28/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11282
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	0.433		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	0.456		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	81%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

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

ARDL No: 008670-01 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-1 Sampling Date: 10/22/2020 Moisture: NA
Received: 10/22/2020 Sampling Time: 1045

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.583	MG/L	3010A	6010C	10/30/20	11/04/20	P7448
(a) Manganese	0.00400	0.00500		0.139	MG/L	3010A	6010C	10/30/20	11/04/20	P7448
Ammonia Nitrogen	0.0200	0.0300	J	0.0201	MG/L	NONE	350.1	NA	10/26/20	10275658
Nitrate as Nitrogen	0.0190	0.0200		0.028	MG/L	NONE	GREEN	NA	10/26/20	10295666
Phosphorus	0.00800	0.0100		0.273	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.141	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	4.0	4.00		20.0	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	4.0	4.00		4.8	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00		19.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-01, Inorganic Analyses

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

Lab Report No: 008670 Report Date: 10/30/2020

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

Field ID:	CAR-2	ARDL Lab No.:	008670-02
Desc/Location:	CARLYLE LAKE	Lab Filename:	E1028019
Sample Date:	10/22/2020	Received Date:	10/22/2020
Sample Time:	1130	Prep. Date:	10/27/2020
Matrix:	WATER	Analysis Date:	10/28/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11282
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	0.444		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	0.478		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	81%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-02
Field ID: CAR-2-0
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 1130

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	10/26/20	10275658
Chlorophyll-a, Correcte	1.0	1.00		53.6	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	10/26/20	10295666
Pheophytin-a	1.0	1.00	J	15.7	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Phosphorus	0.00800	0.0100		0.26	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.128	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	4.0	4.00		15.2	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	4.0	4.00		4.0	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00	J	18.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-03
Field ID: CAR-2-10
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 1140

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		3.88	MG/L	3010A	6010C	10/30/20	11/04/20	P7448
(a) Manganese	0.00400	0.00500		0.430	MG/L	3010A	6010C	10/30/20	11/04/20	P7448
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	10/26/20	10275658
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	10/26/20	10295666
Phosphorus	0.00800	0.0100		0.602	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.13	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	4.0	4.00		37.2	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	4.0	4.00		6.8	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00		17.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-03, Inorganic Analyses

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

Lab Report No: 008670 Report Date: 10/30/2020

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

Field ID:	CAR-4	ARDL Lab No.:	008670-04
Desc/Location:	CARLYLE LAKE	Lab Filename:	E1028020
Sample Date:	10/22/2020	Received Date:	10/22/2020
Sample Time:	1250	Prep. Date:	10/27/2020
Matrix:	WATER	Analysis Date:	10/28/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11282
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	0.267		UG/L	1
Metribuzin	0.222	0.222	ND		UG/L	1
Alachlor	0.222	0.222	ND		UG/L	1
Metolachlor	0.222	0.222	0.256		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	57%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-04
Field ID: CAR-4
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 1250

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	10/26/20	10275658
Chlorophyll-a, Correcte	1.0	1.00		59.0	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	10/26/20	10295666
Pheophytin-a	1.0	1.00		15.3	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Phosphorus	0.00800	0.0100		0.39	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.104	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	4.0	4.00		39.2	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	4.0	4.00		8.0	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00		19.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008670 Report Date: 10/30/2020

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

Field ID:	CAR-13	ARDL Lab No.:	008670-05
Desc/Location:	CARLYLE LAKE	Lab Filename:	E1028021
Sample Date:	10/22/2020	Received Date:	10/22/2020
Sample Time:	1400	Prep. Date:	10/27/2020
Matrix:	WATER	Analysis Date:	10/28/2020
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11282
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	68%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-05
Field ID: CAR-13
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 1400

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	10/26/20	10275658
Nitrate as Nitrogen	0.0190	0.0200		0.519	MG/L	NONE	GREEN	NA	10/26/20	10295666
Phosphorus	0.00800	0.0100		0.749	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.161	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	10.0	10.0		401	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	10.0	10.0		26.0	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00		26.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008670 Report Date: 10/30/2020

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

Field ID:	CAR-12	ARDL Lab No.:	008670-06
Desc/Location:	CARLYLE LAKE	Lab Filename:	E1028022
Sample Date:	10/22/2020	Received Date:	10/22/2020
Sample Time:	1445	Prep. Date:	10/27/2020
Matrix:	WATER	Analysis Date:	10/28/2020
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11282
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	76%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-06
Field ID: CAR-12
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 1445

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	10/26/20	10275658
Chlorophyll-a, Correcte	1.0	1.00		95.3	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Nitrate as Nitrogen	0.0190	0.0200		0.027	MG/L	NONE	GREEN	NA	10/26/20	10295666
Pheophytin-a	1.0	1.00		14.8	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Phosphorus	0.00800	0.0100		0.394	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.0991	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	6.67	6.67		56.0	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	6.67	6.67		10.7	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00		19.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008670 Report Date: 10/30/2020

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

Field ID:	CAR-15	ARDL Lab No.:	008670-07
Desc/Location:	CARLYLE LAKE	Lab Filename:	E1028023
Sample Date:	10/22/2020	Received Date:	10/22/2020
Sample Time:	1300	Prep. Date:	10/27/2020
Matrix:	WATER	Analysis Date:	10/28/2020
Amount Used:	800 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11282
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.250	0.250	ND		UG/L	1
Atrazine	0.250	0.250	0.388		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	0.350		UG/L	1
Chlorpyrifos	0.250	0.250	ND		UG/L	1
Cyanazine	0.250	0.250	ND		UG/L	1
Pendimethalin	0.250	0.250	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	73%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-07
Field ID: CAR-15
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 1300

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		ND	MG/L	NONE	350.1	NA	10/26/20	10275658
Chlorophyll-a, Correcte	1.0	1.00		61.7	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	10/26/20	10295666
Pheophytin-a	1.0	1.00		12.0	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Phosphorus	0.00800	0.0100		0.381	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.0965	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	4.0	4.00		38.8	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	4.0	4.00		8.0	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00		29.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-08
Field ID: CAR-KP-MARINA
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 1310

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		375	COL/100 ML	NONE	1604	NA	10/22/20	10265657

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

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

ARDL No: 008670-09 Sampling Loc'n: CARLYLE LAKE Matrix: WATER
Field ID: CAR-DW-MARINA Sampling Date: 10/22/2020 Moisture: NA
Received: 10/22/2020 Sampling Time: 1155

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		2450	COL/100 ML	NONE	1604	NA	10/22/20	10265657

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-10
Field ID: CAR-BL-MARINA
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 1500

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		1130	COL/100 ML	NONE	1604	NA	10/22/20	10265657

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-11
Field ID: CAR-CSA-MARINA
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 1143

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.0	1.00		199	COL/100 ML	NONE	1604	NA	10/22/20	10265657

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-12
Field ID: KAS-1
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 0745

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.163	MG/L	NONE	350.1	NA	10/26/20	10275658
Chlorophyll-a, Correcte	1.0	1.00		20.9	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
E. Coliform	1.0	1.00		104	COL/100 ML	NONE	1604	NA	10/22/20	10265657
Kjeldahl Nitrogen	0.190	0.200		ND	MG/L	351.2	351.2	11/10/20	11/11/20	11185698
Nitrate as Nitrogen	0.0190	0.0200		0.172	MG/L	NONE	GREEN	NA	10/26/20	10295666
Nitrite as Nitrogen	0.0200	0.0200		0.023	MG/L	NONE	354.1	NA	10/23/20	10265655
Pheophytin-a	1.0	1.00		9.6	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Phosphorus	0.00800	0.0100		0.20	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.068	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	4.0	4.00		16.8	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	4.0	4.00		ND	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00		24.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008670-13
Field ID: KAS-2
Received: 10/22/2020

Sampling Loc'n: CARLYLE LAKE
Sampling Date: 10/22/2020
Sampling Time: 0930

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.0312	MG/L	NONE	350.1	NA	10/26/20	10275658
Chlorophyll-a, Correcte	1.0	1.00		25.4	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
E. Coliform	1.0	1.00		12600	COL/100 ML	NONE	1604	NA	10/22/20	10265657
Kjeldahl Nitrogen	0.190	0.200		1.2	MG/L	351.2	351.2	11/10/20	11/11/20	11185698
Nitrate as Nitrogen	0.0190	0.0200		0.709	MG/L	NONE	GREEN	NA	10/26/20	10295666
Nitrite as Nitrogen	0.0200	0.0200		0.020	MG/L	NONE	354.1	NA	10/23/20	10265655
Pheophytin-a	1.0	1.00		5.7	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Phosphorus	0.00800	0.0100		0.797	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.491	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	6.67	6.67		22.7	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	6.67	6.67		6.67	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00		25.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

METHOD BLANK REPORT

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

Lab Report No: 008670 Report Date: 10/30/2020

Project Name:	CARLYLE LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270C
NELAC Certified - IL100308		Prep Method:	3510C
Field ID:	NA	ARDL Lab No.:	008670-01B1
Desc/Location:	NA	Lab Filename:	E1028014
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	10/27/2020
Matrix:	QC Material	Analysis Date:	10/28/2020
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11282
% Moisture:	NA	Level:	LOW

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

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	87%

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

(a) DOD-QSM Accredited Analyte.

BLANK SUMMARY REPORT

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	ND	MG/L	3010A	6010C	10/30/20	11/04/20	P7448	008670-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	10/30/20	11/04/20	P7448	008670-01B1
Ammonia Nitrogen	0.020	0.030	ND	MG/L	NONE	350.1	NA	10/26/20	10275658	008670-01B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668	008670-02B1
E. Coliform	1.0	1.0	ND	COL/100 ML	NONE	1604	NA	10/22/20	10265657	008670-08B1
Kjeldahl Nitrogen	0.19	0.20	ND	MG/L	351.2	351.2	11/10/20	11/11/20	11185698	008669-12B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	10/26/20	10295666	008670-02B1
Nitrite as Nitrogen	0.020	0.020	ND	MG/L	NONE	354.1	NA	10/23/20	10265655	008670-12B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668	008670-02B1
Phosphorus	0.008	0.010	ND	MG/L	365.2	365.2	10/26/20	10/27/20	10285665	008669-02B1
Phosphorus, -ortho	0.008	0.010	ND	MG/L	NONE	365.2	NA	10/23/20	10265656	008670-03B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	10/26/20	10285663	008670-01B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	10/26/20	10285664	008670-01B1
Total Organic Carbon	0.50	1.0	ND	MG/L	NONE	415.1	NA	11/06/20	11235716	008669-01B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008670

BLANK SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008670 Report Date: 10/30/2020

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

Matrix: QC Material QC Batch: B11282 Prep. Date: 10/27/2020
Amount Used: 1000 mL Level: LOW Analysis Date: 10/28/2020

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	3.43	4	86	--	--	--	30-130	--	--
Atrazine	3.39	4	85	--	--	--	30-130	--	--
Metribuzin	3.3	4	83	--	--	--	30-130	--	--
Alachlor	3.3	4	83	--	--	--	30-130	--	--
Metolachlor	3.43	4	86	--	--	--	30-130	--	--
Chlorpyrifos	3.39	4	85	--	--	--	30-130	--	--
Cyanazine	3.5	4	88	--	--	--	30-130	--	--
Pendimethalin	3.66	4	92	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	81.5	--	30-130

(a) DOD-QSM Accredited Analyte.
'*' indicates a recovery outside of standard limits.
Spike Blanks for 008670-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	4.7	5.0	94	--	--	--	87-115	--	P7448	008670-01C1
(a) Manganese	0.76	0.75	101	--	--	--	90-114	--	P7448	008670-01C1
Ammonia Nitrogen	0.98	1.0	98	--	--	--	80-120	--	10275658	008670-01C1
Kjeldahl Nitrogen	10.0	10.0	100	--	--	--	80-120	--	11185698	008669-12C1
Nitrate as Nitrogen	0.92	1.0	92	--	--	--	80-120	--	10295666	008670-02C1
Nitrite as Nitrogen	1.0	1.0	102	--	--	--	80-120	--	10265655	008670-12C1
Phosphorus	0.65	0.67	97	--	--	--	80-120	--	10285665	008669-02C1
Phosphorus, -ortho	0.094	0.10	94	--	--	--	80-120	--	10265656	008670-03C1
Total Organic Carbon	18.7	20.0	94	--	--	--	76-120	--	11235716	008669-01C1

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

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008670 Report Date: 10/30/2020

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

Field ID:	CAR-1	Prep. Date:	10/27/2020	ARDL Lab No.:	008670-01
Desc/Location:	CARLYLE LAKE	Amount Used:	900 mL	Lab Filename:	
Sample Date:	10/22/2020	% Moisture:	NA	Received Date:	10/22/2020
Sample Time:	1045	QC Batch:	B11282	Analysis Date:	10/28/2020
Matrix:	WATER	Level:	LOW		

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	3.67	4.44	82.5	3.64	4.44	82	30-130	0.6	30
Atrazine	0.433	3.98	4.44	79.8	3.97	4.44	79.5	30-130	0.3	30
Metribuzin	ND	3.49	4.44	78.5	3.53	4.44	79.5	30-130	1.3	30
Alachlor	ND	3.37	4.44	75.8	3.44	4.44	77.5	30-130	2.3	30
Metolachlor	0.456	3.98	4.44	79.3	3.97	4.44	79	30-130	0.3	30
Chlorpyrifos	ND	3.46	4.44	77.8	3.56	4.44	80	30-130	2.9	30
Cyanazine	ND	3.74	4.44	84.3	3.79	4.44	85.3	30-130	1.2	30
Pendimethalin	ND	3.77	4.44	84.8	3.81	4.44	85.8	30-130	1.2	30

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Triphenylphosphate	78	77	30-130

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008670-01, NP PESTICIDES (8270SIM-MOD)

MATRIX SPIKE/SPIKE DUPLICATE REPORT

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.58	1.6	1.0	101	1.5	1.0	94	87-115	4	20	P7448	008670-01MS
(a) Manganese	WATER	0.14	0.64	0.50	100	0.62	0.50	97	90-114	2	20	P7448	008670-01MS
Ammonia Nitrogen	WATER	J 0.020	2.0	2.0	97	2.0	2.0	99	75-125	2	20	10275658	008670-01MS
Nitrate as Nitrogen	WATER	ND	0.84	1.0	84	0.81	1.0	81	75-125	3	20	10295666	008670-02MS
Phosphorus	WATER	0.27	1.2	0.83	107	1.2	0.83	109	75-125	2	20	10285665	008670-01MS
Phosphorus, -ortho	WATER	0.13	0.23	0.10	102	0.23	0.10	96	75-125	3	20	10265656	008670-03MS
Total Organic Carbon	WATER	18.0	17.2	5.0	0 *	17.0	5.0	0 *	76-120	1	20	11235716	008670-02MS

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 008670

SAMPLE DUPLICATE REPORT

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

Lab Report No: 008670 Report Date: 11/23/2020

Project Name: CARLYLE LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	53.6	47.2	--	MG/CU.M.	13	--	10295668	008670-02D1
Pheophytin-a	15.7	24.6	--	MG/CU.M.	44*	--	10295668	008670-02D1
Solids, Total Suspended	20.0	19.6	--	MG/L	2	--	10285663	008670-01D1
Solids, Volatile Suspend	4.8	4.4	--	MG/L	9	--	10285664	008670-01D1

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

Sample Receipt Information

Including as appropriate:

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

ARDL Data Package 8670

ARDL, Inc.

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

8670

CHAIN OF CUSTODY RECORD

PROJECT: Carlyle Lake

SAMPLERS: (Signature) Ben Greeling / Travis Scherker

	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS	Chloro/Pheo	* TOC; T-PO4	O-PO4	*NO3-N, NH3-N	NP Pest	#T. Fe; T. Mn	E. coli	MS/MSD	*NO2-N					REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
1	CAR– 1	10/22/20	1045		X		X		X	X	X	X	X		X							X	
2	CAR – 2 – 0		1130		X		X	X	X	X	X	X										X	
3	CAR – 2 – 10		1140		X		X		X	X	X		X									X	
4	CAR – 4		1250		X		X	X	X	X	X	X										X	
5	CAR – 13		1400		X		X		X	X	X	X										X	
6	CAR – 12		1445		X		X	X	X	X	X	X										X	
7	CAR – 15		1300		X		X	X	X	X	X	X										X	
8	CAR – KP – Marina		1310		X									X								X	
9	CAR – DW – Marina		1155		X									X								X	
10	CAR – BL – Marina		1500		X									X								X	
11	CAR – CSA - Marina		1143		X									X								X	
12	KAS-1		0945		X		X	X	X	X	X			X		X						X	
13	KAS-2		093		X		X	X	X	X	X			X		X						X	

	Date	Time	
Relinquished by: (Signature)	10/22/20	1615	Received by: (Signature)
Relinquished by: (Signature)	10/22/20	1712	Received by: (Signature)
Received for Laboratory by: (Signature)	10/22/20	1712	Shipping Ticket No.

REMARKS/SPECIAL INSTRUCTIONS:

*Preserved with H_2SO_4
#Preserved with HNO_3

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8670 Cooler # Red 1

Number of Coolers in Shipment: 2

Project: Carlyle Lake/Kaskaskia River Date Received: 10/22/2020

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 10/23/2020 (Signature) DCB

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

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

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

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

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 2.2 °C Sample Temp
   Correction factor 0.0 °C

B. **LOG-IN PHASE:** Date samples were logged-in: 10/23/2020 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: ____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

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

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 10/23/2020	On:

Chain-of-Custody # ____

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COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8670 Cooler # Red 2

Number of Coolers in Shipment: 2

Project: Carlyle Lake/Kaskaskia River Date Received: 10/22/2020

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 10/23/2020 (Signature) DCB

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

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

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

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

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 1.9 °C Sample Temp
   Correction factor 0.0 °C

B. **LOG-IN PHASE:** Date samples were logged-in: 10/23/2020 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

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

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 10/23/2020	On:

Chain-of-Custody # _____

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