

Summary Task Force Expenditures

	Approved Budget 2012-13	Actual Expenditures 2012-13	Approved Budget 2013-14	to date Expenditures 2013-14
A. Task Force Administration				
LESJWA Staff	50,000.00	50,000.00	50,000.00	39,603.06
Annual Water Quality Reporting and Database Management				
Grant Preparation				
B. TMDL Compliance Expert (Risk Sciences)	50,000.00	49,088.88	50,000.00	20,426.47
C. TMDL Monitoring Program				
Phase 1 - Watershed Nutrient Monitoring	70,000.00	46,313.40	70,000.00	9,216.56
Phase 1 - Watershed Lab Analysis	15,000.00		15,000.00	
Phase 1 - Canyon Lake Nutrient Monitoring and Lab Analysis				
D. TMDL Implementation Plan Requirements				
Water Quality Modeling (Plans)				
Water Quality Modeling (Implementation)				
Water Quality Monitoring (Plans)				
Pollutant Trading (Plans)				
Canyon Lake Management Plan / Project Alternatives	60,000.00			
Review and Revision of Water Quality Objectives (DO Target Adjustment)			50,000.00	
E. TMDL Implementation Projects				
Canyon Lake Project Alternative (Hybrid Treatment Project)	220,000.00	20,000.00	330,000.00	234,731.19
F. Additional Studies & Models				
Canyon Lake Pathogen Monitoring **				
Monitoring Study - Local Dry-weather Runoff Flows and Water Quality				
Lake Elsinore Biological Monitoring & Bathymetric Analysis				
G. Contingency (approximately 10% of direct stakeholder expenses)	16,000.00		15,000.00	
TOTAL TMDL Implementation Expenditures:	481,000.00	165,402.28	580,000.00	303,977.28
Open Task Orders:				175,159.72
Stakeholder Cash Contributions:		167,711.00		417,323.44
Balance TMDL Implementation Budget:		2,308.72		(61,813.56)
Previous Year Reserve Carryover:		289,279.02		291,587.74
Cummulative Carryover:		291,587.74		229,774.18

NEW TASK FORCE AGREEMENT

Detailed Stakeholder Contributions***

	Approved Budget 2012-13	to date Contributions 2012-13	Approved Budget 2013-14	to date Contributions 2013-14
A. MS4 Co-Permittees (Total)	63,970.92	63,972.00	354,359.36	329,823.44
Riverside County	-na-	-na-	33,900.64	30,165.20
City of Beaumont	1,864.55	1,865.00	19,706.00	19,263.38
City of Canyon Lake	643.66	644.00	18,774.44	18,389.00
City of Hemet	6,285.50	6,286.00	20,750.00	18,174.59
City of Lake Elsinore	-na-	-na-	20,750.00	19,381.20
City of Moreno Valley	15,425.27	15,425.00	109,525.00	103,565.30
City of Murrieta	-na-	-na-	12,500.00	12,426.20
City of Perris	5,751.56	5,752.00	20,750.00	18,868.58
City of Riverside	1,575.46	1,575.00	17,977.00	17,641.00
City of San Jacinto	4,315.45	4,315.00	20,750.00	19,487.00
City of Menifee	23,648.77	23,649.00	46,476.28	44,155.00
City of Wildomar	4,460.69	4,461.00	12,500.00	8,307.00
C. Lake Elsinore Comprehensive Water Management Agreement (Total)				
Elsinore Valley Municipal Water District (EVMWD)	-na-	-na-	12,500.00	12,500.00
City of Lake Elsinore	-na-	-na-	-na-	-na-
D. San Jacinto Agricultural Operators	28,278.01	28,278.00	12,500.00	12,500.00
E. San Jacinto Dairy & CAFO Operators	10,211.35	10,211.00	12,500.00	12,500.00
F. CALTRANS - freeway	13,050.00	13,050.00	12,500.00	12,500.00
G. CA DF&G - San Jacinto Wetlands	13,050.00	13,050.00	12,500.00	12,500.00
H. US Forest Service (USFS)	-na-	-na-	-na-	-na-
I. Eastern Municipal Water District	13,050.00	13,050.00	12,500.00	12,500.00
J. March Air Reserve Base Joint Powers Authority	13,050.00	13,050.00	12,500.00	
K. US Air Force (March Air Reserve Base)	13,050.00	13,050.00	12,500.00	12,500.00
Total Funding Required	167,710.28	167,711.00	454,359.36	417,323.44

NEW TASK FORCE AGREEMENT

NOTES:

** Note: Pathogen monitoring for Canyon Lake is a voluntary response by participants of the Lake Elsinore and Canyon Lake TMDL Task Force to address water quality beyond the scope of the Lake Elsinore and Canyon Lake nutrient TMDLs. This program designed to monitor pathogen compliance for Canyon Lake will continue only until the next CWA 303(d) Listing Cycle.

Paid Stakeholder Contribution
Unpaid Stakeholder Contribution
Work NOT Conducted by Task Force
Expenditures (not budgeted in current year)
Open Task Order
Applied Stakeholder \$ Funding Credit

Detailed Outside Stakeholder Contributions

Approved Budget 2012-13 Actual Expenditures 2012-13 Approved Budget 2013-14 to date Expenditures 2013-14

Stakeholder Funding \$ Credits (costs reflected in stakeholder allocation)

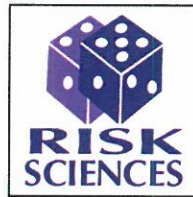
		2013-14 credits	24,536.83	2014-15 credits	
A.	MS4 Funding Credits (RCFC&WCD)				
	Phase 1 - Watershed-wide Monitoring (Lab Analysis)	-	7,184.00	-	
	Phase 1 - Stream gauge O&M				
	Wet Year Watershed-wide Monitoring (Weather Dependant)				
	Canyon Lake Project Credits (GEI)		13,159.83		
	Credit to City of Wildomar for canyon Lake Project Contribution		4,193.00		
B.	Lk Elsinore Comp Water Mgt Agrmt Funding Credits (EVMWD)				
	Phase 1 - Lake Elsinore Nutrient Monitoring (MWH/CSUSB)				
	In-Lake Sediment Reduction Plan (MWH/Horne)				
	In-Lake Project Evaluation				
	In-Lake Sediment Reduction Plan				
	Sediment Treatment Study				
C.	Dairy/Agricultural Operator Funding Credits (WRCAC)				
	Aerial Mapping/Identification of Agricultural Operations				
	Upper Watershed Nutrient Monitoring (dairy/agriculture split 50/50)				
	CA Fish & Game Credit Transfer				
Total Stakeholder Credits			24,536.83		

NEW TASK FC

NOTES:

Stakeholder Contributions estimated as follows:

PRO-RATA SHARE for stakeholders are derived from a formula where the the cost share to MS4 CO-PERMITTEES is 28.5%, Agricultural Operators is 28.5%, EVMWD is 14.25%, the CITY OF LAKE ELSINORE is 14.25% (plus an allocation under MS4), and Dairy is 5% of the TOTAL TMDL Implementation Expenditures minus the fixed cost shares of CALTRANS, CA DF&G, USFS, EMWD, US Air Force (March Air Reserve Base), and the March Air Reserve Base Joint Powers Authority MINUS any Stakeholder Funding \$ Credits provided by that stakeholder.



Canyon Lake

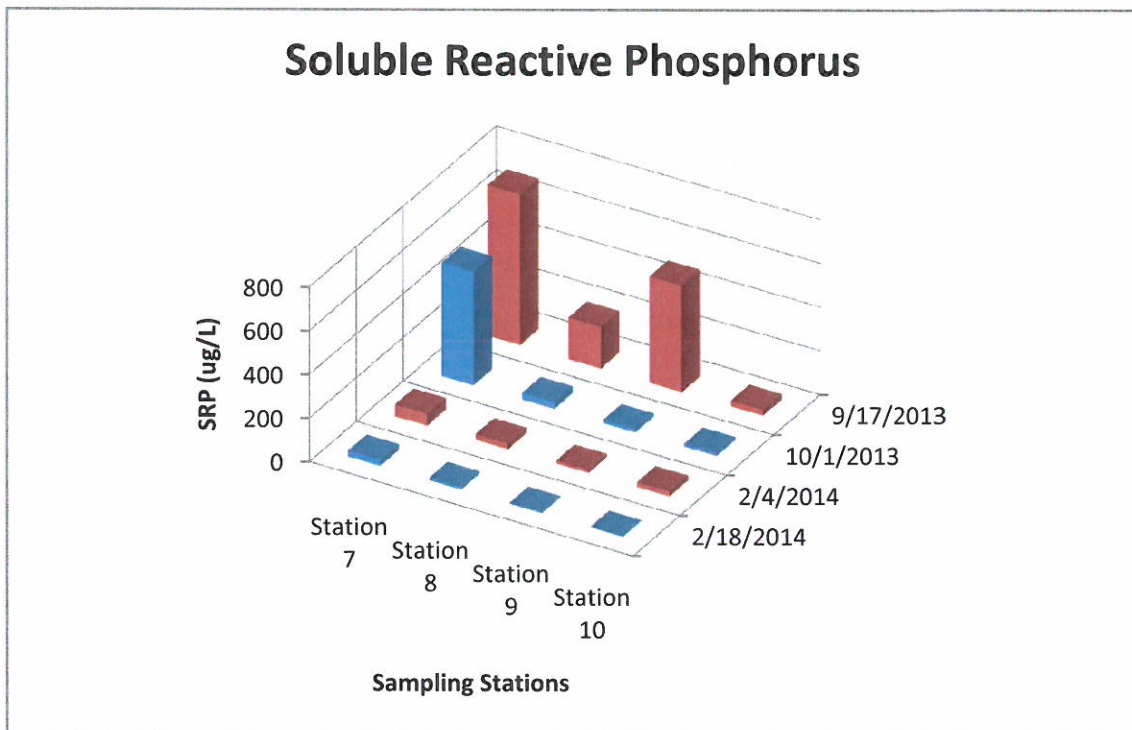
	TMDL Metric	Compliance Threshold	Probable Status in 2015
Response Targets	Chlorophyll-A Target	Summer average ≤ 40 mg/L (2015); ≤ 25 mg/L (2020)	Likely to Attain Target
	Dissolved Oxygen Target	Minimum of 5 mg/L above thermocline (2015) Depth average ≥ 5 mg/L in hypolimnion (2020)	DO concentrations improved; Attainment Unlikely (natural factors); Reconsider DO Target
	Un-ionized Ammonia Target	Varies with pH & temperature; calculated from equation in Basin Plan (2020). New EPA criteria.	UIA concentrations improved; Attainment Uncertain; Other Toxicity Factors (H ₂ S)?
Causal Targets	Total Phosphorus Target	Annual average no greater than 0.1 mg/L (2020)	Likely to Attain Target
	Phosphorus TMDL = 8,691 kg/yr	WLA = 487 kg/yr; LA = 8,204 kg/yr (calculated as 10-yr. running average)	WLA & LA currently complies (due to dry weather) Attainment unlikely if El Niño occurs in 2014-15.
	Total Nitrogen Target	Annual average no greater than 0.75 mg/L (2020)	Target unlikely to be attained; Re-evaluate target as related to DO & Ammonia
	Nitrogen TMDL = 37,735 kg/yr	WLA = 6,248 kg/yr; LA = 31,487 kg/yr (calculated as 10-yr. running average)	10-yr WLA/LA unlikely to be attained; Re-calculate WLA/LA to meet DO & Ammonia targets

Lake Elsinore

	TMDL Metric	Compliance Threshold	Probable Status in 2015
Response Targets	Chlorophyll-A Target	Annual average ≤ 40 mg/L (2015); ≤ 25 mg/L (2020)	Attainment status depends on averaging method
	Dissolved Oxygen Target	Depth average ≥ 5 mg/L (2015) >5mg/L one meter above lake bottom (2020)	DO concentrations improved; Attainment Uncertain); Reconsider DO Target; SSO?
	Un-ionized Ammonia Target	Varies with pH & temperature; calculated from equation in Basin Plan (2020). New EPA criteria.	UIA concentrations improved; Attainment Uncertain; Other Toxicity Factors (H ₂ S)?
Causal Targets	Total Phosphorus Target	Annual average no greater than 0.1 mg/L (2020)	Unlikely to Attain Target
	Phosphorus TMDL = 28,584 kg/yr	WLA = 3,845 kg/yr; LA = 21,969 kg/yr (calculated as 10-yr. running average)	WLA & LA currently complies (due to dry weather) Attainment unlikely if El Niño occurs in 2014-15.
	Total Nitrogen Target	Annual average no greater than 0.75 mg/L (2020)	Target unlikely to be attained Re-evaluate Target related to DO & Ammonia
	Nitrogen TMDL = 239,025 kg/yr	WLA = 7,791 kg/yr; LA = 210,461 kg/yr (calculated as 10-yr. running average)	10-yr WLA/LA unlikely to be attained; Re-calculate WLA/LA to meet DO & Ammonia targets

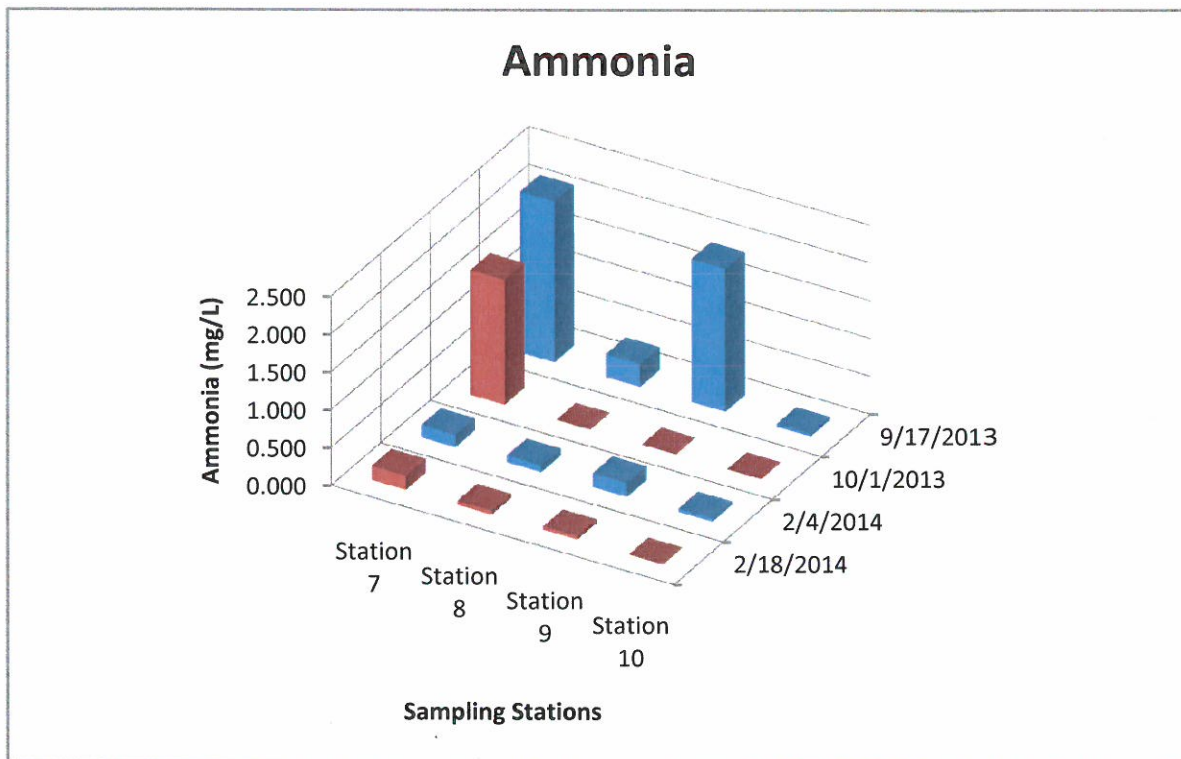
Sampling Event	Station 7	Station 8	Station 9	Station 10
2/4/2014 (before)	54.4	26	13.5	22.6
2/18/2014 (after)	27.5	11	5.42	3.59
9/17/2013	691	191	487	27
10/1/2013	519	31	15	14
10/8/2013	578	37	9	9
10/15/2013	446	55	9	9
12/18/2013	98	96	55	46
3/6/2014	46	24	348	400

Values are for the integrated water column samples and are in ug/L or ppb. Epilimnion and hypo limnion samples showed a similar trend.



Ammonia plot

	Station 7	Station 8	Station 9	Station 10
2/4/2014	0.164	0.090	0.183	0.045
2/18/2014	0.188	0.054	0.044	<0.010
9/17/2013	2.130	0.306	1.890	0.036
10/1/2013	1.650	<0.01	<0.01	<0.01



Sampling Crew: Dr Noblet, Crystal, Sarah, Henry

Sample

	Depth	Temp.	DO	ORP	EC	Turb.
	(m)	(°C)	(mg/L)	pH	(µS/cm)	(NTU)
Station: 7	0.5	12.12	9.48	8.22	1252	4.5
Date: 2/4/2014	S 1	12.12	9.46	8.22	1251	4.5
33°40.697N	2	12.1	9.43	8.21	1251	4.5
117°16.522W	3	12.1	9.11	8.20	1251	4.7
Time: 8:18 am	4	12.08	9.06	8.19	1251	4.7
Weather: Sunny, Clear, cool	5	12.08	9.02	8.17	1252	5.1
	6	12.06	9.15	8.19	1253	5.1
Secchi Depth (cm): 75	Int 7	12.06	9.23	8.20	1251	5.3
	8	12.05	9.27	8.23	1251	5.2
	9	12.03	8.60	8.18	1252	5.6
	10	11.9	8.15	7.80	1257	5.7
	11	11.78	0.33	7.55	1258	7.3
	12	11.75	0.26	7.42	1260	7.9
	13	11.74	0.20	7.36	1259	11.9
	13.1	Bottom				

	Depth	Temp.	DO	ORP	EC	Turb.
	(m)	(°C)	(mg/L)	pH	(µS/cm)	(NTU)
Station: 8	0.5	12.93	14.76	8.64	1240	7.2
Date: 2/4/2014	S 1	12.83	14.73	8.66	1242	6.9
33°41.324N	2	12.59	12.35	8.50	1245	5.9
117°16.123W	3	12.42	10.70	8.37	1249	5.5
Time: 9:15 am	4	12.46	10.03	8.30	1251	5.5
Weather: Sunny, Clear, cold	Int 5	12.38	9.76	8.25	1249	5.5
	6	12.12	5.09	8.00	1254	5.4
Secchi Depth (cm): 70	7	11.99	3.18	7.64	1255	6.9
	7.5	bottom				

	Depth	Temp.	DO	ORP	EC	Turb.
	(m)	(°C)	(mg/L)	pH	(µS/cm)	(NTU)
Station: 9	0.5	12.83	14.17	8.55	1373	8.5
Date: 2/4/2014	1	12.73	14.09	8.54	1374	9.1
33°41.324N	2	12.60	13.95	8.57	1369	8.9
117°16.123W	Int 3	12.56	14.28	8.58	1368	9.2
Time: 10:00 am	only 4	12.28	9.04	7.83	1388.000	7.8
Secchi Depth (cm): 75	4.7	bottom				
Station: C10						

	Depth	Temp.	DO	ORP	EC	Turb.
	(m)	(°C)	(mg/L)	pH	(µS/cm)	(NTU)
Date: 2/4/2014	0.5	13.3	15.6	8.72	1402	23.6
33°40.782N	1	12.95	15.44	8.62	1403	19.6
117°15.066W	Int 2	12.92	12.45	8.51	1407	18.9
Time: 10:30 am	only 2.2	bottom				
Weather: cool, partly cloudy						
Secchi Depth (cm): 35						

Sampling Crew: Dr Noblet, Ingrid, Emmett

Sample	Depth	Temp. (°C)	DO (mg/L)	pH	ORP (mV)	EC (µS/cm)	Turb. (NTU)
Station: 7	0.5	17.46	16.81	9.03	113	1174	9.2
Date: 3/6/2014	1	17.42	16.87	9.19	108	1174	9.2
33°40.697N	E 2	16.37	12.14	8.71	122	1179	13.4
117°16.514W	3	15.18	6.08	8.14	139	1217	9.5
Time: 8:00 am	4	15.01	5.61	7.90	142	1234	8.0
Weather: Sunny, Clear	5	14.83	5.25	7.81	143	1239	7.3
	6*	14.6	3.73	7.90	145	1246	7.5
Secchi Depth (cm): 80	7*	14.43	3.00	7.63	147	1250	6.9
	8*	14.08	0.12	7.50	148	1260	9.0
	9	13.44	0.00	7.41	-87	1264	16.7
	10	12.84	0.00	7.37	-171	1270	15.8
	H 11	12.66	0.00	7.32	-201	1272	13.1
	12	12.55	0.00	7.30	-211	1274	12.7
Note: *Indicates thermocline, 0.00 = <0.5 ppm, lots of debris near surface from runoff	13	12.48	0.00	7.29	-216	1274	11.0
	14	12.43	0.00	7.26	-224	1275	11.0
	15	<u>12.42</u>	<u>0.00</u>	<u>7.18</u>	<u>-240</u>	<u>1280.000</u>	<u>13.6</u>
	15.2 bottom						
Station: 8	E 0.5	17.65	12.62	8.82	79	1121	7.8
Date: 3/6/2014	1	17.52	15.00	8.99	69	1122	8.6
33°41.324N	2	15.62	10.78	8.58	79	1150	8.5
117°16.123W	3	15.05	6.14	7.99	96	1195	8.0
Time: 9:10 am	4	14.97	5.80	7.87	98	1224	7.8
Weather: Sunny, Clear	5*	14.82	3.38	7.66	103	1246	7.3
	H 6	<u>14.20</u>	<u>1.31</u>	<u>7.50</u>	<u>105</u>	<u>1254.000</u>	<u>7.6</u>
Secchi Depth (cm): 80	7	14.56	2.16	7.46	103	1247	7.5
Note: *Indicates thermocline, 0.00 = <0.5 ppm	8	13.81	0.00	7.39	-80	1257	9.3
	9	13.07	0.00	7.33	-190	1273	22.9
	9.4 bottom						
Station: 9	0.5	16.53	11.96	8.67	92	959	17.5
Date: 3/6/2014	1	16.58	13.41	8.67	86	962	17.5
33°41.324N	2	15.77	10.07	8.26	99	963	16.0
117°16.123W	Note: *Indicates thermocline 3*	14.14	4.25	7.74	113	900	24.7
Time: 9:50 am	4	14.03	2.55	7.47	116	955	22.8
Weather: Sunny, Clear	H 5	14.02	1.17	7.3	118	1027	23.8
	6	13.85	0	7.23	-80	1231	29.7
Secchi Depth (cm): 50	6.8 bottom						
Station: C10	0.5	16.96	11.25	8.49	84	900	21.3
Date: 3/6/2014	1	16.56	12.62	8.6	76	897	21.7
33°40.782N	2	14.52	4.81	7.65	100	877	26.4
117°15.066W	3	13.94	2.48	7.48	103	874	34.7
Time: 10:06 am	3.9 bottom						
Weather: Sunny, Clear							

Sampling Crew: Dr Noblet, Ingrid

Sample	Depth (m)	Temp. (°C)	DO (mg/L)	pH	ORP (mV)	EC (µS/cm)	Turb. (NTU)	
Station: 7 Date: 3/13/14 33°40.697N 117°16.514W Time: 8:15 am Weather: Cold , Cloudy Secchi Depth (cm): 190 Note: *Indicates thermocline, Integrated Sample 1-14 m	E	0.5	17.08	8.85	8.32	187	1191	2.1
		1	17.11	8.68	8.42	180	1190	2.3
		2	17.1	8.66	8.46	174	1192	2.3
		3	17.08	8.65	8.47	171	1190	2.2
		4	16.75	7.35	8.30	174	1196	2.1
		*5	15.84	3.56	7.89	189	1207	2.6
	B1	6	14.96	0.00	7.60	193	1239	3.3
		7	14.51	0.00	7.47	193	1252	3.3
		8	14.16	0.00	7.39	-102	1259	5.0
		9	13.66	0.00	7.33	-185	1267	7.5
	B2	10	13.18	0.00	7.27	-220	1274	7.9
		11	13.03	0.00	7.23	-231	1276	7.9
		12	12.87	0.00	7.20	-237	1279	7.9
		13	12.69	0.00	7.17	-244	1281	8.0
	B3	14	12.65	0.00	7.16	-246	1279	8.3
	<u>15</u>	<u>12.59</u>	<u>0.00</u>	<u>7.15</u>	<u>-249</u>	<u>1281.000</u>	<u>9.1</u>	
	15.3	bottom						

Sample	Depth (m)	Temp. (°C)	DO (mg/L)	pH	ORP (mV)	EC (µS/cm)	Turb. (NTU)	
Station: 8 Date: 3/13/14 33°41.324N 117°16.123W Time: 9:20 am Weather: cold, cloudy Secchi Depth (cm): 250 Note: *Indicates thermocline	E	0.5	16.88	7.69	8.18	71	1188	4.5
		1	16.90	7.56	8.21	69	1189	3.5
		2	16.90	7.52	8.23	67	1189	3.0
		3	16.90	7.42	8.24	65	1188	3.2
		4	16.29	5.48	8.00	76	1199	3.1
		*5	15.51	2.23	7.71	86	1221	3.7
		<u>6</u>	<u>14.81</u>	<u>0.00</u>	<u>7.51</u>	<u>90</u>	<u>1241.000</u>	<u>5.0</u>
	H	7	14.31	0.00	7.41	-149	1254	8.0
		8	13.95	0.00	7.33	-205	1262	9.4
		8.9	bottom					

Sample	Depth (m)	Temp. (°C)	DO (mg/L)	pH	ORP (mV)	EC (µS/cm)	Turb. (NTU)	
Station: 9 Date: 3/13/14 33°41.324N 117°16.123W Time: 9:55 am Weather: cloudy, cool Secchi Depth (cm): 60	Int only	0.5	17.18	14.73	9.00	46	955	15.5
		<u>1</u>	<u>17.18</u>	<u>16.07</u>	<u>9.16</u>	<u>39</u>	<u>955.200</u>	<u>13.8</u>
	Note: *Indicates thermocline; Int sample 1-3 m, 4m	2	17.06	15.08	9.16	37	958	7.6
	sample had too much	3	16.42	9.19	8.51	60	999	5.9
		4	14.74	0.00	7.76	86	978	8.9
	5	bottom						

Sample	Depth (m)	Temp. (°C)	DO (mg/L)	pH	ORP (mV)	EC (µS/cm)	Turb. (NTU)	
Station: C10 41711 33°40.782N 117°15.066W Time: 10:35 am Weather: cool , cloudy	Int only	0.5	17.21	15.13	9.1	59	937.5	13
		1	17.18	15.57	9.15	55	937.5	13.2
		2	16.87	14.81	9.09	54	939.9	9
	Secchi Depth (cm): 40	3	16.2	8.49	8.35	80	956.8	9.2
		4	15.02	2.25	7.92	98	968	35.9
	4.1	bottom						

Sampling Crew: Noblet, Ingrid, Crystal

Depth	<u>Depth</u> (m)	<u>Temp.</u> (°C)	<u>DO</u> (mg/L)	<u>pH</u>	<u>ORP</u> (mV)	<u>EC</u> (µS/cm)	<u>Turb.</u> (NTU)
	0.5	18.36	13.60	8.88	220	1187	2.1
	1	18.37	13.54	8.89	218	1187	2.2
E	2	18.34	13.57	8.90	217	1188	2.4
	3	18.29	13.54	8.90	215	1188	2.1
	*4	17.29	3.69	8.16	243	1197	2.9
B1	5	16.25	0.00	7.78	217	1205	3.9
	6	15.05	0.00	7.60	-47	1242	1.9
	7	14.42	0.00	7.46	-186	1255	3.2
	8	13.79	0.00	7.34	-225	1267	4.3
B2	9	13.22	0.00	7.26	-242	1275	4.6
	10	13.04	0.00	7.23	-247	1277	5.1
	11	12.95	0.00	7.24	-249	1279	6.1
	12	12.87	0.00	7.18	-257	1282	6.0
	13	12.86	0.00	7.16	-259	1282	5.8
B3	14	12.83	0.00	7.14	-262	1283	5.9

Note: Int. Sample 1-14 m

Depth	<u>Depth</u> (m)	<u>Temp.</u> (°C)	<u>DO</u> (mg/L)	<u>pH</u>	<u>ORP</u> (mV)	<u>EC</u> (µS/cm)	<u>Turb.</u> (NTU)
	14.8	bottom					
	0.5	19.06	14.52	8.89	42	1183	2.0
E	1	18.96	14.35	8.89	0.42	1182	2.6
	2	18.74	13.93	8.87	44	1183	2.8
	3	18.44	11.83	8.74	50	1186	2.7
	4	17.42	3.90	8.04	82	1199	2.2
	5	15.60	0.00	7.73	-85	1223	2.5
	6	15.34	0.00	7.59	-152	1233	2.5
H	7	14.62	0.00	7.46	-214	1251	4.5
	8	14.11	0.00	7.35	-237	1261	5.6

Note: Int. Sample 1-8 m

Depth	<u>Depth</u> (m)	<u>Temp.</u> (°C)	<u>DO</u> (mg/L)	<u>pH</u>	<u>ORP</u> (mV)	<u>EC</u> (µS/cm)	<u>Turb.</u> (NTU)
	9	bottom					
	0.5	18.87	14.43	9.25	29	984	7.1
Int	1	18.53	14.78	9.26	27	985	7.2
only	2	18.17	14.29	9.21	28	980	7.0
	3	18.01	12.46	8.95	37	1014	4.7
	4	16.04	1.84	8.03	75	999	7.4
	5	14.72	0.00	7.63	24	1032	9.5
	6	13.79	0.00	7.34	-221	1213	10.4

Secchi Depth (cm): 78

Note: Int sample 1-4 m

Depth	<u>Depth</u> (m)	<u>Temp.</u> (°C)	<u>DO</u> (mg/L)	<u>pH</u>	<u>ORP</u> (mV)	<u>EC</u> (µS/cm)	<u>Turb.</u> (NTU)
	6.5	bottom					
Int	0.5	19.47	12.54	9.10	34	966	8.9
only	1	18.79	13.58	9.17	27	968	9.6
	2	18.47	12.80	9.10	28	967	8.4
	3	17.78	9.61	8.82	35	994	7.7
	4	16.32	2.83	8.21	62	1005	11.4
	4.1	bottom					

Secchi Depth (cm): 78

Note: Int. sample