South Tahoe Public Utility District

Indian Creek Reservoir TMDL Progress Report for 2014

Final

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2/27/2015

1 Introduction

In April 2012, the Lahontan Regional Water Quality Control Board (LRWQCB) developed guidance (draft Indian Creek Reservoir Total Maximum Daily Load (TMDL) Tracking Plan) to be used by the South Tahoe Public Utility District (District) for the presentation and analysis of water quality data collected from Indian Creek Reservoir, Alpine County, CA (LRWQCB, 2012). These data are to be reported annually to evaluate Total Maximum Daily Load (TMDL) implementation progress and adaptively manage expectations for meeting TMDL targets at Indian Creek Reservoir (ICR). The following has been prepared to satisfy this annual TMDL reporting requirement for the 2014 calendar year.

2 Background

ICR is a 3,160 acre-foot capacity fresh water reservoir located approximately 26 miles southeast of South Lake Tahoe, within Section 4, T. 10 N, R. 20 E in the northeast portion of Alpine County, California (Figure 1). ICR was constructed in 1967 for the temporary storage of treated wastewater. Since 1989, all make-up water to ICR is provided by fresh water diversions from Indian Creek and the West Fork of the Carson River.

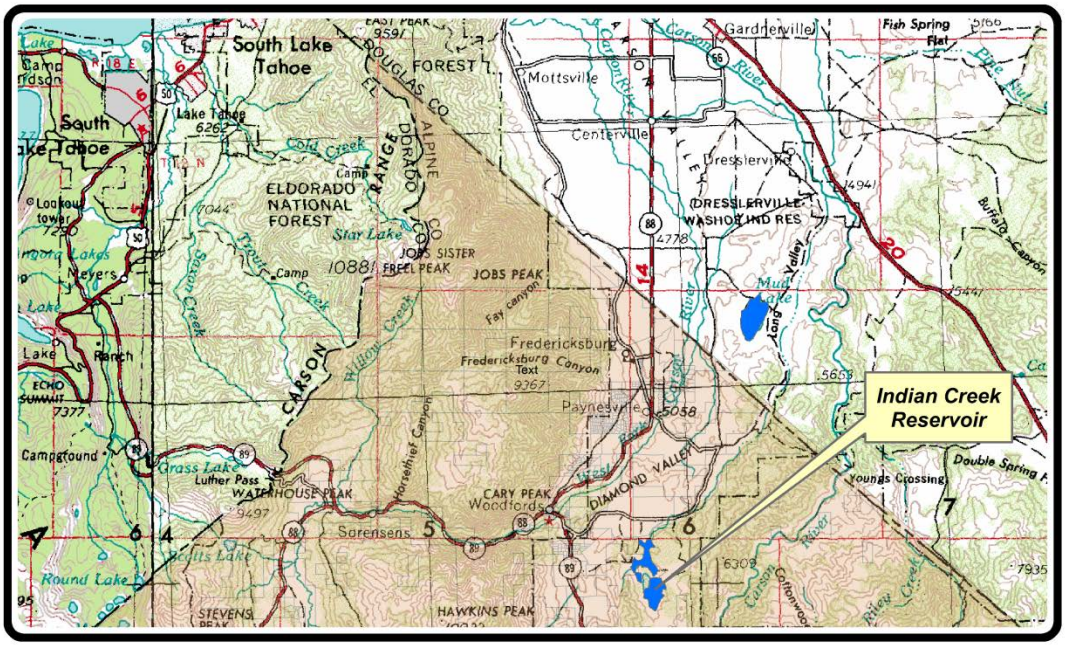

FIGURE 1.
INDIAN CREEK RESERVOIR
ALPINE COUNTY, CA

0 1 2 4 Miles

ICR is Section 303(d) listed for eutrophication. Since the 1970s, it has shown symptoms of eutrophication including impairment of aquatic life and recreational uses and violation of narrative and numerical water quality objectives. Phosphorus has been identified as the primary nutrient contributing to eutrophication. The greatest source of phosphorus loading is believed to be from internal sources (sediment load).

In July 2002, to evaluate water quality improvement, the LRWQCB established numeric targets for five (5) indicator parameters: Total Phosphorus (TP); Dissolved Oxygen (DO); Secchi Depth (SD); Chlorophyll a (Chl-a); and Carlson Trophic State Index (TSI). Interim and long-term numeric targets from the ICR TMDL are summarized in Table 1.

Indicator	**Interim Target** **(Attained by 2013)**	**Final Target** **(Attained by 2024)**
Total Phosphorus (TP)	≤0.04 mg/L, annual mean	≤0.02 mg/L, annual mean
Dissolved Oxygen (DO)	30-day mean – 6.5 mg/L 7-day mean min. – 5.0 mg/L 1-day min. – 4.0 mg/L	Whichever is most restrictive: i) DO depressed not more than 10%; ii)DO % Saturation ≥ 80%; or iii) DO ≥7.0 mg/L
Secchi Depth (SD)	Summer mean ≥ 2 meters	
Chlorophyll a (Chl-a)	Summer mean ≤ 10 mg/cu meter	
Trophic State Index (TSI)	Composite index ≤ 45 units	

Table 1. Water quality indicator parameters and numeric targets

3 HOS Operation

In 2004, the Kennedy Jenks Consultants identified hypolimnetic oxygenation as a preferred alternative to remove beneficial use impairment by reversing eutrophication in ICR (KJC, 2004). In 2005, Alex Horne Associates researched the methods of hypolimnetic oxygenation employed in lakes and reservoirs and recommended a submerged down-flow contact oxygenation system (SDCO or Speece Cone) as the best device for use at ICR (A. Horne Associates, 2005). In December 2006, the District was awarded a Clean Water Act Section 319 (h) Nonpoint Source Implementation Grant (Agreement No. 06-244-556-0) for

the purpose of reducing internal loading of phosphorus to ICR and to optimize reservoir management for protection and enhancement of aquatic life and recreational uses. In 2007, Brown & Caldwell consultants developed an engineering pre-design for the ICR Hypolimnetic Oxygenation System (HOS) (Brown & Caldwell, 2007). In 2008, the District acquired a BLM Right-of-Way Grant to permit the construction, operation, maintenance and termination of the ICR HOS and completed the engineering plans and specifications required for construction.

The ICR HOS consists of an:

- In-reservoir oxygen delivery system (Speece Cone);
- On-site oxygen generation system; and
- Underground and submerged utilities connecting the oxygen generator to the Speece Cone.

In June 2008, work for the on-site oxygen generation system started with construction of the equipment building. In December 2008, the Speece Cone was installed in the deepest portion of ICR (water depth = approximately 32 feet) and connected to the oxygen generator. The Speece Cone is a 10' x 5' diameter, 3/16" mild steel cone fitted with a 2' x 5' diameter skirt and bottom plate mounted on a 12' x 6' steel equipment skid. The equipment skid is fitted with a 7.5 hp submersible pump and motor capable of circulating approximately 2.1 cubic feet per second (cfs) of water through the Speece Cone. The oxygen generation system connected to the Speece Cone includes a 25 hp rotary-screw compressor and pressure swing adsorption oxygen generator housed in an on-shore equipment building. The oxygen generator is an Air Sep AS-450 capable of producing up to 880 pounds per day (lbs/day) of oxygen, as a 95% purity gas. Utility connections between the Speece Cone and oxygen generator system consists of a 1-inch HDPE oxygen delivery line and Type G power cable housed in an 8-inch HDPE protective conduit.

The HOS is operated during the late spring and summer to deliver oxygen to ICR for water quality and aquatic habitat improvement. Run time (in hours), average generation rate (in pounds per day) and total amount of oxygen produced (in pounds) for each year of operation is provided below in Table 2. In 2014, the HOS delivered a total of 108,515 pounds of oxygen to ICR. The HOS operated for 3,493 hours, generating oxygen at an average rate of 587 lbs/day.

YEAR	OPERATING PERIOD		RUN TIME	TOTAL O^2 PRODUCED	AVERAGE O^2 GENERATION RATE
	Start Date	End Date	(hrs.)	(lbs.)	(lbs/day)
2009	6/01/2009	10/28/2009	2,345	72,819	489
2010	5/03/2010	10/29/2010	3,216	91,112	509
2011	4/06/2011	10/31/2011	3,856	109,300	525
2012	4/05/2012	10/12/2012	2,926	83,692	442
2013	4/15/2013	10/11/2013	3,590	106,340	551
2014	4/8/2014	10/10/2014	3,493	108,515	587

Table 2. ICR hypolimnetic oxygenation system (HOS) operation periods.

During operation, District personnel monitor the oxygen generation system on a daily basis. Operating parameters include run time, air pressures, air dryer temperature; oxygen pressures; oxygen flow, pump amps and building temperature. In September 2011, the District inspected the system to evaluate

performance and determined that the oxygen generation system run time is being limited by elevated building temperature and oxygen system output is being limited air receiver tank volume.

The equipment building housing the oxygen generator includes electrical equipment and an air compressor that generate large quantities of heat. The equipment building is ventilated using a 6,750 scfm direct-drive wall exhaust fan. The exhaust fan draws ambient air into the building through an air vent and exhausts the air through a discharge vent to remove heat from the equipment room. During hot weather, average high time temperatures at ICR can easily exceed 85 degrees Fahrenheit. In order to prevent overheating of the air dryer, the District has not run the system during daytime hours. In August 2012, the District installed new ductwork to better exhaust the discharge from the air compressor and reduce the heat load in the building. Improving the ventilation should improve the average oxygen generator run time.

The Air Sep AS-450 uses pressure-swing adsorption technology to produce pure oxygen for delivery to ICR. The oxygen generator consists of two adsorber vessels filled with an inert ceramic material (molecular sieve) that adsorbs nitrogen from air under pressure, separating the compressed air into oxygen. As compressed air passes through one of the adsorbers, the molecular sieve adsorbs the nitrogen. This allows the remaining oxygen to pass through and exit the adsorber as a product gas which is delivered under pressure to the oxygen receiver tank where it is stored prior to discharge to ICR. Before the adsorber becomes saturated with nitrogen; the inlet air flow switches to the second adsorber. The first adsorber is then regenerated by desorbing the nitrogen through depressurization (vented to atmosphere) and purging it with oxygen. The complete cycle is then repeated. During 2013, a new 240-gallon air receiver tank was added to triple the existing air receiver volume; a complete service inspection and repair of the oxygen generator (Air Sep AS-450) and annual service and repair of the Air Dryer (Kaeser TC 44) were also completed. Addition of the air receiver tank increased air volume, thereby increasing the flow and air pressure through the Air Sep AS-450 and oxygen output in pounds per day (lbs/day) to the Speece Cone.

During 2014, the following maintenance was performed on the HOS:

- Oxygen Generation System - annual service inspection and maintenance:
    - Maintain screw compressor (ASD 30): Changed oil, replaced oil separator cartridge;
    - Maintain Air Dryer (TC 44): annual service inspection;
    - Maintain compressor air filter (KOR-100): changed filter element and cleaned housing;
    - Maintain compressor air filter separator (KFS-100): changed filter element; and
    - Maintain compressor oil-water separator (Aquamat 2): no service.

The oxygen generator system operated at about 84% of its output capacity. Following the 2012 and 2013 improvements the average run time for the oxygenation system and the oxygen output has increased by about 20% compared to the 2012 operating period.

Estimated costs for construction, operation and monitoring of the ICR HOS are provided below in Table 3. Total costs for the engineering and construction of the ICR HOS is estimated at $837,300. During

2014, approximately $32,000 was expended by the District for the continued operation and maintenance of the oxygenation system and ICR water quality monitoring.

YEAR	CONTRACTOR	CONSULTING	EQUIPMENT &MATERIALS	DISTRICT LABOR & MONITORING	OTHER	PERMITS	POWER	SUPPLIES	TOTAL
2007		$91,880		$39,615	$4,511	$1,850			$137,856
2008	$232,559	$30,355	$60,700	$210,961	$21,003		$45	$1,322	$556,945
2009	$91,733	$24,609	$16,234	$41,616	$266		$10,507	$276	$185,241
2010				$11,431			$15,846		$27,277
2011				$12,237			$17,745		$29,982
2012				$8,490			$14,800		$23,290
2013			$6,158	$7,494	$2,044		$17,058	$494	$33,248
2014			$2,832	$9,236	($265)		$19,377	$559	$31,738
TOTALS	**$324,292**	**$146,844**	**$85,924**	**$341,080**	**$27,558**	**$1,850**	**$95,379**	**$2,650**	**$1,025,578**

Table 3. ICR HOS annual construction, operation and monitoring costs.

4 Current Data - 2014

The ICR TMDL Tracking Plan (LRWQCB, 2012) requires the reporting of water quality monitoring data from reservoir stations: ICR-1, ICR-3 and ICR-5 (see Figure 2). ICR-1 is located nearest the Speece Cone, at the north end and within the deepest portion of the reservoir. ICR-3 is located near the center of the reservoir and within moderate water depths. ICR-5 is located near the south end of the reservoir within relatively shallow water depths. Reservoir water quality samples and vertical profiles of field measured temperature and dissolved oxygen are collected from each station on a monthly basis (weather permitting). The analytical results for the 2014 raw water samples are provided in Appendix A. The indicator parameter results are summarized in Table 4. A plot showing the dissolved oxygen monitoring results is provided as Figure 4.

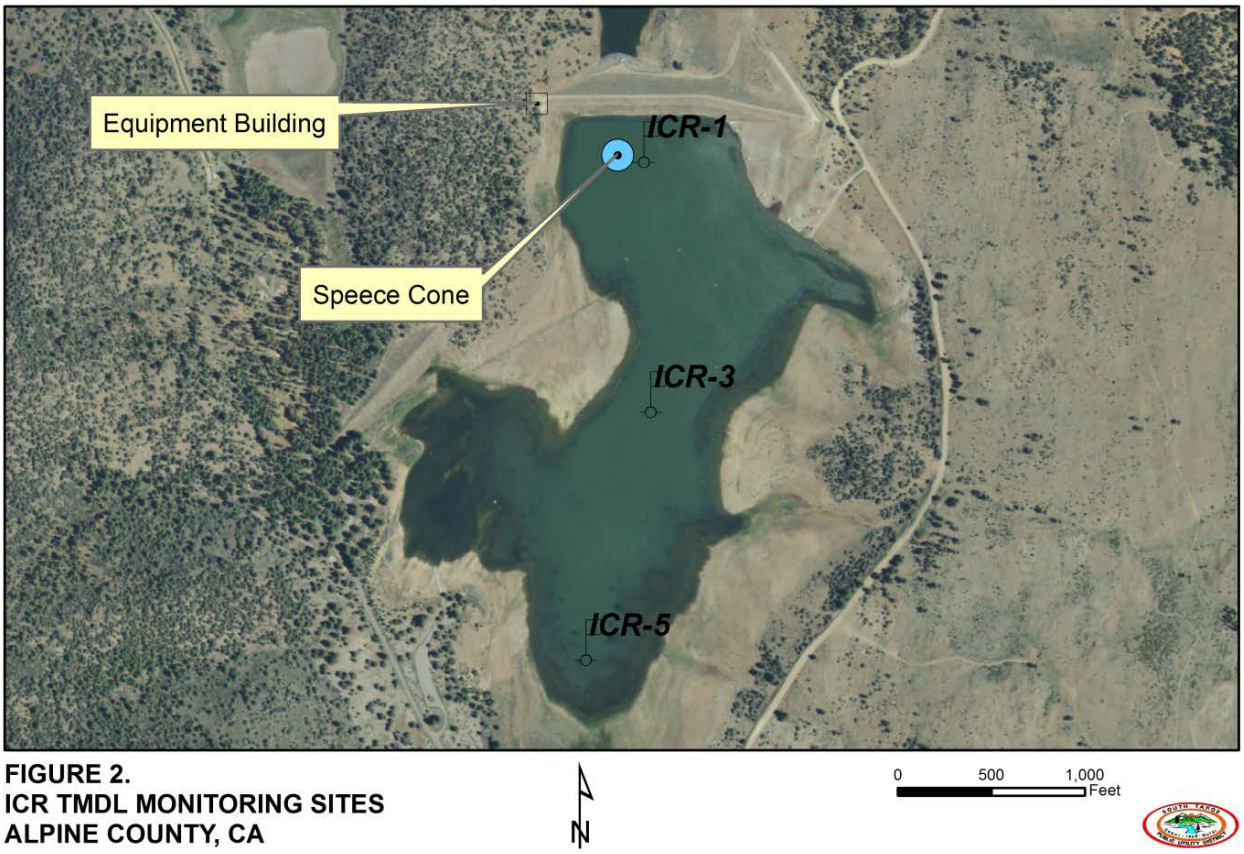

FIGURE 2.
ICR TMDL MONITORING SITES
ALPINE COUNTY, CA

INDICATOR	UNITS	Interim Target (2013)	SITES	LRWQCB TMDL REPORTING REQUIREMENT	COUNT	MEAN	MINIMUM	MAXIMUM
Total Phosphorus (TP)	mg/L	Annual Mean ≤ 0.04	ICR-1, ICR-3, ICR-5	Annual mean of samples collected from all depths from all sites over the reporting period.	66	0.04	0.022	0.07
Dissolved Oxygen (DO)	mg/L	1-day mean min. ≥ 4.0	ICR-1, ICR-3, ICR-5	Mean of samples collected from all depths at each site measured monthly over the reporting period.	**See Figure 4.**			
Secchi Depth (SD)	meters	Summer Mean ≥ 2	ICR-1, ICR-3, ICR-5	Mean for all readings collected over the reporting period.	9	2.20	1.52	3.34
Chlorophyll-a (Chl-a)	mg/m^3	Summer Mean ≤ 10	ICR-1, ICR-3, ICR-5	Mean for all samples collected over the reporting period.	18	2.12	1.00	5.10
Trophic State Index - Secchi Disk [TSI(SD)]	TSI	TSI ≤ 45 units	ICR-1, ICR-3, ICR-5	Mean of all TSI (SD) calculated from SD readings (in meters) collected from all sites over the reporting period.	9	49	43	54
Trophic State Index - Chlorophyll-a [TSI(Chl-a)]	TSI	TSI ≤ 45 units	ICR-1, ICR-3, ICR-5	Mean of all TSI (Chl-a) calculated from Chl-a concentrations (in µg/l) collected from all sites over the reporting period.	18	53	46	58
Trophic State Index - Total Phosphorus [TSI (TP)]	TSI	TSI ≤ 45 units	ICR-1, ICR-3, ICR-5	Mean of all TSI (TP) calculated from TP concentrations (in µg/l) collected from all sites over the reporting period.	18	53	49	56

Table 4. ICR TMDL 2014 Summary of Results.

5 TMDL Targets

The ICR TMDL Tracking Plan requires evaluation of the collected indicator parameter data to ascertain progress toward achieving ICR numeric targets. The following graphs are provided for evaluation.

5.1 Total Phosphorus (TP)

The District collects water quality samples from each site at ICR, one day each month as weather permits. The interim target for TP is less than or equal to 0.04 milligrams per liter (mg/L), as the mean annual concentration in the water column. In order to evaluate TP levels in the reservoir, all available data for sites ICR-1, ICR-3 and ICR-5 were combined and analyzed as an annual mean (see Figure 3). Review of Figure 3 shows that annual mean TP levels have been at or below the target level of 0.04 mg/L since 2010.

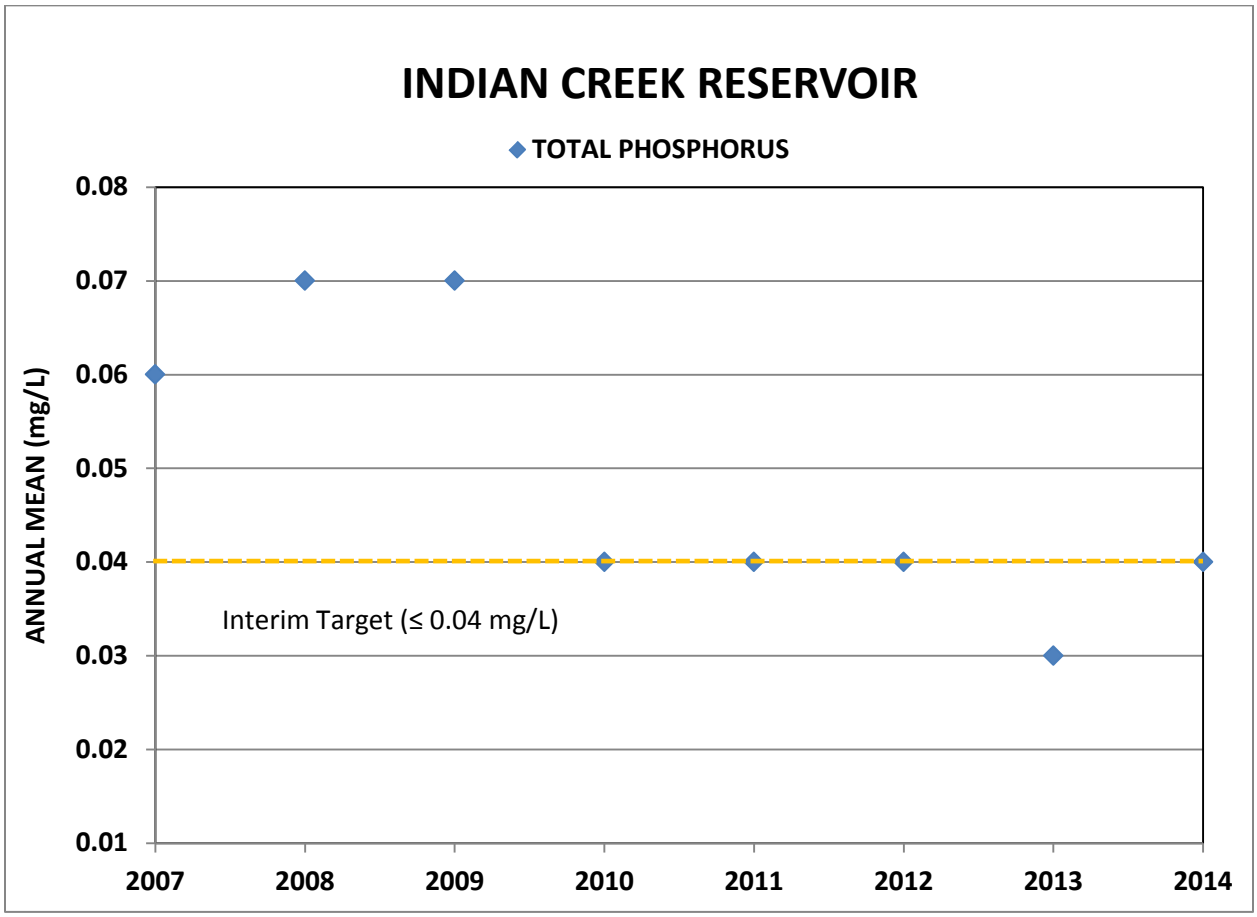

Figure 3. Total phosphorus levels at ICR, plotted as an annual mean, in milligrams per liter (mg/L).

5.2 Dissolved Oxygen (DO)

The District collects DO readings one day each month, as weather permits, from each site at ICR. The interim target value requires a single day minimum of greater than or equal to 4.0 mg/L, as the mean concentration in the water column, at each monitoring site. In order to evaluate DO levels in the reservoir, the data were analyzed by averaging DO readings collected through the water column at each site (ICR-1, ICR-3 and ICR-5) and plotted as a daily mean for each month of the year (see Figure 4). Review of Figure 4 shows that daily mean DO levels were greater than 4.0 mg/L at each site for each monitoring day during 2014.

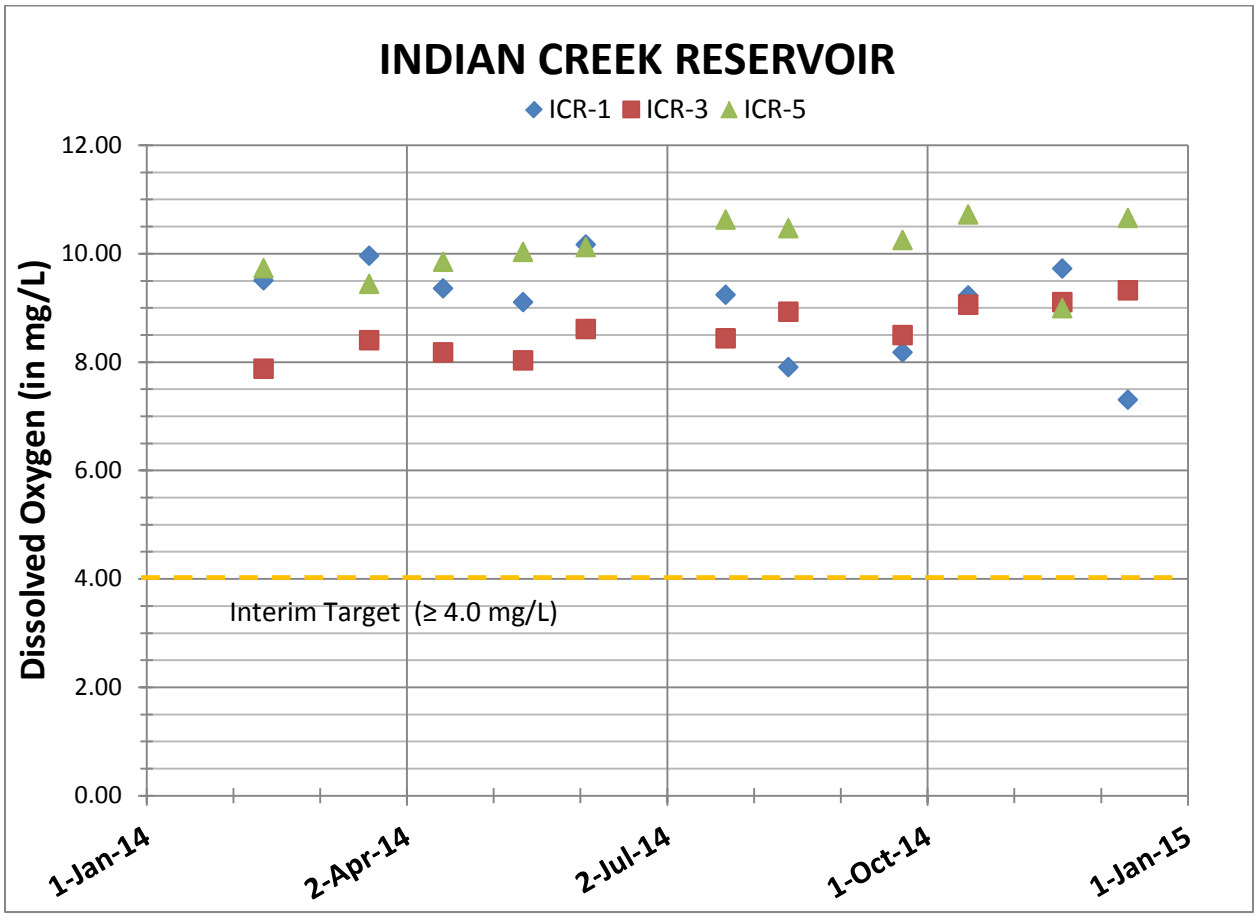

Figure 4. Daily mean dissolved oxygen levels measured at ICR, in milligrams per liter (mg/L).

In order to evaluate ICR TMDL implementation progress, historical daily mean DO levels measured at ICR-1, ICR-3 and ICR-5 were plotted from 2007 through 2014 (see Figure 5). Review of Figure 5 shows that daily mean DO concentrations were less than 4.0 mg/L at ICR-1 during August 2007, August 2008 and August 2011. Daily mean DO concentrations were greater than 4.0 mg/L at all sites during 2009, 2010, 2012, 2013, and 2014.

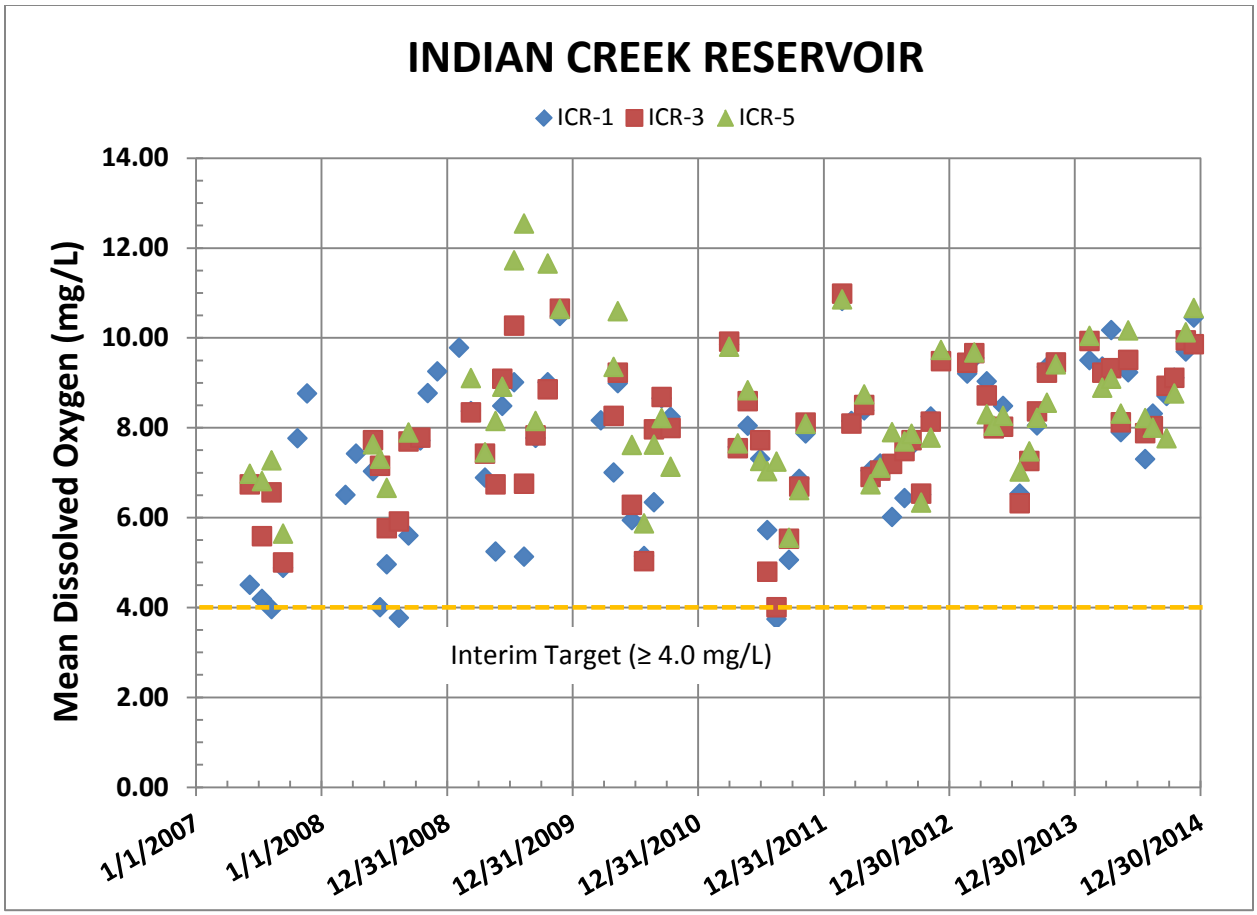

Figure 5. Daily mean dissolved oxygen levels measured at ICR from 2007 through 2014, in milligrams per liter (mg/L).

5.3 Secchi Depth (SD)

The District collects SD readings one day each month, as weather permits, from each site at ICR. The interim target value requires a summer mean value of greater than or equal to 2.0 meters water depth for the entire reservoir. In order to evaluate SD levels at ICR, the data were analyzed by averaging the SD readings measured during the summer (June, July and August) at ICR-1, ICR-3 and ICR-5 and plotted as a summer mean for each year (see Figure 6). Review of Figure 6 shows that, since 2009, summer mean SD levels have been increasing and have been greater than 2.0 meters since 2010.

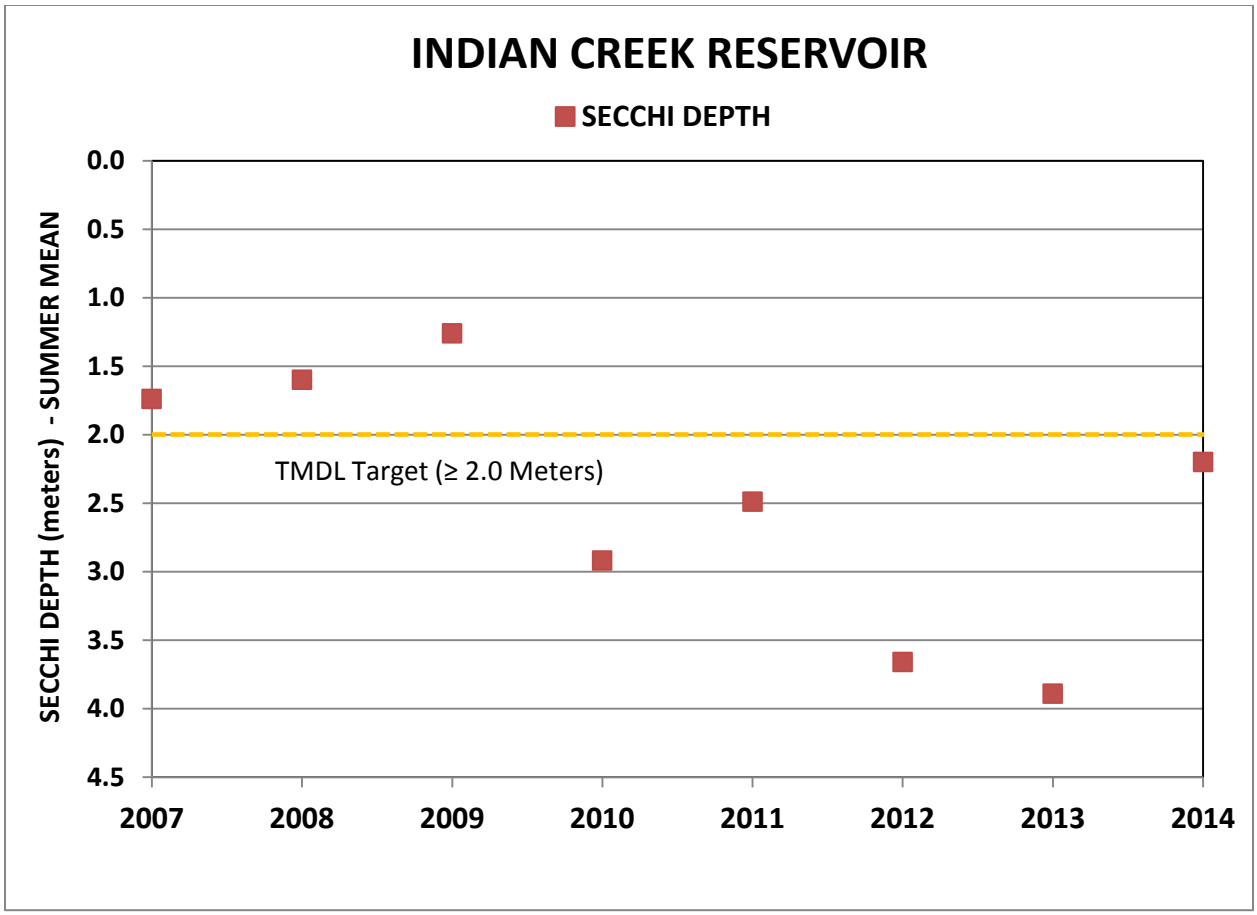

Figure 6. Summer mean secchi depth readings measured at ICR during June, July and August 2007 through 2014, in meters.

5.4 Chlorophyll a (Chl-a)

The District analyzes water quality samples collected one day each month, as weather permits, through the entire water column for Chl-a at each site. The TMDL target value requires a summer mean value of less than or equal to 10 milligrams per cubic meter (mg/m^3), equivalent to micrograms per liter, for the entire reservoir. In order to evaluate Chl-a levels at ICR, the data were evaluated by averaging the Chl-a values measured during the summer (June, July and August)at ICR-1, ICR-3 and ICR-5 and plotted as a summer mean for each year (see Figure 7). Prior to statistical evaluation, an imputed value of one-half the method detection level (MDL) was substituted for Chl-a values below the MDL. Review of Figure 7 shows that, since 2008, Chl-a levels have been decreasing and have been less than 10 mg/m^3 in 2012 and 2013.In In 2014 the Chl-a summer mean value increased to slightly above the TMDL target level.

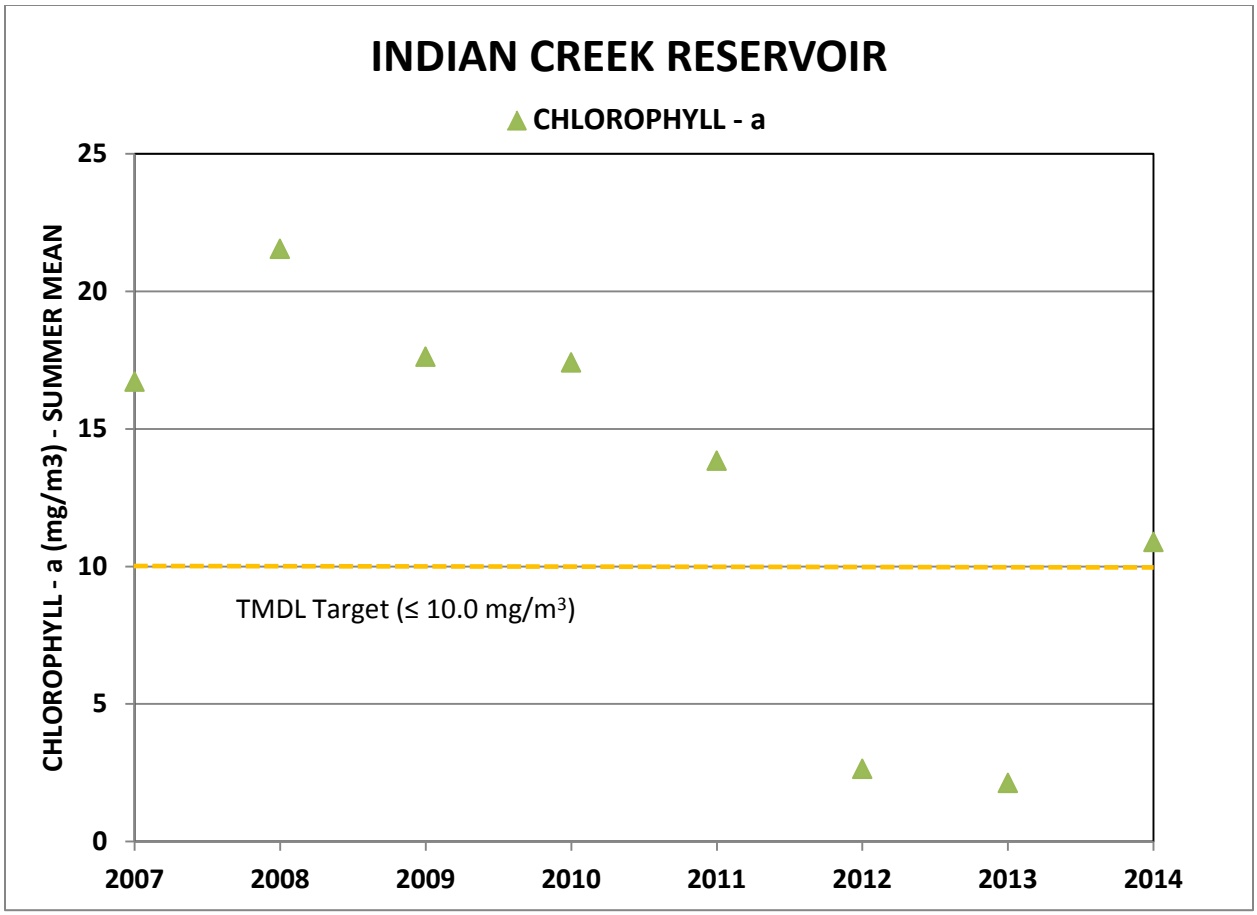

Figure 7. Summer mean chlorophyll-a concentrations measured at ICR during June, July and August 2007 through 2014, in milligrams per cubic meter (mg/m^3).

5.5 Trophic State Index

The ICR TMDL Tracking Plan requires that the summer (June, July and August) TP, SD and Chl-a values be used to calculate a trophic state index (TSI) for each parameter using standard EPA calculations. The TMDL target value requires a TSI of less than or equal to 45 units for the entire reservoir. In order to evaluate TSI, a TSI for each parameter value [TSI(TP), TSI(SD) and TSI(Chl-a)] was calculated. The TSI for all values were then used to produce an average reservoir TSI for each parameter (see Figure 8). Review of Figure 8 shows that, since 2009, average reservoir TSI (TP) and TSI (SD) have been decreasing. TSI (SD) and TSI (Chl-a) were less than 45 units for the first time in 2012. TSI (TP) was at 45 units for the first time in 2013. In 2014 TSI(SD), TSI (Chl-a) and TSI (TP) summer values increased to above TMDL Target levels.

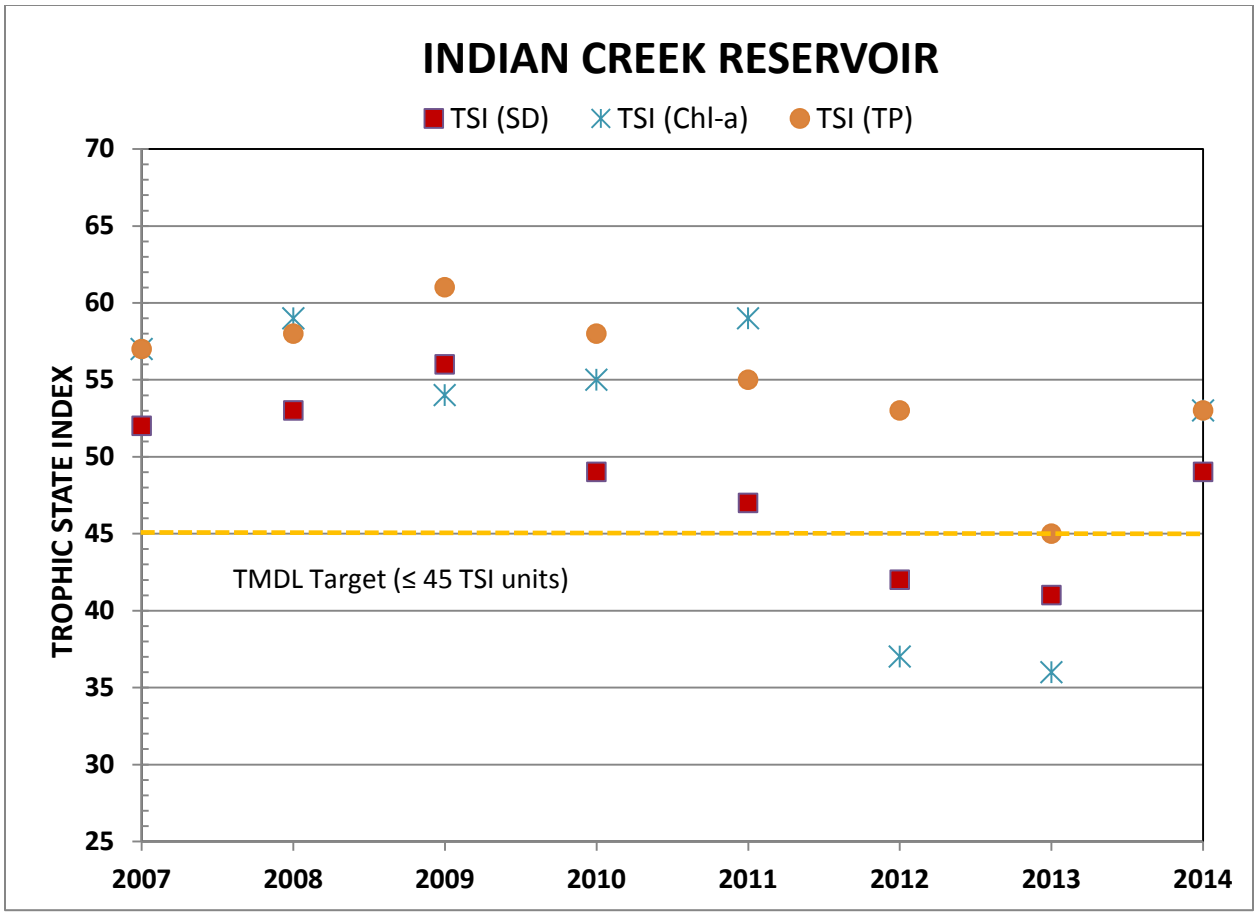

Figure 8. Carlson trophic state index (TSI) values for sechhi depth, chlorophyll-a and total phosphorus, during June, July and August 2007 through 2014, in TSI units.

6 Summary & Conclusions

Evaluation of the 2014 ICR water quality data shows that:

1. Total Phosphorus (TP): the annual mean of samples collected at ICR-1, ICR-3 and ICR-5 is 0.04 mg/L, at TMDL interim target levels.
2. Dissolved Oxygen (DO); the daily mean of samples collected at ICR-1, ICR-3 and ICR-5 are greater than 4.0 mg/L, in compliance with TMDL interim target levels.
3. Secchi Depth (SD): the summer mean for all measurements collected at ICR-1, ICR-3 and ICR-5 is 2.20 meters, in compliance with TMDL numeric targets.
4. Chlorophyll-a (Chl-a): the summer mean for all samples collected at sites ICR-1, ICR-3 and ICR-5 is 10.88 mg/m^3, slightly above TMDL numeric targets.
5. Trophic State Index (TSI): Using the TP, SD and Chl-a values collected during June, July and August, the average reservoir TSI are as follows: TSI (TP) = 53; TSI (SD) = 49; and TSI (Chl-a) = 53. The TSI (TP), TSI (SD) and TSI (Chl-a) are above TMDL numeric targets.

7 References

Alex Horne Associates, 2005. Water Quality Improvements in Indian Creek, Alpine County California: Pre-Design for Hypolimnetic Oxygenation, June 25,2005, revised August 22, 2005.

Brown and Caldwell, 2007. Technical Memorandum No. 1: South Tahoe PUD ICR Oxygenation Pre-Design Tech Memo, September 11, 2007.

Kennedy Jenks Consultants, 2004. Indian Creek Reservoir TMDL Implementation Plan, December 9, 2004

Lahontan Regional Water Quality Control Board, 2012. Draft Indian Creek Reservoir Total Maximum Daily Load (TMDL) Tracking Plan, April 27, 2012.

APPENDIX A

ANALYTICAL RESULTS

2014 ICR WATER QUALITY DATA

SOUTH TAHOE PUBLIC UTILITY DISTRICT
INDIAN CREEK RESERVOIR DATA SUMMARY

2014

Date	Site	**Year**	**HOS**	**Summer**	Depth Ft	Total P mg/l	D.O. mg/l	D.O. % SAT	Chlorophyll mg/m^3	Secchi Depth ft.		NH3 + NH4 mg/L		NH3-N mg/l	Org-N mg/l
02/11/14	ICR-01	2014			0.5	0.030	9.33	89.0	6.8	5.90	<	0.020	<	0.020	0.681
02/11/14	ICR-01	2014			21.1	0.031	9.54	90.8	7.0		<	0.020	<	0.020	0.682
02/11/14	ICR-01	2014			36.1	0.032	9.64	91.5	6.8		<	0.020	<	0.020	0.757
02/11/14	ICR-03	2014			0.6	0.030	9.89	94.2	7.0	5.90	<	0.020	<	0.020	0.643
02/11/14	ICR-03	2014			21.1	0.034	9.96	94.6	7.4		<	0.020	<	0.020	0.725
02/11/14	ICR-05	2014			0.4	0.031	10.04	96.2	6.8	5.25	<	0.020	<	0.020	0.701
03/20/14	ICR-01	2014			1.6	0.038	9.41	100.8	4.6	6.70	<	0.020	<	0.020	0.732
03/20/14	ICR-01	2014			17.9	0.031	9.44	100.6	5.5		<	0.020	<	0.020	0.611
03/20/14	ICR-01	2014			33.0	0.032	9.22	96.4	7.6		<	0.020	<	0.020	0.668
03/20/14	ICR-03	2014			0.5	0.030	9.33	99.5	4.2	6.75	<	0.020	<	0.020	0.741
03/20/14	ICR-03	2014			24.0	0.034	9.10	94.4	6.5		<	0.020	<	0.020	0.736
03/20/14	ICR-05	2014			0.5	0.027	8.89	93.7	4.4	6.65	<	0.020	<	0.020	0.685
04/15/14	ICR-01	2014	YR6		0.5	0.030	9.42	112.9	3.6	7.30	<	0.020	<	0.020	0.613
04/15/14	ICR-01	2014	YR6		18.0	0.025	10.50	122.0	3.8		<	0.020	<	0.020	0.564
04/15/14	ICR-01	2014	YR6		36.0	0.030	10.59	121.6	6.7		<	0.020	<	0.020	0.598
04/15/14	ICR-03	2014	YR6		0.5	0.028	9.33	111.0	3.6	7.20	<	0.020	<	0.020	0.743
04/15/14	ICR-03	2014	YR6		23.8	0.026	9.30	107.0	5.1		<	0.020	<	0.020	0.564
04/15/14	ICR-05	2014	YR6		0.5	0.023	9.09	106.8	3.7	8.10	<	0.020	<	0.020	0.598
05/13/14	ICR-01	2014	YR6		0.2	0.022	8.16	97.6	9.6	6.85	<	0.020	<	0.020	0.642
05/13/14	ICR-01	2014	YR6		21.1	0.028	8.07	93.7	9.2		<	0.020	<	0.020	0.580
05/13/14	ICR-01	2014	YR6		36.0	0.024	7.48	86.5	5.8		<	0.020	<	0.020	0.597
05/13/14	ICR-03	2014	YR6		0.2	0.024	8.24	98.6	9.9	6.96	<	0.020	<	0.020	0.571
05/13/14	ICR-03	2014	YR6		24.2	0.026	7.99	92.8	8.1		<	0.020	<	0.020	0.599
05/13/14	ICR-05	2014	YR6		0.5	0.024	8.31	99.4	9.2	7.22	<	0.020	<	0.020	0.579
06/04/14	ICR-01	2014	YR6	2014-SMR	0.7	0.022	9.91	103.7	14.0	5.00		0.028	<	0.020	0.754
06/04/14	ICR-01	2014	YR6	2014-SMR	18.0	0.034	9.28	94.3	11.0			0.047		0.023	0.666
06/04/14	ICR-01	2014	YR6	2014-SMR	36.0	0.037	8.50	85.9	5.3			0.071		0.029	0.721
06/04/14	ICR-03	2014	YR6	2014-SMR	0.5	0.024	9.77	102.9	15.0	5.35		0.027	<	0.020	0.733
06/04/14	ICR-03	2014	YR6	2014-SMR	20.7	0.026	9.25	93.9	11.0			0.045		0.021	0.727
06/04/14	ICR-05	2014	YR6	2014-SMR	0.5	0.022	10.16	104.7	16.0	5.55		0.029	<	0.020	0.768
07/23/14	ICR-01	2014	YR6	2014-SMR	0.5	0.027	8.10	90.5	7.3	9.25		0.021	<	0.020	0.699
07/23/14	ICR-01	2014	YR6	2014-SMR	18.0	0.029	8.06	90.0	7.7			0.021	<	0.020	0.698
07/23/14	ICR-01	2014	YR6	2014-SMR	36.0	0.037	5.75	63.6	5.0			0.073		0.023	0.653
07/23/14	ICR-03	2014	YR6	2014-SMR	0.5	0.027	8.00	89.3	7.1	10.95		0.025	<	0.020	0.732
07/23/14	ICR-03	2014	YR6	2014-SMR	21.0	0.028	7.75	86.2	6.8			0.026	<	0.020	0.672
07/23/14	ICR-05	2014	YR6	2014-SMR	0.5	0.028	8.21	91.3	7.7	7.80	<	0.020	<	0.020	0.739
08/14/14	ICR-01	2014	YR6	2014-SMR	0.3	0.031	8.59	93.5	14.0	7.30	<	0.020	<	0.020	0.711
08/14/14	ICR-01	2014	YR6	2014-SMR	18.1	0.032	8.56	93.2	13.0		<	0.020	<	0.020	0.695
08/14/14	ICR-01	2014	YR6	2014-SMR	36.1	0.032	7.79	84.1	13.0		<	0.020	<	0.020	0.699
08/14/14	ICR-03	2014	YR6	2014-SMR	0.1	0.032	8.40	91.2	13.0	7.50	<	0.020	<	0.020	0.681
08/14/14	ICR-03	2014	YR6	2014-SMR	20.6	0.034	7.66	82.2	13.0		<	0.020	<	0.020	0.712
08/14/14	ICR-05	2014	YR6	2014-SMR	0.4	0.033	8.00	86.5	16.0	6.25	<	0.020	<	0.020	0.678
09/23/14	ICR-01	2014	YR6		0.2	0.034	9.22	96.4	7.5	12.15		0.051		0.031	0.761
09/23/14	ICR-01	2014	YR6		18.0	0.034	9.19	95.5	6.8			0.053		0.029	0.797
09/23/14	ICR-01	2014	YR6		33.0	0.038	7.69	79.4	4.6			0.067		0.030	0.727
09/23/14	ICR-03	2014	YR6		0.3	0.036	9.08	94.5	7.0	9.80		0.055		0.033	0.747
09/23/14	ICR-03	2014	YR6		18.0	0.041	8.78	90.8	6.1			0.064		0.031	0.721
09/23/14	ICR-05	2014	YR6		0.4	0.038	7.76	79.6	5.7	8.70		0.062		0.022	0.730
10/16/14	ICR-01	2014			0.5	0.060	9.23	87.0	12.0	8.15		0.078		0.020	0.842
10/16/14	ICR-01	2014			18.0	0.062	9.09	85.4	11.0			0.083		0.021	0.895
10/16/14	ICR-01	2014			33.0	0.067	9.02	84.4	14.0			0.083		0.020	0.858
10/16/14	ICR-03	2014			0.7	0.059	9.19	86.6	12.0	8.80		0.084		0.020	0.827
10/16/14	ICR-03	2014			18.0	0.068	9.02	84.5	8.7			0.101		0.021	0.857
10/16/14	ICR-05	2014			0.5	0.063	8.76	81.8	12.0	9.20		0.100	<	0.020	0.844
11/18/14	ICR-01	2014			0.5	0.042	9.89	81.7	18.0	6.65	<	0.020	<	0.020	0.922
11/18/14	ICR-01	2014			18.0	0.052	9.73	79.9	16.0			0.021	<	0.020	0.924
11/18/14	ICR-01	2014			36.1	0.051	9.44	77.4	16.0			0.022	<	0.020	0.941
11/18/14	ICR-03	2014			0.5	0.039	9.85	81.4	16.0	7.25		0.020	<	0.020	0.887
11/18/14	ICR-03	2014			21.0	0.047	10.03	80.6	17.0		<	0.020	<	0.020	0.939
11/18/14	ICR-05	2014			0.4	0.048	10.12	83.3	23.0	6.25	<	0.020	<	0.020	1.020
12/23/14	ICR-01	2014			0.9	0.068	10.63	81.0	17.0	5.75		0.108	<	0.020	1.112
12/23/14	ICR-01	2014			18.0	0.056	10.47	79.7	15.0			0.109	<	0.020	1.041
12/23/14	ICR-01	2014			36.0	0.052	10.25	78.2	10.0			0.112	<	0.020	0.948
12/23/14	ICR-03	2014			0.6	0.052	10.72	82.6	20.0	5.30		0.103	<	0.020	1.017
12/23/14	ICR-03	2014			21.3	0.046	8.99	68.9	12.0			0.108	<	0.020	0.932
12/23/14	ICR-05	2014			0.6	0.049	10.66	82.0	17.0	5.50		0.114	<	0.020	0.946
Maximum					36.1	0.068	10.72	122.0	23.0	12.15		0.114		0.033	1.112
Minimum					0.1	0.022	5.75	63.6	3.6	5.00		0.020		0.020	0.564
Average					12.8	0.037	9.07	91.2	9.9	7.25		0.041		0.021	0.751
# Samples					66	66	66	66	66	33		66		66	66

Date	Site	Year	HOS	Summer	Depth Ft	TKN mg/l	NO3-N mg/l	NO2-N mg/l	Total N mg/L	PO4-P mg/l	Total P mg/l	Temp C	pH	Alk mg/l
02/11/14	ICR-01	2014			0.5	0.681	0.023	< 0.010	0.704	< 0.010	0.030	4.1	6.53	50.2
02/11/14	ICR-01	2014			21.1	0.682	0.042	< 0.010	0.724	< 0.010	0.031	4.0	7.08	50.2
02/11/14	ICR-01	2014			36.1	0.757	0.026	0.011	0.794	< 0.010	0.032	3.9	7.22	49.6
02/11/14	ICR-03	2014			0.6	0.643	0.028	< 0.010	0.671	< 0.010	0.030	4.0	7.36	50.2
02/11/14	ICR-03	2014			21.1	0.725	0.023	0.013	0.761	< 0.010	0.034	3.9	7.38	50.2
02/11/14	ICR-05	2014			0.4	0.701	0.023	< 0.010	0.724	< 0.010	0.031	4.2	7.40	49.2
03/20/14	ICR-01	2014			1.6	0.732	< 0.010	< 0.010	0.732	< 0.010	0.038	8.7	7.78	
03/20/14	ICR-01	2014			17.9	0.611	< 0.010	< 0.010	0.611	< 0.010	0.031	8.5	7.78	
03/20/14	ICR-01	2014			33.0	0.668	< 0.010	< 0.010	0.668	< 0.010	0.032	7.7	7.64	
03/20/14	ICR-03	2014			0.5	0.741	< 0.010	< 0.010	0.741	< 0.010	0.030	8.5	7.74	
03/20/14	ICR-03	2014			24.0	0.736	< 0.010	< 0.010	0.736	< 0.010	0.034	7.4	7.63	
03/20/14	ICR-05	2014			0.5	0.685	< 0.010	< 0.010	0.685	< 0.010	0.027	8.0	7.35	
04/15/14	ICR-01	2014	YR6		0.5	0.613	< 0.010	< 0.010	0.613	< 0.010	0.030	13.6	8.40	
04/15/14	ICR-01	2014	YR6		18.0	0.564	< 0.010	< 0.010	0.564	< 0.010	0.025	12.2	8.29	
04/15/14	ICR-01	2014	YR6		36.0	0.598	< 0.010	< 0.010	0.598	< 0.010	0.030	11.7	7.98	
04/15/14	ICR-03	2014	YR6		0.5	0.743	< 0.010	< 0.010	0.743	< 0.010	0.028	13.3	8.40	
04/15/14	ICR-03	2014	YR6		23.8	0.564	< 0.010	< 0.010	0.564	< 0.010	0.026	11.8	8.12	
04/15/14	ICR-05	2014	YR6		0.5	0.598	< 0.010	< 0.010	0.598	< 0.010	0.023	12.7	8.40	
05/13/14	ICR-01	2014	YR6		0.2	0.642	< 0.010	< 0.010	0.642	0.012	0.022	13.7	8.95	48.4
05/13/14	ICR-01	2014	YR6		21.1	0.580	0.011	< 0.010	0.591	< 0.010	0.028	12.4	8.93	47.8
05/13/14	ICR-01	2014	YR6		36.0	0.597	0.012	< 0.010	0.609	< 0.010	0.024	12.2	8.76	47.8
05/13/14	ICR-03	2014	YR6		0.2	0.571	0.011	< 0.010	0.582	< 0.010	0.024	13.7	8.89	48.6
05/13/14	ICR-03	2014	YR6		24.2	0.599	0.015	< 0.010	0.614	< 0.010	0.026	12.4	8.78	48.0
05/13/14	ICR-05	2014	YR6		0.5	0.579	0.012	< 0.010	0.591	< 0.010	0.024	13.8	8.84	48.4
06/04/14	ICR-01	2014	YR6	2014-SMR	0.7	0.782	< 0.010	< 0.010	0.782	< 0.010	0.022	17.5	9.69	
06/04/14	ICR-01	2014	YR6	2014-SMR	18.0	0.713	< 0.010	< 0.010	0.713	< 0.010	0.034	16.1	9.50	
06/04/14	ICR-01	2014	YR6	2014-SMR	36.0	0.792	< 0.010	< 0.010	0.792	< 0.010	0.037	15.9	9.38	
06/04/14	ICR-03	2014	YR6	2014-SMR	0.5	0.760	< 0.010	< 0.010	0.760	< 0.010	0.024	17.8	9.64	
06/04/14	ICR-03	2014	YR6	2014-SMR	20.7	0.772	< 0.010	< 0.010	0.772	< 0.010	0.026	16.1	9.46	
06/04/14	ICR-05	2014	YR6	2014-SMR	0.5	0.797	< 0.010	< 0.010	0.797	< 0.010	0.022	16.8	9.60	
07/23/14	ICR-01	2014	YR6	2014-SMR	0.5	0.720	< 0.010	< 0.010	0.720	< 0.010	0.027	20.8	9.46	
07/23/14	ICR-01	2014	YR6	2014-SMR	18.0	0.719	< 0.010	< 0.010	0.719	< 0.010	0.029	20.8	9.35	
07/23/14	ICR-01	2014	YR6	2014-SMR	36.0	0.726	0.011	< 0.010	0.737	0.010	0.037	20.3	9.05	
07/23/14	ICR-03	2014	YR6	2014-SMR	0.5	0.757	< 0.010	< 0.010	0.757	< 0.010	0.027	20.7	9.49	
07/23/14	ICR-03	2014	YR6	2014-SMR	21.0	0.698	< 0.010	< 0.010	0.698	< 0.010	0.028	20.6	9.49	
07/23/14	ICR-05	2014	YR6	2014-SMR	0.5	0.739	< 0.010	< 0.010	0.739	< 0.010	0.028	20.6	9.53	
08/14/14	ICR-01	2014	YR6	2014-SMR	0.3	0.711	< 0.010	< 0.010	0.721	< 0.010	0.031	19.5	9.58	45.9
08/14/14	ICR-01	2014	YR6	2014-SMR	18.1	0.695	< 0.010	< 0.010	0.695	< 0.010	0.032	19.4	9.57	46.1
08/14/14	ICR-01	2014	YR6	2014-SMR	36.1	0.699	0.012	< 0.010	0.711	< 0.010	0.032	19.0	9.50	46.1
08/14/14	ICR-03	2014	YR6	2014-SMR	0.1	0.681	0.010	< 0.010	0.691	< 0.010	0.032	19.4	9.53	46.3
08/14/14	ICR-03	2014	YR6	2014-SMR	20.6	0.712	< 0.010	< 0.010	0.712	< 0.010	0.034	18.8	9.31	46.9
08/14/14	ICR-05	2014	YR6	2014-SMR	0.4	0.678	0.014	< 0.010	0.692	< 0.010	0.033	19.1	9.43	46.7
09/23/14	ICR-01	2014	YR6		0.2	0.812	< 0.010	< 0.010	0.812	0.011	0.034	17.5	9.68	
09/23/14	ICR-01	2014	YR6		18.0	0.850	< 0.010	< 0.010	0.850	< 0.010	0.034	17.2	9.57	
09/23/14	ICR-01	2014	YR6		33.0	0.794	< 0.010	< 0.010	0.794	0.011	0.038	16.9	9.40	
09/23/14	ICR-03	2014	YR6		0.3	0.802	< 0.010	< 0.010	0.802	0.011	0.036	17.3	9.67	
09/23/14	ICR-03	2014	YR6		18.0	0.785	< 0.010	< 0.010	0.785	< 0.010	0.041	16.9	9.48	
09/23/14	ICR-05	2014	YR6		0.4	0.792	< 0.010	< 0.010	0.792	0.012	0.038	16.6	9.26	
10/16/14	ICR-01	2014			0.5	0.920	< 0.010	< 0.010	0.920	0.033	0.060	12.7	9.18	
10/16/14	ICR-01	2014			18.0	0.978	< 0.010	< 0.010	0.978	0.032	0.062	12.5	9.17	
10/16/14	ICR-01	2014			33.0	0.941	< 0.010	< 0.010	0.941	0.032	0.067	12.4	9.16	
10/16/14	ICR-03	2014			0.7	0.911	< 0.010	< 0.010	0.911	0.032	0.059	12.7	9.13	
10/16/14	ICR-03	2014			18.0	0.958	< 0.010	< 0.010	0.958	0.037	0.068	12.4	9.08	
10/16/14	ICR-05	2014			0.5	0.944	< 0.010	< 0.010	0.944	0.034	0.063	12.3	8.66	
11/18/14	ICR-01	2014			0.5	0.922	< 0.010	< 0.010	0.922	0.010	0.042	7.1	7.91	51.8
11/18/14	ICR-01	2014			18.0	0.945	< 0.010	< 0.010	0.945	0.010	0.052	6.9	8.04	51.4
11/18/14	ICR-01	2014			36.1	0.963	< 0.010	< 0.010	0.963	< 0.010	0.051	6.8	7.97	52.0
11/18/14	ICR-03	2014			0.5	0.907	< 0.010	< 0.010	0.907	< 0.010	0.039	7.1	8.15	52.4
11/18/14	ICR-03	2014			21.0	0.939	< 0.010	< 0.010	0.939	< 0.010	0.047	6.0	8.06	52.0
11/18/14	ICR-05	2014			0.4	1.020	< 0.010	< 0.010	1.020	< 0.010	0.048	6.9	8.03	52.0
12/23/14	ICR-01	2014			0.9	1.220	< 0.010	< 0.010	1.220	< 0.010	0.068	3.9	7.81	
12/23/14	ICR-01	2014			18.0	1.150	< 0.010	< 0.010	1.150	< 0.010	0.056	3.9	7.77	
12/23/14	ICR-01	2014			36.0	1.060	< 0.010	< 0.010	1.060	< 0.010	0.052	4.0	7.61	
12/23/14	ICR-03	2014			0.6	1.120	< 0.010	< 0.010	1.120	< 0.010	0.052	4.3	7.79	
12/23/14	ICR-03	2014			21.3	1.040	< 0.010	< 0.010	1.040	< 0.010	0.046	4.1	7.64	
12/23/14	ICR-05	2014			0.6	1.060	< 0.010	< 0.010	1.060	< 0.010	0.049	4.3	7.95	
Maximum					36.1	1.220	0.042	0.013	1.220	0.037	0.068	20.8	9.69	52.4
Minimum					0.1	0.564	< 0.010	< 0.010	0.564	0.010	0.022	3.9	6.53	45.9
Average					12.8	0.782	0.012	< 0.010	0.786	0.012	0.037	12.2	8.61	49.1
# Samples					66	66	66	66	66	66	66	66	66	24

SOUTH TAHOE PUBLIC UTILITY DISTRICT
INDIAN CREEK RESERVOIR DATA SUMMARY

2014

Date	Site	**Year**	**HOS**	**Summer**	Depth Ft	MBAS mg/l	COD mg/l	BOD mg/l	CL- mg/l	TDS mg/l	S.S. mg/l	Turb NTU	EC uS/cm	Ca mg/l	Na mg/l
02/11/14	ICR-01	2014			0.5				1.28	67	3.20	2.30	96		
02/11/14	ICR-01	2014			21.1				1.32	70	4.12	3.20	97		
02/11/14	ICR-01	2014			36.1				1.32	50	4.30	2.80	97		
02/11/14	ICR-03	2014			0.6				1.23	60	3.54	2.40	97		
02/11/14	ICR-03	2014			21.1				1.30	65	3.82	3.00	97		
02/11/14	ICR-05	2014			0.4				1.22	68	3.56	2.60	96		
03/20/14	ICR-01	2014			1.6				1.24			1.50	99		
03/20/14	ICR-01	2014			17.9				1.25			1.70	99		
03/20/14	ICR-01	2014			33.0				1.22			1.90	98		
03/20/14	ICR-03	2014			0.5				1.22			1.80	99		
03/20/14	ICR-03	2014			24.0				1.23			1.90	98		
03/20/14	ICR-05	2014			0.5				1.22			1.70	98		
04/15/14	ICR-01	2014	YR6		0.5				1.27			1.20	98		
04/15/14	ICR-01	2014	YR6		18.0				1.29			1.80	98		
04/15/14	ICR-01	2014	YR6		36.0				1.28			2.30	98		
04/15/14	ICR-03	2014	YR6		0.5				1.26			1.50	98		
04/15/14	ICR-03	2014	YR6		23.8				1.26			1.20	99		
04/15/14	ICR-05	2014	YR6		0.5				1.30			1.20	98		
05/13/14	ICR-01	2014	YR6		0.2				1.16	61	2.58	3.00	93		
05/13/14	ICR-01	2014	YR6		21.1				1.07	58	2.58	2.90	92		
05/13/14	ICR-01	2014	YR6		36.0				1.06	60	2.32	2.50	92		
05/13/14	ICR-03	2014	YR6		0.2				1.08	61	2.28	2.60	94		
05/13/14	ICR-03	2014	YR6		24.2				1.05	64	2.32	2.50	93		
05/13/14	ICR-05	2014	YR6		0.5				1.04	63	2.50	2.50	92		
06/04/14	ICR-01	2014	YR6	2014-SMR	0.7				0.88			6.80	103		
06/04/14	ICR-01	2014	YR6	2014-SMR	18.0				0.91			6.40	100		
06/04/14	ICR-01	2014	YR6	2014-SMR	36.0				0.95			4.50	100		
06/04/14	ICR-03	2014	YR6	2014-SMR	0.5				0.91			6.70	102		
06/04/14	ICR-03	2014	YR6	2014-SMR	20.7				0.94			6.40	101		
06/04/14	ICR-05	2014	YR6	2014-SMR	0.5				0.89			7.40	102		
07/23/14	ICR-01	2014	YR6	2014-SMR	0.5				0.88			0.96	102		
07/23/14	ICR-01	2014	YR6	2014-SMR	18.0				0.89			0.96	102		
07/23/14	ICR-01	2014	YR6	2014-SMR	36.0				0.89			1.30	101		
07/23/14	ICR-03	2014	YR6	2014-SMR	0.5				0.90			1.20	102		
07/23/14	ICR-03	2014	YR6	2014-SMR	21.0				0.89			1.10	102		
07/23/14	ICR-05	2014	YR6	2014-SMR	0.5				0.87			0.91	102		
08/14/14	ICR-01	2014	YR6	2014-SMR	0.3				0.96	66	2.96	2.80	110		
08/14/14	ICR-01	2014	YR6	2014-SMR	18.1				0.96	63	2.81	2.10	110		
08/14/14	ICR-01	2014	YR6	2014-SMR	36.1				0.95	65	3.08	2.40	109		
08/14/14	ICR-03	2014	YR6	2014-SMR	0.1				0.94	66	3.16	2.80	110		
08/14/14	ICR-03	2014	YR6	2014-SMR	20.6				0.94	64	3.32	2.30	109		
08/14/14	ICR-05	2014	YR6	2014-SMR	0.4				0.95	67	3.06	2.20	109		
09/23/14	ICR-01	2014	YR6		0.2				1.03			1.10	102		
09/23/14	ICR-01	2014	YR6		18.0				0.98			1.90	102		
09/23/14	ICR-01	2014	YR6		33.0				0.99			2.20	101		
09/23/14	ICR-03	2014	YR6		0.3				0.98			1.70	102		
09/23/14	ICR-03	2014	YR6		18.0				0.97			2.20	102		
09/23/14	ICR-05	2014	YR6		0.4				1.00			1.10	101		
10/16/14	ICR-01	2014			0.5				1.27			2.50	103		
10/16/14	ICR-01	2014			18.0				1.30			3.30	103		
10/16/14	ICR-01	2014			33.0				1.29			4.80	103		
10/16/14	ICR-03	2014			0.7				1.30			2.90	103		
10/16/14	ICR-03	2014			18.0				1.31			3.10	103		
10/16/14	ICR-05	2014			0.5				1.30			3.10	103		
11/18/14	ICR-01	2014			0.5				1.50	76	2.66	2.20	108		
11/18/14	ICR-01	2014			18.0				1.51	71	3.94	2.50	108		
11/18/14	ICR-01	2014			36.1				1.49	74	4.60	2.60	109		
11/18/14	ICR-03	2014			0.5				1.49	76	3.08	2.80	108		
11/18/14	ICR-03	2014			21.0				1.49	75	4.80	3.20	108		
11/18/14	ICR-05	2014			0.4				1.49	71	5.76	4.10	109		
12/23/14	ICR-01	2014			0.9				1.48			4.10	112		
12/23/14	ICR-01	2014			18.0				1.47			4.20	112		
12/23/14	ICR-01	2014			36.0				1.48			4.30	119		
12/23/14	ICR-03	2014			0.6				1.47			5.00	112		
12/23/14	ICR-03	2014			21.3				1.46			4.80	114		
12/23/14	ICR-05	2014			0.6				1.47			4.30	112		
Maximum					36.1		0.0	0.00	1.51	76	5.76	7.40	119	0.00	0.00
Minimum					0.1		0.0	0.00	0.87	50	2.28	0.91	92	0.00	0.00
Average					12.8				1.17	66	3.35	2.81	102		
# Samples					66		0	0	66	24	24	66	66	0	0

Date	Site	Year	HOS	Summer	Depth Ft	Mg mg/l	SAR	Lake Level ft.	% Ice Cover	Algae	Weeds	Coliforms Total MPN	Coliforms Fecal MPN	Fecal Strep MPN
02/11/14	ICR-01	2014			0.5				0	Yes	No	22	2	2
02/11/14	ICR-01	2014			21.1									
02/11/14	ICR-01	2014			36.1									
02/11/14	ICR-03	2014			0.6							22	< 2	
02/11/14	ICR-03	2014			21.1									
02/11/14	ICR-05	2014			0.4							33	< 2	
03/20/14	ICR-01	2014			1.6				0	Yes	No	11	< 2	< 1.8
03/20/14	ICR-01	2014			17.9									
03/20/14	ICR-01	2014			33.0									
03/20/14	ICR-03	2014			0.5							8	< 2	
03/20/14	ICR-03	2014			24.0									
03/20/14	ICR-05	2014			0.5							5	< 2	
04/15/14	ICR-01	2014	YR6		0.5				0	Yes	No	8	< 2	< 1.8
04/15/14	ICR-01	2014	YR6		18.0									
04/15/14	ICR-01	2014	YR6		36.0									
04/15/14	ICR-03	2014	YR6		0.5							< 2	< 2	
04/15/14	ICR-03	2014	YR6		23.8									
04/15/14	ICR-05	2014	YR6		0.5							2	< 2	
05/13/14	ICR-01	2014	YR6		0.2				0	Yes	No	2	< 2	< 1.8
05/13/14	ICR-01	2014	YR6		21.1									
05/13/14	ICR-01	2014	YR6		36.0									
05/13/14	ICR-03	2014	YR6		0.2							5	< 2	
05/13/14	ICR-03	2014	YR6		24.2									
05/13/14	ICR-05	2014	YR6		0.5							5	< 2	
06/04/14	ICR-01	2014	YR6	2014-SMR	0.7				0	Yes	Yes	2	< 2	< 1.8
06/04/14	ICR-01	2014	YR6	2014-SMR	18.0									
06/04/14	ICR-01	2014	YR6	2014-SMR	36.0									
06/04/14	ICR-03	2014	YR6	2014-SMR	0.5							4	< 2	
06/04/14	ICR-03	2014	YR6	2014-SMR	20.7									
06/04/14	ICR-05	2014	YR6	2014-SMR	0.5							5	< 2	
07/23/14	ICR-01	2014	YR6	2014-SMR	0.5				0	Yes	Yes	240	< 2	< 1.8
07/23/14	ICR-01	2014	YR6	2014-SMR	18.0									
07/23/14	ICR-01	2014	YR6	2014-SMR	36.0									
07/23/14	ICR-03	2014	YR6	2014-SMR	0.5							1600	< 2	
07/23/14	ICR-03	2014	YR6	2014-SMR	21.0									
07/23/14	ICR-05	2014	YR6	2014-SMR	0.5							920	< 2	
08/14/14	ICR-01	2014	YR6	2014-SMR	0.3				0	Yes	No	170	< 2	< 1.8
08/14/14	ICR-01	2014	YR6	2014-SMR	18.1									
08/14/14	ICR-01	2014	YR6	2014-SMR	36.1									
08/14/14	ICR-03	2014	YR6	2014-SMR	0.1							24	< 2	
08/14/14	ICR-03	2014	YR6	2014-SMR	20.6									
08/14/14	ICR-05	2014	YR6	2014-SMR	0.4							540	< 2	
09/23/14	ICR-01	2014	YR6		0.2				0	Yes	Yes	110	< 2	< 1.8
09/23/14	ICR-01	2014	YR6		18.0									
09/23/14	ICR-01	2014	YR6		33.0									
09/23/14	ICR-03	2014	YR6		0.3							170	< 2	
09/23/14	ICR-03	2014	YR6		18.0									
09/23/14	ICR-05	2014	YR6		0.4							540	5	
10/16/14	ICR-01	2014			0.5				0	Yes	Yes	27	11	< 1.8
10/16/14	ICR-01	2014			18.0									
10/16/14	ICR-01	2014			33.0									
10/16/14	ICR-03	2014			0.7							23	23	
10/16/14	ICR-03	2014			18.0									
10/16/14	ICR-05	2014			0.5							33	23	
11/18/14	ICR-01	2014			0.5				1	Yes	Yes			
11/18/14	ICR-01	2014			18.0									
11/18/14	ICR-01	2014			36.1									
11/18/14	ICR-03	2014			0.5									
11/18/14	ICR-03	2014			21.0									
11/18/14	ICR-05	2014			0.4									
12/23/14	ICR-01	2014			0.9				0	Yes	Yes			
12/23/14	ICR-01	2014			18.0									
12/23/14	ICR-01	2014			36.0									
12/23/14	ICR-03	2014			0.6									
12/23/14	ICR-03	2014			21.3									
12/23/14	ICR-05	2014			0.6									
Maximum					36.1	0.00	0.00	0.00	1			1600	23	0 2
Minimum					0.1	0.00	0.00	0.00	0			2	2	1.8
Average					12.8				0			168	4	1.8
# Samples					66	0	0	0	11	12	12	27	27	9

BLIC UTILITY DISTRICT
SERVOIR DATA SUMMARY

2014

Date	Site	**Year**	**HOS**	**Summer**	Depth Ft	Air Temp C	SO4 mg/L	Boron mg/L	Fe ug/L	Mn ug/L
02/11/14	ICR-01	2014			0.5	9.4	1.70			
02/11/14	ICR-01	2014			21.1		2.08			
02/11/14	ICR-01	2014			36.1		2.10			
02/11/14	ICR-03	2014			0.6		2.17			
02/11/14	ICR-03	2014			21.1		2.09			
02/11/14	ICR-05	2014			0.4		2.10			
03/20/14	ICR-01	2014			1.6		2.20			
03/20/14	ICR-01	2014			17.9		1.91			
03/20/14	ICR-01	2014			33.0		2.20			
03/20/14	ICR-03	2014			0.5		2.18			
03/20/14	ICR-03	2014			24.0		2.16			
03/20/14	ICR-05	2014			0.5		2.29			
04/15/14	ICR-01	2014	YR6		0.5	12.2	2.18			
04/15/14	ICR-01	2014	YR6		18.0		2.21			
04/15/14	ICR-01	2014	YR6		36.0		2.16			
04/15/14	ICR-03	2014	YR6		0.5		2.12			
04/15/14	ICR-03	2014	YR6		23.8		2.16			
04/15/14	ICR-05	2014	YR6		0.5		2.16			
05/13/14	ICR-01	2014	YR6		0.2	16.6	2.34			
05/13/14	ICR-01	2014	YR6		21.1		2.35			
05/13/14	ICR-01	2014	YR6		36.0		2.26			
05/13/14	ICR-03	2014	YR6		0.2		2.30			
05/13/14	ICR-03	2014	YR6		24.2		2.08			
05/13/14	ICR-05	2014	YR6		0.5		2.44			
06/04/14	ICR-01	2014	YR6	2014-SMR	0.7	19.2	1.97			
06/04/14	ICR-01	2014	YR6	2014-SMR	18.0		2.20			
06/04/14	ICR-01	2014	YR6	2014-SMR	36.0		2.27			
06/04/14	ICR-03	2014	YR6	2014-SMR	0.5		2.26			
06/04/14	ICR-03	2014	YR6	2014-SMR	20.7		2.18			
06/04/14	ICR-05	2014	YR6	2014-SMR	0.5		2.13			
07/23/14	ICR-01	2014	YR6	2014-SMR	0.5	24.0	2.08			
07/23/14	ICR-01	2014	YR6	2014-SMR	18.0		2.43			
07/23/14	ICR-01	2014	YR6	2014-SMR	36.0		2.48			
07/23/14	ICR-03	2014	YR6	2014-SMR	0.5		2.60			
07/23/14	ICR-03	2014	YR6	2014-SMR	21.0		2.56			
07/23/14	ICR-05	2014	YR6	2014-SMR	0.5		2.44			
08/14/14	ICR-01	2014	YR6	2014-SMR	0.3	21.5	2.14			
08/14/14	ICR-01	2014	YR6	2014-SMR	18.1		2.31			
08/14/14	ICR-01	2014	YR6	2014-SMR	36.1		2.60			
08/14/14	ICR-03	2014	YR6	2014-SMR	0.1		2.36			
08/14/14	ICR-03	2014	YR6	2014-SMR	20.6		2.66			
08/14/14	ICR-05	2014	YR6	2014-SMR	0.4		2.88			
09/23/14	ICR-01	2014	YR6		0.2	28.6	2.27			
09/23/14	ICR-01	2014	YR6		18.0		2.65			
09/23/14	ICR-01	2014	YR6		33.0		2.61			
09/23/14	ICR-03	2014	YR6		0.3		2.68			
09/23/14	ICR-03	2014	YR6		18.0		2.60			
09/23/14	ICR-05	2014	YR6		0.4		2.49			
10/16/14	ICR-01	2014			0.5	11.6	2.90			
10/16/14	ICR-01	2014			18.0		2.74			
10/16/14	ICR-01	2014			33.0		2.84			
10/16/14	ICR-03	2014			0.7		2.77			
10/16/14	ICR-03	2014			18.0		2.80			
10/16/14	ICR-05	2014			0.5		2.67			
11/18/14	ICR-01	2014			0.5	3.2	3.03			
11/18/14	ICR-01	2014			18.0		3.46			
11/18/14	ICR-01	2014			36.1		4.72			
11/18/14	ICR-03	2014			0.5		2.93			
11/18/14	ICR-03	2014			21.0		3.29			
11/18/14	ICR-05	2014			0.4		2.84			
12/23/14	ICR-01	2014			0.9	6.0	2.71			
12/23/14	ICR-01	2014			18.0		3.13			
12/23/14	ICR-01	2014			36.0		3.09			
12/23/14	ICR-03	2014			0.6		2.96			
12/23/14	ICR-03	2014			21.3		3.08			
12/23/14	ICR-05	2014			0.6		2.94			
Maximum					36.1	28.6	4.72	0.000	0	0
Minimum					0.1	3.2	1.70	0.000	0	0
Average					12.8	15.2	2.50			
# Samples					66	10	66	0	0	0

Date	Site	**Year**	**HOS**	**Summer**	Depth Ft	Comments
02/11/14	ICR-01	2014			0.5	
02/11/14	ICR-01	2014			21.1	
02/11/14	ICR-01	2014			36.1	
02/11/14	ICR-03	2014			0.6	
02/11/14	ICR-03	2014			21.1	
02/11/14	ICR-05	2014			0.4	
03/20/14	ICR-01	2014			1.6	
03/20/14	ICR-01	2014			17.9	
03/20/14	ICR-01	2014			33.0	
03/20/14	ICR-03	2014			0.5	
03/20/14	ICR-03	2014			24.0	
03/20/14	ICR-05	2014			0.5	
04/15/14	ICR-01	2014	YR6		0.5	
04/15/14	ICR-01	2014	YR6		18.0	
04/15/14	ICR-01	2014	YR6		36.0	
04/15/14	ICR-03	2014	YR6		0.5	
04/15/14	ICR-03	2014	YR6		23.8	
04/15/14	ICR-05	2014	YR6		0.5	
05/13/14	ICR-01	2014	YR6		0.2	
05/13/14	ICR-01	2014	YR6		21.1	
05/13/14	ICR-01	2014	YR6		36.0	
05/13/14	ICR-03	2014	YR6		0.2	
05/13/14	ICR-03	2014	YR6		24.2	
05/13/14	ICR-05	2014	YR6		0.5	
06/04/14	ICR-01	2014	YR6	2014-SMR	0.7	
06/04/14	ICR-01	2014	YR6	2014-SMR	18.0	
06/04/14	ICR-01	2014	YR6	2014-SMR	36.0	
06/04/14	ICR-03	2014	YR6	2014-SMR	0.5	
06/04/14	ICR-03	2014	YR6	2014-SMR	20.7	
06/04/14	ICR-05	2014	YR6	2014-SMR	0.5	
07/23/14	ICR-01	2014	YR6	2014-SMR	0.5	
07/23/14	ICR-01	2014	YR6	2014-SMR	18.0	
07/23/14	ICR-01	2014	YR6	2014-SMR	36.0	
07/23/14	ICR-03	2014	YR6	2014-SMR	0.5	
07/23/14	ICR-03	2014	YR6	2014-SMR	21.0	
07/23/14	ICR-05	2014	YR6	2014-SMR	0.5	
08/14/14	ICR-01	2014	YR6	2014-SMR	0.3	
08/14/14	ICR-01	2014	YR6	2014-SMR	18.1	
08/14/14	ICR-01	2014	YR6	2014-SMR	36.1	
08/14/14	ICR-03	2014	YR6	2014-SMR	0.1	
08/14/14	ICR-03	2014	YR6	2014-SMR	20.6	
08/14/14	ICR-05	2014	YR6	2014-SMR	0.4	
09/23/14	ICR-01	2014	YR6		0.2	
09/23/14	ICR-01	2014	YR6		18.0	
09/23/14	ICR-01	2014	YR6		33.0	
09/23/14	ICR-03	2014	YR6		0.3	
09/23/14	ICR-03	2014	YR6		18.0	
09/23/14	ICR-05	2014	YR6		0.4	
10/16/14	ICR-01	2014			0.5	
10/16/14	ICR-01	2014			18.0	
10/16/14	ICR-01	2014			33.0	
10/16/14	ICR-03	2014			0.7	
10/16/14	ICR-03	2014			18.0	
10/16/14	ICR-05	2014			0.5	
11/18/14	ICR-01	2014			0.5	
11/18/14	ICR-01	2014			18.0	
11/18/14	ICR-01	2014			36.1	
11/18/14	ICR-03	2014			0.5	
11/18/14	ICR-03	2014			21.0	
11/18/14	ICR-05	2014			0.4	
12/23/14	ICR-01	2014			0.9	
12/23/14	ICR-01	2014			18.0	
12/23/14	ICR-01	2014			36.0	
12/23/14	ICR-03	2014			0.6	
12/23/14	ICR-03	2014			21.3	
12/23/14	ICR-05	2014			0.6	
Maximum					36.1	
Minimum					0.1	
Average					12.8	
# Samples					66	