COMBINED AQUATICS STUDY PLANS

CAWG-4-CHEMICAL WATER QUALITY

1.0 EXECUTIVE SUMMARY

A water quality study was conducted in the Big Creek ALP Project area from spring through fall of 2002 to characterize the physical and chemical properties of water upstream and downstream of Project facilities. The study consisted of a review of existing data, and field collection and laboratory analysis of water quality samples.

A review of existing data was conducted by reviewing previous SCE studies and searching web-based databases of the U.S. Environmental Protection Agency (EPA), United States Geological Survey (USGS), and Regional Water Quality Control Board (RWQCB). Previous SCE water quality studies focused primarily on the major reservoirs, impoundments, and tributaries in the system. These studies collected physical and chemical water quality data that indicated that Basin Plan standards were being met. Summaries of the data collected were provided in the Initial Information Package (IIP) for the *Big Creek Hydroelectric System Alternative Licensing Process* (SCE 2000).

Of the databases searched, only the USGS STORET database contained water quality data that pertained to the study area. Physical and chemical data were collected at increasing depths from two stations on Shaver Lake in summer and fall of 1975.

The water quality sampling and laboratory analysis portion of this study included three programs: the Spring (runoff flow) and Fall (baseflow) Stream Sampling Program, the Fecal Coliform Sampling Program, and the Reservoir/Forebay Sampling Program.

<u>SPRING AND FALL SAMPLING PROGRAM</u>

Spring (runoff flow) sampling was conducted at 78 stream locations from May 20 to June 14, 2002. Three locations could not be sampled as follows: Tombstone Diversion Channel (TS-4) was dry, Ross Creek upstream of the San Joaquin River Confluence (RO-3) was dry, and the South Fork San Joaquin River upstream of the confluence of the San Joaquin River (SF-4) was inaccessible due to high flows that posed a safety hazard.

Fall (baseflow) sampling was conducted at 78 stream locations during the period from June 12 through September 6, 2002. Three locations could not be sampled as follows: Tombstone Diversion Channel (TS-4), Ross Creek upstream of the San Joaquin River Confluence (RO-3), and Ely Creek downstream of the diversion (EL-2). Of the 78 sampling locations, 40 stations located on 13 small tributary streams with small diversions were sampled during mid summer in order to obtain data prior to the end of their diversion periods. Water quality sampling stations were established at locations above and below the diversion structures. The remaining 38 stream stations were sampled during late summer/early fall.

Sampling locations described above which could not be sampled during the 2002 sampling activities will be sampled in 2003 provided that the sampling locations are not dry (contain free flowing water) and that sampling locations can be safely accessed.

Water quality conditions at each sampling location were evaluated by collecting in-situ measurements (temperature, pH, dissolved oxygen (DO), turbidity and specific conductance) and submitting samples for laboratory analysis of 34 chemical and/or physical constituents. Several parameters/constituents could not be evaluated due to analytical laboratory detection limits that were too high to allow comparison to the regulatory standard. The results of laboratory analysis indicate that some samples did not meet Basin Plan standards for some parameters, as summarized in the following:

- Approximately one-fourth to one-third of stream pH values measured during spring and fall are below the Basin Plan standard which requires that pH values range between 6.5 to 8.5. Values of pH lower than 6.5 were recorded at locations both above and below active diversions. Values of pH greater than 8.5 were recorded at three locations (BO-2 Bosillo Creek downstream of the diversion at 8.74, NF-1 North Fork Stevenson Creek upstream of the tunnel outlet at 8.87, and PI-1 Pitman Creek upstream of the diversion at 8.66) during the spring sampling event, and at two locations (SF-4 South Fork San Joaquin River at 8.77, and SJ-11 San Joaquin River at powerhouse 3 at 8.66) during the fall sampling event.

- Dissolved oxygen concentrations below the Basin Plan minimum standard of 7.0 mg/L were observed at one station during spring (6.57 mg/L) and at 10 stations during fall (5.29 mg/L to 6.97 mg/L).

- Laboratory analytical results from the spring and fall sampling events indicate that ammonia concentrations were all non-detectable at a detection limit for reporting (DLR) of 1.0 mg/L. However, the water quality criteria for ammonia is a value that is calculated in accordance with guidance provided in the NTR and is determined using the ambient pH and temperature values measured at each sampling location. The ammonia criteria calculated for seven sampling stations were below the laboratory DLR. As such the laboratory results for these seven samples could not be used to assess if the ammonia criteria was met.

- The Basin Plan specifies a criterion for iron of 0.3 mg/L, based on secondary maximum contaminant levels for drinking water. This criterion is based on a taste, odor, and visual threshold (CCR 1996). During the stream sampling program, the 0.3 mg/L criterion was exceeded at 11 locations. The EPA has recommended a value of 1.0 mg/L for the protection of freshwater aquatic life. This EPA value was not exceeded during the spring and summer/fall sampling periods.

- The Basin Plan specifies a Manganese criterion of 0.05 mg/L, based on secondary maximum contaminant levels for drinking water. One manganese concentration on Ely Creek exceeded the criterion during the spring sampling period and one measurement on Stevenson Creek exceeded the criterion during the summer/fall sampling period.

- During the fall sampling period, two nitrate/nitrite results exceeded the Basin Plan criterion of 10 mg/L. A value of 12 mg/L was obtained from Big Creek upstream of Dam 5 (BC-7) on August 27, 2002, and a value of 20 mg/L was obtained from Big Creek upstream of Powerhouse 8 (BC-10) on August 28, 2002.

FECAL COLIFORM SAMPLING PROGRAM

The Fecal Coliform Sampling Program consisted of a screening level assessment and a 30-day, five-sample assessment. A threshold of 200/100 milliliter (ml) was used as a screening level criterion for all water samples obtained during the stream-sampling program. Any sample that exceeded this value would have been included in the more rigorous 30-day, five-sample program. None of the screening level samples exceeded the 200/100 ml threshold and were not incorporated into the more rigorous 30-day, five sample fecal coliform sampling program.

The 30-day, five sample fecal coliform sampling program was conducted at locations that were approved by the CAWG during the development of the study plan and are identified in Table CAWG-4-3. These locations included Shaver Lake and Huntington Lake, which are the lakes that receive significant amounts of contact recreation. The remaining large reservoirs and moderate sized impoundments were only sampled monthly as part of the screening level assessment, in accordance with the study plan. None of the monthly reservoir samples contained concentrations greater than the screening level concentration of 200/100 MPN and were not added to the more rigorous sampling program.

The 30-day, five-sample fecal coliform sampling was conducted between June 26 and July 24, 2002, in the near-shore areas of Huntington and Shaver Lakes and in associated creeks. The Fourth of July period was intentionally chosen to characterize fecal coliform concentrations before, during, and after a heavy recreational use period. The results of this study show that both the geometric mean of all values and the highest values obtained from all study locations were well below the Basin Plan thresholds.

MONTHLY RESERVOIR/FOREBAY PROFILE PROGRAM

The Monthly Reservoir/Forebay Profile Program was performed at 19 stations within four reservoirs and six moderate sized impoundments on a monthly basis from May through September 2002. The four reservoirs included Florence Lake, Huntington Lake, Shaver Lake, Mammoth Pool Reservoir, and the moderate size impoundments included Mono Forebay, Balsam Forebay, Bear Forebay, Dam 4 Forebay, Dam 5 Forebay, and Dam 6 Forebay. (The CAWG-4 Chemical Water Quality Study Plan identifies Lake Thomas A. Edison, Redinger Lake, and Portal Forebay as water bodies that are have or are currently undergoing the Traditional Licensing Process and are not included in the ALP sampling program). Depth profiles were performed in each reservoir of five in-situ measurements (pH, dissolved oxygen, temperature, specific conductance, and turbidity). Water quality samples were collected at each location for laboratory analysis of 34 chemical and/or biological tests. Six additional analyses were performed on samples collected from reservoirs where motorized craft are allowed, including Methyl Tertiary Butyl Ether (MTBE), total petroleum hydrocarbons (TPH) as gasoline and diesel, benzene, toluene, ethylbenzene, and xylene. Laboratory results indicate that pH values, and DO, MTBE, TPH-diesel, benzene, toluene, ethylbenzene, and total xylene concentrations were occasionally detected at values that did not meet Basin Plan standards. In-situ pH values were measured below the Basin Plan standard of 6.5. No pH measurements greater that 8.5 were measured during the reservoir profiling study. Petroleum hydrocarbon concentrations were detected above Basin Plan standards in water samples collected from major reservoirs that allow power boating (Shaver Lake, Huntington Lake, Florence Lake, and Mammoth Pool Reservoir).

2.0 STUDY OBJECTIVES

Determine Project-related sources and magnitudes of impacts to chemical water quality including the following:

- Dissolved Oxygen;
- Bacteria;
- Turbidity/suspended sediment;
- Toxics/metals; and
- Nutrients/Productivity.

Evaluate water quality parameter conditions for aquatic organisms.

3.0 STUDY IMPLEMENTATION

3.1 STUDY ELEMENTS COMPLETED

- Reviewed applicable scientific literature to determine appropriate water quality criteria for evaluating potential Project impacts.
- Reviewed existing data to determine potential areas that do not meet Basin Plan and CTR standards.
- Collected water quality samples upstream, within, and downstream of Project-related infrastructure that could adversely impact chemical water quality. Analyzed samples for parameters that would affect aquatic biota or would have a Basin Plan or CTR standard. These parameters would include organic compounds, metals, nutrients, DO, coliform bacteria, and turbidity.
- The field sampling program included the following:
    - ➢ Spring sampling was conducted at 78 stream locations from May 20 to June 14, 2002. See Table CAWG-4-1 for sample description locations.
    - ➢ Fall sampling was conducted at 78 stream locations from June 12 to September 6, 2002. (Forty stations located on 13 streams with small diversions were sampled during mid summer in order to obtain data prior to

the end of their diversion periods. The remaining 38 stream stations were sampled during late summer/early fall). See Table CAWG-4-1 for sample description locations.

- A 30-day, five-sample coliform sampling event was conducted from June 25 to July 24, 2002, at 19 sites in waters designated for contact recreation. See Table CAWG-4-2 for sample description locations.
- Reservoir and forebay depth profiles of chemical and physical characteristics were performed on a monthly basis between May and September 2002. See Table CAWG-4-1 for sample description locations.

3.2 OUTSTANDING STUDY ELEMENTS

- For turbidity or any point-source discharges, evaluate the erosion or contamination potential of Project-related operations and their proximity to streams and reservoirs;
- Measure in-situ gas saturation at Mammoth Pool Dam during a spill event;
- Collect fish tissue samples for mercury and silver analysis;
- Characterization of potential sediment and/or contamination sources;
- Review existing water quality data with USDA-FS Sierra National Forest (SNF);
- Review existing water quality data with California Department of Fish and Game (CDFG); and
- Obtain laboratory J-quantified values for copper, lead, silver and zinc analyses for comparison to regulatory water quality standards.

4.0 STUDY METHODOLOGY

4.1 REVIEW EXISTING DATA

Several sources of water quality data were searched to determine if historical water quality data were available for the Project area. These data sources included the EPA STORET database, the USGS WATSTORE database, USDA-FS SNF, CDFG, RWQCB, USGS NAWQA Data Exchange Program, previous SCE studies, and other studies. Available historical water quality data was subsequently reviewed and summarized as part of this study.

4.2 EXISTING WATER QUALITY STANDARDS

Water quality in the Project area must meet the objectives presented in the Sacramento River Basin and San Joaquin River Basin Water Quality Control Plan for San Joaquin River (Basin Plan) waters that are sources to Millerton Lake (California RWQCB, Central Valley Region 1998, Basin Plan). These objectives are established to protect beneficial uses designated in the Basin Plan. Water quality objectives are also published in the CTR (Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California. Federal Register, 65 FR 31682, EPA 2000) and the NTR (Water Quality Standards: Establishment of Numeric Criteria for

Priority Toxic Pollutants. Federal Register, 57 FR 60848, EPA 1992). The objectives of the Basin Plan, CTR**,** and NTR are to consider background levels and are based on criteria that protect both human health and aquatic life. However, SWRCB considers all applicable numerical objectives for each constituent, along with water quality goals selected from literature to interpret each applicable narrative objective, and selects the most controlling (most stringent) of these values to determine compliance with the Clean Water Act. Water quality goals that are used to interpret narrative objectives are available in *A Compilation of Water Quality Goals*, (EPA 2000) and include: Maximum Contaminant Levels (MCLs); California Toxics Rule (CTR) Criteria; Public Health Goals (PHGs); State Action Levels; and Drinking Water Health Advisories and Water Quality Advisories.

Existing water quality standards for the physical, chemical, and biological parameters analyzed in this study were identified by reviewing the Basin Plan, CTR, and NTR. The Basin Plan was reviewed to identify the water quality objectives, beneficial uses, and numerical standards established by the RWQCB for waters in the Upper San Joaquin River watershed. The CTR and NTR were also reviewed to identify numerical water quality standards for the list of physical, chemical, and biological parameters analyzed during the water quality study. In addition to the regulatory water quality standards, the analytical laboratory method detection limits were also reviewed and compiled.

4.3 FIELD PROGRAM

This section describes the site selection process and water quality sampling methods utilized by SCE in 2002 to describe water quality conditions in Project area waters. Water quality sampling activities included the completion of three integrated water quality programs: (1) the Spring and Fall Sampling Program in Project area streams; (2) the Reservoir/Forebay Profiling and Sampling Program; and (3) the Fecal Coliform Sampling Program. Table CAWG-4-1 and Figure CAWG-4-1 summarize and show the location of sampling stations established for these programs. The site selection process and each sampling program are discussed below.

4.3.1 SAMPLE SITE SELECTION

STREAM AND RESERVOIR SAMPLING PROGRAMS

Water quality sampling locations were initially presented in the Chemical Water Quality study plan of the Final Technical Study Plan Package (FTSPP) (SCE 2001). Sample locations were selected upstream and downstream of Project components to evaluate if water quality was affected. The sampling sites were selected in association with the following components: large dams with storage, moderate diversion dams with small impoundments, small diversions, power generation facilities, and tailraces (in the forebays).

Specific sampling stations were selected as follows:

- For small diversions, stations were located upstream and downstream of the diversion structures.
- For moderate diversions, stations were located in the diversion pool and upstream and downstream of influences.
- For reservoirs, stations were located in the reservoir and tributary streams on the upstream river segment and in the stream reaches below the reservoirs.
- For power generation facilities, stations were located upstream and downstream of the facilities and within bypass reaches.

Prior to implementing the study plan, the water quality monitoring stations identified in the FTSPP (SCE 2001) were plotted on a GIS-based map and then provided to the Water Quality Subgroup for review and approval. The subgroup members reached a consensus regarding clarification and additions of monitoring station locations. The study identified the sample locations in a table format. These locations were plotted on a map and provided to the water quality subgroup members. Sample locations were discussed and clarified and consensus was obtained from the group. The need for three additional sampling locations were identified during this process. These sample locations were added and include the following locations: San Joaquin River at Ross Creek, San Joaquin River at the Powerhouse No. 8 tailrace in the Dam 6 forebay, and Stevenson Creek upstream of the confluence with the San Joaquin River. A final water quality sampling location map was prepared and distributed to the CAWG (Figure CAWG-4-1). Table CAWG-4-1 provides a summary list of sampling sites and descriptions.

30-DAY FECAL COLIFORM SAMPLING PROGRAM

Fecal coliform sampling locations were initially presented in the CAWG-4 Chemical Water Quality study plan in the FTSPP (SCE 2001). Sampling areas were located in two of the large reservoirs and in associated creeks near campgrounds, picnic areas, cabins, and summer camping facilities. Specific monitoring stations were identified by the Water Quality Subgroup of the CAWG for Shaver Lake, Huntington Lake, Balsam Creek, Billy Creek, Bear Creek, Line Creek, Chiquito Creek, Big Creek, South Fork San Joaquin River, Mono Diversion Forebay, and Boggy Creek.

Prior to implementing the study plan, the fecal coliform monitoring stations identified in the FTSPP were plotted on a GIS-based map and submitted to the Water Quality Subgroup for review and approval. Based on the requests made by the subgroup, the number of monitoring stations was modified. One station, Boggy Creek, near Vermilion Valley Resort, was deleted from the program since it had already been sampled as part of the traditional relicensing process for the Vermilion Valley Project. Five monitoring stations were added to the program, including Billy Creek above the cabins, West Fork Line Creek above the cabins, East Fork Line Creek above the cabins, Bear Creek above the cabins, and Balsam Creek above Camp Sierra. Table CAWG-4-2 provides a summary list of fecal coliform sampling sites. A screening level analysis for fecal coliform was also conducted as part of the spring and fall sampling program, and the reservoir sampling program (described in Section 4.3.4).

4.3.2 Spring (Runoff) and Fall (Baseflow) Stream Sampling Program

Water quality sampling was conducted during spring, summer, and fall of 2002 to assess water quality in Project area streams during the snowmelt runoff period and baseflow period, as described in the CAWG-4 Chemical Water Quality Study Plan in the FTSPP (SCE 2001). The sampling program consisted of measuring in-situ water parameters and collecting water samples for laboratory analyses at 78 stations to obtain water quality data at Project-related structures.

The spring (runoff) sampling program was conducted from May 20 through June 14, 2002. Samples could not be collected from three sampling locations as follows: Tombstone Diversion Channel (TS-4) was dry because the diversion was not in operation, Ross Creek upstream of the San Joaquin River confluence (RO-3) was dry as upstream surface flow was lost to groundwater, and the South Fork San Joaquin River upstream of the confluence with the San Joaquin River (SF-4) could not be accessed due to large and unsafe steam flows.

The fall (baseflow) sampling program was conducted from June 14 through July 12 for small diversions and from August 20 through September 6, 2002 for all other sites. Three sampling locations could not be sampled due to a dry streambed: Tombstone Diversion Channel (TS-4); Ross Creek upstream of the San Joaquin River Confluence (RO-3); and Ely Creek downstream of the diversion (EL-2).

Sampling locations described above which could not be sampled during the 2002 sampling activities will be sampled in 2003 provided that the sampling locations are not dry (contain free flowing water) and that sampling locations can be safely accessed.

In order to obtain baseflow data from 13 tributary streams that have small diversions and which do not continue diverting water beyond summer, an attempt was made to collect samples prior to the end of their diversion periods. The status of diversion activity was tracked by SCE hydrologists to target a date when samples could be collected prior to the end of the diversion period. Between June 12 and July 11, 2002, 40 samples were collected from stations on the following streams:

Hooper Creek should have been sampled in October but was sampled in July by the field technician (in error) at the same time as the other nearby small creeks. Although North Slide Creek, South Slide Creek, and Tombstone Creek diversions are not currently in use, these creeks were still sampled although there were not project operations along these creeks.

Small Stream/Diversion	Date Turned Out	Date Sampled	Comments
Ross Creek	Not applicable	June 12, 2002	Turned in all year
Rock Creek	Not applicable	July 2, 2002	Turned in all year
Ely Creek	No record	July 10, 2002	
Balsam Creek	No record	July 10, 2002	
Pitman Creek	No record	July 10, 2002	
North Slide Creek	Not applicable	July 3, 2002	Diversion out of service
South Slide Creek	Not applicable	July 3, 2002	Diversion out of service
Hooper Creek	October 18, 2002	July 12, 2002	Should have been sampled in October, technician error
Crater Creek	July 16, 2002	July 11, 2002	
Tombstone Creek	Not applicable	July 3, 2002	Diversion out of service
Chinquapin Creek	July 9, 2002	July 2, 2002	
Camp 62 Creek	July 21, 2002	July 2, 2002	
Bolsillo Creek	July 2, 2002	July 2, 2002	

Fall or baseflow sampling was conducted at the remaining 38 stream stations from August 26 through September 6, 2002.

At each sampling station, water quality was assessed using a portable multi-probe water quality meter to collect in-situ measurements of temperature, DO, pH, specific conductivity, and turbidity. Water quality grab samples were concurrently collected from each station and submitted to BSK Analytical Laboratories, a state certified laboratory, in Fresno, California, for analysis. Samples were also collected for chlorophyll-a analysis and submitted to Creek Environmental Laboratories, Inc. in San Luis Obispo, California. Meteorological and general stream conditions were recorded on a standardized field data form at the time of sample collection.

In Project area streams, the water quality sampling sites were located in runs or small pools where stream flow was strong and consistent, but not overly turbulent. In-situ water quality measurements were made by immersing the water quality probes under the water surface and allowing the meter readings to stabilize prior to recording the measurement.

Water quality samples for laboratory analysis were obtained by immersing a clean sample-collection container beneath the surface. Water that filled the container was then decanted into laboratory supplied sample containers, some of which contained preservation agents specific to different analyses. A clean new collection container was used to fill five-sample bottles at each collection site. Samples collected for metals analyses were not filtered in the field. Filtering was conducted in the laboratory prior to analysis. Following collection, all sample containers were immediately capped, labeled, and placed on ice in an insulated cooler for transport to the analytical laboratory. Samples were immediately logged on a chain-of-custody form that was maintained with the samples at all times.

4.3.3 Reservoir/Forebay Profiling and Sampling Program

Depth profiles were conducted in each of the four large reservoirs and six moderate size impoundments to characterize seasonal variation in the temperature gradient, and other in-situ measurements (DO, specific conductance, pH and turbidity). In addition, water quality was characterized by the collection of grab samples that were submitted to a state certified laboratory for chemical analyses, as described in the Chemical Water Quality Study Plan (SCE 2001).

Measurements and sample collections were conducted at three sample stations in each of the main reservoirs: Shaver Lake, Huntington Lake, Florence Lake and Mammoth Pool (Figure CAWG-4-1). For moderate-size impoundments, two sample stations were located in Balsam Forebay and one sample station was located in each of the following forebays: Bear Diversion Forebay, Mono Diversion Forebay, Dam 4 Forebay, Dam 5 Forebay, and Dam 6 Forebay. Sampling stations were selected to collect representative water quality data along a vertical profile and identify whether thermal stratification was present.

Depth profiles were performed from an anchored boat at each monitoring station using a calibrated Hydrolab Quanta® water quality meter with a 100-meter cable. In-situ measurements, including pH, DO, temperature, specific conductance, and turbidity, were recorded at the surface and at 1-meter depth intervals to a depth of 10 meters. If thermal stratification was not present, measurements were taken at 3-meter intervals below 10 meters. If thermal stratification was present, measurements were continued at 1-meter depth intervals until the thermocline was clearly identified. Below the thermocline, measurements were taken at 3-meter intervals. Measurements were taken until the bottom of the reservoir or impoundment was reached.

Water samples for chemical analyses were collected from each station using a Van Dorn water collection container. Either one or two samples were collected at each station, depending on whether thermal stratification was present. One sample was collected at mid-depth, if thermal stratification was not present. Where thermal stratification was present, two water samples were collected, one above and one below the thermocline. For each sample, the water collection container was first lowered to the desired depth in the water column. The container was then sealed at depth, retrieved to the surface, and the sample water transferred to a laboratory-supplied sample bottle, containing the appropriate preservation agent. The Van Dorn water collection container was cleaned prior to use at each sample site. Three additional bottles were collected at each station on the four large reservoirs for analysis of organic constituents. Samples collected for metals analyses were not filtered in the field, filtering was conducted in the laboratory prior to analysis. Following collection, all sample containers were immediately capped, labeled and placed on ice in an insulated cooler for transport to the analytical laboratory. Samples were immediately logged on a chain-of-custody form that was maintained with the samples at all times.

4.3.4 FECAL COLIFORM SAMPLING PROGRAM

Screening-level fecal coliform and total coliform analyses were performed on all water samples collected during this study (e.g., spring, fall, and monthly reservoir). The results of all fecal coliform analyses (using the 3x5 analysis method and 6-hour hold time) from the spring sampling event were below a concentration of 200/100 ml. Therefore, it was not necessary to add any of those sites to the more intensive 30-day, five-sample coliform study.

A 30-day, five-sample fecal coliform sampling program was conducted to determine if reservoirs and streams with significant amounts of contact recreation meet Basin Plan objectives for fecal coliform bacteria. The 30-day, five-sample event was conducted from June 25 through July 24, 2002, which encompassed the Fourth of July holiday. The Fourth of July period was intentionally chosen to characterize fecal coliform concentrations before, during, and after a heavy recreational use period. During this period, fecal coliform samples were collected from 19 sites in waters designated for contact recreation (Table CAWG-4-2). According to the Basin Plan, "the fecal coliform concentration, based on a minimum of not less than five-samples for any 30-day period, shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total samples during any 30-day period exceed 400/100 ml."

Samples were collected once per week for five weeks from 19 sampling stations (Table CAWG-4-2). The sampling stations were located in each of the four large reservoirs and in associated creeks near campgrounds, picnic areas, cabins, and summer camping facilities (Figure CAWG-4-1).

4.4 LABORATORY ANALYSIS AND METHODS

Water quality grab samples were submitted for laboratory analysis of 35 analytes that were initially identified in the CAWG-4 Chemical Water Quality Study Plan of the FTSPP (SCE 2001). These analytes are summarized in Table CAWG-4-3. Also included in Table CAWG-4-3 are five analytes not included in the study plan (alkalinity, benzene, toluene, ethylbenzene, and xylene), thus bringing the total number of constituents analyzed by the laboratory analysis to forty. Six of the 40 constituents were petroleum hydrocarbon related analyses (MTBE, total petroleum hydrocarbons (as gasoline and diesel), benzene, toluene, ethylbenzene and total xylenes). Analyses of these constituents were performed exclusively on samples collected from the four main reservoirs (Mammoth Pool, Florence Lake, Huntington Lake, and Shaver Lake) to determine if power boating activities affect water quality. Analyses of the remaining 34 constituents were performed on all samples collected during this study (Table CAWG-4-3). Appendix A provides a brief description of each parameter that was measured or analyzed in the course of the water quality study, including a definition, typical values found in undisturbed systems, its importance or toxicity to aquatic organisms, and other criteria not discussed in the main report.

In addition to listing the constituents analyzed, Table CAWG-4-3 summarizes the sample container types, method of preservation (if any), and holding times for each analytical method. Water quality samples were submitted for analysis at BSK Analytical Laboratories. Chlorophyll-a samples were submitted to Creek Environmental Laboratories. All analyses were performed according to EPA approved methods. The laboratory provided numeric results if constituents were detected above the practical quantitation limit (PQL). The PQL of these analyses was the same as the DLR. If constituents were not detected above the PQL, the result was reported as ND (not detectable at the PQL).

Table CAWG 4-3 provides both the laboratory method detection limit (MDL) and PQL and is the concentration that the laboratory can report down to with certainty. The laboratory can report down to the MDL which is a much lower value. However, the laboratory will report MDLs as a J-qualified trace value meaning that it is an estimated value with a lower level of certainty. The J-values are presented on the laboratory reports as detected but not quantified (DNQ) values. The laboratory states that trace values between the MDL and DLR are of an unknown data quality, Baseline noise, calibration curves extrapolation below the lowest calibrator, method blank detections, and integration artifacts can all produce apparent DNQ values, which contribute to the unreliability of these values. Within this report, trace values are only provided if the laboratory PQL is greater that the regulatory standard. The laboratory DLR or PQL for five analytes (copper, lead, mercury, silver and zinc) were above the regulatory criteria, therefore the laboratory provided j-quantified values for these analytes. The j-qualified values are summarized in Tables J-1, J-2 and J-3 in Appendix J of this report.

4.5 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Prior to sampling, a quality assurance/quality control (QA/QC) plan was developed and provided to field team members to assure consistency of collection methods, sample preservation, holding times, blanks and duplicates, and documentation.

Standard precautions were established for the collection of water quality samples. At each station all samples were collected by the same person, wearing nitrile gloves. In-stream samples were collected just below the water surface from areas of steady flow using a clean, new sample collection container. Each grab sample was labeled and logged on a chain-of-custody form and inserted into a Ziplock® bag. Samples were immediately stored on ice and transported to the laboratory in coolers.

Coliform samples were delivered to the laboratory within five hours of the sample collection time. All other samples were delivered within 24 hours of the sample collection time. Sample labels were completed and attached to each sample immediately upon collection. A chain-of-custody form was maintained by each field team and completed for each set of samples prior to submittal to the laboratory.

Water samples from reservoirs and smaller impoundments were collected following the same QC procedures. Additional precautions were followed when sampling from a motorized boat. Samples were collected from the bow of the boat after the motor was not running for at least ten minutes to avoid possible hydrocarbon contamination from the boat motor. The sampling equipment was rinsed with distilled water between each sample collection.

Standard QA procedures were performed by the laboratory during analyses of water samples, including matrix and laboratory spikes and spike duplicates, matrix duplicates, and method blanks, as appropriate. Surrogate spikes and trip blanks were included with the hydrocarbon analyses. Results of QA parameters were included with each certified laboratory report.

A QA/QC screening level review was conducted on all laboratory analytical reports. This consisted of answering the following questions for each report:

- Do all dates match the chain-of-custody?
- Is sample identification consistent throughout the report?
- Were all sample holding times met?
- Were all quality control data acceptable?

A complete review of all petroleum hydrocarbon and organic analyses reports from the laboratory was conducted, following the National Functional Guidelines for Organic Data Review (USEPA Contract Laboratory Program 1994). This review evaluated the following criteria:

- Are all method-specified holding times met?
- Are matrix spikes, laboratory spikes, and surrogate spikes within acceptable recovery limits?
- Do laboratory duplicates meet lab control standards?
- Are method blanks free of interference?

Results of the review of laboratory QC parameters is presented in Section 5.6.

5.0 STUDY RESULTS AND ANALYSIS

5.1 REVIEW OF EXISTING INFORMATION

A search of the USGS STORET and database found water quality datasets for two stations in Shaver Lake collected in 1975. Table B-1 in Appendix B provides a summary of the parameters and values from the database.

A search of the USGS WATSTORE database revealed no water quality data available in the study area.

A review of the RWQCB, Central Valley Region website revealed that no water quality data for the study area was available.

The USGS NAWDEX program was identified in the Chemical Water Quality study plan (SCE 2001) as a potential source of historical water quality data. This program no longer exists. Also searched was the USGS NAWQA program, which provides water quality data for freshwater streams throughout the U.S. There was no data available through NAWQA for the study area.

Section 4.3 of the IIP (SCE 2000) summarized water quality studies performed by SCE and other entities. Relevant information from the IIP document has been repeated herein.

Numerous water quality studies have been performed on the lakes, rivers and streams within the watershed. Most studies were performed in conjunction with the preparation of previous license applications and evaluation of modifications to existing projects in the Basin.

Primary productivity in lakes within the Basin is limited by lack of nutrients and short residence time of waters in the reservoirs. Melting snow is low in nutrients and provides most of the inflow to the reservoirs. This low nutrient content inflow is conveyed to the lower elevation water bodies partially through pipelines and tunnels for the hydroelectric projects or through the natural granitic bedrock channels.

RESERVOIR STUDIES

In the summer of 1968, Nicola and Cordone (Nicola and Cordone 1972) performed a limnological survey of 26 high mountain reservoirs in the Sierra Nevada in California. This study included four lakes associated with SCE's hydroelectric developments in the Big Creek System watershed: Lake Thomas A. Edison, Mammoth Pool Reservoir, Huntington Lake, and Shaver Lake. Nicola and Cordone concluded that the majority of these lakes were oligotrophic (nutrient poor) due to their size, depth, and drainage of relatively infertile granitic soils. Temperatures of the lakes were typical of the altitude, depth of the lakes, and climatic conditions. Stratification was generally moderate to weak and temperatures ranged from about 15°C to 22°C. Colder water temperatures were observed in Lake Thomas A. Edison and Huntington Lake (high elevation lakes at about 7,000 feet above mean sea level [msl]). Warmer temperatures were observed in Mammoth Pool Reservoir and Shaver Lake (lower elevation lakes at about 3,400 feet msl and 5,000 feet msl, respectively). Table B-2 in Appendix B presents a summary of the physical and chemical characteristics of water samples collected from these four lakes by Nicola and Cordone 1972.

Limnological studies of Huntington Lake and Shaver Lake were performed by the California Department of Water Resources (DWR) in the summer and fall of 1979. These studies were conducted to develop baseline limnological data for Huntington Lake, Shaver Lake, and the streams entering these lakes. Six sampling stations were established at Huntington Lake, four in the lake and two at Big Creek and Rancheria

Creek, the two largest streams entering Huntington Lake. Six sampling stations were established at Shaver Lake, four in the lake and two along North Fork Stevenson Creek and Pitman Creek. The physical and chemical water quality results from water samples collected during this study are summarized in Table B-3 in Appendix B.

The DWR study concluded that the quality of water in Huntington Lake and Shaver Lake is excellent. Both lakes are low in nutrient and mineral content. Huntington Lake is well mixed and its high flow-through rate results in low nutrient levels. Shaver Lake has a much lower flow-through rate than Huntington Lake and its physical characteristics are not conducive to thorough mixing. Each year, both Shaver Lake and Huntington Lake are drawn down to provide storage space for the spring snowmelt. This flushing helps maintain the excellent water quality in the lakes. Water temperatures are warmer in Shaver Lake than those observed in Huntington Lake. These warmer temperatures are attributed to the lower elevation and a much lower flow-through rate in Shaver Lake (DWR 1980).

Further studies were performed on Shaver Lake by BioSystems in 1987 as part of the proposed, but not implemented, Big Creek Expansion Project (BiCEP) (BioSystems 1987). These studies focused exclusively on Shaver Lake and its watershed. Limnological studies were conducted to document existing conditions in Shaver Lake and consisted of temperature and oxygen profiles, collecting water samples for chemical analysis, and measuring physical parameters. Three sampling stations were established in the lake; one near the dam, one mid-lake, and one near the inflow. Table B-4 in Appendix B presents a summary of previous limnological data from Shaver Lake including the results of the 1987 BioSystems studies.

The BioSystems draft report presented study results indicating that Shaver Lake was thermally stratified in May 1986 with warmer water near the surface extending down two to four meters, and in August extending down four to six meters. Dissolved oxygen concentrations measured in October 1986 revealed substantially lower concentrations at depth, confirming the results of the temperature profiles. The pH in Shaver Lake ranged from 7.4 to 6.4 from June to December 1986, which is consistent with previous studies. Other parameters measured (conductivity, total dissolved solids, turbidity, sodium, calcium, and magnesium) were also consistent with past studies and did not create issues of concern regarding the fishery or human health (BioSystems 1987).

During the BioSystems study, Shaver Lake and several nearby streams (Tamarack Creek, Pitman Creek, North Fork Stevenson Creek, and Balsam Creek) were also sampled and measured by SCE for physical water quality parameters (temperature, DO, conductivity, and pH). Four sampling events were performed in 1978 and 1979 as part of environmental studies in support of the Balsam Meadow Project. The results of the analysis indicate the water quality conditions in Shaver Lake and inflow tributaries meet basin standards (FERC 1982). The results of this study are summarized in Table B-5 in Appendix B.

A water quality study of physical and chemical parameters was performed on the Big Creek No. 3 Project area waters in 1985 and 1986 as part of BiCEP. Water samples were collected from waters impounded above Dam 6, from the San Joaquin River below Dam 6, above Powerhouse No. 3, and in the tailrace below Powerhouse No. 3. Three sampling events were performed in August 1985, October 1985, and July 1986. The draft study results indicate that the Project area waters of Big Creek No. 3 are low in nutrients, minerals, and suspended materials, and contain high concentrations of dissolved oxygen (EA Engineering 1987a). The results of the water quality analyses performed on these were compiled from the draft report of the study and are summarized in Table B-6 in Appendix B.

5.2 REVIEW OF EXISTING WATER QUALITY STANDARDS

The CAWG-4 Chemical Water Quality Study Plan states that the focus of the project effects analysis will be to compare the results of the water quality study to Basin Plan, California Toxics Rule and National Toxics Rule standards. However, when determining compliance with the CWA the SWRCB will consider all applicable numerical objectives for each constituent, along with water quality goals selected from literature to interpret each applicable narrative objective, and select the most controlling (most stringent) of these values. Water quality goals that are used by the SWRCB staff to interpret narrative objectives are available in *A Compilation of Water Quality Goals*, (EPA 2000) and include: MCLs; CTR Criteria; PHGs; State Action Levels; and Drinking Water Health and Water Quality Advisories.

The Basin Plan also identifies specific water quality constituents and their associated water quality objectives for waters of the Basin (Appendix C). The water quality objectives are the allowable limits or levels of water quality constituents, which are established for the protection of beneficial uses of ALP Project waters. The achievement of these objectives depends on applying them to controllable water quality factors.

State law defines beneficial uses to include (but not be limited to) "..domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050(f)). While the Basin Plan does not specify beneficial uses for each of the streams in the Project area, it does establish beneficial uses for tributary waters to Millerton Lake (CVRWQCB 1998). These beneficial uses apply to the ALP Project area waters and include:

Municipal and Domestic Supply – Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Agricultural Supply – Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.

Hydropower Generation – Uses of water for hydropower generation.

Water Contact Recreation – Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, or use of natural hot springs.

Non-contact Water Recreation – Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Warm Freshwater Habitat – Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Cold Freshwater Habitat – Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Wildlife Habitat – Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

5.3 WATER QUALITY SAMPLING RESULTS

The following sections provide a discussion of the results of water quality sampling (both in-situ measurements and laboratory analyses) associated with each water quality program. Results of in-situ measurements taken in Project area waters during the implementation of the stream sampling program are summarized in Tables CAWG-4-4 and CAWG-4-5. In-situ measurements taken during the monthly reservoir and forebay profiling program are summarized in Appendices F through G. Results of in-situ measurements taken in Project area streams and reservoirs during the fecal coliform sampling program are summarized in Table CAWG-4-2. Laboratory analytical results for all three programs are summarized in Tables CAWG-4-6 through CAWG-4-12. Electronic copies of laboratory results are available on CD upon request. Tables 4-13, 4-14 and 4-15 provide a summary of the total metals concentrations reported by the laboratory analyses and include the theoretical dissolved metals concentration determined using the Metals Translator (EPA 1996).

The discussion of results in this Report are organized by program and focus on water quality parameters measured in Project area waters that do not preliminarily meet the Basin Plan, CTR and NTR water quality objectives, as described in the study plan. However, it should be noted that the SWRCB when determining compliance with the CWA will consider all applicable numerical objectives for each constituent, along with water quality goals selected from literature to interpret each applicable narrative objective, and select the most controlling (most stringent) of these values. Water quality goals that are used by the SWRCB staff to interpret narrative objectives are available in *A Compilation of Water Quality Goals*, (EPA 2000).

TECHNICAL ISSUES

The laboratory analytical results indicate that the concentration of mercury, copper, lead, silver and zinc in all of the water samples are below the Basin Plan objectives (copper (1 mg/L), lead (15 µg/L), mercury (2 µg/L), silver (100 µg/L), and zinc (5 mg/L)). However, the CTR and NTR have established a more stringent criteria for these metals to protect freshwater aquatic life. The CTR and NTR set acute and chronic criteria that are hardness-dependent and must be calculated on a station-by-station basis. These calculated criteria are provided in Tables E-1 through E-4 in Appendix E. Due to the naturally low hardness of water in the Project area (hardness as $CaCo_3$ concentrations reported by the laboratory ranged between 2.2 and 25 mg/l), the calculated standards for the five metals are extremely low and are below the laboratory detection limit for reporting (DLR). For each of these metals, the water quality criterion decreases with decreasing water hardness. The formulas for calculating hardness-dependent criteria are provided in the CTR and NTR guidance documents (EPA 2000 and EPA 1999). Hardness-based criteria calculations for the dissolved phase of copper, lead, silver and zinc within for the Project area are presented in Table E-1 through E-4 in Appendix E. Total metals criteria were also calculated based on metals translator conversion factors (EPA 1996) and are also provided in Appendix E.

Due to the low hardness and subsequently low CTR and NTR regulatory standards, the analytical laboratory results reported at the PQL or DLR for the five metals do not indicate whether the CTR and NTR standards are met. To allow comparison to the regulatory standard, the analytical laboratory was requested to review the original raw data files and subsequently report concentrations down to their MDLs, which will be low enough to enable a comparison to the CTR and NTR standards. However, the laboratory reports these results as J-qualified trace values, meaning that they are considered estimated values. The J-qualified trace values for copper, lead, mercury, silver and zinc are summarized in Appendix J. Each metal and the associated laboratory reporting limits and regulatory criteria are discussed in the following.

Copper

The Basin Plan specifies a criterion of 1 mg/L for copper, based on the maximum contaminant level for drinking water (Table CAWG-4-3) and all of the copper analytical results from this study met this objective. However, CTR and NTR hardness-based water quality criteria calculated for dissolved copper is much lower than the Basin Plan standard. The dissolved copper acute criteria range from 0.37 µg/L to 2.8 µg/L and the chronic criteria range from 0.34 µg/L to 2.2 µg/L and are summarized in Table E-1, Appendix E. The laboratory DLR for copper is 0.005 mg/L (or 5 µg/L), which is too high to assess whether the criteria have been met. However, the laboratory MDL or J-qualified trace value for copper is 0.05 µg/L and can be compared to the hardness-based criteria.

Lead

The Basin Plan specifies a criterion of 15 mg/L for lead based on the maximum contaminant level for drinking water (Table CAWG-4-3) and all of the lead analytical results from this study met this objective. However, CTR and NTR hardness-based water quality criteria calculated for dissolved lead is much lower than the Basin Plan standard. The dissolved lead acute criteria range from 0.85 µg/L to 10.2 µg/L and the chronic criteria range from 0.03 µg/L to 0.40 µg/L and are summarized in Table E-2, Appendix E. The laboratory DLR for lead is 5.0 µg/L, which is too high to assess whether the criteria have been met. However, the laboratory MDL or J-qualified trace value for lead is 0.25 µg/L and which will enable comparison to the acute criteria. However, most of the hardness-based chronic criteria are below the 0.25 µg/L laboratory MDL and therefore, preliminary compliance with the chronic criteria can not be assessed.

Mercury

The Basin Plan specifies a mercury criterion of 2 µg/L, based on the maximum contaminant levels for drinking water and all of the mercury laboratory analytical results from this study met this objective. However, the CTR and NTR have established a more stringent criterion of 0.05 µg/L, for the protection of freshwater aquatic life. Results of this study could not be used to assess if the CTR or NTR criteria have been exceeded because the DLR was 0.4 µg/L. The laboratory J-qualified value for mercury is 0.05 µg/L, and can be compared to determine if the mercury results meet the CTR criteria.

Silver

The Basin Plan specifies a criterion of 100 µg/L for silver and all of the silver analytical results from this study have met the Basin Plan objective. However, CTR and NTR hardness-based water quality acute criteria calculated for dissolved silver range from 0.0049 µg/L to 0.20 µg/L (Table E-3, Appendix E). The hardness-based water quality criteria for silver are calculated as acute values only. The laboratory J-qualified data will provide trace values down to the normal laboratory MDL of 0.20 µg/L and the calculated hardness-based criteria for silver for all but three samples are still below the laboratory MDL. (Only three samples during this study have a calculated hardness-based criteria that is greater than the 0.20 µg/L laboratory MDL.) The laboratory results of silver concentrations for the remaining samples can not be used to assess if the silver criteria have been exceeded.

Zinc

The Basin Plan specifies a criterion of 5 mg/L for zinc and all of the zinc analytical results from this study met this objective. However, the CTR and NTR have set acute and chronic criteria that are hardness dependent and must be calculated on a station-by-station basis. For dissolved zinc, the acute criteria range from 4.62 µg/L to 28.7 µg/L and the chronic criteria range from 4.66 µg/L to 28.9 µg/L and are summarized in Table

E-4, Appendix E. The laboratory J-qualified data are reported down to MDL of 5 µg/L. All but six of the study samples are at or above this hardness based criteria value, thus allowing us to assess most of the study results.

5.3.1 STREAM SAMPLING PROGRAM

All parameters measured (either in-situ or laboratory) in Project area streams during the spring and fall sampling program met with Basin Plan, CTR and NTR objectives with the exception of pH, DO, ammonia, nitrate/nitrite, total iron, and total manganese. Location and timing of exceptions varied with each parameter as discussed below.

GENERAL PARAMETERS

pH

According to the Basin Plan, pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses. Approximately 38 percent of the spring in-situ pH values and 21 percent of the fall in-situ pH values were below the Basin Plan standard of 6.5, and values of pH greater than 8.5 were measured in three samples (4%) during the spring and one sample (<1 %) during the fall (Tables CAWG-4-4 and CAWG-4-5). During the spring sampling period, in-situ pH values ranged from 4.69 to 8.87 (Table CAWG-4-4). During the fall sampling period, in-situ pH values ranged from 5.45 to 8.77 (Table CAWG-4-5). Laboratory measurements of pH during the spring ranged from 5.1 to 7.5 (Table CAWG-4-6). Results from fall laboratory pH analyses ranged from 5.1 to 8.2 (Table CAWG-4-7).

Several factors can influence natural pH values, including alkalinity, dissolved carbon dioxide reactions, oxidation of dissolved ferrous iron, dissolved organic matter, and acidic snowmelt. Alkalinity is usually the primary factor that controls pH values. Surface waters within igneous rock catchments typically contain low alkalinity values (low buffering capacity), resulting in more acidic pH values, usually <7.0. According to Wetzel (2001) “The total alkalinity of clear soft water rivers and lakes is often very low, particularly those waters of granitic and sedimentary sandstone regions. River and lake water of these areas have relatively poor buffering capacities and can be modified quickly by modest inputs of acidic waters, such as from rapidly melting snow in spring that had accumulated acidity from atmospheric sources (natural and anthropogenic).” Alkalinity values less than 10 mg/L are considered very low and the pH of these waters is very susceptible to acid inputs. Values between 10 to 20 mg/L are considered moderately susceptible to acid inputs.

The alkalinity of surface waters within the Project area are generally very low (Tables CAWG-4-6 and CAWG-4-7), resulting in relatively low pH values. These pH values were particularly low during the spring snowmelt period, suggesting that slight acidity of the runoff may be influencing pH values. In addition to snowmelt, organic acids that are produced in coniferous woodlands may cause slightly acidic conditions in streams that drain forested areas (Wetzel 2001). Oxidation of dissolved ferrous iron can also cause reductions in pH (Hem 1985).

Dissolved Oxygen

According to the Basin Plan objectives, DO concentrations shall not be reduced below a minimum level of 5.0 mg/L for waters designated as WARM or below a minimum level of 7.0 mg/L for waters designated as COLD at any time. The Basin Plan objective corresponding to the COLD designation (7.0 mg/L) was used in this analysis.

Dissolved oxygen concentrations below the Basin Plan objective were observed at one station during spring (6.57 mg/L) and at 10 stations during fall (5.29 to 6.97 mg/L) (Tables CAWG-4-4 and CAWG-4-5). The spring measurement was from sample location EL-2 at Ely Creek downstream of the diversion. The fall stations along with their corresponding DO concentrations are listed below.

Station Code	Station Description	DO (mg/L)
EL-1	Ely Creek upstream of the diversion	5.29
BE-1	Bear Creek upstream of the forebay	6.97
BE-3	Bear Creek downstream of the forebay	6.19
MO-3	Mono Creek upstream of the SF San Joaquin River confluence	6.60
PI-2	Pitman Creek downstream of the diversion	6.47
RO-2	Ross Creek downstream of the diversion	6.20
SF-1	SF San Joaquin River at Mono Crossing	6.48
SJ-6	Mammoth Powerhouse tailrace	6.23
SS-1	South Slide Creek upstream of the diversion	6.55
ST-1	Stevenson Creek downstream of Shaver Lake Dam	6.80

Turbidity

The Basin Plan states that waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU. Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent. Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs. Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent. In determining compliance with the above limits, appropriate averaging periods may be applied. Natural turbidity is the turbidity of the source of the stream. Therefore, the water quality objective for turbidity is dependent on the turbidity of the unaffected upstream reach. This objective applies to controllable water quality factors. Turbidity values below 10 NTUs are indicative of very clear waters.

In-situ turbidity measurements were obtained at each sample location at the time of sample collection. During the spring sampling event the in-situ turbidity measurements ranged from 1.0 to 30 NTU. Measurements greater than 10 NTU were recorded at only two sampling locations (11 NTU at C62-2 and 30 NTU at SJ-10). During the fall sampling program the in-situ turbidity values ranged from 0 to 36.1 NTU. Measurements greater than 10 NTU were recorded at only three locations (29 NTU at BA-3, 36.1 NTU at HO-2 and 15.5 NTU at HO-3). There was no discernable trend of measured turbidity values above and below project facilities. In-situ turbidity measurements recorded values that were slightly higher at several sampling locations above project facilities. While at other sampling locations the in-situ turbidity values were slightly higher below the project facilities.

NUTRIENTS

Ammonia as NH3

The Basin Plan does not specify a criterion for ammonia, but the NTR has set criteria, which must be calculated using ambient pH and temperature. Tables D-1 and D-2 in Appendix D presents the calculated value for the NTR ammonia criteria that are specific to each sampling site during the spring and fall sampling events, respectively. During the spring and summer/fall sampling periods, ammonia concentrations were all non-detectable at a DLR of 1 mg/L (Tables CAWG-4-6 and CAWG-4-7). Of the 153 water samples collected from the streams, 146 samples have an ammonia criterion greater than 1 mg/L (Appendix D). The remaining seven samples (BC-1, BO-2, NF-1 and PI-1 from the spring sampling and RO-2, SJ-11 and SJ-4 from the fall sampling) had a calculated criteria less than 1.0 mg/L. Therefore, it could not be determined if these seven samples met the criteria because the laboratory method detection limit is greater than the calculated criterion. Of these seven samples, five of these samples are from natural waters located upstream of any project facilities. The locations, dates, and values for these criteria are given below.

Station Code	Description	Date	Ammonia Criterion (mg/L)
BC-1	Big Ck upstream of Huntington Lake	05/24/02	0.80
BO-1	Bolsillo Ck upstream of the diversion	05/28/02	0.73
NF-1	North Fk Stevenson Ck upstream of diversion	05/23/02	0.59
PI-1	Pitman Ck upstream of the diversion	05/24/02	0.83
RO-2	Ross Ck downstream of the diversion	06/12/02	0.59
SJ-11	San Joaquin River upstream of PH-3	09/03/02	0.52
SF-4	SFSJR upstream of confluence w/ Middle Fk	09/04/02	0.55

Nitrate/Nitrite as NO3/NO2

The Basin Plan criterion of 10 mg/L for nitrate/nitrite is based on the maximum contaminant level derived for the protection of drinking water sources (CCR 1996). All spring concentrations were below the Basin Plan criterion (Table CAWG-4-6). Two results exceeded the Basin Plan criterion during the fall sampling period. A value of 12 mg/L was obtained from Big Creek upstream of Dam 5 (BC-7) on August 27, 2002, and a value of 20 mg/L was obtained from Big Creek upstream of Powerhouse 8 (BC-10) on August 28, 2002 (Table CAWG-4-7).

METALS

Arsenic

The Basin Plan specifies a criterion for arsenic of 10 ug/L, based on a primary maximum contaminant level for drinking water. During the spring of 2002 three samples exceeded the criteria, and during the fall sampling period the criteria was exceeded in 5 samples. These samples are summarized as follows:

Station Code	Station Description	Date	Arsenic (µg/L)
SF-2	South Fork San Joaquin at Mono Crossing	6/11/02	14
SF-3	South Fork San Joaquin downstream of Rattlesnake Crossing	6/12/02	13
PI-3	Pitman Creek upstream of Dam 4	5/20/02	14
PI-3	Pitman Creek upstream of Dam 4	7/10/02	20
C62-4	Camp 62 Creek downstream of the South Fork San Joaquin River Confluence	7/2/02	32
SF-2	South Fork San Joaquin at Mono Crossing	8/29/02	14
SF-3	South Fork San Joaquin downstream of Rattlesnake Crossing	8/29/02	10
SF-4	South Fork San Joaquin upstream of the North Fork San Joaquin River Confluence	9/4/02	12

Iron

The Basin Plan specifies a criterion for iron of 0.3 mg/L, based on secondary maximum contaminant levels for drinking water. This criterion is based on a taste, odor and visual threshold and does not pertain to levels that will protect freshwater aquatic organisms (CCR 1996). The EPA has recommended a value of 1.0 mg/L for the protection of freshwater aquatic life. During the spring and fall sampling periods, the 0.3 mg/L criterion was exceeded at 11 locations. However, none of these 11 samples exceeded the EPA recommended value of 1.0 mg/L for the protection of freshwater aquatic life. These samples are summarized as follows:

Manganese

The Basin Plan specifies a manganese criterion of 0.05 mg/L, based on secondary maximum contaminant levels for drinking water. One manganese concentration exceeded the criterion during the spring sampling period. Ely Creek upstream of the diversion (EL-1) contained 0.07 mg/L (Table CAWG-4-6). One manganese concentration exceeded the criterion during the summer/fall sampling period. Stevenson Creek below Shaver Lake Dam (ST-1) contained 0.12 mg/L (Table CAWG-4-7).

Station Code	Station Description	Date	Iron (mg/L)
BC-5	Big Creek downstream of Dam 4	05/20/02	0.35
BC-7	Big Creek upstream of Dam 5	05/21/02	0.39
BA-4	Balsam Creek upstream of the diversion	05/20/02	0.31
EL-1	Ely Creek upstream of the diversion	05/20/02	0.67
HO-3	Hooper Creek upstream of the South Fork San Joaquin River confluence	05/30/02	0.40
SF-3	South Fork San Joaquin River upstream of Rock Creek	06/12/02	0.35
EL-1	Ely Creek upstream of the diversion	05/20/02	0.36
CR-3	Crater Creek upstream of the South Fork San Joaquin River confluence	07/12/02	0.49
SF-1	South Fork San Joaquin River downstream of Florence Lake Dam	08/20/02	0.30
ST-1	Stevenson Creek downstream of Shaver Lake Dam	08/22/02	0.40
ST-2	Stevenson Creek upstream of the San Joaquin River confluence	09/03/02	0.30

Copper (J-value/Trace Value Laboratory Results)

During the spring sampling event, copper concentrations detected in five water samples exceeded the hardness-based acute and chronic criteria (except sample C62-4, where the total metal concentration exceeded only the chronic criterion, Table J-1) at the following sites:

Station Code	Station Description	Date	Copper (µg/L)
C62-4	Camp 62 Creek upstream of the South Fork San Joaquin River confluence. The theoretical dissolved concentration (0.73 µg/L) did not exceed the dissolved criterion.	5/31/02	0.76
TS-2	Tombstone Creek below the diversion	6/7/02	6.1
BC-5	Big Creek downstream of Dam 4	5/20/02	1.54
BA-5	Balsam Creek downstream of the diversion	5/20/02	1.54
SJ-8	San Joaquin River Dam 6	5/21/02	1.63
TS-2	Tombstone Creek below the diversion	7/3/02	1.9
BC-10	Big Creek upstream of Powerhouse No. 8	8/28/02	1.05

Lead (J-value/Trace Value Laboratory Results)

During the spring sampling event, theoretical dissolved lead concentrations detected in four water samples exceeded the hardness-based chronic criteria (see Table J-1) at the following sites:

Station Code	Station Description	Date	Lead (µg/L)
C62-3	Camp 62 Creek downstream of Chinquapin Creek confluence	5/30/02	0.70 µg/L).
C62-4	Camp 62 Creek upstream of the South Fork San Joaquin River confluence	5/31/02	(0.61 µg/L).
BC-5	Big Creek downstream of Dam 4	5/20/02	0.63 µg/L).
BA-5	Balsam Creek downstream of the diversion	5/20/02	0.34 µg/L).
C62-3	Camp 62 Creek downstream of the Chinquapin Creek confluence	7/2/02	0.47 µg/L

Silver (J-value/Trace Value Laboratory Results)

The hardness based calculated criteria silver ranged between 0.0049 and 0.2 µg/L and the laboratory MDL for silver is 0.2 µg/L. Only three samples had a calculated criteria greater than the laboratory MDL RO-1, RO-2 and BC-7 collected on 5/21/02. Laboratory results for these samples were reported at ND, indicating that the samples from these three locations did not exceed the hardness based criteria.

Laboratory analyses reported detectable concentrations of silver in only two samples collected during the study. During the spring sampling 0.3 µg/L (theoretical dissolved 0.26 µg/L) was detected in sample MO-2 (Mono Creek downstream of the Mono diversion), and during the fall 0.4 µg/L (theoretical dissolved 0.34 µg/L) was detected in sample SJ-10 (San Joaquin River downstream of Stevenson Creek).

All other samples were reported as ND at the laboratory MDL of 0.2 µg/L, which is above the hardness based CTR regulatory standard.

Mercury (J-value/Trace Value Laboratory Results)

The CTR criterion for mercury is 0.05 µg/L, based on the protection of human health for consumption of water and organisms.

During the spring and fall (and the monthly reservoir profile) sampling events, the CTR's mercury criterion of 0.05 µg/L was exceeded in the majority of study samples (Tables J-1, J-2, and J-3). All analytical results were within the range of 0.05 µg/L to 0.49 µg/L which is above the Basin Plan (2.0 µg/L) and NTR (1.4/0.77 µg/L) criteria. The date, location and theoretical dissolved mercury for each sampling event not meeting the CTR standard are summarized in Table J-4 in Appendix J.

Zinc (J-value/Trace Value Laboratory Results)

The CTR dissolved zinc acute criteria range from 4.62 µg/L to 28.7 µg/L and the chronic criteria range from 4.66 µg/L to 28.9 µg/L. Six samples from the spring sampling had a hardness based standard below 5 µg/L and could not be compared to the regulatory standard. These samples are:

Station Code	Station Description	Date
BE-1	Bear Creek upstream of Diversion	6/6/02
BE-2	Bear Creek downstream of Diversion	6/6/02
BE-3	Bear Creak upstream of South Fork San Joaquin Confluence	6/6/02
HO-1	Hooper Creek upstream of Diversion	5/30/02
HO-2	Hooper Creek downstream of Diversion	5/20/02
BC-1	Big Creek upstream of Huntington Lake	5/24/02

5.4 Fecal Coliform Bacteria Sampling Program

5.4.1 Screening-level Sampling

A threshold of 200/100 ml was used as a screening level criterion for all water samples obtained during the stream-sampling program. Any sample that exceeded this value would have been included in the more rigorous 30-day, five-sample program. No results that exceeded 200/100 ml were obtained during the stream sampling program (Tables CAWG-4-6 and CAWG-4-7).

5.4.2 30-Day, Five-Sample Fecal Coliform Sampling Program

Fecal coliform sampling was conducted between June 26 and July 24, 2002, according to the Basin Plan, in near-shore areas of two of the large reservoirs and in associated creeks. The Fourth of July period was intentionally chosen to characterize fecal coliform concentrations before, during and after a heavy recreational use period.

Samples were collected once per week for five weeks from 19 monitoring stations located on Huntington Lake, Shaver Lake, Billy Creek, Line Creek, Bear Creek, Balsam Creek, Chiquito Creek, Big Creek, SF San Joaquin River, and the Mono Diversion Forebay (Figure CAWG-4-1 and Table CAWG-4-2).

The Basin Plan thresholds state that “the fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total samples during any 30-day period exceed 400/100 ml.” The results of our study show that both the geometric mean of all values and the highest values obtained from all study locations were well below these thresholds.

5.5 MONTHLY RESERVOIR PROFILE PROGRAM

Water quality stations were established in the four main reservoirs (Shaver Lake, Huntington Lake, Mammoth Pool, and Florence Lake) and in six forebays (Balsam Forebay, Bear Diversion Forebay, Mono Diversion Forebay, Dam 4 Forebay, Dam 5 Forebay, and Dam 6 Forebay) to characterize the variation in water quality from May through September. Monthly profiling and sampling consisted of measuring in-situ parameters (temperature, DO, pH, specific conductance and turbidity) and collecting water quality grab samples for laboratory analysis.

The following provides an overview of the in-situ profiling and laboratory results for each reservoir/forebay. A brief discussion of thermal stratification, DO profiles, and specific exeedences during the season are provided in the overview. Narrative summaries of the monthly profiling and sampling results for each reservoir/forebay are provided in Appendix F. Tables and figures summarizing the in-situ profiling measurements for each reservoir/forebay are provided by monthly event in Appendices G and H, respectively. Laboratory analytical results of water quality samples collected from the reservoirs/forebays are summarized by month in Tables CAWG-4-8 through CAWG-4-12.

5.5.1 SHAVER LAKE

The results of monthly profile data from three monitoring stations in Shaver Lake are presented in Table G-1 in Appendix G and Figures H-1 through H-15 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from the three monitoring stations reveal that thermal stratification occurred at SL-1 in July (5 to 6m), at SL-2 in June (4 to 5m) and July (5 to 6m), and at SL-3 in May (5 to 6m), June (4 to 5m) and July (4 to 5m). Surface water temperatures ranged from 13.2 to 22.76°C during the five months of the sampling season and decreased with depth to about 7.11 to 18.82°C.

Measurements of in-situ DO concentrations during each month reveal that a wide range of values occurred. The range of concentrations among all three stations were 7.51 to 8.99 mg/L in May, 6.58 to 9.79 mg/L in June, 3.82 to 6.24 mg/L in July, 3.82 to 8.28 mg/L in August, and 5.13 to 7.45 mg/L in September.

During all sampling months, except May 2002, DO concentrations below the Basin Plan minimum standard of 7.0 mg/L were measured. A list of these below standard concentrations by month follows:

Month	Station	Depth (m)	DO Concentration (mg/L)
June	SL-1	31	6.94
June	SL-1	34	6.73
June	SL-1	37	6.58
July	ALL	ALL	3.82–6.24
August	SL-1	>13	3.82–6.34
August	SL-2	>10	4.70–6.72
August	SL-3	>7	4.89–6.83
September	SL-1	>10	5.13–6.97
September	SL-2	>8	6.22–6.95
September	SL-3	>7	6.36–6.98

The laboratory analytical results for total petroleum hydrocarbons (diesel (TPH-d) indicate that Basin Plan standards were exceeded during June, July, and August. During June, TPH-d concentrations were detected at all three stations. During July and August, MTBE concentrations >5µg/L were detected at all three stations.

5.5.2 Huntington Lake

The results of monthly profile data from three monitoring stations in Huntington Lake are presented in Table G-2 in Appendix G and Figures H-16 through H-30 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from the three monitoring stations reveal that thermal stratification occurred at HL-1 in July (7 to 10m) and August (11 to 12m), at HL-2 in August (4 to 6m), and at HL-3 in May (5 to 6m), June (8 to 10m), July (5 to 7m), and August (7 to 9 m). Surface water temperatures ranged from to 12.52 to 20.34°C during the five months of the sampling season and decreased with depth. Water temperatures at the reservoir bottom ranged from 5.86 to 16.05°C during the study.

Measurements of in-situ DO concentrations during each month reveal that a wide range of values occurred. The range of concentrations among all three stations were 7.96 mg/L to 9 mg/L in May, 6.97 mg/L to 8.61 mg/L in June, 4.59 mg/L to 6.82 mg/L in July, 4.17 mg/L to 7.91 mg/L for August, and 4.13 mg/L to 8.46 mg/L for September. DO concentrations below the Basin Plan minimum standard of 7.0 mg/l were measured during all sample months, except May 2002. A list of these below standard concentrations by month follows:

Month	Station	Depth (m)	DO Concentration (mg/L)
June	HL-1	2-3	6.98
June	HL-1	5-7	6.98
June	HL-3	4-8	6.88 to 6.97
July	All	All	4.59 to 6.82
August	HL-1	1-2 and 28-43.5	4.17 to 6.93
August	HL-2	31-32	6.55 to 6.90
September	HL-1	31-43	4.13 to 6.32
September	HL-2	28	6.73

The laboratory analytical results for TPH-d indicate that Basin Plan standards were exceeded during June at sample locations HL-1 and HL-3A. No other chemical constituents at concentrations above Basin Plan standards were detected by laboratory analyses during the study.

5.5.3 Florence Lake

The results of monthly profile data from three monitoring stations in Florence Lake are presented in Table G-3 in Appendix G and Figures H-31 through H-45 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from the three monitoring stations in Florence Lake reveal that thermal stratification occurred at FL-1 in July (9 to 10 m), at FL-2 in June (5 to 6 m) and July (9 to 11 m), and at FL-3 in June (5 to 8 m) and July (9 to 10 m). Surface water temperatures ranged from 11.58°C to 19.45°C during the five months of the sampling season, and decreased with depth to about 6.94°C to 18.46°C.

Measurements of in-situ DO concentrations during each month reveal that a wide range of values occurred. The range of concentrations among all three stations were 7.51 mg/L to 9.05 mg/L in May, 6.55 mg/L to 7.58 mg/L in June, 5.03 mg/L to 6.42 mg/L in July, 4.86 mg/L to 6.46 mg/L in August, and 6.24 mg/L to 7.03 mg/L in September.

DO concentrations below the Basin Plan minimum standard of 7.0 were recorded during June, July, August and September as follows:

Month	Station	Depth (m)	DO Concentration (mg/L)
June	FL-1	0-5	6.55-6.92
June	FL-2	1-5	6.70-6.94
June	FL-3	0-6	6.63-6.91
July	All	All	5.03-6.42
August	All	All	4.86-6.37
September	Fl-1	1-8	6.75-6.99
September	Fl-2	All	6.24-6.94
September	FL-3	0	6.89

The laboratory analytical results indicate that TPH-d was detected at sample location FL-1 in July and benzene was detected at sample location FL-2 during August.

5.5.4 Mammoth Pool Reservoir

The results of monthly profile data from three monitoring stations in Mammoth Pool are presented in Table G-4 in Appendix G and Figures H-46 through H-60 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from the three monitoring stations reveal that thermal stratification occurred at MP-1 in June (7-10 m), July (8-9 m), and in August MP-1 showed evidence of weak thermal stratification. Thermal stratification occurred at MP-2 in July (8-9 m). Thermal stratification occurred at MP-3 in June (7 m), July (7-8 m), and there was evidence of weak thermal stratification in September.

Measurements of in-situ DO concentrations during each month reveal that a wide range of values occurred. The ranges of concentrations among all three stations were 8.75 to 10.02 mg/L in May, 6.92 to 8.82 mg/L in June, 5.15 to 6.18 mg/L in July, 4.77 to 7.31 mg/L in August, and 4.98 to 7.90 mg/L in September.

May and June measurements were all above the Basin Plan DO minimum standard of 7.0 mg/L. July, August, and September had DO concentrations below the Basin Plan minimum standard. A list of these below standard concentrations by month follows:

Month	Station	Depth (m)	DO Concentration (mg/L)
July	All	All	5.15-6.18
August	MP-1	16-67	4.77-6.77
August	MP-2	0 and 3-10	6.85-6.97
August	MP-3	All	6.52-6.78
September	MP-1	6-38	4.98-7.90
September	MP-2	9-13.5	6.70-6.98
September	MP-3	0-6	6.04-6.85

Laboratory analytical results indicate that TPH as diesel concentrations exceeded Basin Plan standards during June and July (Tables CAWG-4-9 and CAWG-4-10).

5.5.5 Balsam Forebay

The results of monthly profile data from two monitoring stations in Balsam Forebay are presented in Table G-5 in Appendix G and Figures H-61 through H-70 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from the two monitoring stations reveal that thermal stratification did not occur at BA-1 and BA-2 during the sampling season. Surface water temperatures ranged from 5.72 to 7.04°C and bottom water temperatures ranged from 5.41 to 6.91°C during the five months of the sampling season.

Measurements of in-situ DO concentrations reveal that values ranged from 5.49 mg/L to 9.37 mg/L during the sampling season. Dissolved oxygen levels less than the Basin Plan minimum of 7.0 mg/L occurred in July and August at both stations. During July, all values were less than 7.0 mg/L (possibly a meter error). During August about half of the in-situ DO measurements were slightly below the minimum (Table G-5 in Appendix G).

All laboratory analytical results for 35 chemical constituents, except pH, met the Basin Plan objectives during this study (Tables CAWG-4-8 to CAWG-4-12).

5.5.6 Bear Forebay

The results of monthly profile data from one monitoring station on Bear Forebay (BE-2) are presented in Table G-6 in Appendix G and Figures H-71 through H-75 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from Bear Forebay reveal that thermal stratification did not occur during the five-month sampling period. Surface water temperatures ranged from 7.47 to 15.25°C and bottom water temperatures ranged from 6.59 to 13.99°C.

Measurements of in-situ DO concentrations ranged from 5.59 mg/L to 9.59 mg/L during the sampling period. Values below the 7.0 mg/L Basin Plan minimum occurred throughout the water column in July and August.

All laboratory analytical results for 35 chemical constituents, except pH, met the Basin Plan objectives during this study (Tables CAWG-4-8 to CAWG-4-12).

5.5.7 Mono Forebay

The results of monthly profile data from one monitoring station on Mono Forebay (MO-1) are presented in Table G-7 in Appendix G and Figures H-76 through H-76 through H-

80 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from Mono Forebay reveal that the forebay was thermally stratified during the June sampling event. Surface water temperatures ranged from 10.23 to 17.22°C and bottom water temperatures ranged from 9.75 to 16.12°C.

Measurements of in-situ DO concentrations ranged from 6.13 mg/L to 8.19 mg/L during the sampling period. Values below the 7.0 mg/L Basin Plan minimum occurred at the surface in June and throughout the water column in July.

Analytical results for iron and manganese exceeded the Basin Plan Water Quality objectives of 0.3 mg/l during June. Iron was detected at 0.32 mg/L at MO-1A and manganese was detected at 0.050 µg/l at MO-1B. The remaining chemical constituents analyzed (except pH) met the Basin Plan Water Quality objectives during the June sampling event (Tables CAWG-4-8 to CAWG-4-12).

5.5.8 Dam 4

The results of monthly profile data from one monitoring station at Dam 4 (BC-4) are presented in Table G-8 in Appendix G and Figures H-81 through H-85 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from Dam 4 reveal that thermal stratification did not occur during the five-month sampling period. Surface water temperatures ranged from 6.44 to 16.0°C and bottom water temperatures ranged from 6.36 to 16.0°C.

Measurements of in-situ DO concentrations ranged from 6.62 mg/L to 8.83 mg/L during the sampling period. Values below the 7.0 mg/L Basin Plan minimum occurred in May and July.

All laboratory analytical results for 35 chemical constituents, except pH, met the Basin Plan objectives during this study (Tables CAWG-4-8 to CAWG-4-12).

5.5.9 Dam 5

The results of monthly profile data from one monitoring station at Dam 5 (BC-8) are presented in Table G-9 in Appendix G and Figures H-86 through H-90 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from Dam 5 reveal that thermal stratification did not occur during the five-month sampling period. Surface water temperatures ranged from 6.88 to 17.41°C and bottom water temperatures ranged from 6.83 to 17.3°C.

Measurements of in-situ DO concentrations ranged from 6.93 mg/L to 10.39 mg/L during the sampling period. One measurement below the 7.0 mg/L Basin Plan minimum occurred in July at one meter deep.

All laboratory analytical results for 35 chemical constituents, except pH, met the Basin Plan objectives during this study (Tables CAWG-4-8 to CAWG-4-12).

5.5.10 Dam 6

The results of monthly profile data from one monitoring station at Dam 6 (SJ-8) are presented in Table G-10 in Appendix G and Figures H-91 through H-95 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.

Temperature profiles from Dam 6 reveal that thermal stratification did not occur during the five-month sampling period. Surface water temperatures ranged from 8.72 to 19.79 °C and bottom water temperatures ranged from 8.34 to 18.15°C.

Measurements of in-situ DO concentrations ranged from 5.75 mg/L to 10.37 mg/L during the sampling period. Measurements below the minimum Basin Plan standard of 7.0 mg/L occurred throughout the water column in July and August. In September, measurements at 0, 1, and 2 meters deep were less than 7.0 mg/L.

All laboratory analytical results for 35 chemical constituents, except pH, met the Basin Plan objectives during this study (Tables CAWG-4-8 to CAWG-4-12).

5.5.11 Quality Assurance/Quality Control Results

A detailed summary of the QA/QC review can be found in Tables I-1, I-2, I-3, I-4, and I-5 in Appendix I.

The QC parameters were above laboratory control limits for some analytes including: alkalinity, ammonia, bicarbonate, total dissolved solids, total suspended solids, nitrate, total kjeldahl nitrogen, and turbidity (see Appendix I-4). This type of QC result is common and is usually a result of matrix interference, which, by itself, does not indicate a problem with QC. Because the recovery values of other QC parameters associated with each run were within the established limits, and analysis results were consistent with those of other samples, these QC results are acceptable.

In three cases, QC parameters were below laboratory control limits due to matrix effects (see Appendix I-4). This included matrix spikes for two silver analyses and one iron analysis. Because the matrix spike recoveries were greater than 30 percent, the values are not qualified. Analysis results for the samples are consistent with those for other samples and are considered acceptable.

In five cases, a particular constituent was analyzed outside of the established hold time due to instrument failure or laboratory error (Appendix I-4). This included seven orthophosphate analyses, five biochemical oxygen demand analyses, and three total dissolved solids analyses (Appendix I-4). These sample results were qualified with a "J", indicating that the associated result should be considered an estimated value. Since the analyses were only a day or two beyond the hold time and the data were consistent with that from other analyses, these results are considered acceptable.

As described in Section 4.5, a review of all hydrocarbon and organic analysis QA/QC reports was conducted, following the National Functional Guidelines for Organic Data Review (USEPA Contract Laboratory Program 1994). Surrogate recoveries were high on eight separate laboratory QC reports, possibly due to matrix interference (Table I-5, Appendix I). Because all other QC data in these reports is acceptable, the results for these analyses was not qualified. However, data quality issues did affect six total petroleum hydrocarbon as diesel (TPH-diesel) results. These six diesel results are discussed below.

- Samples HL-1B and FL-3A collected on July 23 and July 24, 2002, respectively, (laboratory ID's 2002071531-231245 and –231246) were extracted for the diesel analysis 28 days after the samples were collected. Since these samples were extracted after the 14 day holding time specified by the analytical method for diesel, their diesel results are "J" qualified. A "J" qualifier indicates that the associated result is considered an estimated value.
- Samples HL-1A collected on July 23, 2002, (2002071531-231244) and FL-1A collected on July 24, 2002 (2002071540-231296), had diesel surrogate recoveries below ten percent. Diesel was not detected in sample HL-1A; therefore this diesel result is rejected. The diesel result of 1,800 μg/L for sample FL-1A is "J" qualified.
- Samples SL-2B and SL-1A collected on August 22, 2002 (2002081318-241520 and –241521, respectively), had diesel surrogate recoveries below acceptance criteria, but above 10 percent. The diesel results for these two samples are "J" qualified.

All other TPH as diesel, TPH as gasoline, benzene, ethylbenzene, toluene, total xylene, and methyl-t-butyl ether results are unqualified.

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TABLES

Table CAWG-4-1. Water Quality Monitoring and Sampling Station Locations for Spring and Fall Stream Sampling Program and Monthly Reservoir/Forebay Profiling Program

Station	Description	GPS Coordinates			Spring Sampling Program	Summer/Fall Sampling Program		Monthly Profiling and Sampling Program				
		Zone	Northing	Easting	May 20-June 14	Small Diversions June 14-July 12	Other Diversions Aug. 20-Sept. 6	May 5/21-6/5	June 24-28	July 22-25	August 19-28	September 23-26
BA-1	Balsam Meadow Forebay at Tunnel Inlet	11 S	0299902	4114983	--	--	--	X	X	X	X	X
BA-2	Balsam Meadow Forebay at Power Tunnel	11 S	0300008	4114999	--	--	--	X	X	X	X	X
BA-3	Balsam Creek Downstream of Balsam Forebay Dam	11 S	0299835	4115400	X	X	--	--	--	--	--	--
BA-4	Balsam Creek Upstream of Diversion	11 S	0299675	4117791	X	X	--	--	--	--	--	--
BA-5	Balsam Creek Downstream of Diversion	11 S	0299411	4118368	X	X	--	--	--	--	--	--
BA-6	Balsam Creek Upstream of Big Creek Confluence	11 S	0299314	4118880	X	X	--	--	--	--	--	--
BC-1	Big Creek Upstream of Huntington Lake	11 S	0308409	4123126	X	--	X	--	--	--	--	--
BC-2	Big Creek Downstream of Dam 1	11S	0303801	4122848	X	--	X	--	--	--	--	--
BC-3	Big Creek Upstream of Dam 4 and Powerhouse 1	11 S	0301427	4119893	X	--	X	--	--	--	--	--
BC-4	Dam 4/Powerhouse 1 Tailrace	11 S	0301165	4119591	--	--	--	X	X	X	X	X
BC-5	Big Creek Downstream of Dam 4/ Powerhouse 1	11 S	0300743	4119572	X	--	X	--	--	--	--	--
BC-6	Big Creek Downstream of Balsam Creek Confluence	11 S	0299266	4119040	X	--	X	--	--	--	--	--
BC-7	Big Creek Upstream of Dam 5/Powerhouse 2	11 S	0295643	4119480	X	--	X	--	--	--	--	--
BC-8	Dam 5 Forebay/Powerhouse 2	11 S	0295272	4119351	--	--	--	X	X	X	X	X
BC-9	Big Creek Downstream of Dam 5/Powerhouse 2	11 S	0295156	4119626	X	--	X	--	--	--	--	--
BC-10	Big Creek Upstream of Powerhouse 8	11 S	0293544	4120613	X	--	X	--	--	--	--	--
BE-1	Bear Creek Upstream of Bear Diversion	11 S	0325190	4134319	X	--	X	--	--	--	--	--
BE-2	Bear Diversion Forebay	11 S	0325066	4134046	--	--	--	X	X	X	X	X
BE-3	Bear Creek Downstream of Bear Diversion	11 S	0324983	4133937	X	--	X	--	--	--	--	--
BE-4	Bear Creek Upstream of South Fork San Joaquin Confluence	11 S	0323512	4132400	X	--	X	--	--	---	--	--
BO-1	Bolsillo Creek Upstream of Diversion	11 S	0319076	4131779	X	X	--	--	--	--	--	--
B0-2	Bolsillo Creek Downstream of Diversion	11 S	0319181	4131337	X	X	--	--	--	--	--	--
BO-3	Bolsillo Creek Upstream of South Fork San Joaquin Confluence	11 S	0319868	4133338	X	X	--	--	--	--	--	--
C62-1	Camp 62 Creek Upstream of Diversion	11 S	0320317	4131076	X	X	--	--	--	--	--	--
C62-2	Camp 62 Creek Downstream of Diversion	11 S	0320268	4131004	X	X	--	--	--	--	--	--

Table CAWG-4-1. Water Quality Monitoring and Sampling Station Locations for Spring and Fall Stream Sampling Program and Monthly Reservoir/Forebay Profiling Program (continued)

Station	Description	GPS Coordinants			Spring Sampling Program	Summer/Fall Sampling Program		Monthly Profiling and Sampling Program				
		Zone	Northing	Easting	May 20-June 14	Small Diversions June 14-July 12	Other Diversions Aug. 20-Sept. 6	May 5/21-6/5	June 24-28	July 22-25	August 19-28	September 23-26
C62-3	Camp 62 Creek Downstream of Chinquapin Creek Confluence	11 S	0320557	4131669	X	X	--	--	--	--	--	--
C62-4	Camp 62 Creek Downstream of South Fork San Joaquin Confluence	11 S	0320533	4132871	X	X	--	--	--	--	--	--
CH-1	Chinquapin Creek Upstream of Diversion	11 S	0320986	4130266	X	X	--	--	--		--	--
CH-2	Chinquapin Creek Downstream of Diversion	11 S	0320949	4130492	X	X	--	--	--	--	--	--
CR-1	Crater creek Upstream of Diversion	11 S	0323163	4127427	X	X	--	--	--	--	--	--
CR-2	Crater Creek Downstream of Diversion	11 S	0323250	4127454	X	X	--	--	--	--	--	--
CR-3	Crater Creek Upstream of South Fork San Joaquin	11 S	0324921	4131027	X	X	--	--	--	--	--	--
CR-4	Crater Creek Diversion Channel	11 S	0324911	4127387	X	Not Collected[1]	--	--	--	--	--	--
EL-1	Ely Creek Upstream of Diversion	11 S	0297140	4117340	X	X	--	--	--	--	--	--
EL-2	Ely Creek Downstream of Diversion	11 S	0297179	4117405	X	X	--	--	--	--	--	--
EL-3	Ely Creek Upstream of Big Creek Confluence	NC	NC	NC	X	X	--	--	--	--	--	--
FL-1	Florence Lake near dam	11 S	0325322	4126643	--	--	X	X	X	X	X	X
FL-2	Florence Lake Middle	11S	0325820	4125930	--	--	X	X	X	X	X	X
FL-3	Florence Lake South	11 S	0326609	4124679	--	--	X	X	X	X	X	X
HL-1	Huntington Lake Near Dam 1	11 S	0303745	4123150	--	--	--	X	X	X	X	X
HL-2	Huntington Lake Middle	11 S	0304605	4123430	--	--	--	X	X	X	X	X
HL-3	Huntington Lake Northeast	11 S	0306970	4123845	--	--	--	X	X	X	X	X
HO-1	Hooper Creek Upstream of Diversion	11 S	0327220	4130573	X	X	--	--	--	--	--	--
HO-2	Hooper Creek Downstream of Diversion	11 S	0327060	4130573	X	X	--	--	--	--	--	--
HO-3	Hooper Creek Upstream of South Fork San Joaquin Confluence	11S	0324669	4131653	X	X	--	--	--	--	--	--
MP-1	Mammoth Pool Near Dam	11 S	0294625	4133684	--	--	X	X	X	X	X	X
MP-2	Mammoth Pool Middle	11 S	0294891	4135727	--	--	X	X	X	X	X	X
MP-3	Mammoth Pool Northeast	11 S	0297732	4139586	--	--	X	X	X	X	X	X
MO-1	Mono Diversion Forebay	11 S	0323105	4136650	--	--	X	X	X	X	X	X
MO-2	Lower Mono Creek Downstream of Mono Diversion	11 S	0322994	4136694	X	--	X	--	--	--	--	--

Table CAWG-4-1. Water Quality Monitoring and Sampling Station Locations for Spring and Fall Stream Sampling Program and Monthly Reservoir/Forebay Profiling Program (continued)

Station	Description	GPS Coordinants			Spring Sampling Program	Summer/Fall Sampling Program		Monthly Profiling and Sampling Program				
		Zone	Northing	Easting	May 20-June 14	Small Diversions June 14-July 12	Other Diversions Aug. 20-Sept. 6	May 5/21-6/5	June 24-28	July 22-25	August 19-28	September 23-26
MO-3	Lower Mono Creek Upstream of Mono Diversion	11 S	0316662	4136271	X	--	X	--	--	--	--	--
NF-1	North Fork Stevenson Creek Upstream of Outlet	11s	0288075	4114131	X	--	X	--	--	--	--	--
NF-2	North Fork Stevenson Creek Downstream of Outlet	11 S	0301777	4114181	X	--	X	--	--	--	--	--
NF-3	North Fork Stevenson Creek at Shaver Lake	11 S	0299834	4112193	X	--	X	--	--	--	--	--
NS-1	North Slide Creek Upstream of Diversion	11 S	0327160	4129222	X	X	--	--	--	--	--	--
NS-2	North Slide Creek Downstream of Diversion	11 S	0327142	4129222	X	X	--	--	--	--	--	--
NS-3	North Slide Creek Upstream of South Fork San Joaquin Confluence	11 S	0326812	4129387	X	X	--	--	--	--	--	--
PI-1	Pitman Creek Upstream of Diversion	11 S	0303501	4119181	X	X	--	--	--	--	--	--
PI-2	Pitman Creek Downstream of Diversion	11 S	0303442	4119196	X	X	--	--	--	--	--	--
PI-3	Pitman Creek Upstream of Dam 4	11 S	0301532	4119708	X	x	--	--	--	--	--	--
RA-1	Rancheria Creek Upstream of Portal Powerhouse	11 S	0308943	4125585	X	--	X	--	--	--	--	--
RA-2	Portal Tailrace	11 S	0308574	4125285	X	--	X	--	--	--	--	--
RK-1	Rock Creek Upstream of Diversion	11 S	0292536	4127942	X	X	--	--	--	--	--	--
RK-2	Rock Creek Downstream of Diversion	11 S	0292568	4127884	X	X	--	--	--	--	--	--
RK-3	Rock Creek Upstream of South Fork San Joaquin Confluence	11 S	0293191	4127962	X	X	--	--	--	--	--	--
RO-1	Ross Creek Upstream of Diversion	11 S	0291982	4123474	X	X	--	--	--	--	--	--
RO-2	Ross Creek Downstream of Diversion	11 S	0292147	4123217	X	X	--	--	--	--	--	--
RO-3	Ross Creek Upstream of South Fork San Joaquin Confluence				Not Collected[1]	Not Collected[1]	--	--	--	--	--	--
SJ-1	San Joaquin River Upstream of Mammoth Pool	11 S	0298534	4141073	X	--	X	--	--	--	--	--
SJ-2	San Joaquin River Downstream of Mammoth Pool Dam	11 S	0293309	4132406	X	--	X	--	--	--	--	--
SJ-3	San Joaquin River Upstream of Rock Creek	11 S	0293241	4127989	X	--	X	--	--	--	--	--
SJ-4	San Joaquin River Upstream of Ross Creek	11 S	0292800	4122126	X	--	X	--	--	--	--	--
SJ-5	San Joaquin River Upstream of Mammoth Pool Powerhouse	11 S	0292613	4121901	X	--	X	--	--	--	--	--
SJ-6	Mammoth Powerhouse Tailrace	11 S	0292637	4121624	X	--	X	--	--	--	--	--
SJ-7	San Joaquin River Powerhouse 8 Tailrace	11 S	0293449	4120488	X	--	X	--	--	--	--	--
SJ-8	San Joaquin River Dam 6	NC	NC	NC	--	--	--	X	X	X	X	X

Table CAWG-4-1. Water Quality Monitoring and Sampling Station Locations for Spring and Fall Stream Sampling Program and Monthly Reservoir/Forebay Profiling Program (continued)

Station	Description	GPS Coordinants			Spring Sampling Program	Summer/Fall Sampling Program		Monthly Profiling and Sampling Program				
		Zone	Northing	Easting	May 20-June 14	Small Diversions June 14-July 12	Other Diversions Aug. 20-Sept. 6	May 5/21-6/5	June 24-28	July 22-25	August 19-28	September 23-26
SJ-9	San Joaquin River Downstream of Dam 6/Powerhouse 8	11 S	0293188	4120352	X	--	X	--	--	--	--	--
SJ-10	San Joaquin River Downstream of Stevenson Creek	11 S	0290399	4116288	X	--	X	--	--	--	--	--
SJ-11	San Joaquin River Upstream of Powerhouse 3	11 S	0288075	4114131	X	--	X	--	--	--	--	--
SJ-12	San Joaquin River Powerhouse 3 Tailrace	11 S	0297896	4114045	X	--	X	--	--	--	--	--
SL-1	Shaver Lake Near Dam	11 S	0295663	4113079	--	--	X	X	X	X	X	X
SL-2	Shaver Lake Middle	11 S	0297248	4110605	--	--	X	X	X	X	X	X
SL-3	Shaver Lake Near Stevenson Creek Inflow	11 S	0298405	4110641	--	--	X	X	X	X	X	X
SF-1	South Fork San Joaquin Downstream of Florence Lake Dam	11 S	0325640	4127119	X	--	X	--	--	--	--	--
SF-2	South Fork San Joaquin at Mono Crossing	11 S	0317761	4134684	X	--	X	--	--	--	--	--
SF-3	South Fork San Joaquin Downstream of Rattlesnake Crossing	11 S	0313835	4137379	X	--	X	--	--	--	--	--
SF-4	South Fork San Joaquin Upstream of North Fork San Joaquin Confluence	11 S	0301690	4145686	Not Collected[2]	--	X	--	--	--	--	--
SF-5	South Fork San Joaquin Upstream of Florence Lake	11 S	0327727	4123486	X	--	X	--	--	--	--	--
SS-1	South Slide Creek Upstream of Diversion	11 S	0327078	4129021	X	X	--	--	--	--	--	--
SS-2	South Slide Creek Downstream of Diversion	11 S	0327065	4129029	X	X	--	--	--	--	--	--
SS-3	South Slide Creek Upstream of South Fork San Joaquin Confluence	11 S	0326755	4129277	X	X	--	--	--	--	--	--
ST-1	Stevenson Creek Downstream of Shaver Lake Dam	11 S	0295471	4113169	X	--	X	--	--	--	--	--
ST-2	Stevenson Creek Upstream of San Joaquin River Confluence	11 S	0290977	4116046	X	--	X	--	--	--	--	--
TS-1	Tombstone Creek Upstream of Diversion	11 S	4127038	326953	X	X	--	--	--	--	--	--
TS-2	Tombstone Creek Downstream of Diversion	11 S	4127049	326989	X	X	--	--	--	--	--	--
TS-3	Tombstone Creek Upstream of South Fork San Joaquin Confluence	11 S	0326038	4127608	X	X	--	--	--	--	--	--
TS-4	Tombstone Diversion Channel				Not Collected[1]	Not Collected[1]	--	--	--	--	--	--

[1] Samples were not collected because the stream was dry.

[2] Water levels were too high to allow safe access to the stream for sampling.

NC= No GPS Coverage

Table CAWG-4-2. Summary of 30-Day, 5-Sample Fecal Coliform Results (MPN)

Site #	Location	GPS Coordinates			Week 1 June 26-27	Week 2 July 1-3	Week 3 July 9-11	Week 4 July 17-18	Week 5 July 22-24	Geometric Mean
FC-1	West end Huntington Lake	11S	0293762	4109052	<2	<2	<2	<2	<2	<2
FC-2	East end Huntington Lake near Bear Cove Picnic Area	11S	0306692	4124798	<2	<2	2	2	<2	<2
FC-3	East end of Huntington Lake near Camp Mirimichi	11S	0307123	4123182	2	<2	2	2	2	<2
FC-4	Billy Creek above cabins/campgrounds	11S	0302196	4123944	30	30	8	8	8	14
FC-5	Billy Creek above high water mark of Huntington Lake	11S	0302177	4123569	11	50	300	50	130	64
FC-6	Line Creek above high water mark of Huntington Lake	11S	0305076	4124447	2	8	30	130	50	20
FC-7E	West Fork Line Creek above the cabins	11S	0304754	4125341	<2	<2	4	8	8	4
FC-7W	East Fork Line Creek above the cabins.	11S	0304876	4125335	<2	13	<2	220	27	13
FC-8	Bear Creek above the high water mark of Huntington Lake	11S	0306612	4124973	<2	8	8	8	2	5
FC-9	Bear Creek above the cabins and campgrounds	11S	0306089	4125416	2	4	11	23	80	11
FC-10	Balsam Creek below Camp Sierra and upstream of the confluence with Big Creek	11S	0299239	4118696	11	110	80	22	13	31
FC-11	Balsam Creek above Camp Sierra and downstream of the diversion	11S	0299418	4118155	80	80	17	30	8	30
FC-12	Shaver lake near Shaver Lake Point at northwest side of lake	11S	0295088	4112248	13	<2	13	7	8	7
FC-13	Shaver Lake near Camp Edison Campground on the west side of lake	11S	0295381	4111044	2	<2	<2	<2	2	<2

Table CAWG-4-2. Summary of 30-Day, 5-Sample Fecal Coliform Results (MPN) (continued)

Site #	Location	GPS Coordinates			Week 1 June 26-27	Week 2 July 1-3	Week 3 July 9-11	Week 4 July 17-18	Week 5 July 22-24	Geometric Mean
FC-14	Shaver Lake near Camp Chawanakee at the south end of the lake	11S	0296386	4110091	<2	<2	2	<2	<2	<2
FC-15	Chiquito creek downstream of the Mammoth Pool Campground a the western tip of Mammoth Pool.	11S	0293046	4135419	8	11	27	2	13	9
FC-16	Mono Diversion Forebay below campground which is 0.5 mile south of Edison Lake	11S	0323097	4136584	<2	<2	<2	<2	<2	<2
FC-17	Big Creek downstream of Edison Fish Hatchery, near the3 town of Big Creek, and just downstream of Dam 4	11S	0300739	4119563	4	8	4	4	13	6
FC-18	Jackass Meadow Campground, which is located about 0.5 mile off the northern tip of Florence Lake.	11S	0325916	4127617	<2	<2	<2	<2	<2	<2

MPN: Most Probable Number of bacterial colonies per 100 ml of water.

Criteria - Geometric mean of 5 samples within 30-day period shall not exceed a geometric mean of 200 MPN/100 ml, nor shall >10% of total samples exceed 400/100 ml.

Geometric Mean: 'n^{th} root of the product of 'n' numbers

Table CAWG-4-3. Summary of Water Quality Analytical Tests, including Laboratory Methods and Detection Limits, and Chemical Water Quality Objectives

Analyte	Laboratory method	Units	Method Detection Limit (MDL)	Practical Quantitation Limit (PQL)	Basin Plan	CA TOXIC RULE	NATIONAL TOXIC RULE	Sample Container	Hold Time	Preservative/ Comment
Alkalinity (as $CaCO_3$)	SM 2320 B	mg/L	1	1	ns	ns	>20	32 oz plastic	14 days	Refrigerate
Ammonia as NH_3	SM 4500-NH_3-F	mg/L	--	1	ns	ns	1[1]	16 oz plastic	28 days	H_2SO_4, Refrigerate
Arsenic – Total	EPA 200.8	µg/L	0.2	2	10[2a]	340/150[3]	340/150[3]	16 oz plastic	6 months	HNO_3
Benzene	EPA-8020	µg/L	--	0.3	1	--	--	40mLVOA's	14 days	HCC, Refrigerate
Bicarbonate (as $CaCO_3$)	SM 2320 B	mg/L	1	1	Ns	ns	ns	32 oz plastic	14 days	Refrigerate
Biochemical Oxygen Demand	SM 5210-B	mg/L	--	5	Ns	ns	ns	32 oz plastic	48 hours	Refrigerate
Boron – Total[4]	EPA 200.7	mg/L	0.01	0.1	Ns	ns	ns	16 oz plastic	28 days	HNO_3
Calcium	EPA 200.7	mg/L	0.01	0.1	Ns	ns	ns	16 oz plastic	6 months	HNO_3, Refrigerate
Carbonate (as $CaCO_3$)	SM 2320 B	mg/L	1	1	ns	ns	ns	32 oz plastic	14 days	Refrigerate
Chlorophyll-a	SM1020OH	mg/L	--	0.001	ns	ns	ns	1 liter amber glass	48 hours	Refrigerate
Chloride	EPA 300.0	mg/L	0.3	1	250[2b]	ns	ns	32 oz plastic	28 days	
Copper – Total	EPA 200.7	mg/L	0.005	0.05	1[2b]	0.0015/.0013[3,5]	0.0015/.0013[3,5]	16 oz plastic	6 months	HNO_3
Ethyl-benzene	EPA-8020	µg/L	--	0.3	700	--	--	40mLVOA's	14 days	HCC, Refrigerate
Fecal Coliform (3x5)[6]	SM 9221-B/E	MPN/ 100 mL	--	2-1600	200	ns	ns	120 ml sterile plastic	6 hours	Sodium thiosulfate, Refrigerate
Fluoride	EPA 300.0	mg/L	0.03	0.1	2[2a]	ns	ns	32 oz plastic	28 days	
Hardness (as $CaCO_3$)	(calculation)	Calc	--	1	ns	ns	ns	16 oz plastic		HNO_3, Refrigerate
Hydroxide (as $CaCO_3$)	SM 2320 B	mg/L	1	1	ns	ns	ns	32 oz plastic		Refrigerate
Iron – Total	EPA 200.7	mg/L	0.02	0.05	0.3[2b]	ns	ns	16 oz plastic	6 months	HNO_3
Lead – Total	EPA 200.8	µg/L	0.25	5	15	4.9/0.19[3,7]	4.9/0.19[3,7]	16 oz plastic	6 months	HNO_3
Magnesium	EPA 200.7	µg/L	25	100	ns	ns	ns	16 oz plastic	6 months	HNO_3
Manganese – Total	EPA 200.7	mg/L	5	10	50[2b]	ns	ns	16 oz plastic	6 months	HNO_3
Mercury – Total	EPA 200.8	µg/L	0.05	0.4	2[2a]	0.05	ns	16 oz plastic	28 days	HNO_3
Methyl-tertiary-butyl Ether (MtBE)	EPA 8015/8020	µg/L	--	5	5[2b]	ns	ns	40 ml VOA's	14 days	HCL, Refrigerate
Molybdenum – Total[8]	EPA 200.8	µg/L	0.025	10	ns	ns	ns	16 oz plastic	6 months	HNO_3

Table CAWG-4-3. Summary of Water Quality Analytical Tests, including Laboratory Methods and Detection Limits, and Chemical Water Quality Objectives (continued)

Analyte	Laboratory method	Units	Method Detection Limit (MDL)	Practical Quantitation Limit (PQL)	Basin Plan	CA TOXIC RULE	NATIONAL TOXIC RULE	Sample Container	Hold Time	Preservative/ Comment
Nitrate (NO_3)/ Nitrite (NO_2)	EPA 353.2	mg/L	--	--	10[2a]	ns	ns	32 oz plastic	48 hours	Refrigerate
Nitrogen- Total Kjeldahl (TKN)	SM 4500- NorgC	mg/L	--	1.0	ns	ns	ns	32 oz plastic	48 hours	Refrigerate
Ortho-phosphate (o-PO_4-P)	EPA 300.0	mg/L	0.07	0.2	ns	ns	ns	32 oz plastic	48 hours	Refrigerate
Potassium	EPA 200.7	mg/L	1	2	ns	ns	ns	16 oz plastic	6 months	HNO_3
Silver	EPA 200.8	µg/L	0.2	10	100[2b]	0.07[9]	0.07[9]	16 oz plastic	6 months	HNO_3
Sodium	EPA 200.7	mg/L	0.05	1	ns	ns	ns	16 oz plastic	6 months	HNO_3
Sulfate (SO_4)	EPA 300.0	mg/L	0.3	2	250[2b]	ns	ns	32 oz plastic	28 days	Refrigerate
Toluene	EPA-8020	µg/L	--	0.3	150	--	--	40 ml VOA's	14 days	HCL, Refrigerate
Total Coliform (3x5, 6 hr hold)[10]	SM 9221-B/E	MPN/ 100 mL	--	2 MPN/100ml	ns	ns	ns	120 ml sterile plastic	6 hours	Sodium thiosulfate, Refrigerate
Total Dissolved Solids	SM 2540-C	mg/L	5	5	500[2b]	ns	ns	32 oz plastic	7 days	Refrigerate
Total Petroleum Hydrocarbons (as gasoline and as diesel)[11]	EPA 8015 (modified)	µg/L	--	50	ns	ns	ns	40 ml VOA's (gas) 400 ml amber glass (diesel)	14 days	HCL, Refrigerate (gas) H_2SO_4, Refrigerate (diesel)
Total Suspended Solids	SM 2540-D	mg/L	5	5	ns	ns	ns	32 oz plastic	7 days	
Turbidity	SM 2130 B	NTU	--	0.1 NTU	Narr. [12]	ns	ns	32 oz plastic	48 hours	
Xylenes - Total	EPA-8020	µg/L	--	0.3	1750	--	--	40 ml VOA's	14 days	HCL, Refrigerate
Zinc – Total	EPA 200.7	mg/L	0.005	0.05	5[2b]	.017/.017[3,13]	.017/.017[3,13]	16 oz plastic	6 months	HNO_3, Refrigerate
pH	EPA 9040	Unitless	n/a	n/a	6.5-8.5[14]	ns	ns	32 oz plastic	Immediately	

Table CAWG-4-3. Summary of Water Quality Analytical Tests, including Laboratory Methods and Detection Limits, and Chemical Water Quality Objectives (continued)

Note: analyses of total metals will be converted to dissolved metals using the default parameters provided in The Metals Translator (EPA 1996).

1 = The criterion for ammonia is dependent on the ambient pH and temperature conditions. The criterion of 1.0 mg/L is an average value based on a range of values that vary according to pH and temperature conditions. The actual criterion for a given sample would depend on the ambient pH and temperature during sample collection.

2 = By reference in the Basin Plan, these values are from the California Code of Regulations. 2a = MCLs, 2b = Secondary MCLs

3 = Maximum Concentration (CMC) (1-hour average)/Continuous concentration (CCC) (4-day average).

4 = Although standards have not been set in the Basin Plan, CTR or NTR, an Agricultural Goal of 0.7 mg/L was reported in the August 2000 Compilation of Water Quality Goals (Reference 19: Ayers and Westcot, 1985).

5 = The criterion for copper is expressed in terms of the dissolved metal in the water column. The copper criterion is also expressed as a function of hardness and decreases as hardness decreases. The values of .0013 and .0015 mg/L are based on a hardness of 10 mg/L. The actual criteria for a given sample would be calculated based on the associated hardness of that sample.

6 = Fecal Coliform (3x5, 6 hour max hold time) test will be performed on the 5 sample/30-day tests

7 = The criterion for lead is expressed in terms of the dissolved metal in the water column. The lead criterion is also expressed as a function of hardness and decreases as hardness decreases. The values of 0.19 ug/L and 4.9 ug/L are based on a hardness of 10 mg/L. The actual criteria for a given sample would be calculated based on the associated hardness of that sample.

8 = A water quality criterion for molybdenum has not been identified in the Basin Plan, CTR or NTR.

9 = The criterion for silver is expressed in terms of the dissolved metal in the water column. The silver criterion is also expressed as a function of hardness and decreases as hardness decreases. The instantaneous maximum of 0.07 ug/L is based on a hardness of 10 mg/L. The actual criterion for a given sample would be calculated based on the associated hardness of that sample.

10 = Fecal and total Coliform test will be performed on samples collected during all sampling events.

11 = Laboratory will run individual TPH-g and TPH-d analyses.

12 = Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: Where natural turbidity is between 0 and 5 NTUs, increases shall not exceed 1 NTU, and where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.

13 = The criterion for zinc is expressed in terms of the dissolved metal in the water column. The zinc criterion is also expressed as a function of hardness and decreases as hardness decreases. The CCC and CMC value of 0.017 mg/L is based on a hardness of 10 mg/L. The actual criterion for a given sample would be calculated based on the associated hardness of that sample.

14 = Changes in normal ambient pH shall not exceed 0.5.

MDL = “the minimum concentration of a substance that can be reported with 99% confidence that the analyte concentration is greater than zero.” (40 CFR Part 136).

PQL = “the lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions.” (50 FR 46906)

RESOURCES

Environmental Protection Agency, Federal Register, May 18, 2000. 40 CFR Part 131, Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California. Final Rule.

Regional Water Quality Control Board, Central Valley Region. August 2000. A Compilation of Water Quality Goals.

Regional Water Quality Control Board, Central Valley Region. 1998. The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region. Fourth Edition. The Sacramento River Basin and the San Joaquin River Basin.

Table CAWG-4-4. Summary of In-situ Stream Measurement Collected During the Spring 2002 Sampling Event

Sample ID #	Location Name	Date	pH	Specific Conductance (us/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (oC)	Water Depth (ft)
BA-3	Balsam Crk DS of Balsam Forebay Dam	6/5/2002	6.05	0.016	*	11.93[a]	10.7	0.4
BA-4	Balsam Crk US of Div	5/20/2002	7.03	0.035	4.8	9.89	4.5	0.4
BA-5	Balsam Crk DS of Div	5/20/2002	7.31	0.050	3.3	9.16	8.0	0.6
BA-6	Balsam Crk US of Big Crk Conf	5/20/2002	6.13	0.057	*	*	8.3	0.5
BC-1	Big Creek US of Huntington Lake	5/24/2002	8.68	0.007	*	*	4.1	1.0
BC-10	Big Crk US PH 8	5/21/2002	7.23	0.041	*	*	11.6	1.0
BC-2	Big Crk DS of Dam 1	5/24/2002	6.60	0.020	2.0	7.57	6.8	
BC-3	Big Crk US dam 4/PH1	5/20/2002	6.54	0.025	9.0	*	5.9	1.0
BC-5	Big Crk DS of Dam 4/ PH 1	5/20/2002	5.24	0.038	8.0	*	9.7	0.7
BC-6	Big Crk DS Balsam Crk Conf	5/20/2002	7.04	0.048	*	*	11.7	1.5
BC-7	Big Crk US PH 2	5/21/2002	6.81	0.055	*	*	8.5	
BC-9	Big Crk DS of Dam 5/PH 2	5/21/2002	6.26	0.019	*	*	6.8	1.0
BE-1	Bear Crk US of Bear Div	6/6/2002	5.76	0.005	*	12.33	6.1	0.5
BE-3	Bear Crk. DS of Bear Div	6/6/2002	5.72	0.005	*	12.15	6.6	2.5
BE-4	Bear Crk US of SFSJR Conf	6/11/2002	7.24	0.010	10.0	11.45	9.6	2.0
BO-1	Bolsillo Crk US of Div	5/28/2002	8.14	0.009	10.0	*	7.2	1.0
BO-2	Bolsillo Crk. DS of Div	5/28/2002	8.74	0.015	1.0	*	6.9	0.7
BO-3	Bolsillo Crk US of SFSJR conf	5/31/2002	6.85	0.025	8.3	7.87	9.4	0.5
C62-1	Camp 62 Crk. US of Div	5/28/2002	5.40	0.007	1.0	*	5.4	1.0
C62-2	Camp 62 Crk DS of Div	5/28/2002	5.15	0.008	11.0	*	5.4	1.0
C62-3	Camp 62 Crk DS Chinqapin Crk	5/30/2002	6.44	0.013	4.5	7.76	8.7	0.3
C62-4	Camp 62 Crk DS SFSJR Conf	5/31/2002	6.61	0.025	6.5	8.83	6.4	0.8
CH-1	Chinquapin Crk US of Div	6/5/2002	4.72	0.006	*	8.83	5.7	0.5
CH-2	Chinquapin Crk DS of Div	6/5/2002	5.82	0.007	*	7.75	6.0	0.7
CR-1	Crater Crk US of Div	6/10/2002	6.87	0.012	10.0	11.47	5.4	1.0
CR-2	Crater Crk DS of Div	6/10/2002	7.02	0.027	10.0	10.63	6.7	0.3
CR-3	Crater Crk US SFSJR Conf	6/10/2002	6.75	0.021	10.0	10.13	13.7	0.5
CR-4	Crater Crk. Div. Channel	5/29/2002	8.11	0.010	7.0	*	9.1	1.4
EL-1	Ely Crk US of Div	5/20/2002	7.33	0.047	4.5	8.66	7.4	0.1
EL-2	Ely Crk DS of Div	5/20/2002	6.71	0.047	1.4	6.57	9.5	0.3
EL-3	Ely Crk US of Big Crk Conf	5/20/2002	4.69	0.034	*	15.60[a]	6.9	1.0
HO-1	Hooper Crk US of Div	5/30/2002	6.13	0.010	5.0	9.03	5.1	0.6
HO-2	Hooper Crk DS of Div	5/30/2002	6.32	0.010	2.3	8.93	5.4	0.8
HO-3	Hooper Crk US SFSJR Conf	5/30/2002	7.92	0.030	10.0	*	9.3	0.8
MO-2	Lower Mono Crk DS of Mono Div	6/6/2002	6.23	0.020	*	11.02	10.9	1.0
MO-3	Lower Mono Crk US of Mono Div	6/11/2002	7.19	0.034	10.0	10.66	12.2	1.5
NF-1	NF Stevenson Crk US of outlet	5/23/2002	8.87	0.018	*	*	6.1	1.0
NF-2	NF Stevenson Crk DS of outlet	5/23/2002	5.58	0.018	*	*	5.0	

Table CAWG-4-4. Summary of In-situ Stream Measurement Collected During the Spring 2002 Sampling Event (continued)

Sample ID #	Location Name	Date	pH	Specific Conductance (us/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (oC)	Water Depth (ft)
NF-3	NF Stevenson Crk at Shaver Lake	5/20/2002	6.75	0.026	1.1	8.58	4.4	1.0
NS-1	North Slide Crk US of Div	5/30/2002	6.04	0.012	8.0	*	9.4	0.4
NS-2	North Slide Crk DS of Div	5/30/2002	6.14	0.012	8.0	*	9.6	0.6
NS-3	North Slide Crk US SFSJR Conf	5/30/2002	6.59	0.016	8.2	8.31	7.9	0.5
PI-1	Pitman Crk US of Div	5/24/2002	8.66	0.009	*	*	2.7	3.0
PI-2	Pittman Crk DS of Div	5/24/2002	5.97	0.057	*	*	3.0	2.0
PI-3	Pitman creek Us dam 4	5/20/2002	5.70	0.045	*	*	8.0	1.5
RA-1	Rancheria Crk US of Portal PH	5/24/2002	6.44	0.017	4.9	10.30	2.4	
RA-2	Portal PH Tailrace	5/24/2002	6.39	0.015	2.9	10.00	6.9	
RK-1	Rock Crk US of Div	5/22/2002	6.87	0.020	6.0	*	7.5	0.5
RK-2	Rock Crk DS of Div	5/22/2002	6.73	0.020	8.0	*	10.6	0.8
RK-3	Rock Crk US of SFSJR Conf	5/22/2002	7.01	0.028	*	*	12.3	1.0
RO-1	Ross Creek US of Div	5/21/2002	7.34	0.049	*	*	9.2	1.0
RO-2	Ross Creek DS of Div	5/21/2002	7.70	0.060	2.2	9.17	10.9	
SF-1	SFSJR DS of Florence Dam	5/29/2002	8.05	0.010	10.0	*	7.3	1.0
SF-2	SFSJR at Mono Xing	6/11/2002	7.15	0.048	10.0	11.20[a]	15.6	2.0
SF-3	SFSJR at Rattle Snake Xing	6/12/2002	7.46	0.045	10.0	9.70	14.2	1.0
SF-5	SFSJR US of Florence Lake	5/29/2002	6.14	0.060	4.0	*	7.1	
SJ-10	SJR DS of Stevenson Crk	5/21/2002	6.82	0.033	30.0	*	13.8	1.0
SJ-11	SJR US of PH 3	5/23/2002	6.78	0.106	*	*	11.8	1.0
SJ-12	SJR PH 3 Tailrace	5/22/2002	7.42	0.018	8.0	*	9.9	2.0
SJ-2	SJR DS of Mammoth Dam	5/22/2002	6.99	0.027	*	*	10.2	1.5
SJ-3	SJR US of Rock Crk Conf	5/22/2002	7.02	0.030	*	*	11.8	2.5
SJ-4	SJR US of Ross Crk Conf	5/21/2002	6.58	0.033	*	*	11.2	0.3
SJ-5	SJR US Mammoth Pool PH	5/21/2002	6.99	0.033	*	*	11.6	0.3
SJ-6	Mammoth Pool PH tailrace	5/21/2002	7.29	0.021	2.2	9.61	9.3	0.7
SJ-7	SJR /PH 8 Tailrace	5/21/2002	6.58	0.022	1.4	10.81	7.3	
SJ-9	SJR DS Dam 6/ PH 8	5/21/2002	6.58	0.019	*	*	10.5	1.5
SS-1	South Slide Crk US of Div	5/30/2002	6.05	0.008	5.0	*	7.8	0.4
SS-2	South Slide Crk DS of Div	5/30/2002	6.02	0.008	*	*	7.9	0.4
SS-3	South Slide Crk US SFSJR Conf	5/30/2002	6.40	0.012	9.3	8.81	6.3	0.4
ST-1	Stevenson Crk DS of Shaver Dam	5/20/2002	6.89	0.022	1.8	8.10	6.1	0.3
ST-2	Stevenson Crk DS of Div	5/21/2002	7.20	0.037	3.2	10.40	8.2	0.5
TS-1	Tombstone Crk US of Div	6/7/2002	6.15	0.013	*	11.91	7.2	0.5
TS-2	Tombstone Crk DS of Div	6/7/2002	6.14	0.013	*	11.80	7.3	0.8
TS-3	Tombstone Crk US SFSJR Conf	5/29/2002	6.04	0.005	9.0	*	6.7	1.5

* = Water quality meter malfunction

[a] Dissolved oxygen concentration greater than 110% saturation. This may occur below cascades, in areas of high photosynthetic rates, or as a result of meter calibration error.

Table CAWG-4-5. Summary of In-situ Stream Measurements Collected During the Fall 2002 Sampling Event

Sample ID #	Location Name	Date	pH	Specific Conductance (us/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (oC)	Water Depth (ft)
BA-3	Balsam DS Forebay	7/10/2002	6.34	0.017	29	9.94	13.4	0.5
BA-4	Balsam US Div	7/10/2002	7.16	0.037	2.5	9.11	15.1	
BA-5	Balsam DS Div	7/10/2002	7.22	0.053	2.1	8.75	16.1	1.5
BA-6	Balsam Creek above Big Crk Confluence	7/11/2002	5.45	0.058	0	*	18.9	1.0
BC-1	Big Creek us of Huntington Lake	8/29/2002	7.06	0.032	0.04	7.84	12.5	0.3
BC-10	Big Creek us of PH8	8/28/2002	7.39	0.016	0	10.12	16.5	1.5
BC-2	Big Creek ds of Dam 1	8/29/2002	6.53	0.016	0.8	7.42	14.6	0.5
BC-3	Big Creek above Powerhouse 1	8/26/2002	7.29	0.017	*	11.62	11.6	3.0
BC-5	Big Creek ds Dam 4/PH1	8/26/2002	6.93	0.018	*	10.21	16.3	0.7
BC-6	Big Creek us Balsam Confluence	9/5/2002	7.10	0.019	*	9.57	16.5	0.6
BC-7	Big Creek us of PH2	8/27/2002	7.73	0.061	0	8.97	18.8	1.5
BC-9	Big Creek ds of Dam 5	8/27/2002	6.36	0.014	*	12.45[a]	16.2	1.5
BE-1	Bear Creek us of Diversion Forebay	8/27/2002	6.80	0.020	0	6.97	11.6	1.0
BE-3	Bear Creek ds of Diversion Forebay	8/27/2002	6.85	0.021	0	6.19	13.6	0.8
BE-4	Bear Creek us from confluence	8/27/2002	6.85	0.016	*	10.61	13.4	2.0
BO-1	Bosillo Creek US Div	7/2/2002	5.90	0.019	*	*	12.2	0.3
BO-2	Bosillo Creek DS Div	7/2/2002	5.77	0.021	*	*	12.1	0.4
BO-3	Bosillo Creek US SFSJR	7/2/2002	5.82	0.022	*	*	12.7	0.8
C62-1	Camp 62 US Div	7/2/2002	5.71	0.011	*	*	11.9	0.4
C62-2	Camp 62 DS Div	7/2/2002	5.96	0.011	*	*	12.1	0.4
C62-3	Camp 62 Crk DS Chinquapin Crk Conf	7/2/2002	5.76	0.017	*	*	12.3	0.5
C62-4	Camp 62 Crk US SFSJR Conf	7/2/2002	6.50	0.014	*	*	13.9	0.6
CH-1	Chinquapin Creek US Div	7/7/2002	5.93	0.014	*	*	12.2	0.3
CH-2	Chinquapin DS Div	7/3/2002	5.72	0.018	*	*	13.4	0.4
CR-1	Crater Creek us Div	7/11/2002	7.07	0.027	2.1	*	12.2	0.5
CR-2	Crater Creek ds Div	7/11/2002	7.13	0.048	7.0	*	10.3	
CR-3	Crater us SFSJR	7/12/2002	5.79	0.040	1.1	*	12.9	1.0
EL-1	Ely US Div	7/10/2002	6.72	0.062	*	5.29	16.2	0.4
EL-2[b]	Ely DS Div	7/10/2002						
EL-3	Ely US Conf	7/10/2002	6.63	0.044	1.4	7.90	16.1	0.3
HO-1	Hooper Creek us of Div	7/11/2002	6.93	0.015	1.1	*	15.2	0.7
HO-2	Hooper Creek ds of Div	7/11/2002	6.70	0.016	36.1	*	14.4	1.5
HO-3	Hooper Creek us of SFSJR	7/12/2002	6.58	0.016	15.5	*	13.3	0.5
MO-2	Mono Creek ds of Mono Forebay	8/26/2002	6.95	0.013	*	9.90	12.0	0.7
MO-3	Mono Creek us from SFSJR Confluence	8/29/2002	7.84	0.026	0	6.60	12.8	1.0
NF-1	NF Stevenson us of Diversion	9/5/2002	6.68	0.038	*	8.88	10.6	0.7
NF-2	NF Stevenson ds of Diversion	9/5/2002	6.57	0.010	*	11.45[a]	16.6	0.8
NF-3	NF Stevenson u/s of Shaver Lake	8/22/2002	6.88	0.019	0	8.32	16.2	1.0
NS-1	North Slide US Div	7/3/2002	6.57	0.018	10	7.43	10.5	

Table CAWG-4-5. Summary of In-situ Stream Measurements Collected During the Fall 2002 Sampling Event

Sample ID #	Location Name	Date	pH	Specific Conductance (us/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (oC)	Water Depth (ft)
NS-2	North Slide DS Div	7/3/2002	6.92	0.013	10	7.76	10.6	0.5
NS-3	North Slide Creek US Conf	7/2/2002	6.65	0.013	10	7.88	10.5	0.5
PI-1	Pitman US Div	7/10/2002	6.62	0.025	0.8	8.74	14.1	1.0
PI-2	Pitman DS Div	7/10/2002	6.71	0.025	0.8	6.47	14.3	0.5
PI-3	Pitman US Dam 4	7/10/2002	7.33	0.060	0.8	7.80	15.2	2.0
RA-1	Rancheria Creek us of Portal PH	8/29/2002	6.98	0.051	0.5	8.50	8.0	0.5
RA-2	Portal Tailrace	8/29/2002	6.78	0.015	1	7.86	15.4	
RA-2	Portal Tailrace	9/3/2002	6.44	0.010	0	10.70	16.3	2.0
RK-1	Rock Creek	7/2/2002	7.71	0.059	*	*	19.5	1.5
RK-2	Rock Creek	7/2/2002	7.60	0.034	*	*	18.7	1.0
RK-3	Rock Creek	7/2/2002	7.45	0.032	*	*	18.7	2.5
RO-1	Ross Ck US Div	6/12/2002	7.67	0.049	*	8.68	20.9	0.5
RO-2	Ross CK DS Div	6/12/2002	8.28	0.066	*	6.20	29.8	
SF-1	San Joaquin d/s of Florence Lake	8/20/2002	6.39	0.013	0.8	7.64	12.6	1.0
SF-2	SFSJR @ Mono Crossing	8/29/2002	8.11	0.052	0	6.48	17.7	
SF-3	San Joaquin at Rattlesnake Crossing	8/29/2002	7.69	0.390	*	9.58	15.2	2.0
SF-4	SFSJR us from Confluence w/ Middle Fort	9/4/2002	8.77	0.068	0	7.22	18.2	2.0
SF-5	San Joaquin River u/s of Florence Lake	8/20/2002	6.84	0.018	0	7.30	13.9	0.6
SJ-1	San Joaquin River u/s Mammoth Pool	8/21/2002	7.47	0.073	0.4	8.07	17.4	3.0
SJ-10	SJR ds Stevenson Creek	9/3/2002	7.00	0.026	*	9.26	17.6	2.0
SJ-11	SJR us PH3	9/3/2002	8.66	0.033	0	8.16	21.7	0.5
SJ-12	SJR PH3 Tailrace	9/3/2002	6.70	0.020	*	8.21	18.0	2.0
SJ-2	San Joaquin Below Mammoth Pool Dam	8/21/2002	6.74	0.024	3.2	8.43	15.7	1.0
SJ-3	SJR US Rock Confluence	9/4/2002	6.91	0.028	*	10.52[a]	18.9	3.0
SJ-4	SJR us Ross	8/28/2002	7.72	0.028	0	9.85	18.5	0.7
SJ-5	SJR us Mammoth PH	8/28/2002	7.70	0.031	0	10.38[a]	18.8	1.5
SJ-5	SJR us of MP	9/3/2002	7.58	0.030	*	9.77	20.9	1.0
SJ-6	Mammoth PH Tailrace	8/28/2002	6.69	0.028	0	6.23	18.5	0.8
SJ-7	PH8 Tailrace	8/28/2002	6.50	0.018	1.4	8.31	15.4	3.0
SJ-9	SJR ds of Dam 6	8/28/2002	6.96	0.044	0	8.89	15.8	0.7
SS-1	South Slide Creek US Div	7/2/2002	6.40	0.011	*	6.55	8.3	0.5
SS-2	South Slide Creek DS Div	7/2/2002	6.92	0.013	10	7.76	10.6	0.6
SS-3	Southslide Creek US Conf	7/2/2002	6.51	0.011	10	8.25	10.2	
ST-1	Stevenson Cr. d/s of Shaver Lake Dam	8/22/2002	6.28	0.022	1.8	6.80	13.3	0.5
ST-2	Stevenson Creek	9/3/2002	7.92	0.025	0	9.21	14.0	0.6
TS-1	Tombstone Creek Above US Div	7/3/2002	8.03	0.015	3	*	8.3	0.4
TS-2	Tombstone Creek DS Div	7/3/2002	8.13	0.015	0	*	8.4	0.5
TS-3	Tombstone Creek Conf US OF	7/3/2002	7.79	0.024	*	*	12.5	1.0

* = Water quality meter malfunction

[a] Dissolved oxygen concentration greater than 110% saturation. This may occur below cascades, in areas of high photosynthetic rates, or as a result of meter calibration error.

[b] EL-2 was dry during the fall sampling period

Table CAWG-4-6. Summary of Analytical Results of Water Quality Sampling for Spring 2002

Station	**BO-1**	**BO-2**	**BO-3**	**C62-1**	**C62-2**	**C62-3**	**C62-4**	**CH-1**	**CH-2**	**CR-1**	**CR-2**	**CR-3**	**CR-4**	**DLR**	**WQ Objective**	**Units**
Date Sampled	5/28/02	5/28/02	5/31/02	5/28/02	5/28/02	5/30/02	5/31/02	6/5/02	6/5/02	6/10/02	6/10/02	6/10/02	5/29/02			
Time Sampled	1000	1030	0830	1115	1143	1250	0910	0800	0815	0945	1005	1326	1045			
Alkalinity (CaCO3)	6.0	4.0	10	4.0	4.0	4.0	6.0	2.0	4.0	6.0	14	8.0	4.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	4.0	ND	ND	ND	ND	ND	ND		10	ug/L
Bicarbonate (CaCO3)	6.0	4.0	10	4.0	4.0	4.0	6.0	2.0	4.0	6.0	14	8.0	4.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.8	1.3	2.4	1.1	1.1	1.2	1.9	0.90	1.1	1.9	3.9	2.6	1.5	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	2.0	ND	ND	ND	ND	1.0	ND	1	250	mg/L
Chlorophyll	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.005	ND	ND	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	5.7	4.1	7.6	3.6	3.6	3.8	5.6	2.4	3.2	5.6	11	7.7	4.6	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	0.070	0.060	0.050	ND	ND	ND	0.080	ND	ND	ND	ND	0.15	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.30	0.20	0.40	0.20	0.20	0.20	0.20	0.10	0.10	0.20	0.40	0.30	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	ND	ND	ND	ND	ND	ND	ND	1.0	1.0	1.0	1.0	1.0	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.3**	**5.1**	**5.9**	**5.2**	**5.1**	**5.5**	**5.6**	**5.3**	**5.4**	**5.6**	6.5	**5.5**	**5.3**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	2.0	1.0	2.0	ND	ND	ND	3.0	ND	ND	1.0	3.0	2.0	1.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	22	14	25	8.0	17	8.0	18	22	17	34	24	33	32	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	5.0	ND	ND	ND	ND	7.0	ND	5	ns	mg/L
Turbidity	0.20	0.20	0.20	0.20	0.20	0.20	0.60	0.20	0.10	0.10	0.10	0.70	0.10	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	4	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	8	7	17	4	2	6	50	2	4	13	22	22	80	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-6. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station Date Sampled Time Sampled	BE-1 6/6/02 0900	BE-2 6/6/02 0950	BE-3 6/6/02 0945	BE-4 6/11/02 0815	MO-1 6/6/02 1145	MO-2 6/6/02 1210	MO-3 6/11/02 1055	SF-1 5/29/02 1000	SF-2 6/11/02 1150	SF-3 6/12/02 1025	SF-5 5/29/02 1240	DLR	WQ Objective	Units
Alkalinity (CaCO3)	2.0	2.0	2.0	6.0	8.0	10	14	4.0	10	14	4.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	2.0	ND	**14**	**13**	ND	2	10	ug/L
Bicarbonate (CaCO3)	2.0	2.0	2.0	6.0	8.0	10	14	4.0	10	14	4.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	0.90	0.90	0.90	1.5	2.3	2.3	3.1	1.4	3.2	3.2	1.0	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	2.0	ND	7.0	6.0	ND	1	250	mg/L
Chlorophyll	ND	ND	ND	ND	ND	ND	ND	ND	0.001	ND	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	2.2	2.2	2.2	4.2	7.4	7.4	10	3.9	9.2	9.6	2.5	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	0.29	0.27	0.22	ND	0.090	**0.35**	0.060	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	ND	ND	ND	0.10	0.40	0.40	0.60	0.10	0.30	0.40	ND	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	0.040	0.040	0.010	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	1.0	1.0	1.0	ND	1.0	1.0	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.4**	**5.2**	**5.4**	**5.3**	**5.6**	**5.6**	**5.5**	**5.3**	**5.6**	**6.1**	**5.7**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	ND	ND	ND	ND	2.0	2.0	4.0	1.0	7.0	6.0	ND	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	3.0	2.0	ND	2	250	mg/L
Total Dissolved Solids (TDS)	7.0	5.0	ND	14	19	16	33	23	38	37	12	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	7.0	ND	5.0	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.40	0.40	0.30	0.20	1.0	1.0	0.50	0.30	0.20	0.80	0.20	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	2	<2	<2	<2	<2	<2	<2	2	2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	17	11	17	170	4	17	<2	17	4	17	11	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-6. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station Date Sampled Time Sampled	HO-1 5/30/02 0800	HO-2 5/30/02 0815	HO-3 5/30/02 0830	NS-1 5/30/02 1045	NS-2 5/30/02 1100	NS-3 5/30/02 0910	SS-1 5/30/02 1210	SS-2 5/30/02 1230	SS-3 5/30/02 0845	TS-1 6/7/02 0930	TS-2 6/7/02 0915	TS-3 5/29/02 0930	DLR	WQ Objective	Units
Alkalinity (CaCO3)	4.0	4.0	10	6.0	6.0	8.0	4.0	4.0	4.0	8.0	8.0	6.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.0	ND	2	10	ug/L
Bicarbonate (CaCO3)	4.0	4.0	10	6.0	6.0	8.0	4.0	4.0	4.0	8.0	8.0	6.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	0.70	0.80	2.8	1.4	1.4	1.5	1.1	1.0	1.0	1.4	1.6	1.3	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll	ND	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	2.2	2.4	8.2	4.3	4.3	4.6	3.2	2.9	3.3	4.3	4.8	4.1	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	**0.40**	0.16	0.20	0.19	ND	0.070	0.080	0.070	0.10	0.070	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.10	0.10	0.30	0.20	0.20	0.20	0.10	0.10	0.20	0.20	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	ND	ND	ND	2.0	ND	ND	ND	ND	ND	2.0	1.0	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ns	ns	mg/L
pH	**5.4**	**5.3**	**5.5**	**5.7**	**5.5**	**5.5**	**5.3**	**5.4**	**5.3**	**5.9**	**5.8**	**5.5**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	ND	ND	4.0	2.0	2.0	2.0	ND	ND	ND	2.0	2.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	10	11	35	22	20	17	6.0	7.0	14	27	20	41	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	6.0	ND	6.0	ND	6.0	7.0	ND	7.0	ND	5	ns	mg/L
Turbidity	0.40	0.40	0.70	0.30	0.40	0.90	0.10	0.80	0.60	0.40	0.40	0.20	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	2	4	<2	<2	<2	<2	<2	<2	<2	2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	7	4	39	50	50	9	13	7	13	13	21	43	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-6. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station **Date Sampled** **Time Sampled**	**NF-1** 5/23/02 1235	**NF-2** 5/23/02 1245	**NF-3** 5/20/02 1245	**RA-1** 5/24/02 0810	**RA-2** 5/24/02 0800	**RO-1** 5/21/02 1007	**RO-2** 5/21/02 1015	**RK-1** 5/22/02 1115	**RK-2** 5/22/02 1130	**RK-3** 5/22/02 1225	**ST-1** 5/20/02 1155	**ST-2** 5/21/02 1301	**DLR**	**WQ Objective**	**Units**
Alkalinity (CaCO3)	6.0	6.0	8.0	8.0	6.0	24	26	12	10	14	8.0	10	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	6.0	6.0	8.0	8.0	6.0	24	26	12	10	14	8.0	10	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	2.0	2.0	2.2	1.6	1.4	5.4	5.4	2.4	2.3	3.4	2.2	3.2	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	2.0	2.0	2.0	ND	1.0	ND	1.0	ND	ND	ND	1.0	2.0	1	250	mg/L
Chlorophyll	ND	ND	0.001	ND	ND	0.001	0.001	ND	ND	ND	0.002	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.10	0.1	2	mg/L
Hardness (Ca CO3)	5.8	5.8	6.3	4.8	4.3	19	19	7.2	7.4	10	6.3	10	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	0.12	0.080	0.14	0.12	ND	ND	ND	0.11	0.21	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.20	0.20	0.20	0.20	0.20	1.3	1.4	0.30	0.40	0.50	0.20	0.50	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	0.010	ND	ND	ND	ND	ND	0.030	0.010	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ns	ns	mg/L
pH	**5.5**	**5.4**	**5.5**	**5.9**	**6.1**	**6.0**	**6.0**	**5.5**	**5.5**	**5.7**	**5.4**	**5.8**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	2.0	2.0	2.0	2.0	1.0	5.0	6.0	2.0	2.0	3.0	2.0	3.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	31	35	27	29	14	74	69	44	41	49	19	42	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	5.0	ND	ND	5.0	ND	ND	ND	ND	5.0	5	ns	mg/L
Turbidity	0.30	0.30	0.40	0.70	1.0	1.8	1.7	0.30	0.30	0.50	0.70	1.6	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	2	2	<2	4	4	8	8	4	<2	130	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	26	70	7	7	11	80	240	27	22	33	21	900	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-6. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station Date Sampled Time Sampled	BC-1 5/24/02 0830	BC-2 5/24/02 0900	BC-3 5/20/02 0815	BC-4 5/20/02 1030	BC-5 5/20/2002 0945	BC-6 5/20/2002 1115	BC-7 5/21/2002 0730	BC-8 5/21/2002 0805	BC-9 5/21/2002 0745	BC-10 5/21/2002 1203	DLR	WQ Objective	Units
Alkalinity (CaCO3)	6.0	6.0	10	6.0	10	22	24	6.0	8.0	18	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	6.0	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	6.0	6.0	10	6.0	10	22	24	6.0	8.0	18	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	0.80	2.0	3.0	1.9	3.3	4.5	6.3	2.1	2.2	4.8	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	2.0	1.0	3.0	4.0	2.0	1.0	1.0	1.0	1	250	mg/L
Chlorophyll	ND	ND	0.002	0.001	0.002	0.002	ND	ND	0.001	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	0.30	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	2.4	5.8	8.7	5.6	9.9	14	19	6.1	6.3	15	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	0.050	0.15	0.080	**0.35**	0.26	**0.39**	0.070	0.090	0.080	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.10	0.20	0.30	0.20	0.40	0.60	0.90	0.20	0.20	0.80	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	0.010	ND	ND	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	ND	ND	1.0	ND	3.0	1.0	1.0	ND	1.0	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	ns
pH	**6.2**	**5.8**	**5.4**	**5.3**	**5.5**	**6.2**	**5.8**	**5.3**	**5.3**	**5.7**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	ND	2.0	3.0	2.0	5.0	8.0	6.0	2.0	2.0	4.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	2.0	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	ND	19	25	14	26	57	63	25	24	37	5	500	mg/L
Total Suspended (TSS)	ND	ND	6.0	5.0	7.0	ND	13	5.0	5.0	7.0	5	ns	mg/L
Turbidity	0.20	0.60	2.2	0.90	2.2	2.1	4.60	0.90	0.80	0.60	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	4	<2	2	4	4	<2	<2	50	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	17	<2	21	<2	11	170	8	7	4	170	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-6. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station Date Sampled Time Sampled	BA-1 6/5/02 1220	BA-2 6/5/02 1330	BA-3 6/5/02 1415	BA-4 5/20/02 0830	BA-5 5/20/02 0905	BA-6 5/20/02 1200	EL-1 5/20/02 0720	EL-2 5/20/02 0756	EL-3 5/20/02 1230	PI-1 5/24/02 0750	PI-2 5/24/02 0740	PI-3 5/20/02 0735	DLR	WQ Objective	Units
Alkalinity (CaCO3)	4.0	4.0	4.0	10	16	18	20	20	18	6.0	6.0	18	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	4.0	4.0	2.0	ND	ND	ND	ND	ND	**14**	2	10	ug/L
Bicarbonate (CaCO3)	4.0	4.0	4.0	10	16	18	20	20	18	6.0	6.0	18	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.7	1.6	2.1	2.6	3.4	4.5	4.4	4.3	3.2	1.0	1.0	3.8	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	1.0	3.0	3.0	2.0	1.0	2.0	ND	ND	2.0	1	250	mg/L
Chlorophyll	ND	ND	ND	0.003	0.001	0.003	0.002	0.002	0.002	0.001	ND	0.001	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	0.10	0.20	0.10	ND	ND	ND	ND	ND	0.30	0.1	2	mg/L
Hardness (Ca CO3)	5.1	4.4	6.1	7.7	10	14	15	14	10	3.3	2.9	10	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	0.050	**0.31**	0.10	0.29	**0.67**	0.070	0.060	0.070	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.20	0.10	0.20	0.30	0.40	0.60	0.90	0.80	0.60	0.20	0.10	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	0.010	ND	0.010	**0.070**	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	ND	ND	1.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ns	ns	mg/L
pH	**5.5**	**5.5**	**5.6**	**5.5**	**5.5**	**5.8**	**5.6**	**5.5**	**5.8**	**6.1**	**5.9**	**5.5**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	1.0	1.0	1.0	4.0	6.0	6.0	4.0	4.0	5.0	1.0	1.0	7.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.0	2	250	mg/L
Total Dissolved Solids (TDS)	12	15	18	26	39	46	57	40	27	17	13	38	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	5.0	ND	ND	ND	5.0	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.50	0.50	0.70	0.80	1.2	1.8	1.2	0.40	0.50	0.40	0.20	0.60	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	4	<2	17	4	<2	<2	<2	2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	<2	14	4	40	4	170	14	70	33	21	17	2	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-6. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station Date Sampled Time Sampled	SJ-1 06/20/02 1210	SJ-2 05/22/02 0925	SJ-3 05/22/02 1210	SJ-4 05/21/02 0910	SJ-5 05/21/02 0930	SJ-6 05/21/02 0910	SJ-7 05/21/02 1217	SJ-8 05/21/02 1130	SJ-9 05/21/02 1126	SJ-10 05/21/02 1345	SJ-11 05/23/02 1030	SJ-12 05/22/02 1415	DLR	WQ Objective	Units
Alkalinity (CaCO3)	10	10	12	14	14	6.0	8.0	6.0	8.0	14	12	8.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	3.0	2.0	2.0	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	10	10	12	14	14	6.0	8.0	6.0	8.0	14	12	8.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.8	2.6	3.2	3.5	3.6	1.8	2.0	2.0	2.1	3.4	3.2	2.0	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	1.0	1.0	2.0	2.0	ND	1.0	1.0	1.0	2.0	2.0	1.0	1	250	mg/L
Chlorophyll	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	6.1	8.6	10	11	11	6.1	5.8	6.2	6.5	11	10	6.2	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	0.050	0.080	0.050	0.090	0.090	0.070	0.060	0.060	0.20	0.11	0.06	0.080	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.40	0.50	0.50	0.60	0.60	0.40	0.20	0.30	0.30	0.60	0.50	0.30	0.1	ns	mg/L
Manganese (Mn)	ND	0.020	ND	ND	ND	ND	ND	ND	0.020	ND	ND	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	ND	ND	ND	1.0	ND	1.0	ND	ND	ND	1.0	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ns	ns	mg/L
pH	7.5	**5.5**	**5.7**	**5.6**	**5.6**	**5.2**	**5.2**	**5.3**	**5.3**	**5.6**	**5.5**	**5.5**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	2.0	3.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0	4.0	4.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	24	37	42	45	40	30	28	35	20	36	34	31	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	5.0	7.0	6.0	8.0	ND	8.0	8.0	ND	ND	5	ns	mg/L
Turbidity	0.40	0.40	0.40	0.80	0.70	1.10	0.50	0.70	0.70	1.0	0.60	1.0	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	4	<2	4	<2	<2	<2	2	2	4	22	2	4	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	8	2	130	130	33	2	22	30	22	240	90	8	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-7. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002

Station **Date Sampled** **Time Sampled**	**BA-3** 7/10/02 0910	**BA-4** 7/10/02 1140	**BA-5** 7/10/02 1110	**BA-6** 7/11/02 1300	**EL-1** 7/10/02 1340	**EL-3** 7/10/02 1410	**PI-1** 7/10/02 0815	**PI-2** 7/10/02 0825	**PI-3** 7/10/02 1035	**DLR**	**WQ Objective**	**Units**
Alkalinity (CaCO3)	6.0	12	18	18	28	18	10	10	22	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	6.0	6.0	6.0	ND	ND	ND	ND	**20**	2	10	ug/L
Bicarbonate (CaCO3)	6.0	12	18	18	28	18	10	10	22	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	2.0	2.7	3.6	3.2	5.8	3.5	2.1	2.1	5.1	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	2.0	3.0	3.0	2.0	1.0	1.0	1.0	2.0	1	250	mg/L
Chlorophyll	0.004	0.001	0.002	0.002	0.001	0.001	ND	ND	0.001	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	0.20	0.20	0.10	ND	ND	ND	0.30	0.1	2	mg/L
Hardness (Ca CO3)	5.8	8.0	11	9.6	19	12	6.5	6.1	14	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	0.11	0.17	0.060	ND	**0.36**	0.050	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.20	0.30	0.40	0.40	1.1	0.70	0.30	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	0.010	ND	ND	ND	0.020	ND	ND	ND	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	1.0	1.0	1.0	1.0	2.0	2.0	ND	1.0	2.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.6**	**6.0**	**6.1**	**6.3**	**6.2**	**6.0**	**5.8**	**5.8**	**6.2**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	1.0	5.0	8.0	8.0	6.0	6.0	3.0	3.0	9.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	2.0	2.0	ND	ND	ND	ND	3.0	2	250	mg/L
Total Dissolved Solids (TDS)	33	27	44	44	ND	45	26	24	49	5	500	mg/L
Total Suspended (TSS)	5.0	ND	ND	5.0	ND	ND	6.0	ND	ND	5	ns	mg/L
Turbidity	0.70	0.50	0.40	0.40	0.90	0.40	0.10	0.10	0.20	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	11	7	30	2	2	13	8	2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	<2	11	21	240	4	220	21	11	7	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity in Project area

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-7. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station	**BO-1**	**BO-2**	**BO-3**	**C62-1**	**C62-2**	**C62-3**	**C62-4**	**CH-1**	**CH-2**	**CR-1**	**CR-2**	**CR-3**			
Date Sampled	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/11/02	7/11/02	7/12/02	**DLR**	**WQ Objective**	**Units**
Time Sampled	1100	1115	0834	1220	1240	1030	0925	1355	1430	1005	1025	0935			
Alkalinity (CaCO3)	12	12	12	8.0	8.0	10	26	10	10	12	22	14	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	**32**	ND	ND	ND	ND	4.0	2	10	ug/L
Bicarbonate (CaCO3)	12	12	12	8.0	8.0	10	26	10	10	12	22	14	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	0.20	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	2.6	2.8	2.9	1.8	1.8	2.4	6.7	1.9	2.3	3.0	5.8	3.2	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND	3.0	1	250	mg/L
Chlorophyll	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.001	ND	0.015	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	0.10	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	8.1	9.0	9.3	5.3	5.3	7.6	19	6.0	7.4	8.7	17	9.2	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	0.10	0.080	0.050	ND	ND	0.060	ND	ND	0.070	ND	ND	**0.49**	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.40	0.50	0.50	0.20	0.20	0.40	0.60	0.30	0.40	0.30	0.60	0.30	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.020	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	1.0	1.0	ND	1.0	1.0	1.0	ND	1.0	1.0	2.0	2.0	2.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.9**	**5.7**	**5.9**	**5.6**	**5.6**	**5.7**	6.6	**5.7**	**5.7**	**6.3**	**6.4**	**5.9**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	2.0	2.0	2.0	1.0	1.0	2.0	17	2.0	2.0	2.0	3.0	6.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	5.0	ND	ND	ND	ND	3.0	2	250	mg/L
Total Dissolved Solids (TDS)	25	27	25	12	18	22	67	16	25	21	46	26	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.20	0.20	0.20	0.10	0.10	0.10	0.20	0.30	0.30	0.10	0.10	0.70	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	4	<2	<2	<2	2	23	2	<2	<2	2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	2	2	70	23	21	50	7	30	50	4	6	23	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-7. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station **Date Sampled** **Time Sampled**	**HO-1** 7/11/02 1230	**HO-2** 7/11/02 1240	**HO-3** 7/12/02 1040	**NS-1** 7/3/02 1015	**NS-2** 7/3/02 1010	**NS-3** 7/3/02 1045	**SS-1** 7/3/02 0930	**SS-2** 7/3/02 0945	**SS-3** 7/3/02 1035	**TS-1** 7/3/02 1040	**TS-2** 7/3/02 1050	**TS-3** 7/3/02 1145	**DLR**	**WQ Objective**	**Units**
Alkalinity (CaCO3)	6.0	8.0	6.0	8.0	8.0	8.0	6.0	8.0	6.0	10	10	10	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	6.0	8.0	6.0	8.0	8.0	8.0	6.0	8.0	6.0	10	10	10	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.2	1.2	1.2	1.6	1.6	1.6	1.5	1.6	1.5	1.5	1.6	1.6	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll	0.001	0.008	0.001	0.001	ND	ND	ND	0.001	ND	ND	ND	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	3.8	3.8	3.8	4.8	4.8	4.8	4.6	4.8	4.6	5.0	4.8	4.8	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	0.11	0.11	0.11	ND	0.090	ND	0.10	0.11	0.19	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.30	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.9**	**5.9**	**5.9**	**5.8**	**5.8**	**5.7**	**5.7**	**5.6**	**5.7**	**5.9**	**5.9**	**5.8**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	ND	2.0	2.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	16	14	16	27	18	18	5.0	16	23	26	29	30	5	500	mg/L
Total Suspended (TSS)	ND	8.0	ND	ND	ND	5.0	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.40	0.70	0.50	0.40	0.30	0.20	0.10	0.20	0.20	0.30	0.30	0.60	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	2	<2	2	110	130	50	<2	2	8	<2	<2	50	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	2	4	130	280	170		11	30					2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally low occurring alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-7. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station Date Sampled Time Sampled	MO-2 8/26/02 1000	MO-3 8/29/02 1030	NF-1 9/5/02 1030	NF-2 9/5/02 1015	NF-3 8/22/02 1500	RA-1 8/29/02 0900	RA-2 8/29/02 0915	RK-1 7/2/02 0950	RK-2 7/2/02 1035	RK-3 7/2/02 1020	RO-1 6/12/02 1535	RO-2 6/12/02 1525	DLR	WQ Objective	Units
Alkalinity (CaCO3)	6.0	8.0	8.0	4.0	6.0	24	4.0	18	18	18	34	32	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	6.0	8.0	8.0	4.0	6.0	24	4.0	18	18	18	34	32	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.8	2.3	3.8	1.6	1.7	5.8	1.5	4.0	3.6	3.6	6.3	5.8	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	1.0	5.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll	0.001	0.001	0.001	0.001	0.001	0.001	0.002	ND	ND	ND	ND	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	5.3	7.0	11	4.4	5.1	17	4.6	12	11	11	21	20	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	0.12	0.090	ND	ND	ND	0.090	0.070	ND	0.060	ND	0.060	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.20	0.30	0.40	0.10	0.20	0.60	0.20	0.60	0.60	0.60	1.4	1.4	0.1	ns	mg/L
Manganese (Mn)	0.020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	ND	5.0	ND	ND	1.0	1.0	ND	1.0	1.0	1.0	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.1**	**6.0**	**5.8**	**5.6**	**5.8**	**6.2**	**5.6**	**6.0**	**6.1**	**6.1**	8.2	6.8	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	2.0	3.0	3.0	1.0	2.0	3.0	1.0	4.0	4.0	4.0	7.0	6.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	17	27	29	7.0	22	48	21	32	32	35	75	82	5	500	mg/L
Total Suspended (TSS)	7.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.50	0.20	ND	0.30	0.40	0.20	0.30	0.20	0.20	0.20	1.0	0.50	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	4	2	7	11	<2	<2	4	2	30	22	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	<2	8	220	2	11	14	<2	41	17	130	110	170	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally low occurring alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-7. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station	**BC-1**	**BC-2**	**BC-3**	**BC-5**	**BC-6**	**BC-7**	**BC-8**	**BC-9**	**BC-10**	**BE-1**	**BE-2**	**BE-3**	**BE-4**	**DLR**	**WQ Objective**	**Units**
Date Sampled	8/29/02	8/29/02	8/26/02	8/26/02	9/5/02	8/27/02	8/27/02	8/27/02	8/28/02	8/27/02	8/27/02	8/27/02	8/27/02			
Time Sampled	1000	0800	1350	1445	1130	1555	1500	1530	1015	1000	1045	1130	1105			
Alkalinity (CaCO3)	14	6.0	8.0	6.0	8.0	30	4.0	6.0	4.0	8.0	8.0	8.0	8.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	14	6.0	8.0	6.0	8.0	30	4.0	6.0	4.0	8.0	8.0	8.0	8.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	3.1	1.7	2.4	2.0	2.0	8.8	1.6	1.7	1.8	2.2	2.2	2.3	2.3	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	1.0	ND	2.0	ND	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll	0.001	0.001	0.002	0.001	0.001	ND	0.001	0.001	ND	0.001	ND	0.001	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	9.4	4.6	6.8	5.8	5.8	25	4.8	5.1	5.3	6.3	6.3	6.6	6.6	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	0.060	ND	0.080	0.10	0.10	0.080	0.080	0.10	0.060	ND	0.090	0.14	0.070	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.40	0.10	0.20	0.20	0.20	0.80	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	0.010	ND	ND	ND	ND	0.030	0.030	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	ND	1.0	ND	1.0	ND	**12**	ND	1.0	20	ND	1.0	1.0	1.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**6.0**	**5.8**	**5.4**	**5.4**	**5.6**	**6.5**	**5.4**	**5.4**	**5.5**	**5.7**	**5.7**	**5.7**	**5.7**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	3.0	1.0	2.0	2.0	2.0	5.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	42	33	22	18	8.0	44	18	12	5.0	18	16	10	10	5	500	mg/L
Total Suspended (TSS)	ND	ND	6.0	ND	ND	32	32	32	ND	17	13	ND	ND	5	ns	mg/L
Turbidity	0.20	0.30	0.50	0.30	0.20	0.30	0.70	0.50	0.20	ND	0.20	0.20	ND	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	13	<2	8	4	2	2	2	2	2	<2	<2	<2	2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	27	2	20	33	900	130	33	11	8	2	2	2	17	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally low occurring alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-7. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station **Date Sampled** **Time Sampled**	**SJ-1** 8/21/02 1045	**SJ-2** 8/21/02 1600	**SJ-3** 9/4/02 1100	**SJ-4** 8/28/02 1125	**SJ-5** 8/28/02 1150	**SJ-6** 8/28/02 1115	**SJ-7** 8/28/02 1030	**SJ-8** 8/28/02 1000	**SJ-9** 8/28/02 0930	**SJ-10** 9/3/02 0950	**SJ-11** 9/3/02 1230	**SJ-12** 9/3/02 1145	**DLR**	**WQ Objective**	**Units**
Alkalinity (CaCO3)	24	10	12	10	12	10	4.0	6.0	6.0	12	10	10	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	9.0	3.0	4.0	2.0	3.0	4.0	ND	2.0	3.0	ND	ND	2.0	2	10	ug/L
Bicarbonate (CaCO3)	24	10	12	10	12	10	4.0	6.0	6.0	12	10	10	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	5.1	2.1	3.0	2.9	3.1	2.6	1.9	2.2	2.3	2.9	3.0	2.3	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	5.0	ND	1.0	1.0	1.0	1.0	ND	1.0	ND	1.0	2.0	1.0	1	250	mg/L
Chlorophyll	0.003	0.001	ND	0.001	ND	ND	0.002	ND	0.001	0.001	ND	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	18	6.9	9.6	9.3	9.8	8.6	5.6	6.7	7.0	8.6	9.1	7.0	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	0.060	0.12	0.070	0.060	ND	0.12	0.13	0.11	0.23	0.090	ND	0.10	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	1.2	0.40	0.50	0.50	0.50	0.50	0.20	0.30	0.30	0.40	0.40	0.30	0.1	ns	mg/L
Manganese (Mn)	ND	0.010	ND	ND	ND	0.010	0.040	0.020	0.030	ND	ND	0.020	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	1.0	1.0	ND	1.0	ND	ND	1.0	7.0	7.0	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	6.5	**5.7**	**6.2**	**5.9**	**5.9**	**5.7**	**5.4**	**5.5**	**5.6**	**6.2**	**6.2**	**6.2**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	8.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0	2.0	3.0	3.0	2.0	1	ns	mg/L
Sulfate (SO4)	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	47	22	ND	24	25	20	14	15	16	9.0	ND	ND	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	6.0	ND	ND	26	ND	20	ND	ND	ND	5	ns	mg/L
Turbidity	0.10	0.40	0.30	1.1	0.30	0.30	0.50	0.40	0.70	0.30	0.20	0.70	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	2	<2	<2	2	2	<2	<2	<2	<2	2	<2	4	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	7	14	2	30	4	22	4	4	6	300	26	30	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally low occurring alkalinity levels Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-7. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station Date Sampled Time Sampled	SF-1 8/20/02 1630	SF-2 8/29/02 1215	SF-3 8/29/02 1045	SF-4 9/4/02 1530	SF-5 8/20/02 1100	ST-1 8/22/02 1530	ST-2 9/3/02 0930	DLR	WQ Objective	Units
Alkalinity (CaCO3)	2.0	12	10	20	4.0	6.0	10	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	**14**	**10**	**12**	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	2.0	12	10	20	4.0	6.0	10	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.4	2.9	2.7	4.2	1.9	1.7	2.7	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	8.0	5.0	9.0	1.0	ND	1.0	1	250	mg/L
Chlorophyll	0.008	ND	ND	ND	ND	0.001	ND	0.001	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	3.9	8.1	8.0	13	5.2	5.5	8.0	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	**0.30**	0.16	0.12	0.12	ND	**0.40**	**0.30**	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.10	0.20	0.30	0.60	0.10	0.30	0.30	0.1	ns	mg/L
Manganese (Mn)	0.030	ND	ND	ND	ND	**0.12**	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2)	1.0	3.0	ND	ND	1.0	1.0	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.1**	**6.0**	**6.0**	**6.3**	**5.6**	**5.5**	**6.2**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	4.0	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	ND	7.0	6.0	9.0	1.0	1.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	2.0	ND	2.0	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	37	38	38	36	14	24	9.0	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.40	0.30	0.30	0.20	ND	1.0	0.60	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	2	2	<2	<2	17	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	2	2	4	7	2	22	50	2	ns	MPN/100mL

ND - Not Detected above DLR * Naturally occurring low alkalinity in Project area.
** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at time of sample collection.
*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection.
‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-8. May 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling

Station	**BA-1**	**BA-2**	**BC-4**	**BC-8**	**BE-2**	**MO-1**	**SJ-8**	**DLR**	**WQ Objective**	**Units**
Date Sampled	6/5/02	6/5/02	5/20/02	5/21/02	6/6/02	6/6/02	5/21/02			
Time Sampled	1220	1330	1030	0805	0950	1145	1130			
Alkalinity (CaCO3)	4.0	4.0	6.0	6.0	2.0	8.0	6.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	4.0	4.0	6.0	6.0	2.0	8.0	6.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.7	1.6	1.9	2.1	0.90	2.3	2.0	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	1.0	1.0	ND	ND	1.0	1	250	mg/L
Chlorophyll-a	ND	ND	0.001	ND	ND	ND	ND	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	5.1	4.4	5.6	6.1	2.2	7.4	6.2	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	0.080	0.070	ND	0.29	0.060	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.20	0.10	0.20	0.20	ND	0.40	0.30	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	0.040	ND	0.01	0.05	mg/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	1.0	1.0	ND	ND	1.0	1.0	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.5**	**5.5**	**5.3**	**5.3**	**5.2**	**5.6**	**5.3**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	1.0	1.0	2.0	2.0	ND	2.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	12	15	14	25	5.0	19	35	5	500	mg/L
Total Suspended (TSS)	ND	ND	5.0	5.0	ND	ND	ND	5	ns	mg/L
Turbidity	0.50	0.50	0.90	0.90	0.40	1.0	0.70	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	2	<2	2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	<2	14	70	50	11	4	30	2	ns	MPN/100mL

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-8. May 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station Date Sampled Time Sampled	MP-1 5/22/02 1115	MP-2 5/22/02 1215	MP-3 5/22/02 1330	SL-1 5/23/02 1200	SL-2 5/23/02 1100	SL-3A 5/23/02 1020	SL-3B 5/23/02 1000	DLR	WQ Objective	Units
Alkalinity (CaCO3)	8.0	8.0	8.0	6.0	6.0	6.0	6.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	8.0	8.0	8.0	6.0	6.0	6.0	6.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	2.0	1.9	1.8	2.0	1.9	1.8	1.8	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	1.0	1.0	ND	1.0	1.0	1.0	ND	1	250	mg/L
Chlorophyll-a	ND	ND	ND	ND	ND	ND	ND	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	6.6	6.0	6.1	5.8	5.6	5.3	5.3	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	0.050	0.060	0.060	ND	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.40	0.30	0.40	0.20	0.20	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	ND	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.5**	**5.6**	**5.6**	**5.1**	**5.1**	**5.1**	**5.1**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	29	21	29	38	20	23	24	5	500	mg/L
Total Suspended (TSS)	ND	5.0	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.50	0.60	0.50	0.60	0.40	0.70	0.70	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	4	<2	11	<2	<2	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	7	<2	11	<2	4	<2	13	2	ns	MPN/100mL
TPH as Diesel	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	ND	ND	ND	ND	5	5	ug/L
Benzene	ND	ND	ND	ND	ND	ND	ND	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ND	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	0.3	1750	ug/L

ND - Not Detected above DLR
* Naturally occurring low alkalinity levels in Project area.
** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection
*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection
‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-8. May 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station Date Sampled Time Sampled	**FL-1** 5/29/02 0930	**FL-2** 5/29/02 1025	**FL-3** 5/29/02 1230	**HL-1** 5/28/02 1035	**HL-2** 5/28/02 1140	**HL-3A** 5/28/02 1230	**HL-3B** 5/28/02 1240	**DLR**	**WQ Objective**	**Units**
Alkalinity (CaCO3)	4.0	2.0	4.0	6.0	4.0	4.0	4.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	4.0	2.0	4.0	6.0	4.0	4.0	4.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.5	1.4	1.2	1.6	1.7	1.4	1.4	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	1.0	1.0	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll-a	ND	ND	ND	ND	ND	ND	ND	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	4.2	3.9	3.0	4.8	5.1	4.3	4.3	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.10	0.10	ND	0.20	0.20	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	ND	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.4**	**5.3**	**5.4**	**5.3**	**5.2**	**5.3**	**5.3**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	25	27	12	16	6.0	13	14	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	6.0	ND	ND	5	ns	mg/L
Turbidity	0.20	0.30	0.20	0.30	0.30	0.30	0.30	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	4	22	30	2	2	4	4	2	ns	MPN/100mL
TPH as Diesel	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	ND	ND	ND	ND	5	5	ug/L
Benzene	ND	ND	ND	ND	ND	ND	ND	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ND	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	0.3	1750	ug/L

ND - Not Detected above DLR

* Naturally occurring alkalinity levels in the Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-9. June 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling

Station **Date Sampled** **Time Sampled**	**FL-1** 6/26/02 1100	**FL-2A** 6/26/02 1100	**FL-2B** 6/26/02 1250	**FL-3A** 6/26/02 1445	**FL-3B** 6/26/02 1500	**HL-1** 6/25/02 1100	**HL-2** 6/25/02 1400	**HL-3A** 6/25/2002 1530	**HL-3B** 6/25/2002 1600	**DLR**	**WQ Objective**	**Units**
Alkalinity (CaCO3)	24	2.0	4.0	6.0	2.0	12	4.0	6.0	2.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	24	2.0	4.0	6.0	2.0	12	4.0	6.0	2.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.1	1.2	1.2	1.2	1.1	1.3	1.3	1.4	1.3	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll-a	ND	0.001	ND	ND	0.001	ND	ND	ND	ND	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	2.7	3.0	3.0	3.0	2.7	3.6	3.6	3.9	3.6	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	ND	ND	ND	ND	ND	0.10	0.10	0.10	0.10	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	ND	ND	ND	ND	ND	ND	ND	1.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**6.2**	**4.6**	**5.0**	**4.8**	**4.8**	**6.1**	**4.8**	**4.8**	**4.9**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	ND	ND	ND	ND	ND	1.0	ND	1.0	ND	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	10	14	ND	ND	ND	12	17	17	16	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.20	0.20	0.20	0.20	0.30	0.40	0.40	0.40	0.40	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	<2	<2	<2	2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	4	2	2	<2	4	4	<2	<2	23	2	ns	MPN/100mL
TPH as Diesel	ND	ND	ND	ND	ND	**57**	ND	**180**	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5	ug/L
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	1750	ug/L

ND - Not Detected above DLR
* Naturally occurring low alkalinity levels in Project area.
** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection
*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection
‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-9. June 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	MP-1 (7M)	MP-1 (10M)	MP-2	MP-3 (4M)	MP-3 (7M)	SL-1	SL-2A	SL-2B	SL-3A	SL-3B	DLR	WQ Objective	Units
Date Sampled	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	6/24/02	6/24/02	6/24/2002	6/24/2002	6/24/2002			
Time Sampled	1030	1040	1420	1300	1300	1430	1145	1200	1030	1045			
Alkalinity (CaCO3)	10	10	10	8.0	10	8.0	12	10	26	6.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	10	10	10	8.0	10	8.0	12	10	26	6.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	2.7	2.8	2.6	2.4	2.4	1.9	1.8	1.7	1.8	1.7	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	2.0	2.0	1.0	1.0	1.0	1.0	1.0	ND	ND	ND	1	250	mg/L
Chlorophyll-a	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	8.4	9.0	8.6	7.6	7.6	5.6	5.3	5.1	5.3	5.1	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.40	0.50	0.50	0.40	0.40	0.20	0.20	0.20	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	0.40	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	1.0	ND	1.0	1.0	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.9**	**5.9**	**5.7**	**6.0**	**5.8**	**5.7**	**5.8**	**5.8**	**7.6**	**5.8**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	20	10	22	19	14	12	21	23	22	26	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	5.0	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.30	0.30	0.20	0.30	0.30	0.50	0.80	0.70	0.80	0.60	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	<2	2	17	2	<2	<2	2	170	4	4	2	ns	MPN/100mL
TPH as Diesel	ND	ND	ND	**610**	ND	**100**	**140**	**75**	**160**	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5	ug/L
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	0.36	ND	0.36	ND	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	ND	ND	0.34	ND	0.32	ND	0.3	1750	ug/L

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-9. June 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	**BA-1**	**BA-2**	**BC-4**	**BC-8**	**SJ-8**	**BE-2**	**MO-1A**	**MO-1B**	**DLR**	**WQ Objective**	**Units**
Date Sampled	6/27/02	6/27/02	6/27/02	6/27/02	6/27/02	6/28/02	6/28/02	6/28/2002			
Time Sampled	1445	1505	0800	0945	1040	1005	0830	0840			
Alkalinity (CaCO3)	4.0	4.0	8.0	10	6.0	4.0	8.0	10	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	4.0	4.0	8.0	10	6.0	4.0	8.0	10	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.4	1.4	1.6	2.0	1.8	1.2	2.3	2.3	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll-a	ND	ND	ND	ND	ND	ND	ND	ND	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	3.5	3.9	4.4	5.8	5.3	3.0	7.4	7.4	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	ND	ND	**0.32**	0.28	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	ND	0.10	0.10	0.20	0.20	ND	0.40	0.40	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	0.020	0.010	ND	0.040	**0.050**	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	ND	ND	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.0**	**5.0**	**4.9**	**5.0**	**5.1**	**5.5**	**5.8**	**5.8**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	1.0	1.0	1.0	2.0	2.0	ND	1.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	16	23	21	26	27	16	31	31	5	500	mg/L
Total Suspended (TSS)	ND	ND	5.0	ND	6.0	ND	ND	ND	5	ns	mg/L
Turbidity	0.40	0.50	0.40	0.40	0.40	0.20	0.80	0.80	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	2	<2	4	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	<2	14	4	4		4	<2	4	2	ns	MPN/100mL

ND - Not Detected above DLR
* Naturally occurring low alkalinity levels in Project area.
** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection
*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection
‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-10. July 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling

Station	MP-1A	MP-1B	MP-2A	MP-2B	MP-3A	MP-3B	SL-1A	SL-1B	SL-2A	SL-2B	SL-3A	SL-3B	DLR	WQ Objective	Units
Date Sampled	7/22/02	7/22/02	7/22/02	7/22/02	7/22/02	7/22/02	7/26/02	7/26/02	7/26/02	7/26/02	7/26/02	7/26/02			
Time Sampled	1330	1345	1200	1215	0915	0925	1100	1115	0945	1000	0900	0915			
Alkalinity (CaCO3)	10	12	10	12	12	14	6.0	6.0	6.0	6.0	6.0	6.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	2.0	3.0	2.0	3.0	3.0	5.0	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	10	12	10	12	12	14	6.0	6.0	6.0	6.0	6.0	6.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	3.1	2.8	2.9	2.9	2.9	3.3	1.7	2.0	1.7	1.7	1.7	1.7	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	3.0	2.0	2.0	2.0	2.0	2.0	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll-a	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.003	0.001	0.001	0.001	0.002	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	10	9.5	9.7	9.7	9.7	11	5.1	5.8	5.1	5.1	5.1	5.1	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.60	0.60	0.60	0.60	0.60	0.70	0.20	0.20	0.20	0.20	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	ND	ND	ND	ND	ND	ND	3.0	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**6.1**	**6.0**	**6.3**	**6.0**	**6.0**	**6.0**	**6.1**	**5.7**	**5.7**	**5.7**	**5.7**	**5.7**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Sodium (Na)	4.0	3.0	3.0	3.0	3.0	4.0	2.0	2.0	2.0	1.0	2.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	30	23	19	28	41	35	24	15	8.0	23	23	23	5	500	mg/L
Total Suspended (TSS)	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	5	ns	mg/L
Turbidity	0.30	0.30	0.40	0.20	0.40	0.30	0.60	0.60	0.60	0.70	0.80	0.90	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	2	<2	7	<2	2	17	<2	<2	<2	<2	<2	<2	2	ns	MPN/100mL
TPH as Diesel	**50**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	ND	ND	ND	5.5	ND	**8.8**	**6.2**	**9.5**	**9.9**	5	5	ug/L
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5	0.32	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	0.46	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ND	0.33	0.64	ND	0.72	1.6	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	ND	0.56	ND	ND	ND	ND	0.43	1.2	0.3	1750	ug/L

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-10. July 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station Date Sampled Time Sampled	FL-1A 7/24/02 1315	FL-1B 7/24/02 1330	FL-2A 7/24/02 1130	FL-2B 7/24/02 1145	FL-3A 7/24/02 1000	FL-3B 7/24/02 1015	HL-1A 7/23/02 1330	HL-1B 7/23/02 1345	HL-2 7/23/02 1030	HL-3A 7/23/02 1130	HL-3B 7/23/02 1145	DLR	WQ Objective	Units
Alkalinity (CaCO3)	4.0	2.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	4.0	2.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.4	1.3	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll-a	0.002	0.001	ND	0.002	0.001	0.001	0.004	0.007	0.006	0.001	0.004	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	3.4	3.4	3.4	3.4	3.4	3.4	4.3	3.9	3.9	4.3	3.6	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.10	0.10	0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.20	0.10	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.4**	**5.3**	**5.4**	**5.5**	**5.4**	**5.4**	**5.6**	**5.5**	**5.8**	**5.7**	**5.7**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	ND	ND	ND	ND	ND	ND	1.0	1.0	ND	1.0	1.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	22	30	33	25	47	27	29	22	17	23	23	5	500	mg/L
Total Suspended (TSS)	ND	8.0	ND	8.0	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.20	0.30	0.20	0.20	0.30	0.40	0.30	0.40	0.50	0.40	0.30	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	8	50	14	<2	2	<2	<2	2	<2	<2	4	2	ns	MPN/100mL
TPH as Diesel	**1800**	**99**	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5	ug/L
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	1750	ug/L

ND - Not Detected above DLR
* Naturally occurring low alkalinity levels in Project area.
** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection
*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection
‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-10. July 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	BA-1A	BA-1B	BA-2	BC-4	BC-8	BE-2	MO-1	SJ-8	DLR	WQ Objective	Units
Date Sampled	7/25/02	7/25/02	7/25/02	7/23/02	7/23/02	7/25/02	7/25/02	7/25/2002			
Time Sampled	1330	1345	1400	1720	1830	0945	0845	1630			
Alkalinity (CaCO3)	6.0	6.0	6.0	4.0	4.0	6.0	6.0	8.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	6.0	6.0	6.0	4.0	4.0	6.0	6.0	8.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.5	1.4	1.5	1.4	1.7	1.2	1.2	1.8	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll-a	0.003	0.004	0.004	0.002	0.001	ND	0.002	0.001	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	4.6	3.9	4.2	4.3	5.1	3.0	3.4	5.3	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	0.070	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.20	0.10	0.10	0.20	0.20	ND	0.10	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	0.020	ND	ND	0.010	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	ND	ND	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.9**	**5.7**	**5.7**	**5.2**	**5.4**	**5.7**	**6.4**	**5.7**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	1.0	1.0	1.0	1.0	1.0	ND	ND	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	35	36	48	23	36	9.0	14	42	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	ND	8.0	5	ns	mg/L
Turbidity	0.60	0.40	0.50	0.20	0.30	0.10	0.30	0.30	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	<2	<2	#	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	2	2	2	<2	9	<2	2	#	2	ns	MPN/100mL

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

\# Sample lost due to lab accident

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-11. August 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling

Station	**FL-1**	**FL-2**	**FL-3**	**HL-1A**	**HL-1B**	**HL-2A**	**HL-2B**	**HL-3A**	**HL-3B**	**DLR**	**WQ Objective**	**Units**
Date Sampled	8/20/02	8/20/02	8/20/02	8/19/02	8/19/02	8/19/02	8/19/02	8/19/2002	8/19/2002			
Time Sampled	1445	1400	1215	1230	1245	1545	1545	1720	1730			
Alkalinity (CaCO3)	4.0	4.0	2.0	8.0	4.0	6.0	4.0	4.0	6.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	4.0	4.0	2.0	8.0	4.0	6.0	4.0	4.0	6.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.3	1.3	1.2	1.4	1.4	1.4	1.5	1.5	1.4	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll-a	0.006	ND	0.004	0.001	0.001	0.001	0.002	0.001	0.001	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	3.6	3.2	3.0	3.9	3.9	3.9	4.6	4.2	3.9	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.10	ND	ND	0.10	0.10	0.10	0.20	0.10	0.10	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	1.0	1.0	1.0	1.0	1.0	1.0	1.0	8.0	1.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.5**	**5.6**	**5.5**	**6.1**	**5.6**	**5.5**	**5.4**	**5.5**	**5.5**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	ND	ND	ND	1.0	1.0	1.0	1.0	1.0	1.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	34	14	14	24	7.0	21	25	27	18	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.20	0.20	0.20	0.50	0.40	0.20	0.30	0.20	0.30	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	<2	<2	<2	2	<2	6	20	7	21	2	ns	MPN/100mL
TPH as Diesel	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5	ug/L
Benzene	ND	0.34	ND	ND	ND	ND	ND	ND	ND	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	1750	ug/L

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-11. August 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station Date Sampled Time Sampled	MP-1 8/21/02 1430	MP-2 8/21/02 1230	MP-3 8/21/02 1130	SL-1A 8/22/02 1310	SL-1B 8/22/02 1320	SL-2A 8/22/02 1040	SL-2B 8/22/02 1050	SL-3A 8/22/2002 0930	SL-3B 8/22/2002 0940	DLR	WQ Objective	Units
Alkalinity (CaCO3)	14	14	16	6.0	6.0	6.0	6.0	4.0	6.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	3.0	3.0	4.0	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	14	14	16	6.0	6.0	6.0	6.0	4.0	6.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	3.3	3.3	3.5	1.8	1.6	1.7	1.7	1.7	1.7	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	3.0	3.0	3.0	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll-a	ND	0.001	0.005	0.007	0.007	0.005	0.005	0.006	0.004	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	11	11	12	5.3	4.8	5.1	5.1	5.1	5.1	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.60	0.60	0.70	0.20	0.20	0.20	0.20	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.9**	**5.9**	**5.9**	**5.7**	**5.7**	**5.6**	**5.6**	**5.6**	**5.6**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	4.0	4.0	4.0	ND	1.0	2.0	1.0	2.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	54	37	38	28	22	21	20	22	22	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.20	0.20	0.30	0.80	0.60	0.60	0.70	0.60	0.50	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	<2	<2	2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	2	<2	<2	9	8	50	13	300	70	2	ns	MPN/100mL
TPH as Diesel	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	**10**	**5.6**	**6.6**	**7.8**	**7.2**	**6.1**	5	5	ug/L
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	1750	ug/L

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-11. August 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station Date Sampled Time Sampled	BA-1 8/23/02 1015	BA-2 8/23/02 0940	MO-1 8/26/02 1015	BC-4 8/26/02 1420	BE-2 8/27/02 1045	BC-8 8/27/02 1500	SJ-8 8/28/02 1000	DLR	WQ Objective	Units
Alkalinity (CaCO3)	4.0	4.0	6.0	4.0	8.0	4.0	6.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	2.0	2	10	ug/L
Bicarbonate (CaCO3)	4.0	4.0	6.0	4.0	8.0	4.0	6.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	36	36	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.5	1.6	1.8	1.5	2.2	1.6	2.2	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	1.0	1	250	mg/L
Chlorophyll-a	0.001	0.002	0.002	0.001	ND	0.001	ND	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	4.6	4.4	5.3	4.6	6.3	4.8	6.7	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	0.10	ND	0.090	0.080	0.11	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.20	0.10	0.20	0.20	0.20	0.20	0.30	0.1	ns	mg/L
Manganese (Mn)	ND	ND	0.020	0.010	ND	0.030	0.020	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	1.0	ND	ND	ND	1.0	ND	7.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.1**	**5.1**	**5.1**	**5.3**	**5.7**	**5.4**	**5.5**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	1.0	1.0	2.0	1.0	2.0	1.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	19	20	16	17	16	18	15	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	13	32	ND	5	ns	mg/L
Turbidity	0.50	0.70	0.50	0.30	0.20	0.70	0.40	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	2	<2	<2	<2	2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	11	50	<2	26	2	33	4	2	ns	MPN/100mL

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-12. September 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling

Station	**FL-1**	**FL-2**	**FL-3**	**HL-1**	**HL-2**	**HL-3**			
Date Sampled	9/24/02	9/24/02	9/24/02	9/23/02	9/23/02	9/23/02	**DLR**	**WQ Objective**	**Units**
Time Sampled	1045	1010	0945	0930	1015	1110			
Alkalinity (CaCO3)	4.0	2.0	6.0	6.0	4.0	4.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	4.0	2.0	6.0	6.0	4.0	4.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.5	1.5	1.6	1.6	1.6	1.6	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	1	250	mg/L
Chlorophyll-a	0.002	0.001	ND	ND	ND	ND	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	4.2	4.2	4.4	4.4	4.4	4.4	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	0.080	0.080	0.070	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.10	0.10	0.10	0.10	0.10	0.10	0.1	ns	mg/L
Manganese (Mn)	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	ND	1.0	ND	ND	1.0	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	1.9	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.4**	**5.4**	**5.7**	**5.7**	**5.7**	**5.7**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	1.0	1.0	1.0	1.0	1.0	1.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	8.0	14	16	20	21	22	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.30	0.30	0.30	0.20	0.20	0.30	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	<2	2	8	8	17	8	2	ns	MPN/100mL
TPH as Diesel	ND	ND	ND	ND	ND	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	ND	ND	ND	5	5	ug/L
Benzene	ND	ND	ND	ND	ND	ND	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	ND	ND	0.3	1750	ug/L

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-12. September 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	**MP-1**	**MP-2**	**MP-3A**	**MP-3B**	**SL-1**	**SL-2**	**SL-3**	**DLR**	**WQ Objective**	**Units**
Date Sampled	9/25/02	9/25/02	9/25/02	9/25/02	9/26/02	9/26/02	9/26/02			
Time Sampled	1440	1350	1100	1110	1530	1500	1420			
Alkalinity (CaCO3)	16	16	16	20	6.0	6.0	6.0	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	4.0	4.0	4.0	6.0	ND	ND	ND	2	10	ug/L
Bicarbonate (CaCO3)	16	16	16	20	6.0	6.0	6.0	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	3.7	3.8	3.8	4.3	1.7	1.7	1.7	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	3.8	3.7	3.4	4.4	ND	ND	ND	1	250	mg/L
Chlorophyll-a	0.002	ND	0.002	0.001	0.003	0.003	0.002	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	12	13	12	14	5.1	5.1	5.1	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	0.15	0.19	ND	ND	ND	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.80	0.80	0.70	0.90	0.20	0.20	0.20	0.1	ns	mg/L
Manganese (Mn)	ND	ND	0.020	0.020	ND	ND	ND	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	ND	ND	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**6.3**	**6.3**	6.5	**6.2**	**5.8**	**5.7**	**5.7**	NA	6.5-8.5	STD
Potassium (K)	ND	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	5.0	5.0	5.0	6.0	2.0	2.0	2.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	32	35	31	32	18	14	22	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.30	0.40	0.50	1.0	0.30	0.40	0.50	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	2	<2	<2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	2	8	<2	50	4	7	4	2	ns	MPN/100mL
TPH as Diesel	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
TPH as Gasoline	ND	ND	ND	ND	ND	ND	ND	50	ns	ug/L
Methyl-t-Butyl Ether	ND	ND	ND	ND	ND	ND	ND	5	5	ug/L
Benzene	ND	ND	ND	ND	ND	ND	ND	0.3	1	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	0.3	700	ug/L
Toluene	ND	ND	ND	ND	ND	ND	ND	0.3	150	ug/L
Total Xylenes	ND	ND	ND	ND	0.64	0.78	0.89	0.3	1750	ug/L

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-12. September 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	BA-1	BA-2	BC-4	BC-8	BE-2	MO-1	SJ-8	DLR	WQ Objective	Units
Date Sampled	9/26/02	9/26/02	9/23/02	9/23/02	9/24/02	9/24/02	9/23/02			
Time Sampled	1010	0940	1600	1450	1320	1410	1410			
Alkalinity (CaCO3)	4.0	ND	4.0	6.0	10	8.0	12	1	>20*	mg/L
Ammonia (NH3-N)	ND	ND	ND	ND	ND	ND	ND	1	1**	mg/L
Arsenic (As)	ND	ND	ND	ND	ND	ND	3.0	2	10	ug/L
Bicarbonate (CaCO3)	4.0	ND	4.0	6.0	10	8.0	12	1	ns	mg/L
Biochemical Oxygen Demand (BOD)	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Calcium (Ca)	1.5	1.5	1.6	1.7	2.8	1.7	3.0	0.1	ns	mg/L
Carbonate (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Chloride (Cl)	ND	ND	ND	ND	ND	ND	2.0	1	250	mg/L
Chlorophyll-a	0.001	0.002	0.001	ND	0.003	0.001	ND	0.0	ns	mg/L
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Fluoride	ND	ND	ND	ND	ND	ND	ND	0.1	2	mg/L
Hardness (Ca CO3)	4.6	4.6	4.4	5.1	8.2	5.1	9.6	1	ns	mg/L
Hydroxide (CaCO3)	ND	ND	ND	ND	ND	ND	ND	1	ns	mg/L
Iron(Fe)	ND	ND	0.070	0.13	0.15	0.10	0.14	0.05	0.3	mg/L
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Magnesium (Mg)	0.20	0.20	0.10	0.20	0.30	0.20	0.50	0.1	ns	mg/L
Manganese (Mn)	ND	ND	0.030	0.030	ND	0.010	0.030	0.01	0.05	ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Nitrate (NO3 + NO2))	1.0	ND	ND	ND	ND	ND	ND	1	10	mg/L
Nitrogen - Total Kjeldahl (TKN)	ND	ND	ND	ND	ND	ND	ND	1.0	ns	mg/L
o-Phosphate (o-PO4-P)	ND	ND	ND	ND	ND	ND	ND	0.2	ns	mg/L
pH	**5.9**	**3.1**	**5.4**	**5.6**	**5.9**	**5.9**	**5.7**	NA	6.5-8.5	STD
Potassium (K)	2.0	ND	ND	ND	ND	ND	ND	2	ns	mg/L
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Sodium (Na)	1.0	1.0	1.0	1.0	2.0	2.0	3.0	1	ns	mg/L
Sulfate (SO4)	ND	ND	ND	ND	ND	ND	ND	2	250	mg/L
Total Dissolved Solids (TDS)	16	25	15	22	20	17	29	5	500	mg/L
Total Suspended (TSS)	ND	ND	ND	ND	ND	ND	ND	5	ns	mg/L
Turbidity	0.20	0.50	0.50	1.0	0.30	0.30	1.0	0.1	‡	NTU
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Fecal Coliform (3x5 MTF)	<2	<2	<2	<2	<2	2	<2	2	200/100 ml	MPN/100mL
Total Coliform (3x5 MTF)	2	50	17	9	8	14	6	2	ns	MPN/100mL

ND - Not Detected above DLR

* Naturally occurring low alkalinity levels in Project area.

** Dependent on pH and temperature. Actual criterion for each sample depends on conditions at the time of sample collection

*** CMC value depends on hardness. Actual criterion for each sample depends on hardness at time of sample collection

‡ Turbidity shall not be increased by >1 NTU where natural turbidity is 0-5 NTU. Where natural turbidity is 5-50 NTU, increases shall not exceed 20%.

Table CAWG-4-13. Summary of Analytical Results of Water Quality Sampling for Spring 2002

Station	BO-1	BO-2	BO-3	C62-1	C62-2	C62-3	C62-4	CH-1	CH-2	CR-1	CR-2	CR-3	CR-4	DLR	WQ Objective	Units
Date Sampled	5/28/02	5/28/02	5/31/02	5/28/02	5/28/02	5/30/02	5/31/02	6/5/02	6/5/02	6/10/02	6/10/02	6/10/02	5/29/02			
Time Sampled	1000	1030	0830	1115	1143	1250	0910	0800	0815	0945	1005	1326	1045			
Arsenic (As)	ND	ND	ND	ND	ND	ND	4.0	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)																
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)															
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)																
Iron(Fe)	0.070	0.060	0.050	ND	ND	ND	0.080	ND	ND	ND	ND	0.15	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)															
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)																
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)															
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)																
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)															
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)																
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)																

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-13. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station	**BE-1**	**BE-2**	**BE-3**	**BE-4**	**MO-1**	**MO-2**	**MO-3**	**SF-1**	**SF-2**	**SF-3**	**SF-5**	**DLR**	**WQ Objective**	**Units**
Date Sampled	6/6/02	6/6/02	6/6/02	6/11/02	6/6/02	6/6/02	6/11/02	5/29/02	6/11/02	6/12/02	5/29/02			
Time Sampled	0900	0950	0945	0815	1145	1210	1055	1000	1150	1025	1240			
Arsenic (As)	ND	ND	ND	ND	ND	ND	2.0	ND	**14**	**13**	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	20	na	14	13	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)													
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	0.29	0.27	0.22	ND	0.090	**0.35**	0.060	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)													
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	0.040	0.040	0.010	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)													
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)													
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-13. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station	**HO-1**	**HO-2**	**HO-3**	**NS-1**	**NS-2**	**NS-3**	**SS-1**	**SS-2**	**SS-3**	**TS-1**	**TS-2**	**TS-3**	**DLR**	**WQ Objective**	**Units**
Date Sampled	5/30/02	5/30/02	5/30/02	5/30/02	5/30/02	5/30/02	5/30/02	5/30/02	5/30/02	6/7/02	6/7/02	5/29/02			
Time Sampled	0800	0815	0830	1045	1100	0910	1210	1230	0845	0930	0915	0930			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.0	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na	na	na	2.0	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)														
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	**0.40**	0.16	0.20	0.19	ND	0.070	0.080	0.070	0.10	0.070	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)														
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)														
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)														
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-13. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station	NF-1	NF-2	NF-3	RA-1	RA-2	RO-1	RO-2	RK-1	RK-2	RK-3	ST-1	ST-2	DLR	WQ Objective	Units
Date Sampled	5/23/02	5/23/02	5/20/02	5/24/02	5/24/02	5/21/02	5/21/02	5/22/02	5/22/02	5/22/02	5/20/02	5/21/02			
Time Sampled	1235	1245	1245	0810	0800	1007	1015	1115	1130	1225	1155	1301			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)														
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	0.12	0.080	0.14	0.12	ND	ND	ND	0.11	0.21	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)														
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	0.010	ND	ND	ND	ND	ND	0.030	0.010	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)														
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)														
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-13. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station	BC-1	BC-2	BC-3	BC-4	BC-5	BC-6	BC-7	BC-8	BC-9	BC-10	DLR	WQ Objective	Units
Date Sampled	5/24/02	5/24/02	5/20/02	5/20/02	5/20/02	5/20/02	5/21/02	5/21/02	5/21/02	5/21/02			
Time Sampled	0830	0900	0815	1030	0945	1115	0730	0805	0745	1203			
Arsenic (As)	ND	ND	ND	ND	ND	6.0	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)												
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	0.050	0.15	0.080	**0.35**	0.26	**0.39**	0.070	0.090	0.080	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)												
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	0.010	ND	ND	ND	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)												
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)												
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-13. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station	BA-1	BA-2	BA-3	BA-4	BA-5	BA-6	EL-1	EL-2	EL-3	PI-1	PI-2	PI-3	DLR	WQ Objective	Units
Date Sampled	6/5/02	6/5/02	6/5/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/24/02	5/24/02	5/20/02			
Time Sampled	1220	1330	1415	0830	0905	1200	0720	0756	1230	0750	0740	0735			
Arsenic (As)	ND	ND	ND	4.0	4.0	2.0	ND	ND	ND	ND	ND	**14**	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	4.0	4.0	2.0	na	na	na	na	na	14			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)														
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	0.050	**0.31**	0.10	0.29	**0.67**	0.070	0.060	0.070	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)														
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	0.010	ND	0.010	0.070	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)														
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)														
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-13. Summary of Analytical Results of Water Quality Sampling for Spring 2002 (continued)

Station	SJ-1	SJ-2	SJ-3	SJ-4	SJ-5	SJ-6	SJ-7	SJ-8	SJ-9	SJ-10	SJ-11	SJ-12	DLR	WQ Objective	Units
Date Sampled	6/20/02	5/22/02	5/22/02	5/21/02	5/21/02	5/21/02	5/21/02	5/21/02	5/21/02	5/21/02	5/23/02	5/22/02			
Time Sampled	1210	0925	1210	0910	0930	0910	1217	1130	1126	1345	1030	1415			
Arsenic (As)	ND	3.0	2.0	2.0	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theocritical Dissolved (As)	NA	3.0	2.0	2.0	NA	NA	NA	NA	NA	NA	NA	NA			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theocritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)														
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theocritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	0.050	0.080	0.050	0.090	0.090	0.070	0.060	0.060	0.20	0.11	0.06	0.080	0.05	0.3	mg/L
Theocritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)														
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theocritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	0.020	ND	ND	ND	ND	ND	ND	0.020	ND	ND	ND	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)														
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)														
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-14. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002

Station	BA-3	BA-4	BA-5	BA-6	EL-1	EL-3	PI-1	PI-2	PI-3	DLR	WQ Objective	Units
Date Sampled	7/10/02	7/10/02	7/10/02	7/11/02	7/10/02	7/10/02	7/10/02	7/10/02	7/10/02			
Time Sampled	0910	1140	1110	1300	1340	1410	0815	0825	1035			
Arsenic (As)	ND	6.0	6.0	6.0	ND	ND	ND	ND	**20**	2	10	ug/L
Theoritical Dissolved (As)	na	6.0	6.0	6.0	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)											
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na			
Iron(Fe)	0.11	0.17	0.060	ND	**0.36**	0.050	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)											
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	0.010	ND	ND	ND	0.020	ND	ND	ND	ND	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)											
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)											
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-14. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station	BO-1	BO-2	BO-3	C62-1	C62-2	C62-3	C62-4	CH-1	CH-2	CR-1	CR-2	CR-3	DLR	WQ Objective	Units
Date Sampled	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	7/11/02	07/11/02	07/12/02			
Time Sampled	1100	1115	0834	1220	1240	1030	0925	1355	1430	1005	1025	0935			
Arsenic (As)	ND	ND	ND	ND	ND	ND	**32**	ND	ND	ND	ND	4.0	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	32	na	na	na	na	4.0			
Boron (B)	ND	ND	ND	ND	ND	ND	0.20	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)														
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	0.10	0.080	0.050	ND	ND	0.060	ND	ND	0.070	ND	ND	**0.49**	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)														
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.020	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)														
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)														
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-14. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station	HO-1	HO-2	HO-3	NS-1	NS-2	NS-3	SS-1	SS-2	SS-3	TS-1	TS-2	TS-3	DLR	WQ Objective	Units
Date Sampled	7/11/02	7/11/02	7/12/02	7/3/02	7/3/02	7/3/02	7/3/02	7/3/02	7/3/02	7/3/2002	07/03/02	07/03/02			
Time Sampled	1230	1240	1040	1015	1010	1045	0930	0945	1035	1040	1050	1145			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)														
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	0.11	0.11	0.11	ND	0.090	ND	0.10	0.11	0.19	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)														
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)														
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)														
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-14. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station	MO-2	MO-3	NF-1	NF-2	NF-3	RA-1	RA-2	RK-1	RK-2	RK-3	RO-1	RO-2	DLR	WQ Objective	Units
Date Sampled	8/26/02	8/29/02	9/5/02	9/5/02	8/22/02	8/29/02	8/29/02	7/2/02	7/2/02	7/2/2002	06/12/02	06/12/02			
Time Sampled	1000	1030	1030	1015	1500	0900	0915	0950	1035	1020	1535	1525			
Arsenic (As)	ND	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	2.0	na	na	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)														
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	0.12	0.090	ND	ND	ND	0.090	0.070	ND	0.060	ND	0.060	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)														
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	0.020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)														
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)														
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-14. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station	BC-1	BC-2	BC-3	BC-5	BC-6	BC-7	BC-8	BC-9	BC-10	BE-1	BE-2	BE-3	BE-4	DLR	WQ Objective	Units
Date Sampled	8/29/02	8/29/02	8/26/02	8/26/02	9/5/02	8/27/02	8/27/02	8/27/02	8/28/02	8/27/02	08/27/02	08/27/02	8/27/02			
Time Sampled	1000	0800	1350	1445	1130	1555	1500	1530	1015	1000	1045	1130	1105			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)															
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	0.060	ND	0.080	0.10	0.10	0.080	0.080	0.10	0.060	ND	0.090	0.14	0.070	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)															
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	0.010	ND	ND	ND	ND	0.030	0.030	ND	ND	ND	ND	ND	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)															
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)															
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-14. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station	SJ-1	SJ-2	SJ-3	SJ-4	SJ-5	SJ-6	SJ-7	SJ-8	SJ-9	SJ-10	SJ-11	SJ-12	DLR	WQ Objective	Units
Date Sampled	8/21/02	8/21/02	9/4/02	8/28/02	8/28/02	8/28/02	8/28/02	8/28/02	8/28/02	9/3/2002	09/03/02	09/03/02			
Time Sampled	1045	1600	1100	1125	1150	1115	1030	1000	0930	0950	1230	1145			
Arsenic (As)	9.0	3.0	4.0	2.0	3.0	4.0	ND	2.0	3.0	ND	ND	2.0	2	10	ug/L
Theoritical Dissolved (As)	9.0	3.0	4.0	2.0	3.0	4.0	na	2.0	3.0	na	na	2.0			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)														
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	0.060	0.12	0.070	0.060	ND	0.12	0.13	0.11	0.23	0.090	ND	0.10	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)														
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	0.010	ND	ND	ND	0.010	0.040	0.020	0.030	ND	ND	0.020	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)														
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)														
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-14. Summary of Analytical Results of Water Quality Sampling for Fall Baseflow 2002 (continued)

Station		SF-1	SF-2	SF-3	SF-4	SF-5	ST-1	ST-2	DLR	WQ Objective	Units
Date Sampled		8/20/02	8/29/02	8/29/02	9/4/02	8/20/02	8/22/02	9/3/02			
Time Sampled		1630	1215	1045	1530	1100	1530	0930			
Arsenic (As)		ND	**14**	**10**	**12**	ND	ND	ND	2	10	ug/L
	Theoritical Dissolved (As)	na	**14**	**10**	**12**	na	na	na			
Boron (B)		ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
	Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metals Translator (EPA 1996)									
Copper (Cu)		ND	ND	ND	ND	ND	ND	ND	0.05	0.0015***	mg/L
	Theoritical Dissolved (Cu)	na	na	na	na	na	na	na			
Iron(Fe)		**0.30**	0.16	0.12	0.12	ND	**0.40**	**0.30**	0.05	0.3	mg/L
	Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metals Translator (EPA 1996)									
Lead (Pb)		ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
	Theoritical Dissolved (Pb)	na	na	na	na	na	na	na			
Manganese (Mn)		0.030	ND	ND	ND	ND	**0.12**	ND	0.01	0.05	mg/L
	Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metals Translator (EPA 1996)									
Mercury (Hg)		ND	ND	ND	ND	ND	ND	ND	0.4	0.05	ug/L
	Theoritical Dissolved (Hg)	na	na	na	na	na	na	na			
Molybdenum (Mo)		ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
	Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metals Translator (EPA 1996)									
Silver (Ag)		ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
	Theoritical Dissolved (Ag)	na	na	na	na	na	na	na			
Zinc (Zn)		ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
	Theoritical Dissolved (Zn)	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. May 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling

Station	**BA-1**	**BA-2**	**BC-4**	**BC-8**	**BE-2**	**MO-1**	**SJ-8**	**DLR**	**WQ Objective**	**Units**
Date Sampled	6/5/02	6/5/02	5/20/02	5/21/02	6/6/02	6/6/02	5/21/02			
Time Sampled	1220	1330	1030	0805	0950	1145	1130			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)									
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	0.080	0.070	ND	0.29	0.060	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)									
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	0.040	ND	0.01	0.05	mg/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)									
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)									
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. May 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	MP-1	MP-2	MP-3	SL-1	SL-2	SL-3A	SL-3B	DLR	WQ Objective	Units
Date Sampled	5/22/02	5/22/02	5/22/02	5/23/02	5/23/02	5/23/02	5/23/02			
Time Sampled	1115	1215	1330	1200	1100	1020	1000			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)									
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na			
Iron(Fe)	0.050	0.060	0.060	ND	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)									
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)									
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)									
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. May 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	FL-1	FL-2	FL-3	HL-1	HL-2	HL-3A	HL-3B	DLR	WQ Objective	Units
Date Sampled	5/29/02	5/29/02	5/29/02	5/28/02	5/28/02	5/28/02	5/28/02			
Time Sampled	0930	1025	1230	1035	1140	1230	1240			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)									
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)									
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)									
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)									
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. June 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling

Station	**FL-1**	**FL-2A**	**FL-2B**	**FL-3A**	**FL-3B**	**HL-1**	**HL-2**	**HL-3A**	**HL-3B**	**DLR**	**WQ Objective**	**Units**
Date Sampled	6/26/02	6/26/02	6/26/02	6/26/02	6/26/02	6/25/02	6/25/02	6/25/2002	6/25/2002			
Time Sampled	1100	1100	1250	1445	1500	1100	1400	1530	1600			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)											
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)											
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)											
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)											
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. June 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	MP-1 (7M)	MP-1 (10M)	MP-2	MP-3 (4M)	MP-3 (7M)	SL-1	SL-2A	SL-2B	SL-3A	SL-3B	DLR	WQ Objective	Units
Date Sampled	7/2/02	7/2/02	7/2/02	7/2/02	7/2/02	6/24/02	6/24/02	6/24/2002	6/24/2002	6/24/2002			
Time Sampled	1030	1040	1420	1300	1300	1430	1145	1200	1030	1045			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)												
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)												
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)												
Mercury (Hg)	ND	ND	ND	ND	ND	ND	0.40	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)												
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. June 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	**BA-1**	**BA-2**	**BC-4**	**BC-8**	**SJ-8**	**BE-2**	**MO-1A**	**MO-1B**	**DLR**	**WQ Objective**	**Units**
Date Sampled	6/27/02	6/27/02	6/27/02	6/27/02	6/27/02	6/28/02	6/28/02	6/28/2002			
Time Sampled	1445	1505	0800	0945	1040	1005	0830	0840			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)										
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	ND	ND	**0.32**	0.28	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)										
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	0.020	0.010	ND	0.040	**0.050**	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)										
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)										
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. July 2002 Reservoir Profiling Summary of Analytical Results of Water Quality Sampling

Station	MP-1A	MP-1B	MP-2A	MP-2B	MP-3A	MP-3B	SL-1A	SL-1B	SL-2A	SL-2B	SL-3A	SL-3B	DLR	WQ Objective	Units
Date Sampled	7/22/02	7/22/02	7/22/02	7/22/02	7/22/02	7/22/02	7/26/02	7/26/02	7/26/02	7/26/02	7/26/02	7/26/02			
Time Sampled	1330	1345	1200	1215	0915	0925	1100	1115	0945	1000	0900	0915			
Arsenic (As)	2.0	3.0	2.0	3.0	3.0	5.0	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	2.0	3.0	2.0	3.0	3.0	5.0	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)														
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)														
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)														
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)														
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	0.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. July 2002 Reservoir Profiling Summary of Analytical Results of Water Quality Sampling (continued)

Station	FL-1A	FL-1B	FL-2A	FL-2B	FL-3A	FL-3B	HL-1A	HL-1B	HL-2	HL-3A	HL-3B	DLR	WQ Objective	Units
Date Sampled	7/24/02	7/24/02	7/24/02	7/24/02	7/24/02	7/24/02	7/23/02	7/23/02	7/23/02	7/23/02	7/23/02			
Time Sampled	1315	1330	1130	1145	1000	1015	1330	1345	1030	1130	1145			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)													
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)													
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na							
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)													
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na							
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)													
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na							
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na							

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. July 2002 Reservoir Profiling Summary of Analytical Results of Water Quality Sampling (continued)

Station	BA-1A	BA-1B	BA-2	BC-4	BC-8	BE-2	MO-1	SJ-8	DLR	WQ Objective	Units
Date Sampled	7/25/02	7/25/02	7/25/02	7/23/02	7/23/02	7/25/02	7/25/02	7/25/02			
Time Sampled	1330	1345	1400	1720	1830	0945	0845	1630			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)										
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	0.070	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)										
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	0.020	ND	ND	0.010	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)										
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)										
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. August 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling

Station	FL-1	FL-2	FL-3	HL-1A	HL-1B	HL-2A	HL-2B	HL-3A	HL-3B	DLR	WQ Objective	Units
Date Sampled	8/20/02	8/20/02	8/20/02	8/19/02	8/19/02	8/19/02	8/19/02	8/19/2002	8/19/2002			
Time Sampled	1445	1400	1215	1230	1245	1545	1545	1720	1730			
Arsenic (As)	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)											
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)											
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)											
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)											
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. August 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	**MP-1**	**MP-2**	**MP-3**	**SL-1A**	**SL-1B**	**SL-2A**	**SL-2B**	**SL-3A**	**SL-3B**	**DLR**	**WQ Objective**	**Units**
Date Sampled	8/21/02	8/21/02	8/21/02	8/22/02	8/22/02	8/22/02	8/22/02	8/22/2002	8/22/2002			
Time Sampled	1430	1230	1130	1310	1320	1040	1050	0930	0940			
Arsenic (As)	3.0	3.0	4.0	ND	ND	ND	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	3.0	3.0	4.0	na	na	na	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)											
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)											
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)											
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)											
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. August 2002 Reservoir Profiling, Summary of Analytical Results of Water Quality Sampling (continued)

Station	BA-1	BA-2	MO-1	BC-4	BE-2	BC-8	SJ-8	DLR	WQ Objective	Units
Date Sampled	8/23/02	8/23/02	8/26/02	8/26/02	8/27/02	8/27/02	8/28/02			
Time Sampled	1015	0940	1015	1420	1045	1500	1000			
Arsenic (As)	ND	ND	ND	ND	ND	ND	2.0	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	2.0			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)									
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	0.10	ND	0.090	0.080	0.11	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)									
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	0.020	0.010	ND	0.030	0.020	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)									
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)									
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. September 2002 Reservoir Profiling, Summary of Analytical Resorts of Water Quality Sampling

Station		**FL-1**	**FL-2**	**FL-3**	**HL-1**	**HL-2**	**HL-3**	**DLR**	**WQ Objective**	**Units**
Date Sampled		9/24/02	9/24/02	9/24/02	9/23/02	9/23/02	9/23/02			
Time Sampled		1045	1010	0945	0930	1015	1110			
Arsenic (As)		ND	ND	ND	ND	ND	ND	2	10	ug/L
	Theoritical Dissolved (As)	na	na	na	na	na	na			
Boron (B)		ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
	Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)								
Copper (Cu)		ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
	Theoritical Dissolved (Cu)	na	na	na	na	na	na			
Iron(Fe)		0.080	0.080	0.070	ND	ND	ND	0.05	0.3	mg/L
	Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)								
Lead (Pb)		ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
	Theoritical Dissolved (Pb)	na	na	na	na	na	na			
Manganese (Mn)		ND	ND	ND	ND	ND	ND	0.01	0.05	ug/L
	Theoritical Dissolved Mn)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)								
Mercury (Hg)		ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
	Theoritical Dissolved (Hg)	na	na	na	na	na	na			
Molybdenum (Mo)		ND	ND	ND	ND	ND	ND	10	ns	ug/L
	Theoritical Dissolved Mo)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)								
Silver (Ag)		ND	ND	ND	ND	ND	ND	10	.07***	ug/L
	Theoritical Dissolved (Ag)	na	na	na	na	na	na			
Zinc (Zn)		ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
	Theoritical Dissolved (Zn)	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. September 2002 Reservoir Profiling, Summary of Analytical Resorts of Water Quality Sampling (continued)

Station	MP-1	MP-2	MP-3A	MP-3B	SL-1	SL-2	SL-3	DLR	WQ Objective	Units
Date Sampled	9/25/02	9/25/02	9/25/02	9/25/02	9/26/02	9/26/02	9/26/02			
Time Sampled	1440	1350	1100	1110	1530	1500	1420			
Arsenic (As)	4.0	4.0	4.0	6.0	ND	ND	ND	2	10	ug/L
Theoritical Dissolved (As)	4.0	4.0	4.0	6.0	na	na	na			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)									
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	0.15	0.19	ND	ND	ND	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)									
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	0.020	0.020	ND	ND	ND	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)									
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)									
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

Table CAWG-4-15. September 2002 Reservoir Profiling, Summary of Analytical Resorts of Water Quality Sampling (continued)

Station	BA-1	BA-2	BC-4	BC-8	BE-2	MO-1	SJ-8	DLR	WQ Objective	Units
Date Sampled	9/26/2002	9/26/2002	9/23/2002	9/23/2002	9/24/2002	9/24/2002	9/23/2002			
Time Sampled	1010	0940	1600	1450	1320	1410	1410			
Arsenic (As)	ND	ND	ND	ND	ND	ND	3.0	2	10	ug/L
Theoritical Dissolved (As)	na	na	na	na	na	na	3.0			
Boron (B)	ND	ND	ND	ND	ND	ND	ND	0.1	ns	mg/L
Theoritical Dissolved (B)	Not applicable - No conversion factor provided for boron in the Metal Translator (EPA 1996)									
Copper (Cu)	ND	ND	ND	ND	ND	ND	ND	0.05	.0015***	mg/L
Theoritical Dissolved (Cu)	na	na	na	na	na	na	na			
Iron(Fe)	ND	ND	0.070	0.13	0.15	0.10	0.14	0.05	0.3	mg/L
Theoritical Dissolved (Fe)	Not applicable - No conversion factor provided for iron in the Metal Translator (EPA 1996)									
Lead (Pb)	ND	ND	ND	ND	ND	ND	ND	5	4.9***	ug/L
Theoritical Dissolved (Pb)	na	na	na	na	na	na	na			
Manganese (Mn)	ND	ND	0.030	0.030	ND	0.010	0.030	0.01	0.05	ug/L
Theoritical Dissolved (Mn)	Not applicable - No conversion factor provided for manganese in the Metal Translator (EPA 1996)									
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.4	CTR=0.5	ug/L
Theoritical Dissolved (Hg)	na	na	na	na	na	na	na			
Molybdenum (Mo)	ND	ND	ND	ND	ND	ND	ND	10	ns	ug/L
Theoritical Dissolved (Mo)	Not applicable - No conversion factor provided for molybdenum in the Metal Translator (EPA 1996)									
Silver (Ag)	ND	ND	ND	ND	ND	ND	ND	10	.07***	ug/L
Theoritical Dissolved (Ag)	na	na	na	na	na	na	na			
Zinc (Zn)	ND	ND	ND	ND	ND	ND	ND	0.05	0.017***	mg/L
Theoritical Dissolved (Zn)	na	na	na	na	na	na	na			

ND - Not Detected above DLR

The conversion factor in the Metals Translator (EPA 1996) for arsenic and lead is 1.0 therefore dissolved and total concentrations will be the same.

The Metals Translator (EPA 1996) does not provide conversion factors for boron, iron, or molybdenum

FIGURES

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APPENDIX A

Overview of Water Quality Parameters

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS

General Parameters

Temperature

Ambient water temperature is a measurement of the intensity of heat stored in a volume of water and is generally reported in degrees Celsius (ºC) or Fahrenheit (ºF). Natural heat sources include solar radiation, air transfer, condensation of water vapor at the water surface, sediments, precipitation, surface runoff, and groundwater (MELP 1998). Anthropogenic sources of heat include industrial effluents, agriculture, forest harvesting, decreases in streamside vegetation, urban development, and mining.

Water temperature has important effects on aquatic life. Increased water temperature reduces oxygen solubility while elevating metabolic oxygen demand, thus causing lower oxygen concentrations, which may be detrimental to some aquatic organisms (MELP 1998). Reproductive activities are often controlled by water temperature. A rise in temperature can also provide conditions for the growth of disease-causing organisms. Temperature also influences the solubility of many chemical compounds, thus affecting their toxicity to aquatic life.

pH

A pH value is a measure of the hydrogen ion activity (concentration) of water. It is controlled by interrelated chemical reactions that produce or consume hydrogen ions (Hem 1989). The pH of water is a useful index of the status of equilibrium reactions in which the water participates. A pH of 7 is considered neutral, values less than 7 are acidic, and values greater than 7 are basic. Since the units of pH are logarithmic, a difference of one full unit represents a 10-fold change in hydrogen ion concentration. The pH of natural freshwaters varies from 4.0 to 10.0, although most fall in the range of 6.5-8.5 (Hem 1989).

Unusually high or low pH can have adverse effects on aquatic life. Values above 9.5 and below 4.5 are lethal to aquatic organisms (Wetzel 2001). In natural waters that are well buffered by the carbon dioxide-bicarbonate system, the pH would be maintained around 7-7.5, even with moderate additions of acid or base. Most streams draining coniferous woodlands tend to be slightly acidic (6.5-6.8) due to organic acids produced by decaying organic matte (NEGRDC 2000). Photosynthesis of aquatic organisms can cause diurnal fluctuations in pH, with a maximum value as high as 9.0 (Hem 1989).

Dissolved Oxygen

Dissolved oxygen (DO) is a measure of the amount of oxygen dissolved in water. Dissolved oxygen is derived from the atmosphere and photosynthetic production by aquatic plants. Values for DO in water analyses are commonly given in mg/L, although

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

a percentage of saturation may also be used. The concentration of DO in surface water is usually less than 10 mg/L (MELP 1998). The actual concentration will vary with other parameters such as temperature, elevation, photosynthetic activity, biotic activity, stream discharge, and the concentration of other solutes (Hem 1989). The maximum solubility of oxygen (fully saturated) at sea level is 12.75 mg/L at 5º C and 8 mg/L at 25º C. Increasing temperature or elevation will result in lower DO.

Dissolved oxygen is essential for the respiration of most aquatic organisms (MELP 1998). Nutrient solubility and availability rely partly on DO levels, and thus it also affects the productivity of aquatic ecosystems. Low DO facilitates the release of nutrients, whereas high DO suppresses nutrient release.

Specific Conductivity

Specific conductivity is a measurement of the ability of water to conduct an electric current and provides an estimate of the concentration of dissolved solids (Stednick 1991). This property is related to water temperature and total ion content, which depends on the concentration of dissolved metals and other dissolved materials (MELP 1998). Specific conductivity is measured in terms of resistance and reported in microsiemens per centimeter (µs/cm). The water source and geologic composition of the watershed are important controlling factors of specific conductivity. The conductivity of freshwater at 25º C varies between 50 and 1500 µs/cm.

Conductivity itself is not an aquatic health concern, but it does serve as an indicator of other water quality concerns (NEGRDC 2000).

Turbidity

Turbidity is a measurement of the amount of light that is scattered or absorbed, and is an indicator of suspended particulate matter in a water body. Materials that contribute to turbidity include silt, clay, finely divided organic material, soluble organic compounds and microorganisms (MELP 1998). Turbidity values are reported in Nephelometric Turbidity Units (NTU). Turbidity values of 10 NTU or less represent very clear water; 50 NTU is cloudy; and 100-500 NTU is very cloudy to muddy (NEGRDC 2000).

High turbidity levels can have adverse effects in aquatic ecosystems. High turbidity reduces light penetration, which impairs photosynthesis of submerged vegetation and algae (MELP 1998). A reduction in plant growth will reduce the production of aquatic invertebrates and fish species. High turbidity affects the ability of fish to find and capture food and can impair gill function in some fish under chronically high levels (NEGRDC 2000). High turbidity also increases the total available surface area of suspended solids upon which bacteria can grow.

Total Suspended Solids

Total suspended solids (TSS) is a measurement of particulate matter suspended in the water column and is typically reported in mg/L (MELP 1998). Turbidity units (NTUs)

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

correspond approximately to TSS concentrations. Total suspended solids fluctuate with stream flow and may increase significantly with increased runoff caused by rainfall and snowmelt. According to one source, average TSS concentrations of 25-80 mg/L represent good to moderate water quality condition (NEGRDC 2000).

As with turbidity, high TSS concentrations can increase turbidity, resulting in reduced light penetration, reduced primary productivity, damage to fish gills, and impaired fish feeding ability.

The freshwater aquatic life criterion for TSS set forth in the EPA's *Quality Criteria for Water* (1976) states that "settable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life."

In other words, light penetration should not be decreased more than 10 percent. Average concentrations of 25 mg/L have been suggested as an indicator of unimpaired water quality and 50 mg/L has been used as a screening level in some states (NEGRDC 2000).

Total Dissolved Solids

Total dissolved solids (TDS) is a measure of the concentration of all dissolved inorganic salts in the water column and is reported in mg/L. The value of TDS in fresh water naturally ranges from 0-1,000 mg/L (MELP 1998). The composition of TDS includes dissolved salts such as sodium, chloride, potassium, calcium, magnesium and sulfate.

The effect of elevated TDS levels on aquatic plants and animals depends on the ionic composition of the dissolved material and the extent of the increase in concentration.

Alkalinity

Alkalinity is a measurement of the ability of water to neutralize acids (buffering capacity) and is generally derived from the presence of dissolved carbonate and bicarbonate ions. Alkalinity is the concentration of bases dissolved in water. These bases are usually carbonate and bicarbonate, but can also be hydroxides. These buffers are important because they slow the rate at which the pH changes. When the pH is very high (>9) hydroxide ions may also be present (Wetzel 2001). Alkalinity is typically expressed as an equivalent amount of calcium carbonate in mg/L and generally ranges from 0-500 mg/L in fresh waters (MELP 1998). Alkalinity values less than 10 mg/L are considered very low and the pH of these waters is very susceptible to acid inputs (Wetzel 2001). Values between 10-20 mg/L are considered moderately susceptible to acid inputs.

In general, very low or high alkalinity itself does not cause detrimental effects to aquatic organisms. However, the concentration of the dissolved materials (alkalinity) and their ratio to one another determine the actual pH and buffering capacity in a given water system (Wetzel 2001). Waters with very low alkalinity values have little capacity to

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

buffer acid inputs and are thus susceptible to acidification (MELP 1998). As previously discussed, extreme pH values can adversely affect aquatic biota, particularly in low pH (acidic) waters. Acidified drainage basins are known to possess increased sulfate and dissolved aluminum concentrations, as well as significant changes in the ion species and ratios (Wetzel 2001). In some inland waters of extremely high salinity, hydroxide, borate, silicate, phosphate and sulfide may be the major sources of alkalinity (Wetzel 2001). Relatively few aquatic organisms are adapted to these unusual conditions.

The Basin Plan, CTR, and NTR do not specify an alkalinity criterion. The NTR recommends a minimum value of 20 mg/L (as $CaCO_3$) for the protection of freshwater aquatic life, except where natural concentrations are less. In most parts of the study area, alkalinity was <20 mg/L and tended to decrease from downstream to upstream.

Hardness

The hardness of water is based on its content of calcium and magnesium salts, combined with bicarbonate and carbonate (temporary hardness) and with sulfates, chlorides, and other anions of mineral acids (permanent hardness) (Wetzel 2001). Hardness is expressed in degrees of hardness or mg/L of calcium carbonate. Values >120 mg/L are considered hard, while values <60 mg/L are considered soft (Hem 1989).

Water hardness can have indirect effects on aquatic biota, primarily by affecting the toxicity of certain metals (MELP 1998). The binding activity of major ions such as calcium and magnesium with metals such as copper, lead, and zinc, will lower the toxicity of these metals by decreasing their bioavailability. Therefore, when water hardness is low, the toxic effects of these metals may increase. The effects of hardness on freshwater fish and other aquatic life appear to be related to the ions causing the hardness rather than hardness (EPA 1986). For this reason, technical guidance groups recommend providing the concentrations of specific ions, rather than using hardness.

The Basin Plan, CTR, and NTR do not specify a hardness criterion. According to Hem (1989), values >120 mg/L are considered hard, while values <60 mg/L are considered soft. The EPA (1986) utilizes the following hardness classification:

0-75 mg/L	soft water
75-150 mg/L	moderately hard water
150-300 mg/L	hard water
300 mg/L and up	very hard

According to this classification, streams in the project area have very soft water. As with the low alkalinity values observed in this study, the low hardness values may have indirect effects on aquatic organisms. In general, soft waters do not have the capacity

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

to reduce the toxicity of metal ions, whereas hard waters may provide ions that bind with metallic ions and reduce their toxic effects.

Bicarbonate

Bicarbonate (HCO_{31}) is formed when carbon dioxide (CO_2) dissolves and hydrates in water. The ratio of bicarbonate to carbonate (CO_3^{2-}) and CO_2 varies with pH (Wetzel 2001). Between pH 7 and 9, HCO_{3-} is the dominant anion. Below pH 7, free CO_2 dominates. Along with other dissolved inorganic carbon constituents, HCO_{3-} influences water quality properties such as alkalinity, hardness and acidity. The HCO_{3-} concentration (reported in mg/L) of most surface streams is less than 200 mg/L bicarbonate (Wetzel 2001).

Carbon is a nutrient required for biological processes. Bicarbonate is one important source of inorganic carbon in photosynthesis and the generation of organic compounds. Subsequently, these compounds provide the energy for metabolism within an ecosystem; as such, they are the basis of primary productivity (Wetzel 2001).

The Basin Plan, CTR, and NTR do not specify a bicarbonate criterion. Along with other dissolved inorganic carbon constituents, bicarbonate influences water quality properties such as alkalinity, hardness and acidity. Bicarbonate is one important source of inorganic carbon in photosynthesis and the generation of organic compounds (Wetzel 2001).

Carbonate

Carbonate (CO_3^{2-}) is formed when carbon dioxide (CO_2) dissolves and hydrates in water. CO_3^{2-} is reported in mg/L. The ratio of CO_3^{2-} to bicarbonate (HCO_{3-}) and CO_2 varies with pH (Wetzel 2001). Above pH 9.5, CO_3^{2-} is the predominant anion. Carbonate influences water quality properties such as alkalinity, hardness and acidity.

Carbon is a nutrient required for biological processes. Carbonate is one important source of inorganic carbon in photosynthesis and the generation of organic compounds. Subsequently, these compounds provide the energy for metabolism within an ecosystem; as such, they are the basis of primary productivity (Wetzel 2001).

The Basin Plan, CTR, and NTR do not specify a carbonate criterion. Carbonate influences water quality properties such as alkalinity, hardness and acidity. Carbonate is one important source of inorganic carbon in photosynthesis and the generation of organic compounds.

Hydroxide

Hydroxide (OH-) ions are generated during the dissociation of carbonate and bicarbonate ions, which occurs during equilibrium reactions of water and dissolved carbon dioxide. In lakes and streams with high carbonate content the hydroxide ions

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

result in alkaline waters. Hydroxide is reported in mg/L. Free hydroxide ions are not present unless carbonate is the predominant ion.

Nutrients (Nitrogen and Phosphorus)

Ammonia as NH3

Ammonia as NH_3 (dissolved form) is a measure of the most reduced inorganic form of nitrogen in water. Ammonia is reported as mg/L or µg/L, with typical surface water values typically less than 0.1 mg/L (MELP 1998).

Complex nitrogen cycling and processes occur within aquatic systems. Nitrogen is an essential plant nutrient which contributes to the productivity of a water body. However, excessive ammonia overstimulates the growth of algae and other plants, leading to eutrophication of a water body. The resulting decease of oxygen levels may cause stress and mortality of fish and invertebrates (NEGRDC 2000). High ammonia concentrations are also toxic to aquatic life. The specific concentration at which ammonia is harmful to organisms depends upon the temperature and pH of the water. As temperature and pH increase and DO decreases, the stressful effects of ammonia increase.

Nitrate/Nitrite as NO3/NO2

Nitrate and nitrite ions are produced during nitrification of reduced and organic forms of nitrogen. Nitrate and nitrite are typically reported in mg/L or µg/L. Nitrite (NO_2) is usually present in only minute quantities in water (<0.001 mg/L) because it is an intermediate, unstable form of nitrogen within the nitrogen cycle (NEGRDC 2000). Nitrate (NO_3) is the most oxidized and stable form of nitrogen in water, and therefore is the principle form of combined nitrogen. Most surface waters contain less than 0.2 mg/L of nitrate (Wetzel 2001).

Nitrate is the primary form of nitrogen used during plant growth (MELP 1998). Sources of elevated nitrate and nitrite come from municipal and industrial wastewaters, agricultural runoff, urban development, and automobile exhausts. As an essential plant nutrient, excessive nitrogen can cause proliferation of algae and macrophytes, resulting in eutrophic water conditions. Eutrophication causes decreased oxygen levels which may cause stress or mortality of fish and invertebrates.

Total Kjeldahl Nitrogen

Total kjeldahl nitrogen (TKN) is a measure of both the ammonia and organic forms of nitrogen. TKN is reported in mg/L or µg/L.

As previously discussed, high ammonia concentrations can be deleterious to aquatic life. Because organic nitrogen is not biologically available, it does not influence plant growth or water quality condition until it is transformed to the inorganic forms of nitrogen (MELP 1998).

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

Orthophosphate

Orthophosphate (PO_4) is a measure of the inorganic oxidized form of soluble phosphorus. It is generally reported in mg/L or µg/L. Background concentrations of orthophosphate in surface waters generally average 10 µg/L (Hem 1989).

Along with nitrogen, phosphorus is a necessary nutrient for plant growth. Orthophosphate is the most readily available form of phosphorus for uptake during photosynthesis. Excess orthophosphate causes prolific algal growth, causing the same detrimental conditions previously described for nitrogen (MELP 1998). Since phosphorus is typically the most limiting nutrient for plant growth in fresh water, orthophosphate additions are often the primary cause of eutrophication of water bodies. Sources of orthophosphate include soil erosion and agricultural, urban and industrial wastewater effluents.

Halides

Chloride

Chloride (Cl-) is among the important anions found in natural waters (Hem 1989). Chloride is reported in mg/L and low concentrations of 8.3 mg/L are present in natural fresh waters (Wetzel 2001).

Chloride influences osmotic salinity balance and ion exchange in aquatic organisms, thus making it an important ion for metabolic processes. Increased chloride levels may reduce the toxicity of nitrite to aquatic life (MELP 1998). High chloride content can adversely affect plant growth. Non-natural sources of chloride include municipal water supplies, sewage plant effluents, urban development and industrial effluents. Igneous rocks do not yield high chloride concentrations to normally circulating natural waters (Hem 1989).

Fluoride

Fluoride (FL-) is a minor halide ion which is mainly found in rock minerals (Hem 1989). Fluoride concentrations are typically reported in mg/L and in most natural waters are less than 1.0 mg/L.

Fluoride is utilized by higher life forms in the structure of bones and teeth and is believed to strengthen resistance to tooth decay. Sources of fluoride include the natural decomposition of igneous and sedimentary rocks, fluoridation of drinking water, and mining activities (MELP 1998). Excessive drinking water concentrations result in mottled tooth enamel.

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

Major ions

Calcium

Calcium (Ca) is the most abundant of the alkaline-earth metals and a major constituent of many common rock minerals and of the solutes present in water (Hem 1989). It contributes to the total hardness of water. Although calcium is an important constituent of igneous rocks, its concentration in associated water bodies is generally low (0.039 mg/L, Wetzel 2001) due to the slow decomposition rate of igneous rock minerals (Hem 1989). Calcium is reported in mg/L, with an average concentration for calcium in river water of 14 mg/L. Water bodies with less than 10 mg/L are considered calcium poor, whereas > 20 mg/L is considered calcium rich.

Calcium is an essential element for metabolism in most plants and animals (Wetzel 2001). It is most commonly present as the calcium ion (Ca^{2+}) and is generally derived from weathering or dissolution of minerals in soil and rocks. Under conditions of high bicarbonate or sulfate concentration, calcium bicarbonate or calcium sulfate may exist (Hem 1989). The distribution of many freshwater species, particularly invertebrates, is related to calcium concentration. Significant changes in calcium concentration in a water body can influence the presence or absence of these organisms.

The Basin Plan, CTR, and NTR do not specify a calcium criterion. An average concentration of calcium in river water is 14 mg/L. According to Hem (1989), water bodies with less than 10 mg/L are considered calcium poor, whereas >20 mg/L is considered calcium rich. Water bodies within the study area all contain <10 mg/L calcium, and would therefore be considered calcium poor. This is typical for waters that drain igneous rock watersheds.

Magnesium

Magnesium (Mg) is a common alkaline-earth metal found in igneous, sedimentary and other rock types. It contributes to the total hardness of water. Magnesium concentration is reported in mg/L or µg/L. It is much more soluble than calcium, with an average concentration of 5 mg/L in North American rivers and 0.031 mg/L in granite drainage basins (Wetzel 2001).

Magnesium is an essential nutrient in the metabolic activity of plants and animals. Magnesium is commonly present as an ion (Mg^{2+}) and is typically derived from the weathering of ferromagnesian minerals in soil and rocks or dissolution of limestone (Hem 1989). As with calcium, magnesium may exist as magnesium bicarbonate or magnesium sulfate under certain conditions.

The Basin Plan, CTR, and NTR do not specify a magnesium criterion. Magnesium may contribute undesirable tastes to drinking water. Magnesium is much more soluble than calcium, with an average concentration of 0.031 mg/L in granite drainage basins. The

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

average values in the Project area are slightly higher than this average, but are lower than the 5 mg/L average for rivers.

Potassium

Potassium (K) is a common element in most rock types, but occurs in generally lower concentrations and is less soluble than calcium and magnesium (Hem 1989). Potassium is reported in mg/L or µg/L, with an average concentration of 1.4 mg/L in North American rivers and 0.008 mg/L in granite drainage basins (Wetzel 2001).

Potassium is important in the cellular ion transport and exchange processes of plants and animals, especially for algae growth (Wetzel 2001). Potassium is derived during the weathering of feldspar and mica minerals from rocks and soil. Another potential source of potassium is release through the decay of plant materials (Hem 1989). The alteration of potassium concentration in natural waters is not common, except when effluent from industrial, agricultural or urban sources exist or runoff from road salts reaches a water body (Wetzel 2001). This type of pollution can cause significant alteration in the ionic composition of water bodies and ultimately change the balance of plant and animal productivity.

The Basin Plan, CTR, and NTR do not specify a potassium criterion. Potassium has an average concentration of 1.4 mg/L in North American rivers and 0.008 mg/L in granite drainage basins (Wetzel 2001).

Sodium

Sodium is the most abundant of the alkaline-earth metals and is commonly found in solution. It generally has lower water concentrations than calcium, except in igneous dominated watersheds (Wetzel 2001). Sodium is typically reported in mg/L, with concentrations that range from < 1 mg/L to > 500 mg/L. An average sodium concentration of 9.0 mg/L is found in North American rivers and 0.088 mg/L in granite drainage basins (Wetzel 2001).

Sodium is important in the cellular ion transport and exchange processes of plants and animals (Wetzel 2001). Certain species of cyanobacteria require high amounts of sodium for photosynthesis, metabolism, and nitrogen fixation. The enrichment of water with high levels of sodium and phosphorus from domestic effluents can result in large cyanobacteria populations (Wetzel 2001). Sodium is typically present as an ion (Na^+) and is commonly derived from the weathering of rocks and soil or the dissolution of sodium salts (Hem 1989). As with potassium, sodium concentrations in natural water bodies are not easily altered, except by pollutants such as road salts, industrial effluent and agricultural runoff (Wetzel 2001).

Sulfate

Sulfate is a relatively common anion produced during geochemical weathering of sulfides (reduced form) from igneous and sedimentary rocks and soils (Hem 1989,

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

Wetzel 2001). Sulfate is reported in mg/L or µg/L, with an average concentration of 20 mg/L in North American rivers and 0.031 mg/L in granite drainage basins.

Sulfur is essential for proper metabolic functioning of all organisms. The primary source of sulfur compounds to water bodies is atmospheric precipitation, which is largely due to the combustion of fossil fuels, oxidation of metallic sulfides, and smelting of ores (Hem 1989; Wetzel 2001). Sulfate is naturally released from volcanic regions, during rock weathering, and through sulfur-reducing bacterial activity (Wetzel 2001). The most extensive natural occurrence of sulfate is in evaporite sediments and rocks. Sulfate tends to form complex ions with sodium and calcium (Hem 1989). Strong acids associated with sulfate are major contributors to acidification of lakes and rivers (Wetzel 2001).

Minor Metallic Elements

Boron

Boron is a light element typically found in igneous rock such as granite. Boron can be liberated in volcanic gases and, as a result, is often found in high concentrations in volcanic areas and thermal springs (Hem 1989). The uncharged ionic form of boron is most common in natural waters. Boron contributes to the buffering capacity of some natural waters (Hem 1989). Boron is reported in mg/L and the average concentration in natural fresh waters is 0.01 mg/L (Wetzel 2001).

Boron is an essential micro-nutrient for plant growth with optimal concentrations in water occurring around 0.2 mg/L total boron. Boron toxicity varies dramatically between crops with citrus considered among the most sensitive of crops. Boron concentrations in excellent to good irrigation waters for crops range from 0.33 to 0.67 mg/L for sensitive crops to 1 to 2 mg/L for tolerant crops.

(Wyoming Department of Agriculture. Evaluation and Classification System for Irrigation Waters. http;//wyagric.state.wy.us/aslab/IrgWExp.htm August 5, 2003. Irrigation Water Quality Standards and Salinity Management.
http://agnews.tamu.edu/drought/DRGHTPAK/SALITAB3 and SALITAB11).

The Basin Plan, CTR, and NTR do not specify a boron criterion. An agricultural water quality goal of 0.7 mg/L has been recommended (Ayers and Westcot 1985) and is included in *A Compilation of Water Quality Goals*, (EPA 2000) and a tentative value of 0.6 mg/L is given for a suggested no adverse response level by the USEPA (Marshack 2000). Results from our study reveal that boron concentrations would not have adverse effects on beneficial uses.

Minor Non-metallic Elements

Arsenic

Arsenic is a widely distributed metallic element in the Earth's crust (ATSDR 2000). Arsenic is highly volatile and is an important component in many biochemical processes

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

(Hem 1989). In its elemental form, it appears as a metal-like substance but it is usually found in compounds with other elements and appears as white or colorless powder (ATSDR 2000). Inorganic arsenic results from compounds with elements such as oxygen, chlorine, or sulfur. Organic arsenic results from compounds with hydrogen and carbon (ATSDR 2000). Organic arsenic is generally less harmful than inorganic arsenic (ATSDR 2000). Arsenic is measured in µg/L or mg/L. Natural surface water normally contains an arsenic concentration of about 1 µg/L

Arsenic can be highly toxic to most organisms in excess concentrations. Concentrations above 5 µg/L have been shown to reduce growth and reproduction in aquatic invertebrates and algae (MELP 2000). Concentrations of 550 µg/L have produced mortality in fish (MELP 2000). Concentrations above 25 µg/L can have negative effects on livestock and, therefore, are potentially toxic to wildlife (MELP 2000). Arsenic is used as a preservative for wood, and is used in pesticides, metal alloys (especially in automobile batteries), and semiconductors and light diodes (ATSDR 2000). It occurs naturally in soil and can enter water from wind-blown dust, runoff, and leaching (ATSDR 2000). Volcanoes are another natural source of arsenic. Anthropogenic sources of arsenic include coal-fired power plants, industrial waste discharge, and agricultural runoff (Hem 1989).

Metals

Copper

Copper is a metallic element, which can occur as a free native metal or combined with ionic minerals (Hem 1989). It is measured in either the total or dissolved state in water samples, and reported in µg/L or mg/L. Copper is typically found in trace concentrations from 1 to 10 µg/L (MELP 1998) and levels near 10 µg/L are common in river water (Hem 1989). The freshwater aquatic life criterion for copper depends on the hardness of the water body being tested. Copper toxicity decreases with increasing hardness and increases with increasing pH (Wetzel 2001).

Copper is an essential element in plant and animal metabolism, but quantities above normal trace concentrations are highly toxic to most aquatic life forms (MELP 1998). Many of the deleterious effects of copper, such as inhibition of phosphorus uptake in green algae, are highly variable depending on other environmental conditions such as pH and water hardness (Wetzel 2001). Copper may be released during industrial, agricultural and mining activities. Other common sources include copper plumbing and equipment (Hem 1989; MELP 1998).

Iron

Iron (Fe) is the second most abundant metallic element in the Earth's outer crust, but concentrations in water tend to be small (Hem 1989). Iron can be measured in either the total or dissolved state and reported as µg/L or mg/L. Average iron concentrations of 40 µg/L are found in the world's lakes and rivers. The typical amount found in neutral

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

and alkaline surface waters ranges from 50 to 200 µg/L (Wetzel 2001). High concentrations of iron are generally only found in acidic waters (pH < 3-4), such as in runoff streams from strip mines (Wetzel 2001). Concentrations of iron above 0.3 mg/L causes undesirable taste, and when precipitated out of solution due to oxidation, causes a reddish brown color to the water. The chemical behavior of iron is highly dependent on oxidation intensity and is a function of pH and temperature (Hem 1989; Wetzel 2001).

Iron is an essential element in plant and animal respiration and its availability in lakes and streams can limit photosynthetic productivity (Wetzel 2001). Iron is released in sediment when igneous rock minerals are broken down by water. Iron is also present in organic matter in soils and can be processed into surface water through oxidation and reduction activities that often involve microorganisms (Hem 1989). Industrial effluent, acid mine drainage, and smelters are also sources of iron (MELP 1998).

Lead

Lead is a metallic element, which is widely dispersed in sedimentary rocks, but has low natural mobility due to low solubility (Hem 1989). The criterion for lead is expressed in terms of dissolved metal in the water column. Because of the high insolubility of lead, however, it is typically measured in the total state as in this study (MELP 1998). Lead concentration is reported in µg/L. Lead concentrations are highly variable in natural waters ranging from <1 µg/L to 50 µg/L for dissolved lead and <1 µg/L to 100 µg/L for extractable lead (Nagpal 1987). The relative abundance of different species of lead are pH dependent and solubility increases with increasing alkalinity (Nagpal 1987). The freshwater aquatic life criterion for lead depends on the hardness of the water body being tested. The toxic effects of lead decrease with increasing DO and hardness concentrations (MELP 1998).

Lead is toxic to all animals (MELP 1998) and is particularly toxic to aquatic organisms at relatively low concentrations (Wetzel 2001). Fossil fuel combustion, especially of leaded gasoline, contributed greatly to the deposition of lead into waterways in the twentieth century. Other sources of lead include industrial effluent, smelting and refining, batteries, and lead pipe used to transport drinking water (Hem 1989, Wetzel 2001).

Manganese

Manganese (Mn) is one of the more abundant metallic elements, however, there is only one-fiftieth the amount of manganese in the Earth's crust as there is iron (Hem 1989). Its chemical reactivity is very similar to that of iron and they behave much the same way in freshwater systems (Wetzel 2001). It is a minor constituent of many igneous and metamorphic minerals (Hem 1989). It can substitute for iron, magnesium, or calcium in silicate structures but is not an essential element of silicate rock minerals (Hem 1989). Small amounts of manganese are often present in dolomite or limestone as a substitute for calcium. In this study manganese was measured in the total state. The EPA's Metal

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

Translator (1996) was used to convert from a total recoverable criterion to a dissolved criterion. The average concentration of manganese in surface waters is about 35 µg/L (Wetzel 2001).

Manganese is an essential nutrient for microflora, plants, and animals as an enzyme catalyst and as an important component of photosynthesis and nitrogen fixation (Wetzel 2001). High concentrations of manganese can have an inhibitory effect on cyanobacteria and green algae and tend to favor diatom growth (Wetzel 2001). Divalent manganese is released into aqueous solution during weathering of rock and through organic processes (Hem 1989).

Mercury

Mercury (Hg) is a trace element in the Earth's crust that normally occurs in quantities of only 1 to 2 ng/L in natural waters (MELP 1998). Mercury may be present in the environment as elemental mercury (Hg^0), inorganic mercury (Hg^{+2}), or organic mercury (primarily methylmercury, MeHg). Various chemical and biological processes can readily convert the various forms of mercury. With the exception of gold mining areas where elemental mercury was used, mercury is typically present in surface waters, sediment, or soils as inorganic mercury.

Mercury is highly volatile and, thus, atmospheric deposition is a major pathway into aquatic systems (Hem 1989; MELP 1998). Impounded water and flooding cause the release of sedimentary mercury (MELP 1998). Sources of mercury contamination include mining and smelting and production of fertilizers (MELP 1998). Mercury is typically measured as the total mercury in water, soil, or tissue samples. Water samples containing just 5 to 10 ng/L are considered polluted (MELP 1998).

Mercury is a serious neuro-toxin and has been found in high concentrations in lakes far removed from sources of mercury (Wetzel 2001). Anaerobic bacteria in sediments readily convert inorganic mercury into methylmercury. Rates of methylmercury production and bioaccumulation depend not only on the abundance of inorganic mercury but also on a complex assortment of environmental variables which affect the activities and species composition of the bacteria and the availability of the inorganic mercury for methylation (HSDB 2003). Once converted to methylmercury by bacteria, it can bioaccumulate in aquatic organisms and be passed up the food chain (Hem 1989). Inorganic mercury does not bioaccumulate in aquatic organisms. Because bacteria mediate the rate of methylmercury formation, fish living in even mildly contaminated waters are often not safe to eat.

Molybdenum

Molybdenum (Mo) is a rare element that is measured in either the total or dissolved state and reported in mg/L or µg/L (Hem 1989, MELP 1998). For this study, it was measured in the total state. The EPA's Metal Translator (1996) was used to convert

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

from a total recoverable criterion to a dissolved criterion. In uncontaminated systems, it occurs in concentrations less than 10 µg/L (MELP 1998).

Molybdenum is a required micronutrient for electron transfer, nitrogen fixation, and protein synthesis in plants and animals (Wetzel 2001). It is a low toxicity element that does not bioaccumulate in animal tissue but does bioaccumulate in plant tissue (MELP 1998). Animals (especially ruminants) that forage on plants containing excessive amounts of molybdenum can develop a condition called molybdenosis, thus, waters containing excessive amounts of molybdenum are not recommended for irrigation (Hem 1989, MELP 1998). Steel and electronics manufacturing, fertilizers, and mining are sources of molybdenum (MELP 1998).

The Basin Plan, CTR, and NTR do not specify a molybdenum criterion. In uncontaminated systems, molybdenum generally occurs at less than 10 µg/L. Recommended guidelines developed for British Columbia, Canada, suggest that total molybdenum should be less than 1 mg/L (=1,000 µg/L) for an average continuous concentration and less than 2 mg/L (= 2,000 µg/L) for an acute concentration to protect freshwater aquatic life. For drinking water, they suggest total molybdenum no greater than 0.25 mg/L (250 µg/L).

Silver

Silver (Ag) is a rare element in crustal rocks (Hem 1989). It is measured in either the total or dissolved state in a water sample and is reported in µg/L. For this study, silver was measured in the dissolved state. The EPA's Metal Translator (1996) was used to convert from a total recoverable criterion to a dissolved criterion. The silver criterion is expressed as a function of hardness and decreases as hardness decreases. The solubility of silver in natural water is low (Hem 1989).

Silver can be toxic to aquatic organisms in concentrations above 5 µg/L (Hem 1989, MELP 1998). Sources of silver include mining, photography, coin and jewelry production, and the manufacture of chemicals (MELP 1998).

Zinc

Zinc is a fairly abundant element in crustal rocks (Hem 1989). It is measured either in the total or dissolved state and reported in µg/L or mg/L. In this study, it was measured in the total state and reported in mg/L. The EPA's Metal Translator (1996) was used to convert from a total recoverable criterion to a dissolved criterion. The zinc criterion is expressed as a function of hardness and decreases with decreased hardness. It can reach a maximum concentration of 50 mg/l in naturally acidic water (MELP 1998).

Zinc is an essential element in plant and animal metabolism (Hem 1989). Although it is not usually harmful to terrestrial wildlife, it is highly toxic to aquatic organisms, especially fish (MELP 1998). Toxicity of zinc decreases with increasing water hardness, increases with increasing temperature, and increases with decreasing DO (MELP 1998). Sources

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

of zinc include metallurgy, mining, textiles, printing, agriculture, and urban runoff (Hem 1989; MELP 1998).

Coliform Bacteria

Total Coliform

Coliform bacteria are a group of several genera of relatively harmless microorganisms that live in soil, water, and the intestines of cold- and warm-blooded animals including humans (BASIN 2002; NREPC 2002). These bacteria occur naturally in surface and shallow ground waters and are essential in the breakdown of organic matter in water. Oxygen is not a requirement for these bacteria but they can use it. They produce acid and gas from the fermentation of lactose. Coliform bacteria are not pathogenic and are only mildly infectious. The total coliform group is relatively easy to culture in the lab, and therefore, has been selected as the primary indicator bacteria for the presence of disease causing organisms. If large numbers of coliform bacteria are found in water, there is a high probability that pathogenic bacteria or organisms, such as Giardia may be present . Coliform bacteria, rather than the actual pathogens, are used to assess water quality because they are they are easier to isolate and identify (El Dorado County EMD 2002).

Fecal coliform

Fecal coliform is a subgroup of the coliform bacteria that live in the intestinal tract and feces of warm-blooded animals (NREPC 2002). The most common member of this group is *Escherichia coli.* Fecal coliform concentrations are reported as the number of bacterial colonies per 100 mL of sample water (#/100 mL, WSDE 2002). Fecal coliform bacteria can multiply quickly under optimum growing conditions and die off rapidly when conditions change. For this reason, fecal coliform bacteria counts are difficult to predict (WSDE 2002).

Fecal coliform species are not usually harmful but are an indicator of the possible presence of pathogenic bacteria that live in the same environments (BASIN 2002) thus, it is used as a parameter for testing the quality of waters used for recreation. The presence of fecal coliform indicates contamination from the feces of humans or other animals. Swimming in waters with high levels of fecal coliform bacteria presents a risk of contracting diseases such as typhoid fever, hepatitis, gastroenteritis, ear infection, and dysentery (BASIN 2002). Some strains of *E. coli*, such as *E. coli* O157:H7 which is found in the digestive tract of cattle, can cause intestinal illness. The major sources of fecal coliform to freshwater are wastewater treatment plant effluent, failing septic systems, human and animal wastes (BASIN 2002; WSDE 2002). Human and animal wastes are washed into storm drains, streams, and lakes during storms (NREPC 2002).

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

Organics

Methyl-tertiary butyl ether (MTBE)

MTBE is a chemical compound manufactured by the reaction of methanol and isobutylene. It is produced in mass quantities and used as an additive to raise the oxygen content of gasoline thereby reducing emissions such as carbon monoxide and other pollutants (EPA 2002). The EPA has not set a national standard for MTBE nor has the CTR set a state standard. MTBE is measured in parts per billion, mg/L, or µg/L.

The possible negative effects of MTBE in aquatic systems are not clear. Lakes subject to recreational activities are at the greatest potential risk of ecological effects from MTBE (Johnson 1998). Recreational watercraft with two-cycle engines pass as much as 25% of their fuel into the water column through their exhaust. Although MTBE seems to be relatively persistent in groundwater, studies have shown it to evaporate quickly from surface water (EPA 2002). MTBE does not sorb to soils but is dissolved in interstitial water in sediment making it available to benthic organisms in nearshore sediments and at the sediment-water interface (Johnson 1998). It is assumed that MTBE does not bioaccumulate. Two recent studies indicate that MTBE levels found in typical surface waters do not present a significant toxicological risk to aquatic organisms (Johnson 1998; Werner and Hinton 1998). Negative effects were not observed in algae until concentrations of MTBE reached 2,400 mg/L. In invertebrates, amphibians, and fish, the lowest concentrations at which negative effects were observed were 44mg/L, 2,500 mg/L, and 574 mg/L, respectively (Johnson 1998; Werner and Hinton 1998). In addition to two-stroke engines, MTBE can enter surface waters from fuel spills, leaking storage tanks and pipelines, storm run-off, and precipitation from atmospheric MTBE (EPA 2002).

Total Petroleum Hydrocarbons – gasoline and diesel

Total petroleum hydrocarbons (TPH) is a term used to describe a large family of chemical compounds originating from crude oil. These chemical compounds are made up primarily of hydrogen and carbon and are called hydrocarbons. It is impractical to measure each hydrocarbon individually because there are so many of them, instead, TPH are used to measure hydrocarbon contamination (ATSDR 1999b). Some of the chemicals found in TPH include hexane, benzene, toluene, xylenes, naphthalene, and fluorene, as well as jet fuels and mineral oils (ASTDR 1999b). There are no state or federal standards for levels of TPH.

Total petroleum hydrocarbons compounds can effect the lungs, liver, kidneys, and central nervous systems of animals as well as reproduction and fetus development (ASTDR 1999b). Total petroleum hydrocarbons can be released into water through spills or leaks or indirectly through storm runoff. Sources include industrial release, automobiles, and manufacturing.

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

Benzene

Benzene is a clear, colorless, aromatic liquid that is highly flammable. It is formed from both natural and human processes (ATSDR 1997). It is used as a building block in the manufacture of plastics, rubber, resins, detergents, pesticides and synthetic fabrics such as polyester and nylon (ATSDR 1997; EPA 2002a). It is one of the top 20 chemicals produced in the U.S. by volume (ATSDR 1997). Benzene is measured in mg/L.

Benzene is a known human carcinogen and has been linked to several forms of leukemia. When pregnant animals are exposed to benzene fumes, offspring have low birth weights, delayed bone formation, and damaged bone marrow (ATSDR 1997). Sources of benzene include industrial and motor vehicle emissions, automobile service stations, leakage from storage tanks and hazardous waste sites, and tobacco smoke (ATSDR 1997). Natural sources of benzene include volcanoes and forest fires. It may be degraded by bacteria and other microorganisms in water, and does not appear to bioaccumulate (EPA 2002a). Most of the benzene released into surface water evaporates within a few hours (EPA 2002a).

Ethylbenzene

Ethylbenzene is a clear, colorless, flammable liquid with a gasoline-like aroma. Its primary use is in the production of the chemical styrene, which is used in many plastics (ASTDR 1999a). It is also found in inks, insecticides, paints, fuels, and other chemicals (ASTDR 1999a). Ethylbenzene is measured in mg/L.

Studies have shown negative effects on the eyes, liver, kidneys, and central nervous systems of animals breathing ethylbenzene (ATSDR 1999a). Experimental data suggest that ethylbenzene does not bioaccumulate in aquatic organisms (EPA 2002b). Ethylbenzene evaporates quickly from surface water and is broken down by chemicals that occur naturally there. In soil, ethylbenzene is broken down by bacteria and it adsorbs only moderately to sediment (ATSDR 1999a, EPA 2002b). Ethylbenzene is released to the air primarily from its use in gasoline. It can be released into surface waters through industrial discharges, leaking gasoline storage tanks, and wastewater (ATSDR 1999a, EPA 2002b).

Toluene

Toluene is a clear, colorless liquid with a distinctive smell. It is used as a solvent in paints, paint thinners, fingernail polish, adhesives, and rubber (ATSDR 2001). Toluene is measured in mg/L.

Toluene can affect the central nervous system, liver, and kidney in mammals but specific risks to aquatic organisms are unknown. High concentrations may be toxic to microorganisms (EPA 2002b). It does not bioaccumulate in aquatic organisms (EPA 2002b). Toluene evaporates quickly from water and does not significantly adsorb to

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

sediment (EPA 2002b). Toluene is released into waterways by direct discharges, fuel and solvent spills, leaking storage tanks, and leaching from landfills (ATSDR 2001; EPA 2002b). It occurs naturally in crude oil and in the tolu tree and is a by product of gasoline and other fuels from crude oil (ATSDR 2001).

Total Xylenes

Total xylenes are a group of similar organic compounds that include o-xylene and p-xylene, (EPA 2002b). They are clear, colorless, flammable liquids with a sweet aroma. Xylenes are used primarily as solvents and are rapidly replacing benzene because they are considered safer (EPA 2002b). Xylene is one of the top 30 chemicals produced in the U.S. by volume (ATSDR 1996). Xylenes are measured in mg/L.

Potential effects from xylenes include damage to the liver, kidneys, and central nervous system (EPA 2002b). Specific effects on aquatic organisms are unknown. Bioaccumulation of xylenes is not expected to be significant in aquatic organisms (EPA 2002b). Xylenes evaporate quickly from soil and surface waters (ATSDR 1996) and have low to moderate soil sediment adsorption (EPA 2002b). They are broken down by microorganisms in soil and water (ATSDR 1996). Major sources of xylenes include emissions from petroleum refineries, gas and diesel engines, and solvents in products such as enamels, lacquers, and pesticides; leaks and evaporation from gasoline transport and storage; agricultural spraying; and leaching from landfills (ASTDR 1996, EPA 2002b). Xylenes occur naturally in petroleum and coal tar and in many plants and they are released during forest fires (ASTDR 1996, EPA 2002b).

Chlorophyll-a

Chlorophyll-a is the primary pigment produced by oxygen using, photosynthetic organisms and is reported in µg/L or mg.L (Wetzel 2001). It is used to measure the amount of phytoplankton in the primary productivity in a body of water (MELP 1998). Waters are considered oligotrophic if chlorophyll-a levels are below 3 µg/L and eutrophic if chlorophyll-a is greater than 15 µg/L (MELP 1998). High light or nutrient inputs tend to result in high chlorophyll-a levels and elevated temperatures and input of sediments or herbicides result in lowered chlorophyll-a (MELP 1998). Chlorophyll-a can be measured in either µg/L or mg/L.

Excess nutrient inputs, particularly nitrogen and phosphorus, can have negative impacts on aquatic organisms. Nutrient influxes increase algal and macrophytic productivity in a process known as eutrophication (Welch 1992). Over time, this can lead to decreases in dissolved oxygen, which can cause serious declines in benthic invertebrates and stress or mortality of fish (Welch 1992). Eutrophication can also cause a shift in species composition toward bottom dwellers such as carp (Welch 1992). Sources of nutrients that lead to eutrophication include agricultural runoff, sewage treatment effluent, and forest harvesting, (MELP 1998).

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

The Basin Plan, CTR, and NTR do not specify a chlorophyll-a criterion. Chlorophyll-a concentrations less than 0.003 mg/L are considered low and indicative of an oligotrophic water body (Wetzel 2001). Chlorophyll-a concentrations greater than 0.015 mg/L are considered high and indicative of a eutrophic water body (Wetzel 2001). High chlorophyll-a concentrations are frequently associated with high nutrient inputs.

Biochemical Oxygen Demand

Biochemical oxygen demand (BOD) is a measure of the dissolved oxygen consumed by microorganisms during the breakdown of organic matter (EEA 2002). As BOD increases, DO, which is essential in the respiration of most aquatic organisms, decreases (MELP 1998, EEA 2002).

High BOD results from eutrophication caused by nutrient influxes such as are associated with organic pollution from wastewater and agricultural runoff (EEA 2002). The effects of eutrophication include stress or mortality of fish and invertebrates as discussed previous sections.

The Basin Plan, CTR, and NTR do not specify a criterion for BOD. A typical BOD concentration for natural surface waters is approximately 1.0 mg/L and for urban runoff is approximately 17 mg/L (Welch 1992).

APPENDIX A. OVERVIEW OF WATER QUALITY PARAMETERS (continued)

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APPENDIX B

STORET, Water Quality Data, Shaver Lake 1975

Appendix B Table B-1. STORET Water quality data collected from Shaver Lake Dam in 1975

Station 062201 – Midway along Dam – June 14, 1975

Date	Parameter	0 ft.	3 ft.	10 ft.	16 ft.	24 ft.	45 ft.	100 ft
6/4/75	Temperature (degrees centigrade)	17.5	17.5	9.5	7.5	6.3	5.0	4.6
	Conductivity (umhos/cm@25C)	15.0	15	13.0	12.0	11.0	11.0	12.0
	Dissolved Oxygen (mg/L)	8.6	9.0	10.4	--	--	9.4	--
	pH (standard units)	10.2	10	9.6	9.6	9.2	8.8	8.2
	Total Alkalinity (mg/L)	25.0	19.0	18.0	19.0	18.0	21.0	--
	Total Ammonia (mg/L)	0.06	0.04	0.04	0.04	0.06	0.06	--
	Total Kjeldahl Nitrogen (mg/L)	0.80	0.20	0.20	0.20	0.20	0.20	--
	Total Nitrite + Nitrate (mg/L)	0.05	0.04	0.04	0.04	0.06	0.06	--
	Dissolved Orthophosphate (mg/L)	.022	.008	.006	.004	.004	.008	--
	Chlorophyll a (µg/L)	1.8	--	--	--	--	--	--
Date	**Parameter**	**0 ft.**	**5 ft.**	**20 ft.**	**30 ft.**	**60 ft.**	**86 ft.**	
6/24/75	Temperature (degrees centigrade)	15.7	15.7	15.5	11.6	8.8	7.9	
	Conductivity (umhos/cm@25C)	30.4	15.1	15.2	16.9	23.2	27	
	Dissolved Oxygen (mg/L)	7.8	7.8	7.8	9.6	9.2	8.2	
	pH (standard units)	5.9	6.1	5.95	5.7	6.2	6.2	
	Total Alkalinity (mg/L)	12.0	13	13	10	11	10	
	Total Ammonia (mg/L)	0.03	0.04	0.03	0.04	0.03	0.03	
	Total Kjeldahl Nitrogen (mg/L)	0.30	0.20	0.20	0.20	0.20	0.30	
	Total Nitrite + Nitrate (mg/L)	0.02	0.02	0.02	0.02	0.02	0.02	
	Dissolved Orthophosphate (mg/L)	.002	.017	.004	.002	.002	0.01	
	Chlorophyll a (µg/L)	1.2	--	--	--	--	--	
Date	**Parameter**	**0 ft.**	**5 ft.**	**15 ft.**	**32 ft.**	**65 ft.**		
11/13/75	Temperature (degrees centigrade)	14.4	13.5	13.5	13.5	13.5		
	Conductivity (umhos/cm@25C)	37	37	37	37	37		
	Dissolved Oxygen (mg/L)	7.6	7.6	7.6	7.6	7.8		
	pH (standard units)	6.9	6.9	6.9	6.9	7.0		
	Total Alkalinity (mg/L)	26	22	24	10	10		
	Total Ammonia (mg/L)	0.02	0.02	0.02	0.02	0.02		
	Total Kjeldahl Nitrogen (mg/L)	0.20	0.20	0.20	0.20	0.20		
	Total Nitrite + Nitrate (mg/L)	0.02	0.02	0.02	0.02	0.02		
	Dissolved Orthophosphate (mg/L)	.002	.002	.002	.002	.002		
	Chlorophyll a (µg/L)	2.0	--	--	--	--		

APPENDIX B Table B-1. STORET Water quality data collected from Shaver Lake Dam in 1975 (continued)

Station 062202 – Center of Lake

Date	Parameter	0 ft.	3 ft.	10 ft.	16 ft.	24 ft.	40 ft.	54 ft
6/4/75	Temperature (degrees centigrade)	18.5	18.5	9.5	8.0	6.5	5.4	5.0
	Conductivity (umhos/cm@25C)	16	16	11	12	10	10	11
	Dissolved Oxygen (mg/L)	8.8	9.0	9.8	10	10	9.6	9.8
	pH (standard units)	10.9	9.6	9.6	9.2	9.2	9.4	9.3
	Total Alkalinity (mg/L)	23	21	21	10	10	10	10
	Total Ammonia (mg/L)	0.05	0.05	0.04	0.04	0.02	0.04	0.04
	Total Kjeldahl Nitrogen (mg/L)	0.60	0.20	0.20	0.20	0.20	0.20	0.20
	Total Nitrite + Nitrate (mg/L)	0.05	0.05	0.21	0.04	0.03	0.06	0.06
	Dissolved Orthophosphate (mg/L)	0.01	.006	.004	.003	.003	.004	.004
	Chlorophyll a (µg/L)	1.4	--	--	--	--	--	--
Date	**Parameter**	**0 ft.**	**5 ft.**	**20 ft.**	**30 ft.**	**60 ft.**	**95 ft.**	
6/24/75	Temperature (degrees centigrade)	14.7	14.7	14.3	11.5	9.5	7.5	
	Conductivity (umhos/cm@25C)	64.1	45.5	13.9	20	29	30	
	Dissolved Oxygen (mg/L)	8.4	8.4	9.0	9.0	9.0	8.4	
	pH (standard units)	8.2	8.1	7.5	6.8	6.9	6.7	
	Total Alkalinity (mg/L)	155	13	12	12	10	11	
	Total Ammonia (mg/L)	0.07	0.03	0.07	0.03	0.02	0.04	
	Total Kjeldahl Nitrogen (mg/L)	2.9	0.40	0.40	0.50	0.40	0.50	
	Total Nitrite + Nitrate (mg/L)	0.02	0.02	0.02	0.02	0.02	0.02	
	Dissolved Orthophosphate (mg/L)	.068	0.01	.005	.004	.003	.003	
	Chlorophyll a (µg/L)	1.5	--	--	--	--	--	
Date	**Parameter**	**0 ft.**	**5 ft.**	**15 ft.**	**35 ft.**	**76 ft.**		
11/13/75	Temperature (degrees centigrade)	13.5	13.4	13.4	13.5	13.3		
	Conductivity (umhos/cm@25C)	37	38	39	39	37		
	Dissolved Oxygen (mg/L)	8.0	8.0	8.2	8.2	7.8		
	pH (standard units)	7.0	6.95	6.9	6.9	6.8		
	Total Alkalinity (mg/L)	10	11	20	17	14		
	Total Ammonia (mg/L)	0.02	0.02	0.02	0.02	0.02		
	Total Kjeldahl Nitrogen (mg/L)	0.20	0.20	0.20	0.20	0.20		
	Total Nitrite + Nitrate (mg/L)	0.02	0.02	0.05	0.05	0.02		
	Dissolved Orthophosphate (mg/L)	.002	.002	.018	.005	.003		
	Chlorophyll a (µg/L)	2.3	--	--	--	--		

Appendix B Table B-2. Summary of Limnological Data from Lake Thomas A. Edison, Mammoth Pool Reservoir, Huntington Lake and Shaver Lake, Summer 1968

Chemical Characteristics of Reservoirs

Reservoir	ph	Ca^{+2} (mg/l)	Mg^{+} (mg/l)	Na^{+} (mg/l)	K^{+} (mg/l)	SO_4^{-2} (mg/l)	PO_4^{-3} (mg/l)	NO_3 (mg/l)	CL^{-} (mg/l)	TDS (mg/l)	Alkalinity
Lake Thomas A Edison	6.9	.17	0.7	2.1	0.0	2.8	.26	0.0	1.0	26.4	6.5
Mammoth Pool Reservoir	7.0	3.7	0.7	4.6	0.2	3.3	.02	1.1	6.2	44.4	12.5
Huntington Lake	6.7	1.8	0.0	0.7	0.0	3.6	.02	0.0	1.1	18.1	6.0
Shaver Lake	7.4	1.7	0.2	1.7	0.4	5.4	.14	0.0	0.6	21.9	6.5

Temperature and Dissolved Oxygen Characteristics, and Mean Secchi Disk Transparency of Reservoirs

	Mean epilim-nion Temp.	Surface D.O.	Metalimnion		Bottom			Degree of Stratifi-cation	Depth of Metalim-nion	Secchi Disc Transparency
			Temp °C	D.O °C	Temp.	D.O.	% sat.			
Lake Thomas A Edison	14.9	7.8	--	--	14.5	7.6	102.4	none	--	--
Mammoth Pool Reservoir	21.8	8.7	14.6	5.9	9.0			moderate	44.0-49.0	10.0
Huntington Lake	15.2	8.0	11.7	3.3	9.8	0.3	3.6	moderate	33.0-36.0	9.0
Shaver Lake	21.7	8.6	20.0	7.8	17.3	5.9	77.3	weak	14.0-17.0	4.2

Source: Nicola, S. J. and Cordone, A. J., A Limnological Survey of Reservoirs of the Sierra Nevada, California, September 1972. Department of Fish and Game.

Appendix B Table B-3. Summary of surface water analyses at various sampling stations within Huntington Lake, Shaver Lake and Tributary Streams

(Constituents in milligrams per liter)

														As Nitrogen				As Phosphorous								
Station Location	Date Sampled	Time (PST)	Depth (meters)	Lab pH	Calcium	Magnesium	Sodium	Potassium	Alkalinity ($CaCO_3$)	Sulfate	Chlorine	Boron	Fluorine	NO_2	NO_3	NH_4	Org N	Ortho-Phosphate	Total Phosphorus	Electric Conductivity (uS/cm)	Total Dissolved Solids	Hardness	Turbidity (JTU)	Biological Oxygen Demand	VSS	SS
Huntington Lake																										
Big Creek Cove	6-05-79	0900	1	6.7	1.2	0.0	1.1	0.3	6	0.0	0.0	0.0	0.0	0.000	0.00	0.15	0.17	0.01	0.04	12	69	3	0	0.7	0.7	1.4
	8-07-79	1340	1	–	–	–	–	–	–	–	–	–	–	0.000	0.04	0.00	0.17	0.00	0.03	–	–	–	–	0.7	0.7	5.2
Home Creek Cove	6-05-79	1010	1	–	–	–	–	–	–	–	–	–	–	0.000	0.00	0.11	0.00	0.00	0.01	–	–	–	–	0.3	0.6	1.1
	8-07-79	1040	1	–	–	–	–	–	–	–	–	–	–	0.001	0.04	0.00	0.29	0.00	0.02	–	–	–	–	0.6	1.6	2.6
At Lakeshore	6-05-79	0830	1	6.8	1.2	0.0	1.3	0.3	6	0.0	0.0	0.0	0.0	0.000	0.00	0.07	0.08	0.01	0.02	12	6	3	0	0.9	1.0	1.7
	8-07-79	1130	1	6.9	1.0	0.0	1.0	0.2	5	0.0	0.5	0.0	0.0	0.001	0.04	0.00	0.30	0.02	0.02	12	9	2	0	0.7	1.6	2.9
At Main Dam (No. 1)	6-05-79	0950	1	6.9	1.2	0.0	1.1	0.3	6	0.0	0.0	0.0	0.0	0.000	0.00	0.06	0.00	0.00	0.04	13	5	3	0	0.8	0.6	0.9
	8-07-79	1015	1	6.9	1.0	0.0	1.0	0.2	5	0.5	0.5	0.0	0.0	0.001	0.04	0.00	0.23	0.00	0.02	13	8	2	0	0.6	1.3	4.6
Shaver Lake																										
At Dam	6-04-79	1030	1	7.0	1.6	0.0	1.8	0.4	8	0.0	0.0	0.0	0.0	0.000	0.02	0.11	0.11	0.00	0.04	17	9	4	0	0.7	0.7	1.8
	8-06-79	1620	1	6.9	2.0	0.0	1.4	0.3	8	0.5	0.0	0.0	0.0	0.000	0.07	0.00	0.33	0.00	0.04	17	13	5	1	0.7	3.8	6.2
Near Dorabelle	6-04-79	–	1	–	–	–	–	–	–	–	–	–	–	0.000	0.00	0.11	0.00	0.00	0.05	–	–	–	–	0.7	0.6	1.2
	8-06-79	1430	1	–	–	–	–	–	–	–	–	–	–	0.000	0.07	0.00	0.22	0.00	0.04	–	–	–	–	0.7	2.2	2.2
Near North Fork	6-04-79	1125	1	7.0	1.6	0.0	1.8	0.4	8	0.0	0.0	0.0	0.0	0.000	0.00	0.15	0.00	0.00	0.05	17	10	4	0	0.6	0.5	1.2
Stevenson Creek	8-06-79	1350	1	6.9	2.0	0.0	1.6	0.3	8	0.5	0.5	0.0	0.0	0.001	0.07	0.00	0.18	0.00	0.04	18	12	5	1	0.8	3.0	5.8
At Shaver Lake Point	6-04-79	–	1	–	–	–	–	–	–	–	–	–	–	0.000	0.00	0.07	0.11	0.00	0.04	–	–	–	–	0.6	0.6	1.3
	8-06-79	1520	1	–	–	–	–	–	–	–	–	–	–	0.001	0.09	0.00	0.33	0.01	0.04	–	–	–	–	0.7	2.6	6.2
Tributary Streams																										
Bear Creek	6-12-79	1330	Surface	–	–	–	1.2	–	–	1.4	0.0	–	–	0.000	0.00	0.00	0.19	0.00	0.01	–	10	–	–	0.3	2.6	4.2
near Lakeshore	8-08-79	0935	Surface	–	–	–	3.6	–	–	0.0	0.0	–	–	0.001	0.02	0.00	0.17	0.00	0.06	–	25	–	–	0.5	2.4	6.8
Big Creek at Golden	6-12-79	1200	Surface	–	–	–	0.8	–	–	0.0	0.0	–	–	0.000	0.00	0.00	0.30	0.00	0.02	–	19	–	–	0.5	3.0	5.2
Arrow Campground	8-08-79	0845	Surface	–	–	–	2.2	–	–	0.0	0.0	–	–	0.001	0.02	0.00	0.51	0.00	0.02	–	20	–	–	0.5	2.0	7.6
Deer Creek	6-12-79	1320	Surface	–	–	–	2.6	–	–	1.0	0.0	–	–	0.000	0.00	0.00	0.38	0.00	0.02	–	31	–	–	0.4	2.8	3.4
At Lakeshore	8-08-79	0920	Surface	–	–	–	5.0	–	–	0.5	0.0	–	–	0.001	0.11	0.00	0.24	0.00	0.35	–	34	–	–	0.5	1.8	6.7
Home Creek at	6-12-79	1400	Surface	–	–	–	1.0	–	–	2.9	0.0	–	–	0.000	0.00	0.00	0.21	0.00	0.01	–	11	–	–	0.3	3.0	6.8
Highway 168 Bridge	8-08-79	1005	Surface	–	–	–	2.6	–	–	0.0	0.5	–	–	0.001	0.00	0.00	0.21	0.00	0.02	–	25	–	–	0.6	1.4	4.2
Line Creek at	6-12-79	1345	Surface	–	–	–	0.5	–	–	0.5	0.0	–	–	0.000	0.00	0.00	0.28	0.00	0.01	–	24	–	–	0.7	3.0	7.0
Highway 168 Bridge	8-08-79	0950	Surface	–	–	–	3.0	–	–	0.0	0.0	–	–	0.001	0.00	0.00	0.18	0.00	0.02	–	14	–	–	0.5	2.6	7.4
Pitman Creek Near	6-12-79	1130	Surface	–	–	–	0.9	–	–	1.4	0.7	–	–	0.000	0.00	0.00	0.29	0.00	0.01	–	24	–	–	0.4	2.2	7.0
Tamarack Mountain	8-08-79	0820	Surface	–	–	–	3.2	–	–	0.0	0.5	–	–	0.001	0.00	0.00	0.21	0.00	0.03	–	26	–	–	0.7	2.0	7.4
Rancheria Creek at	6-12-79	1240	Surface	–	–	–	0.8	–	–	0.5	0.0	–	–	0.000	0.02	0.00	0.22	0.00	0.01	–	8	–	–	0.4	2.8	4.0
Highway 168 Bridge	8-08-79	0900	Surface	–	–	–	0.8	–	–	0.5	0.5	–	–	0.001	0.00	0.02	0.15	0.00	0.02	–	8	–	–	0.8	1.3	2.8
Stevenson Creek,	6-12-79	1025	Surface	–	–	–	0.7	–	–	1.4	0.0	–	–	0.000	0.02	0.00	0.28	0.00	0.00	–	11	–	–	0.4	2.4	4.0
North Fork (Tunnel Creek) above Shaver	8-08-79	1610	Surface	–	–	–	3.8	–	–	1.0	0.5	–	–	0.001	0.04	0.00	0.11	0.00	0.02	–	26	–	–	0.6	1.1	3.3

Source: Limnological Study of Huntington and Shaver Lakes, Department of Water Resources, 1980

Appendix B Table B-4. Summary of Limnology data from Studies of Shaver Lake between 1968-1986. (Constituents in mg/l, except as noted)

Station	Month	Year	Depth meter	Secchi (meters)	Temp. C	DO	pH	Alkalinity (CaCO3)	NH3 (N)	NH4 (N)	NO2 (N)	NO3 (N)	NO2+NO3 (NO2+NO3)	KJEL.N (N)	Organic N (N)	Total N (N)	Ortho-Phosphate	Total Phosphate	Chlorophyll A (ug/l)	Primary Productivity* mgC/m3	Conductivity umhos/cm	Total Dissolved Solids	Calcium	Magnesium	Sodium	Turbidity (JTU)	Biological Oxygen Demand	Fecal Coliforms MPH/100ml	Total Coliforms MPN/100ml	Source
									As Nitrogen																					
DAM	June 4	1975	0.0	2.7	17.5	8.6	10.2	25.0	0.06	-	-	-	0.05	0.80	-	-	0.022	0.037	1.8	-	15.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 4	1975	0.9	-	17.5	9.0	10.0	19.0	0.04	-	-	-	0.04	0.20	-	-	0.008	0.018	-	-	15.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 4	1975	3.0	-	9.5	10.4	9.6	18.0	0.04	-	-	-	0.04	0.20	-	-	0.006	0.017	-	-	13.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 4	1975	4.9	-	7.5	-	9.6	19.0	0.04	-	-	-	0.04	0.20	-	-	0.004	0.015	-	-	12.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 4	1975	7.3	-	6.3	-	9.2	18.0	0.06	-	-	-	0.06	0.20	-	-	0.004	0.014	-	-	11.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 4	1975	13.7	-	5.0	9.4	8.8	21.0	0.06	-	-	-	0.06	0.20	-	-	0.008	0.015	-	-	11.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 4	1975	30.5	-	4.6	-	8.2	-	-	-	-	-	-	-	-	-	-	-	-	-	12.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 24	1975	0.0	-	15.7	7.8	5.9	12.0	0.03	-	-	-	0.02	0.30	-	-	0.002	0.018	1.2	-	30.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 24	1975	1.5	-	15.7	7.8	6.1	13.0	0.04	-	-	-	0.02	0.20	-	-	0.003	0.017	-	-	15.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 24	1975	6.1	-	15.5	7.8	6.0	13.0	0.03	-	-	-	0.02	0.20	-	-	0.004	0.130	-	-	15.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 24	1975	9.1	-	11.6	9.6	5.7	10.0	0.04	-	-	-	0.02	0.20	-	-	0.002	0.130	-	-	17.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 24	1975	18.3	-	8.8	9.2	6.2	11.0	0.03	-	-	-	0.02	0.20	-	-	0.002	0.120	-	-	23.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 24	1975	26.2	-	7.9	8.2	6.2	10.0	0.03	-	-	-	0.02	0.30	-	-	0.010	0.222	-	-	27.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	Nov. 13	1975	0.0	4.7	14.4	7.6	6.9	26.0	0.02	-	-	-	0.02	0.20	-	-	0.200	0.009	2.0	-	37.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	Nov. 13	1975	1.5	-	13.5	7.6	6.9	22.0	0.02	-	-	-	0.02	0.20	-	-	0.200	0.010	-	-	37.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	Nov. 13	1975	4.6	-	13.5	7.6	6.9	24.0	0.02	-	-	-	0.02	0.20	-	-	0.200	0.010	-	-	37.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	Nov. 13	1975	9.8	-	13.5	7.6	6.9	10.0	0.02	-	-	-	0.02	0.20	-	-	0.200	0.010	-	-	37.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	Nov. 13	1975	19.8	-	13.5	7.8	7.0	10.0	0.02	-	-	-	0.02	0.20	-	-	0.002	0.011	-	-	37.0	-	-	-	-	-	-	-	-	EPA (1978)
DAM	June 4	1979	1.0	-	-	-	7.0	8.0	-	0.11	0.000	0.02	-	-	0.11	-	0.000	0.040	-	-	17.0	9.0	1.6	0.00	1.8	0.0	0.7	-	-	CDWR (1980)
DAM	Aug. 6	1979	1.0	-	-	-	6.9	8.0	-	0.00	0.000	0.07	-	-	0.33	-	0.000	0.040	-	-	17.0	13.0	2.0	0.00	1.4	1.0	0.7	-	-	CDWR (1980)
DAM	August	1985	0.0	-	21.7	7.8	7.0	8.6	<0.01	-	-	0.03	-	0.10	-	0.13	0.020	0.050	0.8	-	21.9	14.0	1.8	0.21	1.8	2.0	<0.5	<2	<2	EA (1986)
DAM	August	1985	Bottom	-	10.1	1.5	6.0	8.6	0.03	-	-	0.07	-	0.11	-	0.18	<0.01	0.070	0.7	-	25.5	19.0	2.1	0.30	1.6	0.8	<0.5	<2	5	EA (1986)
DAM	Oct	1985	0.0	-	13.0	8.1	6.7	10.0	0.01	-	-	0.03	-	0.27	-	0.30	<.010	0.030	3.8	-	24.0	17.0	2.2	0.30	2.0	1.8	<.5	<2	<2	EA (1986)
DAM	Oct	1985	Bottom	-	13.0	2.2	6.1	11.0	0.01	-	-	<.01	-	0.14	-	0.15	<.010	0.050	3.9	-	31.0	19.0	2.1	0.30	2.1	2.5	0.8	<2	2	EA (1986)
DAM	July	1986	0.0	-	20.5	7.8	7.0	5.3	0.01	-	-	0.02	-	0.10	-	0.12	0.010	0.010	0.8	-	18.0	17.0	1.6	0.60	1.3	0.8	<1.0	<2	11	EA (1986
DAM	July	1986	Bottom	-	12.0	8.2	6.8	5.6	0.01	-	-	0.05	-	0.13	-	0.18	<0.010	<0.010	0.6	-	19.0	17.0	1.8	0.60	1.3	0.4	<1.0	2	27	EA (1986)
Dorabelle	June 4	1979	1.0	-	-	-	-	-	-	0.11	0.000	0.00	-	-	0.00	-	0.000	0.050	-	-	-	-	-	-	-	-	0.7	-	-	CDWR (1980)
Dorabelle	Aug. 6	1979	1.0	-	-	-	-	-	-	0.00	-	0.07	-	-	0.22	-	0.000	0.040	-	-	-	-	-	-	-	-	0.7	-	-	CDWR (1980)
N. Fork Stevenson Cr.	June 4	1979	1.0	-	-	-	7.0	8.0	-	0.15	0.000	0.00	-	-	0.00	-	0.000	0.050	-	-	17.0	10.0	1.6	0.00	1.8	0.0	0.6	-	-	CDWR (1980)
	Aug. 6	1979	1.0	-	-	-	6.9	8.0	-	0.00	0.001	0.07	-	-	0.18	-	0.000	0.040	-	-	18.0	12.0	2.0	0.00	1.6	1.0	0.8	-	-	CDWR (1980)
Shaver Point	June 4	1979	1.0	-	-	-	-	-	-	0.07	0.000	0.00	-	-	0.11	-	0.000	0.040	-	-	-	-	-	-	-	-	0.6	-	-	CDWR (1980)
Shaver Point	Aug 6	1979	1.0	-	-	-	-	-	-	0.00	0.001	0.09	-	-	0.33	-	0.010	0.040	-	-	-	-	-	-	-	-	0.7	-	-	CDWR (1980)
Mid-Lake	7-1,9-30	1968	0.0	4.2	-	8.6	7.4	6.5	-	-	-	0.00	-	-	-	-	0.140	-		22.7*	-	21.9	1.7	0.20	1.7	-	-	-	-	Nicolo & Cordone (1972)
Mid-Lake	7-1,9-30	1968	mid epil	-	19.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Nicolo & Cordone (1972)

APPENDIX B Table B-4 Summary of Limnology data from Studies of Shaver Lake between 1968-1986. (Constituents in mg/l, except as noted) (continued)

Station	Month	Year	Depth meter	Secchi (meters)	Temp. C	Dissolved Oxygen	pH	Alkalinity (CaCO3)	NH3 (N)	NH4 (N)	NO2 (N)	NO3 (N)	NO2+NO3 (NO2+NO3)	KJEL.N (N)	Organic N (N)	Total N (N)	OrthoPhos-phate	Total Phosphate	Chlorophyll A (ug/l)	Primary Productivity* mgC/m3	Conductivity umhos/cm	Total Dissolved Solids	Calicum	Magnesium	Sodium	Turbidity (JTU)	Biological Oxygen Demand	Fecal Cliforms MPH/100ml	Total Coliforms MPN/100ml	Source
Mid-Lake	7-1,9-30	1968	14.0-17.0	-	20.0	7.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Nicolo & Cordone (1972)
Mid-Lake	7-1,9-30	1968	bottom	-	17.3	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Nicolo & Cordone (1972)
Mid-Lake	June 4	1975	0.0	3.8	18.5	8.8	10.9	23.0	0.05	-	-	-	0.05	0.60	-	-	0.010	0.041	1.4	-	16.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 4	1975	0.9	-	18.5	9.0	9.6	21.0	0.05	-	-	-	0.05	0.20	-	-	0.006	0.015	-	-	16.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 4	1975	3.0	-	9.5	9.8	9.6	21.0	0.04	-	-	-	0.21	0.20	-	-	0.004	0.019	-	-	11.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 4	1975	4.9	-	8.0	10.0	9.2	10.0	0.04	-	-	-	0.04	0.20	-	-	0.003	0.013	-	-	12.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 4	1975	7.3	-	6.5	10.0	9.2	10.0	0.02	-	-	-	0.03	0.20	-	-	0.003	0.013	-	-	10.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 4	1975	12.2	-	5.4	9.6	9.4	10.0	0.04	-	-	-	0.06	0.20	-	-	0.004	0.019	-	-	10.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 4	1975	16.5	-	5.0	9.8	9.3	-	0.04	-	-	-	0.06	0.20	-	-	0.004	0.012	-	-	11.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 24	1975	0.0	3.0	14.7	8.4	8.2	-	-	-	-	-	-	-	-	-	-	-	1.5	-	64.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 24	1975	1.5	-	14.7	8.4	8.1	13.0	0.03	-	-	-	0.02	0.40	-	-	0.010	0.022	-	-	45.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 24	1975	6.1	-	14.3	9.0	7.5	12.3	0.07	-	-	-	0.02	0.40	-	-	0.005	0.014	-	-	14.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 24	1975	9.1	-	11.5	9.0	6.8	12.0	0.03	-	-	-	0.02	0.50	-	-	0.004	0.012	-	-	20.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 24	1975	18.3	-	9.5	9.0	6.9	10.0	0.02	-	-	-	0.02	0.40	-	-	0.003	0.012	-	-	29.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	June 24	1975	29.0	-	7.5	8.4	6.7	11.0	0.04	-	-	-	0.02	0.50	-	-	0.003	0.182	-	-	30.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	Nov. 13	1975	0.0	5.2	13.5	8.0	7.0	10.0	0.02	-	-	-	0.02	0.20	-	-	0.002	0.009	2.3	-	37.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	Nov. 13	1975	1.5	-	13.4	8.0	7.0	11.0	0.02	-	-	-	0.02	0.20	-	-	0.002	0.010	-	-	38.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	Nov. 13	1975	4.6	-	13.4	8.2	6.9	20.0	0.02	-	-	-	0.05	0.20	-	-	0.018	0.015	-	-	39.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	Nov. 13	1975	10.7	-	13.5	8.2	6.9	17.0	0.02	-	-	-	0.05	0.20	-	-	0.005	0.012	-	-	39.0	-	-	-	-	-	-	-	-	EPA (1978)
Mid-Lake	Nov. 13	1975	23.2	-	13.3	7.8	6.8	14.0	0.02	-	-	-	0.02	0.20	-	-	0.003	0.018	-	-	37.0	-	-	-	-	-	-	-	-	EPA (1978)

Source: Draft Technical Report on Shaver Lake Fisheries Studies conducted in support of the Big Creek Expansion Project, BioSystems Analysis, Inc. 1987

Appendix B Table B-5. Water quality data for aquatic stations* in Shaver Lake and Tributary Creeks

	Tamarack		Pitman		North Fork Stevenson Creek		Balsam		Shaver Lake	
Month/Parameter	**T-1**	**T-2**	**P-1**	**P-2**	**S-1**	**S-2**	**B-1**	**B-3**	**SL-1**	**SL-5**
October 1978										
Temperature	3.9°C	2.8°C	4.2°C	1.1°C	9.0°C	1.1°C	11.0°C	–	16.2°C	–
Dissolved oxygen	–	–	–	–	–	–	–	–	–	–
Conductivity	0.1	0.1	0.1	0	0.15	0.1	0.2	–	0.1	–
pH	8.2	7.8	8.5	9.0	7.8	7.4	7.4	–	7.1	–
February 1979										
Temperature	1.3°C	–	–	1.4°C	2.3°C	–	0°C	–	–	–
Dissolved oxygen	8.5	–	–	8.5	9.2	–	8.2	–	–	–
Conductivity	12	–	–	15	14	–	28	–	–	–
pH	–	–	–	–	–	–	–	–	–	–
May-June 1979										
Temperature	10.0°C	10.2°C	4.0°C	5.9°C	11.0°C	3.6°C	9.4°C	14°C	17.0°C	17.°C
Dissolved oxygen	11.2	11.6	7.9	8.6	8.6	7.1	7.2	8.1	9.2	10.2
Conductivity	7.3	14.0	9.7	7.0	12.0	10.0	29.0	23	16	12.0
pH	8.6	8.0	8.2	9.2	7.9	7.9	7.9	8.5	8.3	7.6
August 1979										
Temperature	16°C	20°C	23.5°C	22.5°C	21°C	18°C	22°C	14°C	26°C	23°C
Dissolved oxygen	7.2	6.4	6.6	6.2	7.0	7.2	6.8	8.3	6.2	6.6
Conductivity	24	52	–	39	47	44	36	52	–	49
pH	7.3	8.4	6.4	8.3	7.8	8.3	8.0	8.3	8.4	8.2

*Station Locations:

T-1 Tamarack Creek
T-2 South Fork Tamarack Creek
P-1 Downstream of Tunnel Diversion
P-2 Upstream of Tunnel Diversion
S-1 Downstream of Tunnel Discharge
S-2 Upstream of Tunnel Discharge
B-1 West Fork Balsam Creek
B-3 Balsam Creek below confluence of West Fork
SL-1 Near Balsam Meadow site
SL-5 North Central near East Shore

Source: Balsam Meadow Development of Big Creek Project No. 67, Final Environmental Impact Statement, September 1982

Appendix B Table B-6. Physical-Chemical Data of Water Samples Collected in the Dam 6 Pool an the San Joaquin River for Big Creek No. 3 Project (1985-1986)

		Above Dam 6		San Joaquin River		
Parameter	**Date**	**Top**	**Bottom**	**Below Dam 6**	**Above Powerhouse 3**	**pH 3 Afterbay**
Calcium	8/85	2.1	1.7	1.9	2.9	1.6
	10/85	3.7	--	3.1	3.7	2.9
	7/86	1.3	1.4	1.5	2.2	1.3
Magnesium	4/85	0.32	0.22	0.24	0.43	0.19
	10/85	0.80	--	0.70	0.50	0.50
	7/86	0.20	0.20	0.20	0.30	0.20
Potassium	8/85	0.37	0.38	0.28	0.74	0.22
	10/85	0.70	--	0.50	0.90	0.60
	7/86	0.30	0.40	0.20	0.60	0.20
Sodium	8/85	2.0	1.4	1.4	3.2	1.3
	10/85	5.8	--	3.3	3.8	3.4
	7/86	1.0	1.0	0.90	1.9	1.0
Total	8/85	19	25	10	29	14
Dissolved	10/85	35	--	24	29	19
Solid	7/86	26	24	15	23	13
Total	8/85	1.0	1.0	1.0	1.1	<0.50
Suspended	10/85	0.50	--	<0.50	<0.50	0.50
Solid	7/86	<0.50	2.4	<0.50	0.80	2.0
Turbidity	8/85	1.0	1.2	1.5	0.30	1.6
(NTU)	10/85	0.65	--	1.1	0.45	1.2
	7/86	1.5	2.5	0.90	0.50	1.0
Alkalinity	8/85	7.0	4.0	--	9.7	11
(as $CaCO_3$)	10/85	17	--	10	15	11
	7/86	4.6	4.7	5.2	7.8	4.8
Hardness	8/85	6.6	5.1	5.7	9.0	4.8
	10/85	12	--	11	11	9.3
	7/86	4.1	4.3	4.6	6.7	4.1
Bicarbonate	8/85	9.0	5.0	7.0	12	13
	10/85	21	--	12	19	14
	7/86	5.6	5.7	6.3	9.5	5.9
Biological	8/85	0.60	0.8	<0.50	<0.50	<0.50
Oxygen	10/85	<0.50	--	<0.50	0.60	<0.50
Demand	7/86	<1.0	<1.0	<1.0	<1.0	<1.0

APPENDIX B Table B-6 Physical-Chemical Data of Water Samples Collected in the Dam 6 Pool an the San Joaquin River for Big Creek No. 3 Project (1985-1986) (continued)

		Above Dam 6		San Joaquin River		
Parameter	**Date**	**Top**	**Bottom**	**Below Dam 6**	**Above Powerhouse 3**	**pH 3 Afterbay**
Total	8/85	0.07	0.09	0.10	0.10	0.11
Kjeldahl	10/85	0.19	--	0.82	0.12	0.15
Nitrogen	7/86	0.05	0.08	0.06	0.12	0.06
Total	4/85	0.12	0.17	0.18	0.14	0.17
Nitrogen	10/85	0.24	--	0.85	0.13	0.16
	7/86	0.05	0.09	0.06	0.16	0.08
NH_3 as N	8/85	<0.01	0.01	0.02	<0.01	<0.01
	10/85	0.01	--	0.03	<0.01	0.02
	7/86	0.01	0.01	0.02	0.02	0.01
NO_3 as N	8/85	0.04	0.08	0.08	0.04	0.06
	10/85	0.05	--	0.03	<0.01	0.01
	7/86	<0.01	0.01	<0.01	0.01	0.02
Total	8/85	0.11	0.08	0.13	<0.05	0.05
Phosphorus	10/85	0.20	--	0.10	0.02	0.01
	7/86	<0.01	<0.01	<0.01	<0.01	<0.01
Ortho-	8/85	0.01	0.02	0.07	0.05	<0.01
Phosphorus	10/85	<0.01	--	<0.01	0.02	<0.01
(PO_4)	7/86	<0.01	0.02	0.02	0.02	0.02
$SO4^{--}$	8/85	<1.0	5.0	2.0	2.0	<1.0
	10/85	1.8	--	0.70	1.0	1.0
	7/86	0.80	0.70	0.60	0.80	0.80
Chlorine	8/85	2.3	1.6	<0.30	3.3	0.7
	10/85	7.3	--	6.1	4.6	4.0
	7/86	0.40	0.45	0.45	1.2	0.15
Chla	8/85	1.2	2.3	1.9	0.50	1.5
(ug/l)	10/85	0.70	--	1.0	0.50	1.0
	7/86	<0.50	<0.50	<0.50	<0.50	<0.50
Total	8/85	2	79	21	8	23
Coliforms	10/85	<2	--	<4	2	<2
(MPN/100ml)	7/86	8	33	33	11	49
Fecal	8/85	<2	<2	<2	8	<2
Coliform	10/85	<2	--	<2	<2	<2
(MPN/100ml)	7/86	<2	2	<2	<2	5

APPENDIX B Table B-6 Physical-Chemical Data of Water Samples Collected in the Dam 6 Pool an the San Joaquin River for Big Creek No. 3 Project (1985-1986) (continued)

		Above Dam 6		San Joaquin River		
Parameter	**Date**	**Top**	**Bottom**	**Below Dam 6**	**Above Powerhouse 3**	**pH 3 Afterbay**
Dissolved Oxygen	8/85	7.9	8.7	9.1	9.4	10
	10/85	7.9	8.4	8.7	9.2	8.9
	7/86	9.4	9.8	9.2	8.6	9.8
Conductivity (umho)	8/85	24	20	21	38	19
	10/85	56	--	36	43	36
	7/86	14	14	14	24	16
PH	8/85	6.6	6.8	7.0	7.4	6.9
	10/85	6.9	7.0	7.1	7.1	7.0
	7/86	6.8	6.8	7.0	7.2	6.9
Temperature (C)	8/85	17.6	15.0	17.2	24.9	15.4
	10/85	13.5	12.9	13.0	14.0	13.0
	7/86	13.3	14.4	14.5	20.5	13.5

A. Except as noted; in mg/l.

Source: Draft, Report on Water Use and Water Quality for Big Creek Powerhouse No. 3, EA Engineering, Science, and Technology, Inc., August 1987.

APPENDIX C

Basin Plan Objectives

APPENDIX C. BASIN PLAN OBJECTIVES

The Porter-Cologne Water Quality Control Act defines water quality objectives as "...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area" (Water Code Section 13050(h)). The following water quality objectives established in the Basin Plan (CVRWQCB 1998) apply to all surface waters in the Sacramento and San Joaquin River basins.

Bacteria - In waters designated for contact recreation, the fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a geometric mean of 200/100 ml. Nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.

Biostimulatory Substances - Water shall not contain biostimulatory substances that promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

Chemical Constituents - Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. Water quality objectives for chemical constituents in the San Joaquin River Basin above Millerton Lake are not listed in detail in the Basin Plan. However, the Basin Plan does specify that, at a minimum, water designated for use as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the provisions of Title 22 of the California Code of Regulations.

Color - Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.

Dissolved Oxygen - For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. The DO concentrations shall not be reduced below the following minimum levels at any time:

Waters designated WARM	5.0 mg/l
Waters designated COLD	7.0 mg/l
Waters designated SPWN	7.0 mg/l

Floating Material - Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.

Oil and Grease - Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.

APPENDIX C. BASIN PLAN OBJECTIVES (CONTINUED)

pH - The pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses. In determining compliance with the water quality objective for pH, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

Pesticides - No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.

Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.

Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency (EPA), or the Executive Officer.

Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see State Water Resources Control Board Resolution No. 68-16 and 40 C.F.R. Section 131.12.).

Pesticide concentrations shall not exceed the lowest levels technically and economically achievable.

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the Maximum Contaminant Levels (MCLs), set forth in California Code of Regulations, Title 22, Division 4, Chapter 15.

Where more than one objective may be applicable, the most stringent objective applies.

Radioactivity - Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. At a minimum, waters designated for use as MUN shall not contain concentrations of radionuclides in excess of the MCLs specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations.

Sediment - The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Settable Material - Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses.

Suspended Material - Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

APPENDIX C. BASIN PLAN OBJECTIVES (continued)

Tastes and Odors - Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to MUN water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance or otherwise adversely affect beneficial uses.

Temperature - At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5º F above natural receiving water temperature. In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

Toxicity - All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

Turbidity - Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.

Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.

Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.

Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

APPENDIX D

Calculated Ammonia Concentration Criteria
Per National Toxics Rule Guidelines

Appendix D Table D-1. Spring Ammonia Calculations

Sample ID #	Location Name	Date	pH	Temperature (oC)	Ammonia Criteria Continuous Concentration with fish early life stages present (mg/l)*
BA-3	Balsam Crk DS Forebay	6/5/02	6.05	10.7	5.29
BA-4	Balsam Creek US diversion	5/20/02	7.03	4.5	5.84
BA-5	Balsam Creek DS Div.	5/20/02	7.31	8.0	5.04
BA-6	Balsam Creek US BC	5/20/02	6.13	8.3	6.17
BC-1	Big Creek US Huntington Lake	5/24/02	8.68	4.1	0.80
BC-10	Big Creek US PH 8	5/21/02	7.23	11.6	4.99
BC-2	Big Creek DS of Dam	5/24/02	6.60	6.8	6.57
BC-3	Big Creek US dam4/PH1	5/20/02	6.54	5.9	6.63
BC-5	Big Creek DS of Wastewater	5/20/02	5.24	9.7	5.64
BC-6	BC DS Balsam Confluence	5/20/02	7.04	11.7	4.96
BC-7	Big Creek US PH 2	5/21/02	6.81	8.5	6.09
BC-9	Big Creek DS of Dam 4/ PH2	5/21/02	6.26	6.8	6.80
BE-1	Bear Crk US Div	6/6/02	5.76	6.1	7.01
BE-3	Bear Crk. DS Div	6/6/02	5.72	6.6	6.89
BE-4	Bear Creek above confl.	6/11/02	7.24	9.6	5.27
BO-1	Bosillo Crk US Div	5/28/02	8.14	7.2	1.97
BO-2	Bosillo Crk. DS Div	5/28/02	8.74	6.9	0.73
BO-3	Bosillo Crk US S	5/31/02	6.85	9.4	5.76
C62-1	Camp 62 Crk DS Div	5/28/02	5.15	5.4	7.07
C62-2	Camp 62 Crk. US Div	5/28/02	5.40	5.4	7.05
C62-3	Camp 62 Creek DS Chinquapin Crk Conf	5/30/02	6.44	8.7	6.02
C62-4	camp 62 Crk US SFSJR Confluence	5/31/02	6.61	6.4	6.55
CH-1	Chinquipin crk US div	6/5/02	4.72	5.7	7.08
CH-2	Chinqiupin Crk DS Div	6/5/02	5.82	6.0	7.00
CR-1	Crater Crk US Div	6/10/02	6.87	5.4	6.17
CR-2	Crater Crk DS From Div	6/10/02	7.02	6.7	5.86
CR-3	Crater Crk	6/10/02	6.75	13.7	4.36
CR-4	Crater Crk. Div. US Florence Lake	5/29/02	8.11	9.1	2.07
EL-1	Ely Creek US Div	5/20/02	7.33	7.4	4.98
EL-2	Ely Creek DS Div	5/20/02	6.71	9.5	5.71
EL-3	Ely Creek US of BC conf	5/20/02	4.69	6.9	6.75
HO-1	Hooper Crk US of Div	5/30/02	6.13	5.1	6.90
HO-2	Hooper Crk DS of Div	5/30/02	6.32	5.4	6.80
HO-3	Hooper Crk US SJR confluence	5/30/02	7.92	9.3	2.72
MO-2	Mono Crk DS Div	6/6/02	6.23	10.9	5.22
MO-3	Mono Crk Above SJR Confluence	6/11/02	7.19	12.2	4.80
NF-1	NF Stev US Div	5/23/02	8.87	6.1	0.59
NF-2	NF Stev. DS Div	5/23/02	5.58	5.0	7.03
NF-3	NF Stev US Shaver Lake	5/20/02	6.75	4.4	6.37

Appendix D Table D-1. Spring Ammonia Calculations

Sample ID #	Location Name	Date	pH	Temperature (oC)	Ammonia Criteria Continuous Concentration with fish early life stages present (mg/l)*
NS-1	North Slide US of Diversion	5/30/02	6.04	9.4	5.75
NS-2	Nothern Slide DS of Diverison	5/30/02	6.14	9.6	5.67
NS-3	North Slide	5/30/02	6.59	7.9	6.33
PI-1	Pittman US of Div	5/24/02	8.66	2.7	0.83
PI-2	Pittman DS of Div	5/24/02	5.97	3.0	6.96
PI-3	Pitman creek US dam4	5/20/02	5.70	8.0	6.29
RA-1	Rancheria Creek US of PH	5/24/02	6.44	2.4	6.72
RA-2	Portal Powerhouse Tailrace	5/24/02	6.39	6.9	6.76
RK-1	Rock US Div	5/22/02	6.87	7.5	6.17
RK-2	Rock Creek DS Diversion	5/22/02	6.73	10.6	5.32
RK-3	Rock US of SJR Confluence	5/22/02	7.01	12.3	4.77
RO-1	Ross Creek US Diversion	5/21/02	7.34	9.2	4.94
RO-2	Ross Creek DS Diversion	5/21/02	7.70	10.9	3.58
SF-1	S.F. SJR DS Florence Dam	5/29/02	8.05	7.3	2.26
SF-2	San Joaquin river at mono xing	6/11/02	7.15	15.6	3.85
SF-3	SanJauquin at Rattle Snake xing	6/12/02	7.46	14.2	4.22
SF-5	S.F.SJR US Florence Lake	5/29/02	6.14	7.1	6.67
SJ-10	SJR DS of Stevenson Creek	5/21/02	6.82	13.8	4.33
SJ-11	SJR US PH 3 Tailrace	5/23/02	6.78	11.8	4.92
SJ-12	SJR PH 3 Tailrace	5/22/02	7.42	9.9	4.66
SJ-2	SJR DS of Mammoth Dam	5/22/02	6.99	10.2	5.46
SJ-3	SJR US Rock Confluence	5/22/02	7.02	11.8	4.92
SJ-4	San Joaquin River US Ross	5/21/02	6.58	11.2	5.12
SJ-5	San Joaquin US Mammoth Pool PH	5/21/02	6.99	11.6	4.99
SJ-6	Mammoth Pool PH tailrace	5/21/02	7.29	9.3	5.11
SJ-7	SJR /PH 8 Tailrace	5/21/02	6.58	7.3	6.57
SJ-9	San Joaquin DS Dam 6	5/21/02	6.58	10.5	5.35
SS-1	South Slide Crk US Diversion Dam	5/30/02	6.05	7.8	6.37
SS-2	South Slide Crk DS Div	5/30/02	6.02	7.9	6.33
SS-3	South Slide Creek	5/30/02	6.40	6.3	6.75
ST-1	Stevenson DS Shaver Dam	5/20/02	6.89	6.1	6.14
ST-2	Stevenson US of San Joaquin Confluence	5/21/02	7.20	8.2	5.39
TS-1	Tombstone Crk - Above Div	6/7/02	6.15	7.2	6.62
TS-2	Tombstone Crk -below Div	6/7/02	6.14	7.3	6.58
TS-3	Tombstone US of SFSJR	5/29/02	6.04	6.7	6.84

*Note: Ammonia criteria calculated using guidance from the National Toxic Rule, and based on ambient pH and temperature conditions.

Appendix D Table D-2. Fall Ammonia Calculations

Sample ID #	Location Name	Date	pH	Temperature (°C)	Ammonia Criteria Continuous Concentration with fish early life stages present (mg/l)*
RO-1	Ross Ck US Div	6/12/02	7.67	20.9	2.45
RO-2	Ross CK DS Div	6/25/02	8.28	29.8	0.59
BO-3	Bosillo Creek US SFSJR	7/2/02	5.82	12.7	7.00
SS-1	South Slide Creek US Div	7/2/02	6.40	8.3	8.30
C62-4	Camp 62 Crk US SFSJR Conf	7/2/02	6.50	13.9	4.10
SS-2	South Slide Creek DS Div	5/21/02	6.92	10.6	11.60
RK-1	Rock Creek	7/2/02	7.71	19.5	2.57
RK-2	Big Creek US Dam4/PH1	7/2/02	7.60	18.7	3.04
C62-3	Big Creek DS of Wastewater	7/2/02	5.76	12.3	7.01
RK-3	Rock Creek	7/2/02	7.45	18.7	3.48
SS-3	Southslide Creek US Conf	7/2/02	6.51	10.2	6.66
NS-3	North Slide Creek US Conf	7/2/02	6.65	10.5	6.51
BO-1	Bosillo Creek US Div	7/2/02	5.90	12.2	6.98
BO-2	Bosillo Creek DS Div	7/2/02	5.77	12.1	7.01
C62-1	Camp 62 US Div	7/2/02	5.71	11.9	7.02
C62-2	Camp 62 DS Div	7/2/02	5.96	12.1	6.96
NS-2	North Slide DS Div	7/3/02	6.92	10.6	6.08
NS-1	Bosillo Crk US S	7/3/02	6.57	10.5	6.60
TS-1	Tombstone Creek Above US Div	7/3/02	8.03	8.3	2.33
TS-2	Tombstone Creek DS Div	7/3/02	8.13	8.4	2.00
CH-2	Camp 62 Creek DS Chinquapin Crk Conf	7/3/02	5.72	13.4	7.01
TS-3	Tombstone Creek Conf US OF	7/3/02	7.79	12.5	3.22
CH-1	Chinquapin Creek US Div	7/7/02	5.93	12.2	6.97
PI-1	Pitman US Div	7/10/02	6.62	14.1	6.54
PI-2	Pitman DS Div	7/10/02	6.71	14.3	6.43
BA-3	Balsam DS Forebay	7/10/02	6.34	13.4	6.79
PI-3	Pitman US Dam 4	7/10/02	7.33	15.2	4.77
BA-5	Balsam DS Div	7/10/02	7.22	16.1	4.80
BA-4	Balsam US Div	7/10/02	7.16	15.1	5.31
EL-1	Ely US Div	7/10/02	6.72	16.2	5.74
EL-3	Ely US Conf	7/10/02	6.63	16.1	5.91
CR-1	Crater Creek US Div	7/11/02	7.07	12.2	5.74
CR-2	Crater Creek DS Div	7/11/02	7.13	10.3	5.59
HO-1	Hooper Creek US of Div	7/11/02	6.93	15.2	5.79
HO-2	Hooper Creek DS of Div	7/11/02	6.70	14.4	6.44
BA-6	Balsam Creek above Big Crk Confluence	7/11/02	5.45	18.9	5.31
CR-3	Crater US SFSJR	7/12/02	5.79	12.9	7.00
HO-3	Hooper Creek US of SFSJR	7/12/02	6.58	13.3	6.59
SF-5	San Joaquin River US of Florence Lake	8/20/02	6.84	13.9	6.23

Appendix D Table D-2. Fall Ammonia Calculations

Sample ID #	Location Name	Date	pH	Temperature (°C)	Ammonia Criteria Continuous Concentration with fish early life stages present (mg/l)*
SF-1	San Joaquin DS of Florence Lake	8/20/02	6.39	12.6	6.76
SJ-1	Northern Slide DS of Diversion	8/21/02	7.47	17.4	3.71
SJ-2	San Joaquin Below Mammoth Pool Dam	8/21/02	6.74	15.7	5.91
NF-3	NF Stevenson US of Shaver Lake	8/22/02	6.88	16.2	5.54
ST-1	Stevenson Cr. DS of Shaver Lake Dam	8/22/02	6.28	13.3	6.83
MO-2	Pitman creek US dam4	8/26/02	6.95	12.0	6.02
BC-3	Big Creek above Powerhouse 1	8/26/02	7.29	11.6	5.11
BC-5	Big Creek DS Dam 4/PH1	8/26/02	6.93	16.3	5.40
BE-1	Bear Creek US of Diversion Forebay	8/27/02	6.80	11.6	6.29
BE-3	Bear Creek DS of Diversion Forebay	8/27/02	6.85	13.6	6.21
BE-4	Bear Creek US from confluence	8/27/02	6.85	13.4	6.21
BC-7	Big Creek US of PH2	8/27/02	7.73	18.8	2.62
BC-9	Big Creek DS of Dam 5	8/27/02	6.36	16.2	6.08
BC-10	S.F. SJR DS Florence Dam	8/28/02	7.39	16.5	4.20
SJ-4	San Joaquin river at mono xing	8/28/02	7.72	18.5	2.71
SJ-5	SJR US Mammoth PH	8/28/02	7.70	18.8	2.72
SJ-6	Mammoth PH Tailrace	8/28/02	6.69	18.5	4.99
SJ-7	PH8 Tailrace	8/28/02	6.50	15.4	6.29
SJ-9	SJR DS of Dam 6	8/28/02	6.96	15.8	5.52
BC-1	Big Creek US of Huntington Lake	8/29/02	7.06	12.5	5.77
BC-2	Big Creek DS of Dam 1	8/29/02	6.53	14.6	6.62
MO-3	Mono Creek US from SFSJR Confluence	8/29/02	7.84	12.8	3.03
RA-1	Rancheria Creek US of Portal PH	8/29/02	6.98	8.0	5.95
RA-2	Portal Tailrace	8/29/02	6.78	15.4	11.60
SF-2	SFSJR at Mono Crossing	8/29/02	8.11	17.7	1.68
SF-3	San Joaquin at Rattlesnake Crossing	8/29/02	7.69	15.2	3.46
RA-2	Portal Tailrace	9/3/02	6.44	16.3	5.99
SJ-5	South Slide Crk US Diversion Dam	9/3/02	7.58	6.1	2.69
SJ-6	SJR Mammoth PH Tailrace	9/3/02	8.10	19.2	1.55
SJ-10	SJR DS Stevenson Creek	9/3/02	7.00	17.6	4.84
SJ-11	SJR US PH3	9/3/02	8.66	21.7	0.52
SJ-12	SJR PH3 Tailrace	9/3/02	6.70	18.0	5.15
ST-2	Stevenson Creek	9/3/02	7.92	14.0	2.72
SJ-3		9/4/02	6.91	18.9	4.60
SF-4	Tombstone US of SFSJR	9/4/02	8.77	18.2	0.55
BC-6	Big Creek US Balsam Confluence	9/5/02	7.10	16.5	4.99
NF-1	NF Stevenson US of Diversion	9/5/02	6.68	10.6	6.47
NF-2	NF Stevenson DS of Diversion	9/5/02	6.57	16.6	5.77

*Note: Ammonia criteria calculated using guidance from the National Toxic Rule, and based on ambient pH and temperature conditions.

APPENDIX E

Calculated Metals (Copper, Lead, Silver, and Zinc) Concentration Criteria per National Toxics Rule Guidelines

Appendix E Table E-1. Hardness Adjusted Criteria for Acute and Chronic Concentrations of Dissolved and Total Copper (as per National Toxic Rule Guidelines)

	Dissolved Copper (ug/L) Criteria		Total Copper (ug/L) Criteria	
Hardness	Acute	Chronic	Acute	Chronic
2.2	0.37	0.34	0.38	0.36
2.4	0.40	0.37	0.42	0.39
2.5	0.42	0.38	0.43	0.40
2.9	0.48	0.43	0.50	0.45
3.0	0.49	0.45	0.51	0.47
3.2	0.52	0.47	0.55	0.49
3.3	0.54	0.49	0.56	0.51
3.6	0.59	0.52	0.61	0.54
3.8	0.62	0.55	0.64	0.57
3.9	0.63	0.56	0.66	0.58
4.1	0.66	0.58	0.69	0.61
4.2	0.68	0.60	0.71	0.62
4.3	0.69	0.61	0.72	0.63
4.4	0.71	0.62	0.74	0.65
4.6	0.74	0.64	0.77	0.67
4.8	0.77	0.67	0.80	0.70
5.1	0.81	0.70	0.85	0.73
5.3	0.84	0.73	0.88	0.76
5.6	0.89	0.76	0.93	0.79
5.7	0.90	0.77	0.94	0.81
5.8	0.92	0.79	0.96	0.82
6.0	0.95	0.81	0.99	0.84
6.1	0.96	0.82	1.00	0.85
6.2	0.98	0.83	1.02	0.87
6.3	0.99	0.84	1.03	0.88
6.5	1.02	0.87	1.07	0.90
6.6	1.04	0.88	1.08	0.91
7.2	1.13	0.95	1.17	0.98
7.4	1.16	0.97	1.20	1.01
7.6	1.19	0.99	1.23	1.03
7.7	1.20	1.00	1.25	1.04
8.2	1.27	1.06	1.33	1.10
8.6	1.33	1.10	1.39	1.15
8.7	1.35	1.11	1.40	1.16
9.2	1.42	1.17	1.48	1.21
9.6	1.48	1.21	1.54	1.26
9.9	1.52	1.24	1.58	1.29
10.0	1.54	1.25	1.60	1.30
11.0	1.68	1.36	1.75	1.41
14.0	2.11	1.67	2.20	1.74
15.0	2.25	1.77	2.34	1.84
19.0	2.81	2.17	2.93	2.26

Laboratory: PQL = 50 ug/L MDL = 5 ug/L

Appendix E Table E-2. Hardness Adjusted Criteria for Acute and Chronic Concentrations of Dissolved and Total Lead (as per National Toxic Rule Guidelines)

	Dissolved Lead (ug/L) Criteria		Total Lead (ug/L) Criteria	
Hardness	Acute	Chronic	Acute	Chronic
2.2	0.85	0.03	0.63	0.02
2.4	0.94	0.04	0.71	0.03
2.5	0.99	0.04	0.75	0.03
2.9	1.18	0.05	0.90	0.04
3.0	1.22	0.05	0.94	0.04
3.2	1.32	0.05	1.02	0.04
3.3	1.37	0.05	1.06	0.04
3.6	1.51	0.06	1.19	0.05
3.8	1.61	0.06	1.27	0.05
3.9	1.66	0.06	1.31	0.05
4.1	1.76	0.07	1.40	0.05
4.2	1.81	0.07	1.44	0.06
4.3	1.86	0.07	1.49	0.06
4.4	1.91	0.07	1.53	0.06
4.6	2.01	0.08	1.62	0.06
4.8	2.11	0.08	1.71	0.07
5.1	2.26	0.09	1.85	0.07
5.3	2.37	0.09	1.94	0.08
5.6	2.52	0.10	2.08	0.08
5.7	2.57	0.10	2.13	0.08
5.8	2.62	0.10	2.18	0.08
6.0	2.73	0.11	2.27	0.09
6.1	2.78	0.11	2.32	0.09
6.2	2.83	0.11	2.37	0.09
6.3	2.89	0.11	2.42	0.09
6.5	2.99	0.12	2.52	0.10
6.6	3.05	0.12	2.57	0.10
7.2	3.37	0.13	2.87	0.11
7.4	3.47	0.14	2.97	0.12
7.6	3.58	0.14	3.07	0.12
7.7	3.64	0.14	3.12	0.12
8.2	3.91	0.15	3.38	0.13
8.6	4.13	0.16	3.59	0.14
8.7	4.18	0.16	3.65	0.14
9.2	4.46	0.17	3.92	0.15
9.6	4.68	0.18	4.13	0.16
9.9	4.85	0.19	4.30	0.17
10.0	4.91	0.19	4.35	0.17
11.0	5.47	0.21	4.92	0.19
14.0	7.20	0.28	6.68	0.26
15.0	7.79	0.30	7.30	0.28
19.0	10.18	0.40	9.86	0.38

Laboratory: PQL = 5 ug/L MDL = .25 ug/L

Appendix E Table E-3. Hardness Adjusted Criteria for Acute and Chronic Concentrations of Dissolved and Total Silver (as per National Toxic Rule Guidelines)

	Dissolved Silver (ug/L) Criteria		Total Silver (ug/L) Criteria	
Hardness	Acute	Chronic	Acute	Chronic
2.2	0.00	n/a	0.01	n/a
2.4	0.01	n/a	0.01	n/a
2.5	0.01	n/a	0.01	n/a
2.9	0.01	n/a	0.01	n/a
3.0	0.01	n/a	0.01	n/a
3.2	0.01	n/a	0.01	n/a
3.3	0.01	n/a	0.01	n/a
3.6	0.01	n/a	0.01	n/a
3.8	0.01	n/a	0.01	n/a
3.9	0.01	n/a	0.02	n/a
4.1	0.01	n/a	0.02	n/a
4.2	0.01	n/a	0.02	n/a
4.3	0.02	n/a	0.02	n/a
4.4	0.02	n/a	0.02	n/a
4.6	0.02	n/a	0.02	n/a
4.8	0.02	n/a	0.02	n/a
5.1	0.02	n/a	0.02	n/a
5.3	0.02	n/a	0.03	n/a
5.6	0.02	n/a	0.03	n/a
5.7	0.02	n/a	0.03	n/a
5.8	0.03	n/a	0.03	n/a
6.0	0.03	n/a	0.03	n/a
6.1	0.03	n/a	0.03	n/a
6.2	0.03	n/a	0.03	n/a
6.3	0.03	n/a	0.03	n/a
6.5	0.03	n/a	0.04	n/a
6.6	0.03	n/a	0.04	n/a
7.2	0.04	n/a	0.04	n/a
7.4	0.04	n/a	0.05	n/a
7.6	0.04	n/a	0.05	n/a
7.7	0.04	n/a	0.05	n/a
8.2	0.05	n/a	0.05	n/a
8.6	0.05	n/a	0.06	n/a
8.7	0.05	n/a	0.06	n/a
9.2	0.06	n/a	0.07	n/a
9.6	0.06	n/a	0.07	n/a
9.9	0.06	n/a	0.08	n/a
10.0	0.07	n/a	0.08	n/a
11.0	0.08	n/a	0.09	n/a
14.0	0.12	n/a	0.14	n/a
15.0	0.13	n/a	0.16	n/a
19.0	0.20	n/a	0.23	n/a

n/a = not applicable
Laboratory: PQL = 10 ug/L MDL = 0.2 ug/L

Appendix E Table E-4. Hardness Adjusted Criteria for Acute and Chronic Concentrations of Dissolved and Total Zinc (as per National Toxic Rule Guidelines)

	Dissolved Zinc (ug/L) Criteria		Total Zinc (ug/L) Criteria	
Hardness	Acute	Chronic	Acute	Chronic
2.2	4.62	4.66	4.72	4.72
2.4	4.97	5.01	5.08	5.08
2.5	5.15	5.19	5.26	5.26
2.9	5.84	5.88	5.97	5.97
3.0	6.01	6.05	6.14	6.14
3.2	6.34	6.39	6.49	6.49
3.3	6.51	6.56	6.66	6.66
3.6	7.01	7.07	7.17	7.17
3.8	7.34	7.40	7.50	7.50
3.9	7.50	7.56	7.67	7.67
4.1	7.82	7.89	8.00	8.00
4.2	7.99	8.05	8.17	8.17
4.3	8.15	8.21	8.33	8.33
4.4	8.31	8.38	8.49	8.49
4.6	8.63	8.70	8.82	8.82
4.8	8.94	9.02	9.14	9.14
5.1	9.41	9.49	9.63	9.63
5.3	9.73	9.81	9.94	9.94
5.6	10.19	10.27	10.42	10.42
5.7	10.34	10.43	10.58	10.58
5.8	10.50	10.58	10.73	10.73
6.0	10.80	10.89	11.05	11.05
6.1	10.96	11.05	11.20	11.20
6.2	11.11	11.20	11.36	11.36
6.3	11.26	11.35	11.51	11.51
6.5	11.56	11.66	11.82	11.82
6.6	11.71	11.81	11.98	11.98
7.2	12.61	12.71	12.89	12.89
7.4	12.90	13.01	13.20	13.20
7.6	13.20	13.31	13.50	13.50
7.7	13.35	13.46	13.65	13.65
8.2	14.08	14.19	14.39	14.39
8.6	14.66	14.78	14.99	14.99
8.7	14.80	14.92	15.13	15.13
9.2	15.52	15.65	15.87	15.87
9.6	16.09	16.22	16.45	16.45
9.9	16.51	16.65	16.89	16.89
10.0	16.66	16.79	17.03	17.03
11.0	18.06	18.20	18.46	18.46
14.0	22.15	22.33	22.65	22.65
15.0	23.48	23.68	24.01	24.01
19.0	28.69	28.93	29.34	29.34

Laboratory: PQL = 50 ug/L MDL = 5 ug/L

APPENDIX F

Narrative Summaries of Monthly Reservoir/Forebay Profiling

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING

The following provides a narrative summary of the reservoir/forebay water quality profiling and sampling results for each reservoir/forebay (Shaver Lake, Huntington Lake, Florence Lake, Mammoth Pool Reservoir, Balsam Meadow Forebay, Bear Forebay, Mono Forebay, Dam 4 Forebay, Dam 5 Forebay, and Dam 6 Forebay on a monthly basis.

SHAVER LAKE

MAY 23, 2002

Water Quality Depth Profile Results

Temperature profile results show that thermal stratification occurred between 5.0 m (12.03°C) and 6.0 m (10.92°C) at SL-3 during the May sampling event (Figure H-3, Appendix H). SL-1 and SL-2 were not thermally stratified, but the temperature profiles suggest the formation of a weak thermocline (Figures H-1 and H-2, Appendix H). Total water depths were approximately 43 meters (m) at SL-1, 22 m at SL-2, and 19 m at SL-3. Surface water temperatures ranged from 13.20°C at SL-1 to 14.09°C at SL-3 (Table G-1, Appendix G). Bottom water temperatures ranged from 7.11°C at SL-1 to 8.24°C at SL-3 (Table G-1, Appendix G).

In-situ pH measurements reveal that the majority of values were within the Basin Plan criterion of 6.5-8.5 (Figures H-1 to H-3, Appendix H). At each station, a few values were below 6.5 near the profile bottom (Table G-1, Appendix G). Measurements of pH ranged from 7.07 (surface) to 6.17 (bottom) at SL-1, from 7.02 (surface) to 6.23 (bottom) at SL-2, and from 7.30 (surface) to 6.33 (bottom) at SL-3. Lower pH values at depth are typical of large water bodies where dissolved oxygen (DO) tends to decrease with depth, which causes reduced conditions and lower pH.

In-situ DO levels ranged from 8.54 mg/l (surface) to 6.47 mg/l (bottom) at SL-1, from 8.22 mg/L (surface) to 7.77 mg/L (bottom) at SL-2, and from 8.33 mg/L (1 m) to 8.15 mg/L (bottom) to at SL-3 (Table G-1, Appendix G). One measurement at station SL-1 was below the Basin Plan standard of 7.0 mg/L (6.47 mg/L at the bottom of the profile).

Water Chemistry Results

Laboratory analytical results of 40 chemical constituents (Table CAWG-4-8) in samples collected from all stations (except pH) met the Basin Plan objectives during the May sampling event.

During the May and June sampling events a dissolved copper concentration of 1.63 ug/L was detected at location SL-3 (Shaver Lake near Stevenson Creek inflow) at 2.0 ug/L and 0.81 ug/L, respectively. These concentrations were above the hardness based acute and chronic standards of standard of 0.98 and 0.83 ug/L, respectively. In July a dissolved copper concentration of 7.78 ug/L was detected at location SL-1 (Shaver Lake near the Dam) which is above the hardness based criteria. A dissolved

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

lead concentration of 2.7 ug/L was also detected at location SL-1 during the July event which exceeded the acute and chronic harness based criteria of 2.26 ug/L and 0.09 ug/L, respectively.

JUNE 24, 2002 (SHAVER LAKE)

Water Quality Depth Profile Results

Temperature profile results show that thermal stratification occurred between 4.0 m (19.43°C) and 5.0 m (16.62°C) at SL-2 and between 4.0 m (19.62°C) and 5.0 m (17.64°C) at SL-3 during the June sampling event (Figures H-5 and H-6, Appendix H). SL-1 was not thermally stratified (Figure H-4, Appendix H). Total water depths were approximately 37 m at SL-1, 20 m at SL-2, and 22 m at SL-3. Surface water temperatures ranged from 20.27 °C at SL-3 to 20.64 °C at SL –1 (Table G-1, Appendix G). Bottom water temperatures ranged from 10.08 °C at SL-1 to 12.08°C at SL-2 (Table G-1, Appendix G).

In-situ pH values were below the Basin Plan criterion of 6.5-8.5 at all sites (Figures H-4, H-5 and H-6, Appendix H). Measurements of pH ranged from 5.64 (5 m) to 5.26 (bottom) at SL-1, from 5.91 (surface) to 5.35 (bottom) at SL-2, and from 5.91 (4 m) to 5.36 (bottom) at SL-3 (Table G-1, Appendix G).

In-situ DO concentration ranged from 9.79 mg/L (surface) to 6.58 mg/L (bottom) at SL-1, from 7.89 mg/L (5m) to 7.18 mg/L (bottom) at SL-2, and from 7.72 mg/L (7 m) to 7.17 mg/L (bottom) at SL-3 (Figures H-4, H-5 and H-6, Appendix H). All DO concentrations, except three measurements near the bottom of SL-1, were above the lower limit of 7.0 for cold water bodies (Table G-1, Appendix G).

Water Chemistry Results

Laboratory analyses detected concentrations of diesel phase total petroleum hydrocarbons (TPH-d) at SL-1 (100 µg/L), SL-2A (140 µg/L), SL-2B (75 µg/L), and SL-3A (160 µg/L) (Table CAWG-4-9). Laboratory analytical results indicate that the remaining chemical constituents met the Basin Plan objectives during the June sampling event.

During the May and June sampling events a dissolved copper concentration of 1.63 ug/L was detected at location SL-3 (Shaver Lake near Stevenson Creek inflow) at 2.0 ug/L and 0.81 ug/L, respectively. These concentrations were above the hardness based acute and chronic standards of standard of 0.98 and 0.83 ug/L, respectively. In July a dissolved copper concentration of 7.78 ug/L was detected at location SL-1 (Shaver Lake near the Dam) which is above the hardness based criteria. A dissolved lead concentration of 2.7 ug/L was also detected at location SL-1 during the July event

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

which exceeded the acute and chronic harness based criteria of 2.26 ug/L and 0.09 ug/L, respectively.

JULY 26, 2002 (SHAVER LAKE)
Water Quality Depth Profile Results

Temperature profile results show that thermal stratification occurred between 5.0 m (21.89°C) and 6.0 m (20.81°C) at SL-1, between 4.0 m (22.53°C) and 5.0 m (20.73°C) at SL-2, and between 4.0 m (22.39°C) and 5.0 m (20.96°C) at SL-3 during July (Figures H-7, H-8 and H-9, Appendix H). Total water depths were approximately 38 m at SL-1, 23 m at SL-2, and 22 m at SL-3. Surface water temperatures ranged from 22.37 °C at SL-1 to 22.76 °C at SL –2 (Table G-1, Appendix G). Bottom water temperatures ranged from 11.70 °C at SL-1 to 14.17°C at SL-2 (Table G-1, Appendix G).

At each station, in-situ pH measurements from the surface to approximately 7-10 m deep were within the Basin Plan criterion of 6.5-8.5 (Figures H-7, H-8 and H-9, Appendix H). In general, pH values ranged from 6.85 (surface) to 5.88 (bottom) at SL-1, from 6.92 (surface) to 5.99 (bottom) at SL-2, and from 6.83 (surface) and 6.00 (bottom) at SL-3 (Table G-1, Appendix G).

In-situ DO levels ranged from 6.24 mg/l (9 m) to 3.82 mg/l (bottom) to at SL-1, from 4.72 mg/l (bottom) to 5.60 mg/l (6 m) at SL-2, and from 4.53 mg/l (bottom) to 5.49 mg/l (7 m) at SL-3 (Figures H-7, H-8 and H-9, Appendix H). None of the DO concentrations met the lower limit of 7.0 mg/L for cold water bodies.

Water Chemistry Results

Laboratory analyses detected concentrations of MtBE at SL-1A (5.5 µg/L), SL-2A (8.8 µg/L), SL-2B (6.2 µg/L), SL-3A (9.5 µg/L), and SL-3B (9.9 µg/L) (Table CAWG-4-10). Laboratory results indicate that the remaining chemical constituents met the Basin Plan objectives during the July sampling event (Table CAWG-4-10).

AUGUST 22, 2002 (SHAVER LAKE)
Water Quality Depth Profile Results

Temperature profile results show that thermal stratification did not occur at any of the sampling stations during the August sampling event (Figures H-10, H-11 and H-12, Appendix H). Total water depths were approximately 37 m at SL-1, 26 m at SL-2, and 22 m at SL-3. Surface water temperatures ranged from 21.15 °C at SL-3 to 21.60 °C at SL –1 (Table G-1, Appendix G). Bottom water temperatures ranged from 14.24 °C at SL-1 to 16.50°C at SL-3 (Table G-1, Appendix G).

In-situ pH measurements in the upper portion of the profiles (0 to 13 m depth) met the Basin Plan criterion of 6.5-8.5 (Figures H-10, H-11, H-12, Appendix H). Measurements below 13 m to the bottom of the reservoir were below 6.5. Measurements of pH ranged

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

from 7.24 (3 m) to 5.96 (bottom) at SL-1, from 7.08 (1 m) to 6.01 (bottom) at SL-2, and from 7.14 (surface) to 6.15 (bottom) at SL-3 (Table G-1, Appendix G).

In-situ DO levels ranged from 8.28 mg/l (9 m) to 3.82 mg/l (bottom) at SL-1, from 7.42 mg/l (2 m) to 4.70 mg/l (bottom) at SL-2, and 7.23 mg/l (7 m) to from 4.89 mg/l (bottom) to SL-3 (Figures H-10, H-11 and H-12, Appendix H). At each sampling station, DO concentrations were at or above the Basin standard of 7.0 mg/L from the surface to depths of 7, 10 and 13 m (Table G-1, Appendix G).

Water Chemistry Results

Laboratory analyses detected concentrations of MtBE at SL-1A (10.0 µg/L), SL-1B (5.6 µg/L), SL-2A (6.6 µg/L), SL-2B (7.8 µg/L), SL-3A (7.2 µg/L), and SL-3B (6.1 µg/L). Laboratory analytical results indicate that the remaining chemical constituents met the Basin Plan objectives during the August sampling event (Table CAWG-4-11).

SEPTEMBER 26, 2002 (SHAVER LAKE)
Water Quality Depth Profile Results

Temperature profile results show that complete thermal mixing occurred at each station during the September sampling event (Figures H-13, H-14 and H-15, Appendix H). Total water depths were approximately 26 m at SL-1, 16 m at SL-2, and 21 m at SL-3. Surface water temperatures ranged from 19.43 °C at SL-1 to 19.96 °C at SL –3 (Table G-1, Appendix G). Bottom water temperatures ranged from 18.43 °C at SL-1 to 18.82°C at SL-2 (Table G-1, Appendix G).

Profile results show that all but three in-situ pH values met the Basin Plan Water Quality objective of 6.5 to 8.5 (Figures H-13, H-14 and H-15, Appendix H). Three pH measurements at SL-1 were below 6.5 near the profile's bottom at 19, 22 and 25 m (Table G-1, Appendix G). Measurements of pH ranged from 7.34 (8 m) to 6.37 (bottom) at SL-1, from 7.05 (surface) to 6.76 (bottom) at SL-2, and from 7.02 (7 m) to 6.69 (bottom) at SL-3 (Table G-1, Appendix G).

In-situ DO concentrations ranged from 7.45 mg/l (surface to 5.13 mg/l (bottom) at SL-1, from 7.33 mg/l (surface) to 6.22 mg/l (bottom) at SL-2, and from 7.08 mg/l (7 m) to 6.36 mg/l (bottom) at SL-3 (Figures H-13, H-14 and H-15, Appendix H). In the upper portion of each profile, DO concentrations were above the lower limit of 7.0 mg/L for cold water bodies. Below approximately 8-10 m deep the DO levels were below the Basin Plan standard of 7.0 mg/L, with the lowest value measured at 5.13 mg/l (Table G-1, Appendix G).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

Water Chemistry Results

With the exception of pH values, laboratory analytical results indicate that, the remaining chemical constituents met the Basin Plan objectives during the September sampling event (Table CAWG-4-12).

HUNTINGTON LAKE

MAY 28, 2002
Water Quality Depth Profile Results

Thermal stratification occurred between 5.0 m (11.21°C) and 6.0 m (9.99°C) at HL-3 during the May sampling event (Figure H-18, Appendix H). HL-1 and HL-2 were not thermally stratified (Figures H-16 and H-17, Appendix H). Total water depths were approximately 43 m at HL-1, 39 m at HL-2, and 20 m at HL-3. Surface water temperatures ranged from 12.52 °C at HL -2 to 12.91 °C at HL-3 (Table G-2*,* Appendix G). Reservoir bottom water temperatures ranged from 5.86 °C at HL-1 to 6.81°C at HL-3 (Table G-2, Appendix G).

Results from in-situ pH profiles show that the Basin Plan criterion were met from the surface to approximately 10 m deep (Figures H-16, H-17, H18, Appendix H). Data collected for pH ranged from 6.70 (1 m) to 6.20 (bottom) at HL-1, from 6.70 (surface) to 6.21 (bottom) at HL-2, and from 6.89 (surface) to 6.16 (bottom) at HL-3 (Table G-2, Appendix G).

Dissolved oxygen levels ranged from 8.17 mg/L (1 m) to 8.64 mg/L (15 m) at HL-1, from 8.72 (10 m) to 7.96 mg/L (bottom) at HL-2, and from 8.31 mg/L (1m) to 9.00 mg/L (9m) at HL-3 (Figures H-16, H-17, and H-18, Appendix H). All DO levels met the Basin Plan criteria (Table G-2, Appendix G).

Water Chemistry Results

Laboratory analytical results indicate that the chemical constituents met the Basin Plan objectives during the May sampling event (Table CAWG-4-8).

JUNE 25, 2002 (HUNTINGTON LAKE)
Water Quality Depth Profile Results

Thermal stratification occurred between 8.0 m (17.85°C) and 10.0 m (13.87°C) at HL-3 during the sampling event in June (Figure H-21, Appendix H). HL-1 and HL-2 were not thermally stratified (Figures H-19 and H-20, Appendix H). Total water depths were approximately 44 m at HL-1, 35 m at HL-2, and 15 m at HL-3. Surface water temperatures ranged from 17.19 °C at HL-1 to 18.07 °C at HL-3 (Table G-2, Appendix G). Bottom water temperatures ranged from 7.69 °C at HL-1 to 13.13 °C at HL-3 (Table G-2, Appendix G).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

In-situ pH measurements were below the Basin Plan criterion of 6.5 to 8.5 at all sampling stations (Figures H-19, H-20, H-21, Appendix H). Data collected for pH ranged from 5.99 (9 m) and 5.32 (bottom) at HL-1, 5.64 (surface) and 5.16 (bottom) at HL-2, and 5.69 (6 m) and 5.50 (surface) at HL-3 (Table G-2, Appendix G).

Dissolved oxygen levels ranged from 6.97 mg/L (5 m) to 7.83 mg/l (13 m) at HL-1, from 8.16 mg/L (surface) to 7.28 mg/L (bottom) at HL-2, and from 6.88 mg/L (8 m) to 7.68 mg/L (13 m) at HL-3 (Figures H-19, H-20, H-21, Appendix H). DO concentrations were slightly below the lower limit of 7.0 mg/L in the upper portion of the profiles for HL-1 and HL-3 (Table G-2, Appendix G).

Water Chemistry Results

Laboratory analyses detected concentrations of TPH-d at HL-1 (57.0 ug/L) and HL-3A (180.0 ug/L) (Table CAWG-4-9). Laboratory analytical results indicate that the remaining chemical constituents met the Basin Plan Water Quality objectives during the sampling event in June (Table CAWG-4-9).

JULY 23, 2002 (HUNTINGTON LAKE)

Water Quality Depth Profile Results

Thermal stratification occurred between 7.0 m (18.63°C) and 10.0 m (14.25°C) at HL-1 and between 5.0 m (19.53°C) and 7.0 m (16.49°C) at HL-3 during the July sampling event (Figures H-22 and H-24, Appendix H). HL-2 was not thermally stratified (Figure H-23, Appendix H). Total water depths were approximately 44 m at HL-1, 22 m at HL-2, and 17 m at HL-3. Surface water temperatures ranged from 19.54 °C at HL-1 to 20.30 °C at HL –3 (Table G-2, Appendix G). Bottom water temperatures ranged from 8.60 °C at HL-1 to 13.61 °C at HL-3 (Table G-2, Appendix G).

In-situ pH measurements reveal that the majority of values were within the Basin Plan criterion of 6.5-8.5 (Figures H-22, H-23, and H-24, Appendix H). At each station, a few values were below 6.5 near the profile bottom (Table G-2, Appendix G). Data collected for pH ranged from 7.07 (8 m) to 5.75 (bottom) at HL-1, from 7.21 (9 m) to 6.10 (bottom) at HL-2, and from 6.92 (surface) to 6.31 (bottom) at HL-3 (Table G-2, Appendix G).

Dissolved oxygen levels ranged from 6.82 mg/l (9 m) to 4.59 mg/l (bottom) for HL-1, 5.39 mg/L (1 m) to 6.61 mg/L (10 m) for HL-2, and 5.23 mg/L (3 m) to 6.22 mg/L (10 m) at HL-3 (Figures H-22, H-23, H-24, Appendix H). All DO levels were below the Basin Plan lower limit of 7.0 mg/L (Table G-2, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the July sampling event met Basin Plan Water Quality objectives (Table CAWG-4-10).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

AUGUST 19, 2002 (HUNTINGTON LAKE)

Water Quality Depth Profile Results

Thermal stratification occurred between 11.0 m (16.74°C) and 12.0 m (15.68°C) at HL-1, between 4.0 m (19.01°C) and 6.0 m (18.05°C) at HL-2, and between 7.0 m (19.28°C) and 9.0 m (17.43°C) at HL-3 during the August sampling event (Figures H-25, H-26, and H-27, Appendix H). Total water depths were approximately 44 m at HL-1, 32 m at HL-2, and 17 m at HL-3. Surface water temperatures ranged from 18.66 °C at HL -1 to 19.43 °C at HL-3 (Table G-2, Appendix G). Bottom water temperatures ranged from 9.87 °C at HL-1 to 15.56 °C at HL-3 (Table G-2, Appendix G).

In-situ pH measurements reveal that the majority of values were within the Basin Plan criterion of 6.5 to 8.5 at all sites (Figures H-25, H-26, and H-27, Appendix H). Data collected for pH ranged from 6.74 (11 m) to 5.85 (bottom) at HL-1, from 6.72 (8 m) to 6.07 (bottom) at HL-2, and from 6.76 (surface) to 6.62 (bottom) at HL-3 (Table G-2, Appendix G). At stations HL-1 and HL-2, a few values were below 6.5 near the profile bottom (Table G-2, Appendix G).

Dissolved oxygen concentrations ranged from 7.67 mg/l (12 m) to 4.17 mg/L (bottom) at HL-1, from 7.89 mg/L (10 m) to 6.55 mg/L (bottom) at HL-2, and from 7.15 mg/L (7 m) to 7.91 mg/L (13 m) at HL-3 (Figures H-25, H-26, and H-27, Appendix H). DO concentrations at HL-1 and HL-2 dropped below the Basin Plan standard of 7.0 mg/L at approximately 28 feet below the surface (Table G-2, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the August sampling event met the Basin Plan Water Quality standards (Table CAWG-4-11).

SEPTEMBER 23, 2002 (HUNTINGTON LAKE)

Water Quality Depth Profile Results

Total thermal mixing occurred at each site during the September sampling event (Figures H-28, H-29, and H-30, Appendix H). Total water depths were approximately 43 m at HL-1, 29 m at SL-2, and 11 m at HL-3. Surface water temperatures ranged from 16.17 °C at HL-1 to 17.57 °C at HL-3 (Table G-2, Appendix G). Bottom water temperatures ranged from 9.51 °C at HL-1 to 16.05°C at HL-3 (Table G-2, Appendix G).

In-situ pH measurements reveal that the majority of values were within the Basin Plan criterion of 6.5 and 8.5 (Figures H-28, H-29, and H-30, Appendix H). Data collected for pH ranged from 7.02 (13 m) to 6.31 (bottom) at HL-1, from 7.17 (16 m) to 6.61 (bottom) at HL-2, and from 6.96 (bottom) to 6.69 (3 m) at HL-3 (Table G-2, Appendix G).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

Dissolved oxygen levels ranged from 8.46 mg/L (13 m) to 4.13 mg/L (bottom) at HL-1, from 8.36 mg/L (surface) to 6.73 mg/L (bottom) at HL-2, and from 8.44 mg/L (surface) to 8.10 mg/L (bottom) at HL-3 (Figures H-28, H-29, and H-30, Appendix H). DO concentrations at HL-1 and HL-2 dropped below the Basin Plan standard of 7.0 mg/L at approximately 31 and 28 feet below the surface, respectively (Table G-2, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the September sampling event met the Basin Plan water quality objectives (Table CAWG-4-12).

FLORENCE LAKE

May 29, 2002
Water Quality Depth Profile Results

Weak thermal stratification was suggested, but no established thermocline was evident at any site during the sampling event in May (Figures H-31, H-32, H-33, Appendix H). Total water depths were approximately 20 m at FL-1, 24 m at FL-2, and 11 m at FL-3. Surface water temperatures ranged from 11.58 °C at FL-1 to 13.28 °C at FL–3 (Table G-3, Appendix G). Bottom water temperatures ranged from 6.94 °C at FL-2 to 7.39 °C at FL-3 (Table G-3, Appendix G).

In-situ pH measurements reveal that the majority of values were within the Basin Plan criterion of 6.5 to 8.5 (Figures H-31, H-32, H-33, Appendix H). Data collected for pH ranged between 6.54 (surface) and 6.23 (bottom) at FL-1, 6.74 (surface) and 6.13 (bottom) at FL-2, and 6.49 (surface) and 6.03 (bottom) at FL-3 (Table G-3, Appendix G).

Dissolved oxygen levels ranged from 7.51 mg/L (1 m) to 8.28 mg/L (bottom) at FL-1, 7.95 mg/L (surface) to 8.72 mg/L (bottom) at FL-2, and 8.76 mg/L (surface) to 9.05 mg/L (bottom) at FL-3 (H-31, H-32, H-33). DO levels met the Basin Plan criteria (Table G-3, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the May sampling event were below the Basin Plan water quality limits (Table CAWG-4-8).

JUNE 26, 2002 (FLORENCE LAKE)
Water Quality Depth Profile Results

Thermal stratification occurred between 5.0 m (16.57°C) and 6.0 m (14.63°C) at FL-2 and between 5.0 m (17.29°C) and 8.0 m (13.80°C) at FL-3 during the sampling event in June (Figures H-35 and H-36, Appendix H). FL-1 was not thermally stratified (Figure H-34, Appendix H). Total water depths were approximately 30 m at HL-1, 30 m at HL-2,

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

and 20 m at HL-3. Surface water temperatures ranged from 19.54 °C at HL-1 to 20.30 °C at HL–3 (Table G-3, Appendix G). Bottom water temperatures ranged from 8.60 °C at HL-1 to 13.61 °C at HL-3 (Table G-3, Appendix G).

In-situ pH measurements were lower than the Basin Plan criterion of 6.5 to 8.5 at all sites (Figures H-34, H-35, H-36, Appendix H). Measurements of pH ranged from 5.90 (7 m) to 5.10 (bottom) at FL-1, 5.79 (6 m) to 5.22 (bottom) at FL-2, and 5.72 (4 m) to 5.44 (bottom) at FL-3 (Table G-3, Appendix G).

Dissolved oxygen levels ranged from 6.55 mg/L (surface) to 7.58 mg/L (13 m) at FL-1, 6.70 mg/L (4 m) to 7.58 mg/L (surface) for FL-2, and 6.63 mg/L (4 m) to 7.50 mg/L (bottom) at FL-3 (Figures H-34, H-35, H-36, Appendix H). The majority of DO levels were above the lower limit of 7.0 mg/l and occurred at depths below 5 to 6 m (Table G-3, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the June sampling event met the Basin Plan water quality objectives (Table CAWG-4-9).

JULY 24, 2002 (FLORENCE LAKE)
Water Quality Depth Profile Results

Thermal stratification occurred between 9.0 m (18.96°C) and 11.0 m (16.65°C) at FL-1, between 9.0 m (18.54°C) and 10.0 m (17.18°C) at FL-2 and between 9.0 m (18.62°C) and 10.0 m (17.70°C) at FL-3 during the sampling event in July (Figures H-37, H-38, H-39, Appendix H). Total water depths were approximately 27 m at HL-1, 28 m at HL-2, and 18 m at HL-3. Surface water temperatures ranged from 18.96°C at FL-3 to 19.37°C at FL–1 (Table G-3, Appendix G). Bottom water temperatures ranged from 10.81°C at FL-2 to 13.91°C at FL-3 (Table G-3, Appendix G).

Depth profiles for pH revealed that most measurements were within the Basin Plan criterion of 6.5 to 8.5 at all sites (Figures H-37, H-38, H-39, Appendix H). Data collected for pH ranged from 6.86 (surface) to 6.31 (bottom) at FL-1, 7.14 (16 m) to 6.05 (bottom) at FL-2, and 6.74 (13 m) to 6.50 (9 m) at FL-3 (Table G-3, Appendix G).

Dissolved oxygen levels ranged from 5.12 mg/L (5 m) to 6.37 mg/L (19 m) at FL-1, 5.15 mg/L (3 m and 8 m) to 6.42 mg/L (18 m) at FL-2, and 5.03 mg/L (2 m) to 6.19 mg/L (bottom) for FL-3 (Figures H-37, H-38, H-39, Appendix H). DO levels at all sites and depths were below the lower limit of 7.0 mg/l (Table G-3, Appendix G).

Water Chemistry Results

.Laboratory analysis detected concentrations of TPH-d at FL-1A (1800.0 ug/L) and FL-1B (99.0 ug/L) (Table CAWG-4-10). The remaining chemical constituents analyzed

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

during the July sampling event met the Basin Plan water quality objectives (Table CAWG-4-10).

AUGUST 20, 2002 (FLORENCE LAKE)
Water Quality Depth Profile Results

Total thermal mixing occurred at each site during the sampling event in August (Figures H-40, H-41, and H-42, Appendix H). Total water depths were approximately 18 m at FL-1, 21 m at FL-2, and 12 m at FL-3. Surface water temperatures ranged from 19.07°C at FL-3 to 19.42°C at FL-2 (Table G-3, Appendix G). Bottom water temperatures ranged from 12.06°C at FL-2 to 18.46°C at FL-3 (Table G-3, Appendix G).

Depth profiles for pH revealed that most measurements were within the Basin Plan criterion of 6.5 to 8.5 at all sites (Figures H-40, H-41, and H-42, Appendix H). Data collected for pH ranged between 6.72 (1 m) and 6.54 (17 m) at FL-1, 6.67 (surface) and 5.86 (20 m) at FL-2, and 6.70 (surface) to 6.59 (6 m) at FL-3 (Table G-3, Appendix G).

Dissolved oxygen levels ranged from 5.84 mg/L (6 m) to 6.46 mg/L (17 M) at FL-1, 6.37 (17 m) to 4.86 mg/L (bottom) at FL-2, and 6.25 mg/L (surface) to 5.82 mg/L (bottom) for FL-3 (Figures H-40, H-41, H-42, Appendix H). DO levels at all sites and depths were below the lower limit of 7.0 (Table G-3, Appendix G).

Water Chemistry Results

Laboratory analysis detected a concentration of benzene in sample FL-2 (0.34 ug/L) (Table CAWG-4-11). The remaining chemical constituents analyzed during the August sampling event met the Basin Plan water quality objectives.

SEPTEMBER 24, 2002 (FLORENCE LAKE)
Water Quality Depth Profile Results

Total thermal mixing occurred at each site during the sampling event in September (Figures H-43, H-44, H-45, Appendix H). Total water depths were approximately 10 m at FL-1, 10 m at FL-2, and 1 m at FL-3. Surface water temperatures ranged from 16.05°C at FL-3 to 16.68°C at FL -1 (Table G-3, Appendix G). Bottom water temperatures ranged from 15.77°C at FL-2 to 15.85°C at FL-1 (Table G-3, Appendix G).

Depth profiles for pH were close to and lower than the Basin Plan criterion of 6.5 to 8.5 at all sites. Data collected for pH ranged between 6.40 (surface) and 6.75 (bottom) at FL-1 and 6.35 (surface) and 6.67 (8 m) at FL-2. The only measurement taken at FL-3 was at the surface, and was 6.37 (Table G-3, Appendix G). These results are higher than the analytical pH results.

Dissolved oxygen levels ranged from 6.75 mg/L (1 m) to 7.03 mg/L (surface) at FL-1 and 6.24 mg/L (bottom) to 6.94 mg/L (surface) at FL-2.. The only measurement taken

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

at FL-3 was at the surface, and was 6.89 mg/L. DO levels at all sites were above or slightly below the Basin Plan criteria of 7.0 mg/l (Table G-3, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the September sampling event met the Basin Plan water quality limits (Table CAWG-4-12).

MAMMOTH POOL RESERVOIR

MAY 22, 2002
Water Quality Depth Profile Results

Weak thermal stratification was forming, but no established thermocline was evident at any site during the sampling event in May (Figures H-46, H-47, and H-48, Appendix H). Total water depths were approximately 67 m at MP-1, 14 m at MP-2, and 18 m at MP-3. Surface water temperatures ranged from 14.84 °C at MP-3 to 14.25 °C at MP-2 (Table G-4, Appendix G). Bottom water temperatures ranged from 6.97 °C at MP-3 to 10.24 °C at MP-2.

Depth profiles for pH were within the Basin Plan criterion of 6.5 and 8.5 at all sites. Data collected for pH ranged between 7.27 (surface) and 6.59 (bottom) at MP-1, 7.14 (surface) and 6.65 (bottom) at MP-2, and 7.00 (surface) and 6.71 (7 m) at MP-3 (Table G-4, Appendix G).

Dissolved oxygen levels ranged from 8.75 mg/L (3 m) to 9.81 mg/L (bottom) at MP-1, 8.98 mg/L (surface) to 9.64 mg/L (bottom) at MP-2, and 9.11 mg/L (5 m) to 10.02 mg/L (bottom) at MP-3. DO levels were above the lower limit of 7.0 (Table G-4, Appendix G).

Water Chemistry Results

All chemical constituents analyzed met the Basin Plan water quality objectives during the sampling event in May (Table CAWG-4-8).

JULY 2, 2002 (MAMMOTH POOL RESERVOIR)
Water Quality Depth Profile Results

Thermal stratification occurred between 7.0 m (21.21°C) and 10.0 m (18.76°C) at MP-1, between 4.0 m (23.19°C) and 7.0 m (19.67°C) at MP-3. (Figures H-49 and H-51, Appendix H). MP-2 was not thermally stratified (Figure H-50, Appendix H). Total water depths were approximately 69 m at MP-1, 30 m at MP-2, and 8 m at MP-3. Surface water temperatures ranged from 23.18°C at MP-3 to 22.24°C at MP-1 (Table G-4, Appendix G). Bottom water temperatures ranged from 12.67°C at MP-1 to 19.54°C at MP-3 (Table G-4, Appendix G).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

Many of the in-situ pH values measured at the sites were slightly below the Basin Plan criterion of 6.5-8.5. Data collected for pH ranged between 7.55 (surface) and 6.43 (bottom) at MP-1, 7.46 (surface) and 6.58 (bottom) at MP-2, and 7.25 (surface) and 6.99 (bottom) at MP-3 (Table G-4, Appendix G).

Dissolved oxygen levels ranged from 6.92 mg/L (1 m) to 8.68 (bottom) at MP-1, 8.7 mg/L (bottom) to 8.82 mg/L (surface) at MP-2, and 7.88 mg/L (bottom) to 8.33 mg/L (7 m) at MP-3. With the exception of the one value recorded at 6.92 mg/l all DO measurements met the Basin Plan standard of 7.0 mg/l (Table G-4, Appendix G).

Water Chemistry Results

A detection of TPH-d (610.0 µg/L) occurred at MP-3A (Table CAWG-4-9). The remaining chemical constituents analyzed met the Basin Plan water quality objectives during the sampling event in June.

JULY 22, 2002 (MAMMOTH POOL RESERVOIR)
Water Quality Depth Profile Results

Thermal stratification occurred between 8.0 (23.36°C) and 9.0 (21.74°C) m at MP-1, between 8.0 (23.60°C) and 9.0 (21.71°C) m at MP-2 and between 7.0 (24.25°C) and 8.0 (22.10°C) at MP-3 during the sampling event in July (Figures H-52, H-53, H-54, Appendix H). Total water depths were approximately 57 m at MP-1, 25 m at MP-2, and 26 m at MP-3. Surface water temperatures ranged from 24.42°C at MP-2 to 24.05°C at MP-1 (Table G-4, Appendix G). Bottom water temperatures ranged from 14.16°C at MP-1 to 17.56°C at MP-2.

Many of the in-situ pH values measured at the sites were slightly below the Basin Plan criterion of 6.5-8.5. Measurements of pH ranged between 7.29 (7 m) and 6.26 (bottom) at MP-1, 7.26 at (7 m) and 6.52 (bottom) at MP-2, and 7.28 (3 m) and 6.43 (bottom) at MP-3 (Table G-4, Appendix G).

Dissolved oxygen levels ranged from 6.14 mg/L (bottom) to 5.36 mg/L (13 m) at MP-1, 6.07 mg/L (surface) to 5.15 mg/L (22 m) at MP-2, and 5.17 mg/L (19 m) to 5.95 mg/L (11 m) at MP-3. Measurements of DO were below the Basin Plan limit of 7.0 (Table G-4, Appendix G).

Water Chemistry Results

A detection of TPH-d (50.0 µg/L) occurred at MP-1A (Table CAWG-4-10). The remaining chemical constituents analyzed met the Basin Plan water quality objectives during the sampling event in July.

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

AUGUST 21, 2002 (MAMMOTH POOL RESERVOIR)

Water Quality Depth Profile Results

The reservoir was not stratified during the sampling event in August (Figures H-56 and H-57, Appendix H). Location MP-1 showed evidence of weak stratification (Figure H-55, Appendix H). Total water depths were approximately 67 m at MP-1, 10 m at MP-2, and 14 m at MP-3. Surface water temperatures ranged from 23.50°C at MP-3 to 22.61°C at MP-1 (Table G-4, Appendix G). Bottom water temperatures ranged from 10.43°C at MP-1 to 22.83°C at MP-2 (Table G-4, Appendix G).

In-situ measurements of pH were within or only slightly below the Basin Plan criterion of 6.5 to 8.5 at all sites. Data collected for pH ranged from 7.44 (9 m) to 6.16 (bottom) at MP-1, 6.46 (surface) to 7.50 (5 m) at MP-2, and 7.50 (surface) to 7.30 (bottom) at MP-3 (Table G-4, Appendix G).

Dissolved oxygen levels ranged from 7.31 mg/L (surface) to 4.77 mg/L (bottom) at MP-1, 7.02 mg/L (2 m) to 6.85 mg/L (7 m) at MP-2, and 6.52 mg/L (9 m) to 6.77 mg/L (1 m) at MP-3. DO levels were slightly below or close to the lower limit of 7.0 (Table G-4, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the August sampling event met the Basin Plan water quality limits (Table CAWG-4-11).

SEPTEMBER 25, 2002 (MAMMOTH POOL RESERVOIR)

Water Quality Depth Profile Results

The reservoir was not thermally stratified during the September sampling event (Figures H-58 and H-59, Appendix H). MP-3 showed evidence of weak thermal stratification (Figure H-60, Appendix H). Total water depths were approximately 38 m at MP-1, 14 m at MP-2, and 14 m at MP-3. Surface water temperatures ranged from 21.52°C at MP-3 to 20.97°C at MP –1 (Table G-4, Appendix G). Bottom water temperatures ranged from 18.09°C at MP-3 to 20.59°C at MP-2 (Table G-4, Appendix G).

In-situ measurements of pH were within the Basin Plan criterion of 6.5 to 8.5 at all sites. Data collected for pH ranged between 7.40 (4 m) and 6.89 (bottom) at MP-1, 7.13 (surface) and 7.55 (7 m) at MP-2, and 6.90 (surface) and 7.46 (bottom) at MP-3 (Table G-4, Appendix G).

Dissolved oxygen levels ranged from 4.91 mg/L (bottom) to 7.90 mg/L at MP-1, 6.70 mg/L (bottom) to 7.36 mg/L (2 m) at MP-2, and 6.04 mg/L (6 m) to 7.50 mg/L (9 m) at MP-3. Concentrations of DO decreased with depth (Table G-4, Appendix G).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

Water Chemistry Results

All chemical constituents analyzed during the September sampling event met the Basin Plan water quality standards (Table CAWG-4-12).

BALSAM FOREBAY

JUNE 5, 2002
Water Quality Depth Profile Results

The forebay was not stratified during the sampling event (Figures H-61 and H-62, Appendix H). Total depths were approximately 18 m at BA-1 and 12 m at BA-2. Surface water temperatures ranged from 11.21°C at BA-2 to 10.83°C at BA-1 (Table G-5, Appendix G). Bottom water temperatures ranged from 10.20°C at BA-1 to 10.78°C at BA-2.

In-situ measurements of pH were slightly below Basin Plan water quality objective between 6.5 and 8.5. Data collected for pH ranged between 6.44 at the surface and 6.27 near 10 m at BA-1 and between 6.48 at the surface and 6.30 near 5 m at BA-2 (Table G-5, Appendix G).

Dissolved oxygen levels ranged between 6.99 mg/l and 6.80 mg/l at BA-1, and between 7.12 mg/l and 6.94 mg/l at BA-2. In-situ measurements of DO concentrations were above or only slightly below the Basin Plan limit of 7.0 mg/l.

Water Chemistry Results

All chemical constituents analyzed during the May sampling event met the Basin Plan water quality limits (Table CAWG-4-8).

The results of monthly profile data from one monitoring station at Dam 6 (SJ-8) are presented in Table G-10 in Appendix G and Figures H-91 through H-95 in Appendix H. The laboratory analytical results are summarized by month in Tables CAWG-4-8 to CAWG-4-12.
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JUNE 27, 2002 (BALSAM FOREBAY)
Water Quality Depth Profile Results

The forebay was not stratified during the June sampling event (Figures H-63 and H-64, Appendix H). Total depths were approximately 7 m at BA-1 and 12 m at BA-2. Surface water temperatures ranged from 15.40°C at BA-2 to 16.17°C at BA-1 (Table G-5, Appendix G). Bottom water temperatures ranged from 12.35°C at BA-1 to 12.51°C at BA-2.

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

In-situ measurements of pH fell below the Basin Plan water quality objective of 6.5-8.5. Data collected for pH ranged between 6.48 at the surface and 6.30 near 5 m at BA-, and between 5.76 near the surface and 5.38 near 8 m at BA-2 (Table G-5, Appendix G).

Dissolved oxygen levels ranged between 7.83 mg/l and 7.49 mg/l at BA-1, and between 8.78 mg/l and 7.44 mg/l at BA-2. DO concentrations were above the lower limit of 7.0 mg/L for cold water bodies (Table G-5, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the June sampling event met the Basin Plan water quality objectives (Table CAWG-4-9).

JULY 25, 2002 (BALSAM FOREBAY)
Water Quality Depth Profile Results

The forebay was not thermally stratified during the July sampling event (Figures H-65 and H-66, Appendix H). However, two samples were obtained at BA-2. Total Depths were approximately 9 m at BA-1 and 17 m at BA-2. Surface water temperatures ranged from 20.99°C at BA-1 to 21.14°C at BA-2 (Table G-5, Appendix G). Bottom water temperatures ranged from 14.07°C at BA-1 to 15.81°C at BA-2.

In-situ measurements of pH were within or slightly below the Basin Plan water quality objective of 6.5 to 8.5. Data collected for pH ranged between 6.86 at the surface and 6.41 near the bottom at BA-1 and between 6.93 at the surface and 6.52 near the bottom at BA-2 (Table G-5, Appendix G).

Dissolved oxygen levels ranged between 6.01 mg/l and 5.33 mg/l at BA-1, and between 5.81 mg/l and 5.33 mg/l at BA-2. DO levels were below the Basin Plan objective of 7.0 mg/L (Table G-5, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the July sampling event met the Basin Plan water quality objectives (Table CAWG-4-10).

AUGUST 23, 2002 (BALSAM FOREBAY)
Water Quality Depth Profile Results

The forebay was not stratified during the August sampling event (Figures H-67 and H-68, Appendix H). Total water depths were approximately 16 m at BA-1 and 10 m at BA-2. Surface water temperatures ranged from 18.17°C at BA-1 to 18.09°C at BA-2 (Table G-5, Appendix G). Bottom water temperatures ranged from 16.85°C at BA-1 to 17.0°C at BA-2.

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

In-situ measurements of pH were within the Basin Plan water quality objective of 6.5 to 8.5. Data collected for pH ranged between 6.95 at the surface and 6.68 near 10 m at BA-1 and between 7.04 at the surface and 6.74 near the bottom at BA-2 (Table G-5, Appendix G).

Dissolved oxygen levels ranged between 7.44 mg/l and 6.80 mg/l at BA-1, and between 7.15 mg/l and 6.82 mg/l at BA-2. DO levels were for the most part above or close to the lower limit of 7.0 for cold water bodies.

Water Chemistry Results

All chemical constituents analyzed during the August sampling event met the Basin Plan water quality objectives (Table CAWG-4-11).

SEPTEMBER 26, 2002 (BALSAM FOREBAY)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the September sampling event (Figures H-69 and H-70, Appendix H). Total water depths were approximately 17 m at BA-1 and 9 m at BA-2. Surface water temperatures ranged from 16.27°C at BA-1 to 16.17°C at BA-2 (Table G-5, Appendix G). Bottom water temperatures ranged from 16.18°C at BA-1 to 16.17°C at BA-2.

In-situ measurements of pH were within the Basin Plan water quality objective of 6.5 to 8.5. Data collected for pH ranged between 6.91 at the bottom and 6.73 near 4 m at BA-1 and between 6.98 at the surface and 6.75 near 3 m at BA-2 (Table G-5, Appendix G).

Dissolved oxygen levels ranged between 7.41 mg/l and 7.22 mg/l at BA-1, and between 7.49 mg/l and 7.12 mg/l at BA-2 (Table G-5, Appendix G).

Water Chemistry Results

All chemical constituents analyzed during the September sampling event met the Basin Plan water quality objectives (Table CAWG-4-12).

BEAR FOREBAY

JUNE 6, 2002

Water Quality Depth Profile Results

The forebay was not stratified during the May sampling event (Figure H-71, Appendix H). The total depth was 4.6 m. Water temperatures ranged from 6.59°C (4 m) to 7.47°C (surface) (Table G-6, Appendix G).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

In-situ measurements of pH values ranged from 6.05 (4 m) to 6.21 (surface) (Table G-6, Appendix G) and were outside of the Basin Plan criterion of 6.5 to 8.5. In-situ measurements of DO concentrations ranged from 8.90 mg/L to 9.59 mg/L (Table G-6, Appendix G), meeting the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents were performed and all results (except pH) met the Basin Plan water quality objectives during the May sampling event (Table CAWG-4-8).

JUNE 28, 2002 (BEAR FOREBAY)
Water Quality Depth Profile Results

The forebay was not thermally stratified during the June sampling event (Figure H-72, Appendix H). The total depth was 2.3 m. Water temperatures ranged from 11.99°C (2 m) to 12.47°C (surface) (Table G-6, Appendix G).

In-situ measurement of pH concentrations ranged from 5.95 (2 m) to 6.07 (surface) and were below the Basin Plan criterion of 6.5 to 8.5 during the June sampling event (Table G-6, Appendix G).

In-situ DO concentrations at BE-1 ranged from 7.87 mg/l to 7.98 mg/l (Table G-6, Appendix G), meeting the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the June sampling event (Table CAWG-4-9).

JULY 25, 2002 (BEAR FOREBAY)
Water Quality Depth Profile Results

The forebay was not stratified during the July sampling event (Figure H-73, Appendix H). The total depth was 2.2 m and water temperatures ranged from 13.99°C (2 m) to 14.51°C (surface) (Table G-6, Appendix G).

In-situ measurements of pH values ranged from 6.38 (2 m) to 6.61 (surface) (Table G-6, Appendix G) and were below the Basin Plan criterion of 6.5 to -8.5.

In-situ DO concentrations ranged from 5.59 mg/l and 5.73 mg/l (Table G-6, Appendix G), and were below the Basin Plan lower limit of 7.0 mg/L.

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the July sampling event (Table CAWG-4-10).

AUGUST 27, 2002 (BEAR FOREBAY)
Water Quality Depth Profile Results

The forebay was not thermally stratified during the August sampling event (Figure H-74, Appendix H). The total depth was 2.2 m and water temperatures ranged from 13.27 (bottom) to 14.73°C (surface) (Table G-6, Appendix G).

In-situ measurements of pH values ranged between 6.68 (bottom) to 6.79 (surface) (Table G-6, Appendix G) and met the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO concentrations ranged between 5.98 mg/l and 6.00 mg/l (Table G-6, Appendix G) and were below the Basin Plan objective of 7.0 mg/L.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the August sampling event (Table CAWG-4-11).

SEPTEMBER 24, 2002 (BEAR FOREBAY)
Water Quality Depth Profile Results

The forebay was not thermally stratified during the September sampling event (Figure H-75, Appendix H). The total depth was 1.9 m and water temperatures ranged from 13.96°C (bottom) to 15.25°C (surface) (Table G-6, Appendix G).

In-situ measurements of pH values ranged from 6.54 (surface) to 6.61 (1 m) (Table G-6, Appendix G) and met the Basin Plan criterion of 6.5 to 8.5.

In-situ DO levels ranged between 6.98 mg/l and 7.26 mg/l (Table G-6, Appendix G). These levels were above or only slightly below the Basin Plan lower limit of 7.0 mg/L.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the September sampling event (Table CAWG-4-12).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

MONO FOREBAY

JUNE 6, 2002
Water Quality Depth Profile Results

The forebay was statified during the sampling event (Figure H-76, Appendix H). The total depth was 2.2 m and water temperatures ranged from 12.22°C (2 m) to 17.22°C (surface) (Table G-7, Appendix G).

In-situ measurements of pH values ranged from 6.73 (1 m) to 6.74 (surface) (Table G-7, Appendix G) and were within the Basin Plan criterion of 6.5 to 8.5. In-situ measurements of DO concentrations levels at MO-1 ranged between 5.51 mg/l and 6.22 mg/l and were below the Basin Plan lower limit of 7.0 mg/L (Table G-7, Appendix G).

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the May sampling event (Table CAWG-4-8).

JUNE 28, 2002 (MONO FOREBAY)
Water Quality Depth Profile Results

The forebay was thermally stratified between 2.0 m (13.09°C) and 3.0 m (10.18°C) during the June sampling event (Figure H-77, Appendix H). The total depth was 4.0 m and water temperatures ranged from 9.75°C (bottom) to 15.75°C (surface) (Table G-7, Appendix G).

In-situ measurements of pH values ranged from 5.78 (surface) to 6.03 (bottom) (Table G-7, Appendix G) and were below the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO levels ranged from 6.83 mg/l and 7.60 mg/l (Table G-7, Appendix G). One measurement at the surface (6.83 mg/L) was below the Basin Plan standard of 7.0 mg/L.

Water Chemistry Results

Analytical results for iron and manganese exceeded the Basin Plan water quality objectives during June (Table CAWG-4-9). Iron was detected at 0.32 mg/L at MO-1A and manganese was detected at 0.050 µg/l at MO-1B. The remaining chemical constituents analyzed (except pH) met the Basin Plan water quality objectives during the June sampling event.

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

JULY 25, 2002 (MONO FOREBAY)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the July sampling event (Figure H-78, Appendix H). The total water depth was 4.3 m and water temperatures ranged from 10.20°C (2.0 m) to 10.20°C (surface) (Table G-7, Appendix G).

In-situ pH measurements pH ranged between 6.39 (surface) and 6.54 (bottom). All but one of the value were below the Basin Plan criterion of 6.5 to 8.5 (Table G-7, Appendix G).

In-situ measurements of DO levels ranged from 6.13 mg/l to 6.76 mg/l (Table G-7, Appendix G) and were below the Basin Plan lower limit of 7.0 mg/L.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the July sampling event (Table CAWG-4-10).

AUGUST 26, 2002 (MONO FOREBAY)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the August sampling event (Figure H-79, Appendix H). The total depth was 4.0 m and water temperatures ranged from 12.01°C (2.0 m) to 12.07°C (surface) (Table G-7, Appendix G).

In-situ measurements of pH values ranged from 6.73 (3 m) and 6.85 (surface) (Table G-7, Appendix G) and were within the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO concentrations ranged from 7.39 mg/l to 7.58 mg/l (Table G-7, Appendix G) and were above the Basin Plan lower limit of 7.0 mg/L for cold water bodies.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the August sampling event (Table CAWG-4-11).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

SEPTEMBER 24, 2002 (MONO FOREBAY)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the September sampling event (Figure H-80, Appendix H). The total water depth was 1.9 m and the water temperature was 16.12 throughout the depth profile (Table G-7, Appendix G).

In-situ measurements of pH values were 6.73 mg/l throughout the depth profile and were within the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO levels ranged between 7.26 mg/l and 7.38 mg/l (Table G-7, Appendix G). These levels were above the Basin Plan lower limit of 7.0 mg/L.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the September sampling event (Table CAWG-4-12).

DAM 4

MAY 20, 2002

Water Quality Depth Profile Results

The forebay was not thermally stratified during the May sampling event (Figure H-81, Appendix H). The total depth was 20.0 m and water temperatures ranged from 6.33°C (11 m) to 6.44°C (surface) (Table G-8, Appendix G).

In-situ measurements of pH values ranged from 6.61 mg/l (10 m) to 7.08 mg/l (12 m) (Table G-8, Appendix G) and were within the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO concentrations ranged from 6.86 mg/l to 7.06 mg/l (Table G-8, Appendix G). All DO measurements, except one taken at the surface, were below the Basin Plan lower limit of 7.0 mg/L.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the May sampling event (Table CAWG-4-8).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

JUNE 27, 2002 (DAM 4)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the June sampling event (Figure H-82, Appendix H). The total water depth was 20.03 m and water temperatures ranged from 10.05°C (19 m) to 10.23°C (surface) (Table G-8, Appendix G).

In-situ measurements of pH values ranged between 5.39 mg/l (7 m) and 5.47 mg/l (surface) and were below the Basin Plan criterion of 6.5 to 8.5 (Table G-8, Appendix G).

In-situ measurements of DO concentrations ranged from 8.66 mg/l to 8.83 mg/l (Table G-8, Appendix G) and were above the Basin Plan lower limit of 7.0 mg/L.

Water Chemistry Results

Laboratory analyses of chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the June sampling event (Table CAWG-4-9).

JULY 23, 2002 (DAM 4)

Water Quality Depth Profile Results

The forebay was not stratified during the July sampling event (Figure H-83, Appendix H). The total water depth was 20.0 m and water temperatures ranged from 11.56°C (surface) to 11.51°C (bottom) (Table G-8, Appendix G).

In-situ measurements of pH values pH ranged between 6.10 mg/l (surface) and 6.38 mg/l (7 m) (Table G-8, Appendix G) and were below the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO levels ranged from 6.62 mg/l and 6.98 mg/l (Table G-8, Appendix G) and were below the Basin Plan standard of 7.0 mg/L.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the July sampling event (Table CAWG-4-10).

AUGUST 26, 2002 (DAM 4)

Water Quality Depth Profile Results

The forebay was not stratified during the August sampling event (Figure H-84, Appendix H). The total water depth was 20.0 m and water temperatures ranged from 13.97°C (bottom) to 14.07°C (surface) (Table G-8, Appendix G).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

In-situ measurements of pH values ranged between 6.55 mg/l (surface) and 6.34 mg/l (bottom) (Table G-8, Appendix G). All in-situ pH values, except two at the top of the profile, were below the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO concentrations ranged from 7.27 mg/l to 7.64 mg/l and were above the Basin Plan lower limit of 7.0 mg/L for cold water bodies (Table G-8, Appendix G).

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the August sampling event (Table CAWG-4-11).

SEPTEMBER 23, 2002 (DAM 4)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the September sampling event (Figure H-85, Appendix H). The total water depth was 20.0 m and water temperatures ranged from 16.00°C (surface) to 15.64°C (bottom) (Table G-8, Appendix G).

In-situ measurements of pH values ranged from 6.80 mg/l (surface) to 6.97 mg/l (13 m) (Table G-8, Appendix G) and were within the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO concentrations ranged from 7.71 mg/l to 8.29 mg/l (Table G-8, Appendix G) and met the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the September sampling event (Table CAWG-4-12).

DAM 5

MAY 21, 2002

Water Quality Depth Profile Results

The forebay was not thermally stratified during the May sampling event (Figure H-86, Appendix H). The total water depth was 13.0 m and water temperatures ranged from 6.83°C (bottom) to 6.92°C (2 m) (Table G-9, Appendix G).

In-situ measurements of pH values ranged from 6.83 mg/l (8 m) to 7.16 mg/l (surface) (Table G-9) and met the Basin Plan standard.

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

In-situ measurements of DO concentrations levels ranged from 9.66 mg/l to 10.39 mg/l (Table G-9, Appendix G) and were above the lower limit of 7.0 mg/L for cold water bodies.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the May sampling event (Table CAWG-4-8).

JUNE 27, 2002 (DAM 5)
Water Quality Depth Profile Results

The forebay was not thermally stratified during the June sampling event (Figure H-87, Appendix H). The total water depth was 13.0 m and water temperatures ranged from 10.74°C (bottom) to 11.77°C (surface) (Table G-9, Appendix G).

In-situ measurements of pH values ranged from 5.46 mg/l (bottom) to 5.84 mg/l (surface) (Table G-9, Appendix G) and were below the Basin Plan standard of 6.5 to 8.5.

In-situ measurements of DO levels ranged from 8.63 mg/l to 9.99 mg/l (Table G-9, Appendix G) and met the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the June sampling event (Table CAWG-4-9).

JULY 23, 2002 (DAM 5)
Water Quality Depth Profile Results

The forebay was not stratified during the July sampling event (Figure H-88, Appendix H). The total water depth was 13.0 m and water temperatures ranged from 12.33°C (bottom) to 12.42°C (surface) (Table G-9, Appendix G).

In-situ measurements of pH values ranged from 6.24 mg/l (8m) to 6.45 mg/l (surface) (Table G-9, Appendix G) and were below the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO levels ranged from 6.93 mg/l to 7.28 mg/l (Table G-9, Appendix G). All measurements except one (6.93 mg/L at 1m) were above the Basin Plan standard of 7.0 mg/L.

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

Water Chemistry Results

Laboratory analyses of 35 chemical constituent indicate that all results (except pH) met the Basin Plan water quality objectives during the July sampling event (Table CAWG-4-10).

AUGUST 27, 2002 (DAM 5)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the August sampling event (Figure H-89, Appendix H). The total water depth was 13.3 m and water temperatures ranged from 15.53 (bottom) to 15.60°C (surface) (Table G-9, Appendix G).

In-situ measurements of pH values ranged from 6.47 mg/l (13 m) to 6.79 mg/l (surface) and were above and only slightly below the Basin Plan criterion of 6.5 to 8.5 (Table G-9, Appendix G). Values at two depths (8 m and 13 m) were below 6.5.

In-situ measurements of DO concentrations ranged from 7.05 mg/l to 7.34 mg/l (Table G-9, Appendix G) and met the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the August sampling event (Table CAWG-4-11).

SEPTEMBER 23, 2002 (DAM 5)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the September sampling event (Figure H-90, Appendix H). The total water depth was 13.0 m and water temperatures ranged from 17.29°C (7 m) to 17.41°C (surface) (Table G-9, Appendix G).

In-situ measurements of pH values ranged from 6.62 mg/l (1 m) to 6.91 mg/l (10 m) (Table G-9, Appendix G) and were within the Basin Plan criterion of 6.5 to 8.5.

In-situ measurements of DO concentrations ranged from 8.44 mg/l to 8.52 mg/l (Table G-9, Appendix G) and met the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the September sampling event (Table CAWG-4-12).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

DAM 6

MAY 21, 2002

Water Quality Depth Profile Results

The forebay was not thermally stratified during the May sampling event (Figure H-91, Appendix H). The total water depth was 20.3 m and water temperatures ranged from 8.34°C (bottom) to 8.72°C (surface) (Table G-10, Appendix G).

In-situ measurements of pH values ranged from 6.68 mg/l (13 m) to 6.95 mg/l (surface) (Table G-10, Appendix G) and met the Basin Plan criterion of 6.5-8.5.

In-situ measurements of DO concentrations ranged from 10.06 mg/l to 10.37 mg/l (Table G-10, Appendix G) and met the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the May sampling event (Table CAWG-4-8).

JUNE 27, 2002 (DAM 6)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the June sampling event (Figure H-92, Appendix H). The total water depth was 20.9 m and water temperatures ranged from 12.04°C (19 m) to 13.21°C (2 m) (Table G-10, Appendix G).

In-situ measurements of pH values pH ranged from 5.44 mg/l (5 m) to 5.67 mg/l (19 m) and were below the Basin Plan criterion of 6.5 to 8.5. (Table G-10, Appendix G).

In-situ measurements of DO concentrations ranged from 9.66 mg/l and 10.19 mg/l (Table G-10, Appendix G) and met the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the June sampling event (Table CAWG-4-9).

JULY 25, 2002 (DAM 6)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the sampling July event in (Figure H-93, Appendix H). The total water depth was 19.2 m and water temperatures ranged from 13.52°C (19 m) to 15.00°C (surface) (Table G-10, Appendix G).

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

In-situ measurements of pH values ranged from 6.30 mg/l (16 m) to 6.46 mg/l (surface) (Table G-10, Appendix G) and were slightly below the Basin Plan criterion of 6.5 to 8.5

In-situ measurements of DO concentration ranged from 6.22 mg/l to 6.73 mg/l (Table G-10, Appendix G) and were below the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the July sampling event (Table CAWG-4-10).

AUGUST 28, 2002 (DAM 6)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the August sampling event in (Figure H-94, Appendix H). The total water depth was 20.4 m and water temperatures ranged from 16.42°C (2 m) to 17.95°C (surface) (Table G-10, Appendix G).

In-situ measurements of pH values ranged from 6.45 mg/l (6 m) to 6.58 mg/l (10 m). Approximately half of the measured values were only slightly below Basin Plan objective of 6.5 to 8.5 (Table G-10, Appendix G).

In-situ measurements of DO concentrations ranged from 5.75 mg/l to 7.10 mg/l (Table G-10, Appendix G) and all but two measurements were below the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results (except pH) met the Basin Plan water quality objectives during the August sampling event (Table CAWG-4-11).

SEPTEMBER 23, 2002 (DAM 6)

Water Quality Depth Profile Results

The forebay was not thermally stratified during the sampling event in September (Figure H-95, Appendix H). The total water depth was 20.7 m and water temperatures ranged from 18.15°C (19 m) to19.79°C (surface) (Table G-10, Appendix G).

In-situ measurements of pH values ranged from 6.94 (3 m) to 7.07 mg/l (19 m) (Table G-10, Appendix G) and met the Basin Plan standard.

APPENDIX F: SUMMARIES OF MONTHLY RESERVOIR/FOREBAY PROFILING (continued)

In-situ measurements of DO concentrations ranged between 6.85 mg/l and 7.60 mg/l (Table G-10, Appendix G). All DO concentrations, except three near the surface, were above the Basin Plan standard.

Water Chemistry Results

Laboratory analyses of 35 chemical constituents indicate that all results met the Basin Plan water quality objectives during the September sampling event (Table CAWG-4-12).

APPENDIX G

Summary Table of In-situ Reservoir/Forebay Profile Measurements (by month)

Appendix G Table G-1
Shaver Lake Profile Data, May – September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
May 23, 2002	SL-1	11:30	0	7.07	0.020	1.0	8.54	13.20
			1	7.06	0.020	1.0	8.47	13.45
			2	7.03	0.020	1.2	8.39	13.37
			3	7.05	0.020	1.2	8.34	13.27
			4	6.99	0.020	1.2	8.39	13.25
			5	7.00	0.020	1.6	8.53	12.92
			6	6.92	0.020	1.3	8.84	12.28
			7	6.86	0.020	1.5	8.88	12.00
			8	6.80	0.020	1.1	8.90	11.82
			9	6.73	0.020	0.8	8.99	11.45
			10	6.75	0.020	1.2	8.95	11.22
			13	6.69	0.020	0.9	8.93	10.17
			16	6.60	0.021	0.9	8.77	9.47
			19	6.53	0.020	0.8	8.69	8.85
			22	6.36	0.020	0.7	8.53	8.08
			25	6.26	0.020	0.6	8.23	7.70
			28	6.23	0.020	1.0	7.96	7.59
			31	6.19	0.021	1.0	7.83	7.50
			34	6.17	0.020	1.0	7.76	7.44
			37	6.21	0.021	1.0	7.71	7.43
			40	6.18	0.021	1.1	7.51	7.23
			43	6.36	0.047	6000	6.47	7.11
	SL-2	10:10	0	6.98	0.020	0.7	8.22	14.09
			1	7.02	0.020	0.9	8.07	13.73
			2	6.96	0.020	0.9	8.07	13.67
			3	6.92	0.020	1.2	8.12	13.60
			4	6.92	0.020	1.0	8.12	13.08
			5	6.88	0.019	1.1	8.07	12.47
			6	6.81	0.020	0.5	8.28	11.83
			7	6.74	0.019	0.8	8.29	11.10
			8	6.67	0.019	0.9	8.34	10.75
			9	6.61	0.019	0.7	8.33	10.59
			10	6.61	0.020	0.8	8.33	10.19
			13	6.52	0.020	0.4	8.30	9.66
			16	6.44	0.020	0.8	8.32	8.98
			19	6.36	0.020	0.7	8.16	8.06
			22	6.23	0.020	0.8	7.77	7.73
			Bottom 23.3					
	SL-3	09:00	0	7.30	0.020	1.3	8.28	13.76
			1	7.10	0.020	1.5	8.33	13.67
			2	7.05	0.020	1.6	8.18	13.62
			3	7.02	0.019	1.4	8.04	13.59
			4	6.97	0.020	1.0	8.13	13.53
			5	6.91	0.020	1.2	8.34	12.03

Appendix G Table G-1
Shaver Lake Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
			6	6.83	0.019	1.3	8.45	10.92
			7	6.72	0.020	1.1	8.38	10.61
			8	6.63	0.020	1.1	8.45	10.51
			9	6.61	0.019	1.1	8.49	10.17
			10	6.55	0.019	1.0	8.30	10.08
			13	6.51	0.019	1.0	8.50	9.60
			16	6.38	0.020	1.0	8.34	8.76
			19	6.33	0.021	0.7	8.15	8.24
			Bottom 20.4					
June 24, 2002	SL-1	13:30	0	5.55	0.023	4.1	9.79*	20.64
			1	5.50	0.022	4.6	8.50*	20.53
			2	5.49	0.022	4.5	8.20*	20.47
			3	5.58	0.020	1.1	9.00*	18.50
			4	5.63	0.020	1.2	9.13*	17.73
			5	5.64	0.020	1.3	9.23*	16.82
			6	5.64	0.019	1.3	8.99*	16.12
			7	5.58	0.020	1.1	8.77*	15.42
			8	5.56	0.020	1.0	8.60*	15.06
			9	5.61	0.021	1.1	8.91*	14.72
			10	5.54	0.022	1.0	8.50*	14.52
			13	5.44	0.024	0.6	7.95*	13.64
			16	5.33	0.032	0.4	7.61*	12.80
			19	5.58	0.030	0.4	7.59*	12.26
			22	5.52	0.030	0.3	7.55*	11.65
			25	5.46	0.032	0.3	7.40*	11.18
			28	5.39	0.032	0.3	7.19*	10.75
			31	5.34	0.033	0.3	6.94*	10.37
			34	5.30	0.034	0.3	6.73*	10.22
			37	5.26	0.034	0.3	6.58*	10.08
			Bottom 40					
	SL-2	11:15	0	5.91	0.021	0.5	7.59*	20.55
			1	5.86	0.021	1.0	7.42*	20.54
			2	5.80	0.021	0.8	7.27*	20.33
			3	5.80	0.021	0.9	7.31*	19.72
			4	5.80	0.020	1.0	7.32*	19.43
			5	5.79	0.019	0.9	7.89*	16.62
			6	5.77	0.018	0.9	7.88*	16.19
			7	5.68	0.018	0.8	7.69*	15.58
			8	5.66	0.018	0.7	7.71*	15.08
			9	5.61	0.018	0.8	7.61*	15.03
			10	5.57	0.017	1.2	7.56*	14.66
			11	5.54	0.018	0.7	7.63*	14.33
			13	5.48	0.017	0.7	7.68*	13.91
			16	5.48	0.017	0.6	7.54*	13.24

Appendix G Table G-1
Shaver Lake Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			19	5.40	0.017	0.4	7.27*	12.50
			20	5.35	0.017	0.3	7.18*	12.02
			Bottom 24.5					
	SL-3	09:40	0	5.86	0.020	1.1	7.39*	20.27
			1	5.84	0.020	1.1	7.34*	20.03
			2	5.89	0.020	1.0	7.33*	19.77
			3	5.86	0.020	1.1	7.31*	19.71
			4	5.91	0.020	1.0	7.27*	19.62
			5	5.91	0.019	1.1	7.66*	17.64
			6	5.79	0.018	0.8	7.68*	16.18
			7	5.76	0.017	0.8	7.72*	15.34
			8	5.73	0.017	0.7	7.63*	15.12
			9	5.67	0.017	0.7	7.60*	14.74
			10	5.61	0.017	0.8	7.59*	14.40
			11	5.59	0.017	0.7	7.56*	14.29
			12	5.56	0.017	0.9	7.51*	14.18
			13	5.54	0.016	0.7	7.50*	13.96
			16	5.47	0.016	0.5	7.59*	13.36
			19	5.42	0.016	0.5	7.40*	12.56
			22	5.36	0.017	0.4	7.17*	11.80
			Bottom 23.9					
July 26, 2002	SL-1	10:30	0	6.84	0.018	0.5	5.60	22.37
		10:30	1	6.85	0.018	0.6	5.46	22.26
		10:30	2	6.78	0.018	0.8	5.47	22.15
		10:30	3	6.79	0.018	0.9	5.50	22.10
		10:30	4	6.77	0.018	1.4	5.58	22.06
		10:30	5	6.84	0.018	1.0	5.81	21.89
		10:30	6	6.91	0.018	0.6	6.18	20.81
		10:30	7	6.88	0.018	0.9	6.20	19.79
		10:30	8	6.83	0.017	0.9	6.20	19.13
		10:30	9	6.78	0.018	1.0	6.24	18.58
		10:30	10	6.79	0.017	1.0	6.23	18.12
		10:30	13	6.47	0.018	0.8	5.79	17.07
		10:30	16	6.13	0.018	0.7	5.21	15.74
		10:30	19	6.09	0.019	0.8	4.87	14.51
		10:30	22	6.00	0.019	0.3	4.76	13.51
		10:30	25	5.97	0.019	0.4	4.72	13.17
		10:30	29	5.95	0.019	0.6	4.57	12.86
		10:30	32	5.94	0.020	0.6	4.50	12.67
		10:30	35	5.90	0.020	0.8	4.16	12.20
		10:30	38	5.88	0.020	0.7	3.82	11.70
		10:30	Bottom 38.5					

Appendix G Table G-1
Shaver Lake Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
SL-2	SL-2	09:30	0	6.92	0.018	0.4	5.30	22.76
		09:30	1	6.77	0.018	0.7	5.28	22.68
		09:30	2	6.73	0.018	0.8	5.25	22.55
		09:30	3	6.73	0.018	0.9	5.26	22.46
		09:30	4	6.67	0.018	0.9	5.23	22.53
		09:30	5	6.60	0.017	0.9	5.48	20.73
		09:30	6	6.52	0.017	1.0	5.58	20.03
		09:30	7	6.48	0.018	1.0	5.60	19.22
		09:30	8	6.44	0.018	1.2	5.55	18.92
		09:30	9	6.43	0.018	1.0	5.53	18.24
		09:30	10	6.35	0.018	1.1	5.49	17.98
		09:30	13	6.25	0.018	1.0	5.36	17.29
		09:30	16	6.18	0.018	0.8	5.34	16.48
		09:30	19	6.07	0.018	0.7	5.00	15.04
		09:30	22	5.99	0.019	0.7	4.72	14.17
		09:30	Bottom 23.5					
SL-3		08:30	0	6.83	0.018	0.9	5.13	22.47
		08:30	1	6.81	0.018	1.0	5.20	22.45
		08:30	2	6.69	0.018	0.9	5.18	22.43
		08:30	3	6.66	0.018	0.9	5.18	22.41
		08:30	4	6.63	0.018	1.0	5.18	22.39
		08:30	5	6.55	0.017	1.1	5.41	20.96
		08:30	6	6.55	0.017	1.1	5.41	20.03
		08:30	7	6.53	0.018	1.1	5.49	19.32
		08:30	8	6.41	0.017	0.9	5.43	18.93
		08:30	9	6.40	0.017	1.2	5.35	18.30
		08:30	10	6.35	0.017	1.4	5.35	18.01
		08:30	13	6.27	0.017	1.2	5.26	17.24
		08:30	16	6.22	0.018	1.1	5.31	16.44
		08:30	19	6.12	0.018	1.2	5.00	15.04
		08:30	22	6.00	0.018	0.8	4.53	13.66
		08:30	Bottom 22.5					
August 22, 2002	SL-1A	12:45	0	7.15	0.018	0.9	7.63	21.60
		12:45	1	7.17	0.018	1.2	7.74	21.31
		12:45	2	7.21	0.018	1.4	7.80	21.17
		12:45	3	7.24	0.018	1.2	7.72	21.06
		12:45	4	7.23	0.018	1.4	7.73	21.01
		12:45	5	7.22	0.018	1.0	7.78	20.98
		12:45	6	7.13	0.018	1.3	7.63	20.96
		12:45	7	7.15	0.018	1.3	7.84	20.73
		12:45	8	7.19	0.017	0.8	8.15	19.92
		12:45	9	7.22	0.017	0.9	8.28	19.65

Appendix G Table G-1
Shaver Lake Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
		12:45	10	7.06	0.017	1.1	8.21	19.45
		12:45	11	6.86	0.017	0.9	7.79	19.07
		12:45	13	6.66	0.017	0.8	7.01	18.44
		12:45	16	6.34	0.018	0.5	6.34	17.86
		12:45	19	6.23	0.018	0.5	6.02	17.20
		12:45	22	6.15	0.018	0.8	5.63	16.52
		12:45	25	6.11	0.019	0.8	5.41	16.27
		12:45	28	6.06	0.019	0.6	5.06	15.92
		12:45	31	6.00	0.019	0.7	4.95	15.67
		12:45	34	5.98	0.020	192.0	4.23	14.90
		12:45	37	5.96	0.020	22.0	3.82	14.24
	SL-2	10:20	0	7.07	0.018	0.7	7.34	21.50
		10:20	1	7.08	0.018	1.1	7.39	21.50
		10:20	2	7.04	0.018	1.1	7.42	21.33
		10:20	3	7.02	0.018	0.8	7.36	21.24
		10:20	4	7.02	0.018	0.7	7.39	21.10
		10:20	5	6.98	0.018	0.8	7.39	21.02
		10:20	6	6.96	0.018	0.9	7.36	20.97
		10:20	7	6.95	0.018	1.1	7.37	20.91
		10:20	8	6.80	0.017	0.5	7.27	19.65
		10:20	9	6.66	0.017	0.4	7.14	19.41
		10:20	10	6.58	0.017	0.8	7.02	19.15
		10:20	13	6.50	0.017	0.5	6.72	18.64
		10:20	16	6.38	0.017	0.8	6.21	17.97
		10:20	19	6.23	0.018	0.6	5.70	17.42
		10:20	22	6.15	0.018	1.0	5.42	16.47
		10:20	25	6.01	0.019	1.1	4.70	15.80
		10:20	26.1	Bottom				
	SL-3	09:00	0	7.14	0.018	1.0	7.16	21.15
		09:00	1	7.10	0.018	1.1	7.71	21.15
		09:00	2	7.09	0.018	0.7	7.24	21.15
		09:00	3	7.07	0.018	1.0	7.28	21.14
		09:00	4	7.03	0.018	1.0	7.02	21.13
		09:00	5	7.05	0.018	1.1	7.02	21.13
		09:00	6	6.99	0.018	0.9	7.12	21.13
		09:00	7	6.97	0.018	1.0	7.23	20.62
		09:00	8	6.88	0.017	0.9	6.83	19.63
		09:00	9	6.71	0.017	0.8	6.74	19.21
		09:00	10	6.63	0.017	1.1	6.65	18.91
		09:00	11	6.57	0.017	0.8	6.49	18.78
		09:00	13	6.46	0.017	0.4	6.42	18.45
		09:00	16	6.37	0.017	0.7	6.14	17.99
		09:00	19	6.28	0.018	0.8	5.63	17.55
		09:00	22	6.15	0.018	0.9	4.89	16.50
		09:00	22.6	Bottom				

Appendix G Table G-1
Shaver Lake Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
September 26, 2002	SL-1	15:30	0	7.23	0.017	0.3	7.45	19.43
		15:30	1	7.18	0.017	0.5	7.40	19.41
		15:30	2	7.18	0.017	0.9	7.25	19.30
		15:30	3	7.28	0.017	1.0	7.26	19.16
		15:30	4	7.25	0.017	0.7	7.10	19.12
		15:30	5	7.27	0.017	0.5	7.29	19.09
		15:30	6	7.31	0.017	0.8	7.26	19.06
		15:30	7	7.31	0.017	0.9	7.34	19.02
		15:30	8	7.34	0.017	0.8	7.16	19.00
		15:30	9	7.29	0.017	0.8	7.11	19.00
		15:30	10	7.29	0.017	1.2	7.15	18.98
		15:30	13	7.18	0.017	1.2	6.97	18.91
		15:30	16	6.64	0.017	0.8	5.65	18.66
		15:30	19	6.48	0.017	0.9	5.29	18.56
		15:30	22	6.38	0.017	0.9	5.16	18.50
		15:30	25	6.37	0.017	1.3	5.13	18.43
		15:30	25.8	Bottom				
	SL-2	14:40	0	7.05	0.017	0.6	7.33	19.84
		14:40	1	7.01	0.017	0.7	7.31	19.83
		14:40	2	6.94	0.017	0.5	7.26	19.81
		14:40	3	7.03	0.017	0.7	7.33	19.70
		14:40	4	7.10	0.017	0.6	7.28	19.68
		14:40	5	7.13	0.017	0.9	7.32	19.49
		14:40	6	7.12	0.017	0.8	7.30	19.35
		14:40	7	7.05	0.017	0.6	7.18	19.02
		14:40	8	7.00	0.018	0.8	7.03	18.94
		14:40	9	6.96	0.017	0.4	6.95	18.92
		14:40	10	6.86	0.017	1.1	6.80	18.88
		14:40	13	6.76	0.017	0.2	6.22	18.82
		14:40	15.8	Bottom				
	SL-3	13:45	0	7.02	0.017	0.4	7.02	19.96
		13:45	1	7.00	0.017	0.6	7.00	19.88
		13:45	2	7.02	0.017	0.7	6.97	19.71
		13:45	3	7.06	0.017	0.7	6.90	19.50
		13:45	4	7.10	0.017	0.4	7.00	19.45
		13:45	5	7.17	0.017	0.7	6.95	19.41
		13:45	6	7.17	0.017	0.6	7.04	19.38
		13:45	7	7.09	0.017	0.9	7.08	19.09
		13:45	8	7.03	0.017	1.0	6.98	19.03
		13:45	9	6.88	0.017	0.4	6.80	18.96
		13:45	10	6.72	0.017	0.6	6.62	18.90
		13:45	13	6.75	0.017	0.7	6.65	18.77
		13:45	16	6.72	0.017	0.8	6.49	18.66
		13:45	19	6.69	0.017	0.5	6.36	18.49
		13:45	21	Bottom				

* Adjusted for Altitude - YSI meter used - was not able to adjust pressure (mm Hg) in the field

Appendix G Table G-2
Huntington Lake Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
May 28, 2002	HL-1	09:46	0	6.68	0.016	0.5	8.18	12.70
			1	6.70	0.016	0.9	8.17	11.87
			2	6.64	0.016	1.0	8.19	11.64
			3	6.67	0.016	0.8	8.21	11.49
			4	6.65	0.016	0.9	8.22	11.37
			5	6.65	0.016	0.8	8.18	11.04
			6	6.60	0.016	0.9	8.23	10.87
			7	6.60	0.016	0.7	8.27	10.39
			8	6.61	0.016	0.9	8.33	9.73
			9	6.54	0.016	0.9	8.32	9.42
			10	6.50	0.016	1.0	8.35	9.26
			11	6.45	0.015	1.0	8.47	8.90
			12	6.48	0.015	1.1	8.61	8.70
			13	6.42	0.016	1.3	8.53	8.52
			14	6.40	0.016	1.4	8.50	8.14
			15	6.37	0.016	1.5	8.64	7.97
			18	6.29	0.017	1.2	8.63	7.35
			21	6.25	0.019	1.2	8.38	6.68
			24	6.23	0.019	1.4	8.46	6.39
			27	6.25	0.019	1.1	8.44	6.29
			30	6.26	0.019	1.2	8.41	6.27
			33	6.23	0.019	1.6	8.31	6.24
			36	6.21	0.020	1.2	8.29	5.94
			39	6.22	0.020	1.1	8.25	5.86
			42	6.20	0.020	1.5	8.22	5.86
			42.9					
	HL-2	11:00	0	6.70	0.016	0.7	8.21	12.52
			1	6.65	0.016	0.8	8.18	12.43
			2	6.68	0.016	1.0	8.25	12.07
			3	6.61	0.016	0.7	8.10	11.93
			4	6.60	0.016	0.7	8.33	11.78
			5	6.57	0.016	0.5	8.33	11.24
			6	6.62	0.016	0.9	8.49	10.83
			7	6.62	0.015	0.9	8.60	9.88
			8	6.53	0.016	0.8	8.66	9.35
			9	6.53	0.016	1.1	8.66	9.19
			10	6.51	0.016	0.7	8.72	8.82
			13	6.41	0.015	1.0	8.73	7.53
			16	6.32	0.017	0.9	8.53	7.30
			19	6.29	0.018	0.9	8.45	6.79
			22	6.29	0.018	1.1	8.30	6.48
			25	6.27	0.018	1.0	8.35	6.40
			28	6.29	0.018	1.0	8.30	6.30
			31	6.22	0.019	0.8	8.08	6.03

Appendix G Table G-2
Huntington Lake Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
			34	6.24	0.019	0.6	8.14	5.96
			37	6.21	0.020	1.1	7.96	5.91
			39.4	Bottom				
	HL-3	12:10	0	6.89	0.016	0.1	8.34	12.91
			1	6.83	0.016	0.2	8.31	12.87
			2	6.76	0.016	0.3	8.31	12.80
			3	6.75	0.016	0.2	8.30	12.79
			4	6.75	0.016	0.0	8.41	12.09
			5	6.60	0.013	0.0	8.42	11.21
			6	6.46	0.014	0.2	8.76	9.99
			7	6.45	0.015	0.4	8.83	9.62
			8	6.43	0.015	0.3	8.98	9.25
			9	6.41	0.014	0.5	9.00	8.93
			10	6.34	0.014	0.5	8.85	8.82
			13	6.31	0.015	0.2	8.90	7.91
			16	6.23	0.013	0.5	8.76	7.21
			19	6.16	0.015	0.5	8.67	6.81
			19.6	Bottom				
June 25, 2002	HL-1	10:00	0	5.83	0.017	0.1	7.07*	17.19
			1	5.85	0.017	0.3	7.05*	17.20
			2	5.92	0.016	0.2	6.98*	16.82
			3	5.96	0.016	0.3	6.98*	16.69
			4	5.96	0.017	0.3	7.00*	16.62
			5	5.95	0.017	0.3	6.98*	16.56
			6	5.93	0.016	0.4	6.97*	16.51
			7	5.93	0.017	0.4	6.98*	16.32
			8	5.97	0.017	0.4	7.13*	15.70
			9	5.99	0.016	0.4	7.61*	14.24
			10	5.99	0.016	0.6	7.75*	13.47
			13	5.91	0.014	0.3	7.83*	11.53
			16	5.80	0.015	0.6	7.63*	10.66
			19	5.67	0.016	0.5	7.58*	9.98
			22	5.52	0.016	0.3	7.50*	9.33
			25	5.51	0.016	0.6	7.48*	9.15
			28	5.51	0.016	0.4	7.36*	8.87
			31	5.46	0.017	0.4	7.38*	8.60
			34	5.42	0.018	0.4	7.35*	8.39
			37	5.38	0.018	0.4	7.28*	8.07
			40	5.38	0.018	0.3	7.16*	7.89
			43	5.32	0.018	0.5	7.07*	7.69
			44.3	Bottom				

Appendix G Table G-2
Huntington Lake Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
	HL-2	13:20	0	5.64	0.019	0.2	8.16*	17.67
			1	5.59	0.020	0.1	7.73*	17.56
			2	5.58	0.019	0.2	7.53*	17.37
			3	5.58	0.019	0.2	7.49*	16.81
			4	5.58	0.019	0.2	7.41*	16.71
			5	5.63	0.019	0.2	7.34*	16.21
			6	5.62	0.019	0.3	7.45*	15.68
			7	5.64	0.019	0.2	7.73*	14.71
			8	5.64	0.018	0.2	8.06*	13.19
			9	5.60	0.019	0.2	8.05*	12.82
			10	5.54	0.020	0.2	7.94*	12.31
			13	5.43	0.022	0.2	7.85*	11.37
			16	5.38	0.024	0.2	7.74*	10.45
			19	5.34	0.024	0.4	7.63*	10.02
			22	5.26	0.025	0.3	7.53*	9.65
			25	5.21	0.025	0.3	7.48*	9.44
			28	5.20	0.026	0.6	7.32*	8.94
			31	5.17	0.026	0.4	7.28*	8.60
			34	5.16	0.027	0.5	7.28*	8.35
			34.5	Bottom				
	HL-3	14:55	0	5.50	0.017	4.3	7.35*	18.07
			1	5.58	0.019	4.4	7.21*	18.10
			2	5.58	0.019	4.3	7.12*	18.08
			3	5.64	0.019	4.0	7.05*	18.08
			4	5.65	0.019	4.1	6.97*	18.01
			5	5.66	0.018	4.0	6.96*	17.96
			6	5.69	0.019	4.2	6.91*	17.93
			7	5.69	0.018	4.1	6.89*	17.90
			8	5.68	0.018	4.0	6.88*	17.85
			9	5.69	0.017	4.5	7.52*	15.08
			10	5.61	0.017	4.7	7.63*	13.87
			11	5.55	0.017	4.2	7.61*	13.66
			12	5.55	0.018	4.3	7.68*	13.54
			13	5.56	0.018	4.2	7.68*	13.13
			14.8	Bottom				
July 23, 2002	HL-1	12:50	0	6.86	0.013	0.3	6.21	19.54
			1	6.86	0.013	0.2	5.70	19.46
			2	6.74	0.014	0.0	5.75	19.10
			3	6.75	0.014	0.0	5.69	18.97
			4	6.75	0.013	0.0	5.65	18.93
			5	6.78	0.014	0.0	5.84	18.74
			6	6.80	0.013	0.3	5.77	18.63
			7	6.89	0.014	0.1	6.04	18.16

Appendix G Table G-2
Huntington Lake Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			8	7.07	0.013	0.4	6.47	17.03
			9	7.05	0.013	0.1	6.82	15.13
			10	6.83	0.013	0.6	6.55	14.25
			11	6.72	0.013	0.3	6.40	14.05
			13	6.54	0.014	0.3	6.33	13.45
			16	6.32	0.013	0.3	6.18	12.86
			19	6.13	0.013	0.1	5.97	11.69
			22	6.02	0.013	0.1	5.92	11.12
			25	5.94	0.013	0.2	5.85	10.85
			28	5.88	0.013	0.2	5.73	10.60
			31	5.84	0.014	0.2	5.70	10.48
			34	5.84	0.014	0.1	5.63	10.44
			37	5.77	0.014	0.2	5.50	10.06
			40	5.76	0.014	0.3	5.30	9.64
			43	5.75	0.016	0.6	4.59	8.60
			44	Bottom				
	HL-2	10:15	0	6.83	0.013	0.7	5.48	19.55
			1	6.89	0.013	0.5	5.39	19.52
			2	6.96	0.013	0.5	5.40	19.38
			3	6.81	0.013	0.4	5.52	19.27
			4	6.75	0.013	0.4	5.50	19.10
			5	6.78	0.013	0.7	5.50	19.06
			6	6.82	0.013	0.7	5.58	18.50
			7	6.97	0.013	1.2	6.08	17.57
			8	7.14	0.013	0.8	6.40	17.00
			9	7.21	0.013	0.7	6.54	16.45
			10	7.10	0.013	0.8	6.61	15.45
			11	6.66	0.013	0.7	6.55	14.58
			13	6.25	0.013	0.4	6.50	13.62
			14	7.43	0.014	0.9	6.09	13.57
			16	6.39	0.014	0.9	6.08	13.09
			19	6.19	0.013	0.3	5.91	11.68
			21	6.10	0.013	0.9	5.84	11.55
			22	Bottom				
	HL-3	11:20	0	6.92	0.013	0.6	5.45	20.30
			1	6.81	0.013	0.5	5.34	20.34
			2	6.74	0.013	0.4	5.38	20.01
			3	6.75	0.014	0.7	5.23	19.89
			4	6.69	0.014	0.7	5.36	19.74
			5	6.75	0.013	0.5	5.41	19.59
			6	6.72	0.014	0.3	5.79	17.55
			7	6.67	0.014	0.5	5.90	16.49

Appendix G Table G-2
Huntington Lake Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			8	6.64	0.014	0.6	6.14	16.05
			9	6.63	0.014	0.4	6.18	15.61
			10	6.59	0.014	0.7	6.22	15.12
			13	6.51	0.014	0.4	6.10	14.19
			16	6.31	0.014	0.4	5.85	13.61
			16.5	Bottom				
August 19, 2002	HL-1	11:40	0	6.57	0.014	0.2	7.11	18.66
			1	6.67	0.014	0.0	6.86	18.62
			2	6.69	0.014	0.3	6.86	18.51
			3	6.68	0.014	0.6	7.18	18.18
			4	6.65	0.014	0.8	7.10	18.09
			5	6.66	0.014	0.6	7.21	18.06
			6	6.67	0.014	0.5	7.21	18.04
			7	6.72	0.014	0.4	7.16	18.03
			8	6.70	0.014	0.5	7.23	17.98
			9	6.70	0.014	0.4	7.03	17.82
			10	6.70	0.014	0.5	7.13	17.66
			11	6.74	0.014	0.6	7.48	16.74
			12	6.71	0.014	0.5	7.67	15.68
			13	6.67	0.014	0.6	7.64	15.55
			16	6.53	0.014	0.6	7.41	14.55
			19	6.43	0.014	0.7	7.36	14.36
			22	6.34	0.014	1.0	7.05	13.55
			25	6.26	0.014	0.8	7.00	13.28
			28	6.21	0.014	0.5	6.93	12.92
			31	6.16	0.014	0.8	6.81	12.68
			34	6.10	0.014	2.2	6.71	12.47
			37	6.05	0.014	0.9	6.42	11.73
			40	5.98	0.014	0.9	6.16	11.04
			43	5.85	0.016	8.7	4.17	9.87
			43.5	Bottom				
	HL-2	14:50	0	6.58	0.014	0.1	7.55	19.12
			1	6.61	0.014	0	7.26	19.12
			2	6.57	0.014	0	7.30	19.08
			3	6.63	0.014	0.1	7.27	19.04
			4	6.63	0.014	0.3	7.26	19.01
			5	6.63	0.014	0.3	7.30	18.25
			6	6.66	0.014	0.7	7.28	18.05
			7	6.70	0.014	0.6	7.27	17.90
			8	6.72	0.014	0.6	7.58	16.88
			9	6.70	0.014	0.3	7.74	16.55
			10	6.71	0.014	0.1	7.89	16.22

Appendix G Table G-2
Huntington Lake Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			11	6.68	0.014	0.7	7.86	16.06
			13	6.63	0.015	0.1	7.85	15.52
			16	6.45	0.014	0.2	7.60	14.84
			19	6.39	0.014	0.6	7.37	14.30
			22	6.31	0.014	0.5	7.23	13.94
			25	6.26	0.014	0.3	7.12	13.58
			28	6.17	0.014	0.5	6.90	13.08
			31	6.07	0.014	0.6	6.55	12.65
			32	Bottom				
	HL-3	17:00	0	6.76	0.014	0	7.46	19.43
			1	6.75	0.014	0	7.34	19.43
			2	6.74	0.014	0	7.22	19.44
			3	6.72	0.014	0.2	7.20	19.44
			4	6.73	0.014	0	7.23	19.42
			5	6.73	0.014	0.1	7.18	19.35
			6	6.73	0.014	0.1	7.20	19.34
			7	6.68	0.014	0.2	7.15	19.28
			8	6.72	0.014	0.3	7.53	18.30
			9	6.74	0.014	0.5	7.75	17.43
			10	6.77	0.014	0.1	7.63	17.15
			13	6.63	0.014	0.7	7.91	16.39
			16	6.62	0.015	0.5	7.81	15.56
			17	Bottom				
September 23, 2002	HL-1	9:00	0	6.55	0.015	0.5	8.23	16.17
			1	6.61	0.015	0.5	8.04	16.17
			2	6.54	0.015	0.3	8.23	16.16
			3	6.57	0.015	0.5	8.05	16.16
			4	6.60	0.015	0.6	8.30	16.14
			5	6.66	0.015	0.2	8.25	16.14
			6	6.71	0.015	0.1	8.26	16.14
			7	6.78	0.015	0.6	8.25	16.13
			8	6.85	0.015	0.4	8.26	16.14
			9	6.91	0.015	0.4	8.26	16.14
			10	6.97	0.015	0.3	8.21	16.13
			13	7.02	0.015	0.7	8.46	16.11
			16	6.98	0.016	0.4	8.23	16.09
			19	7.00	0.015	0.6	8.21	16.07
			22	7.02	0.015	0.6	8.18	16.03
			25	6.83	0.015	0.8	7.66	15.79
			28	6.76	0.015	0.6	7.58	15.53
			31	6.50	0.015	1.1	6.32	14.47
			34	6.36	0.016	1.4	5.62	13.62

Appendix G Table G-2
Huntington Lake Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			37	6.30	0.016	0.7	5.24	12.06
			40	6.31	0.017	2.1	4.13	10.74
			43	Bottom				9.51
	HL-2	10:00	0	6.93	0.015	0.03	8.36	16.65
			1	6.81	0.015	0.3	8.35	16.55
			2	6.76	0.015	0.3	8.28	16.52
			3	6.74	0.015	0.4	8.34	16.47
			4	6.75	0.015	0.4	8.31	16.42
			5	6.76	0.015	0.5	8.27	16.37
			6	6.79	0.015	0.6	8.27	16.32
			7	6.83	0.015	0.6	8.27	16.25
			8	6.90	0.015	0.5	8.29	16.21
			9	6.95	0.015	0.4	8.27	16.20
			10	7.00	0.015	0.4	8.31	16.20
			13	7.13	0.015	0.5	8.31	16.15
			16	7.17	0.015	0.6	8.31	16.04
			19	7.03	0.015	0.5	8.00	15.84
			22	6.85	0.015	1.0	7.94	15.82
			25	6.84	0.015	0.4	7.86	15.70
			28	6.61	0.016	0.8	6.73	14.86
			28.4	Bottom				
	HL-3	10:50	0	6.84	0.015	0	8.44	17.57
			1	6.75	0.015	0.1	8.40	17.18
			2	6.67	0.016	0.2	8.39	17.02
			3	6.69	0.015	0	8.37	16.86
			4	6.75	0.015	0	8.39	16.78
			5	6.78	0.015	0.2	8.36	16.37
			6	6.81	0.015	0.5	8.34	16.26
			7	6.86	0.015	0.2	8.28	16.16
			8	6.92	0.015	0.2	8.33	16.12
			9	6.95	0.015	0.5	8.15	16.06
			10	6.96	0.015	0.4	8.10	16.05
			10.8	Bottom				

* *Adjust DO readings to altitude* YSI meter used - was not able to adjust pressure (mm Hg) in the field

Appendix G Table G-3
Florence Lake Profile Data, May - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
May 29, 2002	FL-1	09:00	0	6.54	0.014	0.3	7.64	11.58
		09:00	1	6.52	0.014	0.5	7.51	11.12
		09:00	2	6.47	0.014	0.2	7.51	10.99
		09:00	3	6.42	0.014	0.8	7.73	10.85
		09:00	4	6.44	0.015	0.6	7.61	10.71
		09:00	5	6.40	0.014	0.5	7.79	10.71
		09:00	6	6.32	0.014	0.7	7.92	10.05
		09:00	7	6.33	0.015	0.5	7.90	10.01
		09:00	8	6.34	0.014	0.6	7.90	9.82
		09:00	9	6.31	0.014	0.8	8.07	9.69
		09:00	10	6.37	0.015	0.6	8.05	9.56
		09:00	13	6.39	0.015	0.4	7.90	8.31
		09:00	16	6.27	0.014	0.6	8.36	7.32
		09:00	19	6.23	0.015	1.3	8.28	7.25
		09:00	20	Bottom				
	FL-2	10:00	0	6.74	0.015	0.6	7.95	12.53
		10:00	1	6.66	0.014	0.6	8.13	11.61
		10:00	2	6.51	0.014	0.6	8.05	11.04
		10:00	3	6.46	0.014	0.8	8.02	10.94
		10:00	4	6.43	0.015	0.5	8.05	10.84
		10:00	5	6.33	0.015	0.6	8.25	10.18
		10:00	6	6.34	0.015	0.6	8.30	10.08
		10:00	7	6.36	0.015	0.9	8.33	9.67
		10:00	8	6.32	0.015	0.6	8.48	8.63
		10:00	9	6.35	0.015	0.7	8.56	8.35
		10:00	10	6.31	0.015	0.7	8.54	8.13
		10:00	13	6.25	0.015	0.7	8.54	7.56
		10:00	16	6.30	0.015	0.7	8.36	7.38
		10:00	19	6.18	0.014	0.6	8.58	7.19
		10:00	22	6.13	0.014	0.9	8.72	6.94
		10:00	23.9	Bottom				
	FL-3	12:10	0	6.49	0.015	0.0	8.76	13.28
		12:10	1	6.36	0.015	0.0	8.77	11.57
		12:10	2	6.25	0.014	0.0	8.77	10.97
		12:10	3	6.23	0.015	0.2	8.82	10.19
		12:10	4	6.21	0.014	0.0	8.85	9.81
		12:10	5	6.22	0.013	0.0	8.86	9.34
		12:10	6	6.19	0.012	0.2	8.93	8.56
		12:10	7	6.11	0.012	0.1	8.94	8.26
		12:10	8	6.14	0.012	0.2	9.01	7.93
		12:10	9	6.12	0.012	0.3	8.95	7.78
		12:10	10	6.03	0.011	0.5	9.05	7.39

Appendix G Table G-3
Florence Lake Profile Data, May - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
		12:10	11	Bottom				
June 26, 2002	FL-1	10:00	0	5.78	0.016	Won't stabilize	6.55*	17.58
		10:00	1	5.81	0.015	1.0 (0.0 - 1.2)	6.57*	17.25
		10:00	2	5.86	0.015	(0.0 - 2.5)	6.56*	17.25
		10:00	3	5.79	0.015	(7.0 - 15.0)	6.89*	17.14
		10:00	4	5.82	0.015	(0.0 - 1.0)	6.90*	17.12
		10:00	5	5.84	0.015	Won't stabilize	6.92*	16.54
		10:00	6	5.89	0.014	Won't stabilize	7.25*	15.30
		10:00	7	5.90	0.014	Won't stabilize	7.50*	14.03
		10:00	8	5.83	0.013	(0.0 - 1.0)	7.47*	13.64
		10:00	9	5.81	0.013	(0.0 - 1.0)	7.54*	13.13
		10:00	10	5.76	0.013	(0.0 - 3.0)	7.52*	12.75
		10:00	13	5.57	0.013	(1.5 - 2.0)	7.58*	11.08
		10:00	16	5.55	0.013	(1.5 - 4.0)	7.47*	10.01
		10:00	19	5.44	0.013	(1.0 - 3.0)	7.52*	9.33
		10:00	22	5.38	0.013	(2.0 - 4.0)	7.48*	9.05
		10:00	25	5.24	0.014	(0.0 - 1.5)	7.44*	8.87
		10:00	28	5.10	0.018	Won't stabilize	7.39*	8.65
		10:00	29.80	Bottom				
	FL-2	12:00	0	5.66	0.016	Neg numbers	7.58*	17.77
		12:00	1	5.71	0.017	Won't stabilize	6.94*	17.76
		12:00	2	5.59	0.016	-x to 5.0	6.79*	17.65
		12:00	3	5.66	0.016	-x to 2.5	6.78*	17.39
		12:00	4	5.75	0.016	0.8 - 2.2	6.70*	17.09
		12:00	5	5.78	0.015	0.2	6.78*	16.57
		12:00	6	5.79	0.014	Won't stabilize	7.24*	14.63
		12:00	7	5.75	0.014	-x to 8.0	7.29*	14.11
		12:00	8	5.70	0.014	0.3 to 6.0	7.28*	13.73
		12:00	9	5.67	0.014	2.1	7.43*	13.13
		12:00	10	5.61	0.014	0.8	7.52*	12.79
		12:00	11	5.60	0.014	1.4 - 1.9	7.36*	12.27
		12:00	13	5.55	0.014	1.0	7.45*	11.62
		12:00	16	5.50	0.014	0.6	7.53*	10.62
		12:00	19	5.41	0.015	1.4	7.47*	9.49
		12:00	22	5.33	0.015	1.5 - 2.3	7.42*	9.30
		12:00	25	5.28	0.016	2.0 - 2.9	7.39*	8.93
		12:00	28	5.22	0.017	2.5	7.31*	8.70

Appendix G Table G-3
Florence Lake Profile Data, May - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
		12:00	29.70	Bottom				
	FL-3	14:15	0	5.63	0.017	NC	6.87*	17.52
		14:15	1	5.70	0.017	NC	6.68*	17.55
		14:15	2	5.70	0.017	NC	6.70*	17.54
		14:15	3	5.73	0.017	NC	6.66*	17.54
		14:15	4	5.72	0.016	NC	6.63*	17.54
		14:15	5	5.72	0.017	NC	6.67*	17.29
		14:15	6	5.72	0.015	NC	6.91*	15.97
		14:15	7	5.72	0.015	NC	7.11*	14.99
		14:15	8	5.70	0.016	NC	7.27*	13.80
		14:15	9	5.69	0.014	NC	7.28*	13.21
		14:15	10	5.64	0.014	NC	7.29*	13.00
		14:15	11	5.61	0.014	NC	7.39*	12.03
		14:15	12	5.57	0.014	NC	7.40*	11.75
		14:15	13	5.50	0.014	NC	7.44*	11.43
		14:15	16	5.48	0.014	NC	7.46*	10.61
		14:15	19	5.44	0.014	NC	7.50*	9.61
		14:15	20.2	Bottom				
July 24, 2002	FL-1	12:50	0	6.86	0.011	0.0	5.34	19.37
		12:50	1	6.86	0.011	0.2	5.13	19.36
		12:50	2	6.72	0.011	0.5	5.22	19.36
		12:50	3	6.62	0.011	0.0	5.21	19.32
		12:50	4	6.60	0.011	0.5	5.20	19.29
		12:50	5	6.70	0.011	0.3	5.12	19.02
		12:50	6	6.62	0.011	0.5	5.20	19.10
		12:50	7	6.56	0.011	0.4	5.17	19.05
		12:50	8	6.60	0.011	0.0	5.19	19.00
		12:50	9	6.58	0.011	0.0	5.22	18.96
		12:50	10	6.77	0.011	0.3	5.74	17.69
		12:50	11	6.96	0.011	0.3	6.02	16.65
		12:50	13	7.28	0.011	0.3	6.16	15.96
		12:50	16	7.28	0.011	0.3	6.26	14.53
		12:50	19	6.65	0.011	0.2	6.37	12.79
		12:50	22	6.56	0.011	0.3	6.28	11.60
		12:50	25	6.31	0.011	0.5	6.14	11.03
		12:50	26.5	Bottom				
	FL-2	10:55	0	6.75	0.011	0.0	5.48	19.26
		10:55	1	6.63	0.011	0.2	5.22	19.24
		10:55	2	6.64	0.011	0.1	5.23	19.24
		10:55	3	6.55	0.011	0.2	5.15	19.23

Appendix G Table G-3
Florence Lake Profile Data, May - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
		10:55	4	6.63	0.011	0.0	5.15	19.09
		10:55	5	6.63	0.011	0.1	5.18	19.05
		10:55	6	6.58	0.011	0.5	5.17	19.02
		10:55	7	6.55	0.011	0.2	5.18	19.00
		10:55	8	6.62	0.011	0.2	5.15	18.97
		10:55	9	5.61	0.011	0.0	5.30	18.54
		10:55	10	6.61	0.011	0.0	5.73	17.18
		10:55	11	6.78	0.011	0.5	5.99	16.47
		10:55	13	7.07	0.011	0.6	6.22	15.51
		10:55	16	7.14	0.011	0.1	6.35	14.50
		10:55	18	6.77	0.011	0.4	6.42	13.61
		10:55	19	6.60	0.011	0.4	6.31	12.87
		10:55	22	6.15	0.011	0.6	5.92	11.16
		10:55	25	6.05	0.011	0.6	5.86	10.81
		10:55	27.5	Bottom				
	FL-3	09:40	0	6.70	0.011	0.1	5.22	18.96
		09:40	1	6.71	0.011	0.1	5.20	18.97
		09:40	2	6.71	0.011	0.2	5.03	18.90
		09:40	3	6.65	0.011	0.3	5.08	18.88
		09:40	4	6.66	0.011	0.1	5.04	18.84
		09:40	5	6.62	0.011	0.1	5.13	18.79
		09:40	6	6.59	0.011	0.1	5.07	18.75
		09:40	7	6.65	0.011	0.3	5.13	18.71
		09:40	8	6.57	0.011	0.0	5.13	18.66
		09:40	9	6.50	0.011	0.0	5.14	18.62
		09:40	10	6.63	0.011	0.0	5.25	17.70
		09:40	11	6.69	0.011	0.3	5.81	16.44
		09:40	13	6.74	0.011	0.3	5.91	15.63
		09:40	16	6.65	0.011	0.2	6.19	14.20
		09:40	17	6.53	0.011	0.4	6.04	13.91
		09:40	17.5	Bottom				
August 20, 2002	FL-1	14:30	0	6.69	0.011	0.3	6.09	19.42
		14:30	1	6.72	0.011	0.1	6.03	19.34
		14:30	2	6.66	0.012	0.2	5.97	19.15
		14:30	3	6.64	0.011	0.2	5.84	19.12
		14:30	4	6.65	0.012	0.0	5.89	19.08
		14:30	5	6.65	0.011	0.0	5.88	19.06
		14:30	6	6.65	0.011	0.3	5.84	19.06
		14:30	7	6.59	0.012	0.0	5.77	19.02
		14:30	8	6.62	0.012	0.2	5.87	18.98
		14:30	9	6.59	0.012	0.0	5.89	18.96
		14:30	10	6.61	0.012	0.0	5.89	18.93

Appendix G Table G-3
Florence Lake Profile Data, May - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
		14:30	13	6.62	0.012	0.4	5.86	18.80
		14:30	16	6.61	0.012	0.1	6.17	17.14
		14:30	17	6.54	0.012	0.1	6.46	16.30
		14:30	18.4	Bottom				
	FL-2	13:30	0	6.67	0.011	0.0	6.14	19.45
		13:30	1	6.65	0.012	0.0	6.06	19.39
		13:30	2	6.66	0.012	0.0	6.04	19.17
		13:30	3	6.63	0.011	0.2	6.01	19.12
		13:30	4	6.69	0.011	0.0	5.88	19.09
		13:30	5	6.60	0.011	0.0	5.89	19.08
		13:30	6	6.57	0.012	0.0	5.91	19.05
		13:30	7	6.58	0.012	0.0	5.90	19.05
		13:30	8	6.54	0.012	0.0	5.99	18.99
		13:30	9	6.62	0.011	0.1	5.97	18.98
		13:30	10	6.65	0.012	0.2	5.92	18.96
		13:30	13	6.61	0.012	0.0	5.97	18.76
		13:30	16	6.53	0.013	0.0	6.24	17.80
		13:30	17	6.29	0.013	0.0	6.37	16.80
		13:30	18	6.19	0.012	0.4	6.30	15.03
		13:30	19	6.03	0.013	0.4	5.75	13.30
		13:30	20	5.86	0.013	0.7	4.86	12.06
		13:30	20.7	Bottom				
	FL-3	11:45	0	6.70	0.012	0.0	6.25	19.07
		11:45	1	6.64	0.012	0.2	6.07	19.11
		11:45	2	6.62	0.012	0.1	6.05	19.10
		11:45	3	6.60	0.011	0.4	5.96	19.04
		11:45	4	6.63	0.012	0.1	5.96	19.10
		11:45	5	6.61	0.012	0.1	5.91	19.08
		11:45	6	6.59	0.011	0.4	5.91	19.08
		11:45	7	6.67	0.011	0.1	5.93	19.08
		11:45	8	6.66	0.012	0.3	5.88	19.08
		11:45	9	6.65	0.011	0.0	5.85	19.06
		11:45	10	6.65	0.012	0.0	5.90	19.05
		11:45	11	6.65	0.012	0.4	5.82	18.46
		11:45	11.5	Bottom				
September 24, 2002	FL-1	10:45	0	6.40	0.014	0.5	7.03	16.68
		10:45	1	6.34	0.014	0.1	6.75	16.23
		10:45	2	6.35	0.014	0.6	6.99	16.16
		10:45	3	6.41	0.014	0.6	6.97	16.11
		10:45	4	6.52	0.014	0.5	6.96	16.03
		10:45	5	6.60	0.014	0.6	6.91	16.00

Appendix G Table G-3
Florence Lake Profile Data, May - September 2002 (continued

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
		10:45	6	6.66	0.014	0.2	6.97	15.90
		10:45	7	6.68	0.014	0.4	6.87	15.86
		10:45	8	6.72	0.014	0.3	6.88	15.87
		10:45	9	6.75	0.014	0.4	7.00	15.85
		10:45	9.5	Bottom				
	FL-2	10:10	0	6.35	0.015	0.5	6.94	16.42
		10:10	1	6.36	0.015	0.5	6.86	16.33
		10:10	2	6.41	0.015	0.8	6.72	16.26
		10:10	3	6.41	0.015	0.2	6.71	16.21
		10:10	4	6.46	0.014	0.4	6.58	16.19
		10:10	5	6.54	0.014	0.4	6.63	16.17
		10:10	6	6.63	0.014	0.3	6.45	16.13
		10:10	7	6.67	0.014	0.3	6.53	16.12
		10:10	8	6.67	0.014	0.6	6.30	16.06
		10:10	9	6.64	0.015	0.6	6.24	15.91
		10:10	10	6.49	0.015	0.7	6.24	15.77
		10:10	10.4	Bottom				
	FL-3	9:45	0	6.37	0.015	0.3	6.89	16.05

NC: Not Collected

* YSI meter used - was not able to adjust pressure (mm Hg) in the field

Appendix G Table G-4
Mammoth Pool Profile Data, May – September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
May 22, 2002	MP-1	10:20	0	7.27	0.026	2.2	8.76	14.28
			1	7.11	0.026	1.5	8.78	13.12
			2	7.05	0.027	1.8	8.82	12.97
			3	7.03	0.026	1.6	8.75	12.90
			4	7.00	0.026	1.8	8.81	12.79
			5	7.02	0.026	1.5	8.83	12.32
			6	6.93	0.026	1.9	8.85	12.05
			7	6.86	0.026	1.5	8.95	11.50
			8	6.76	0.025	1.3	9.02	10.92
			9	6.77	0.024	1.6	9.08	10.78
			10	6.78	0.023	1.5	9.20	10.70
			13	6.75	0.024	1.3	9.27	10.41
			16	6.71	0.026	1.3	9.33	10.01
			19	6.74	0.027	1.2	9.28	9.89
			22	6.75	0.026	0.9	9.25	9.71
			25	6.73	0.026	1.2	9.27	9.60
			28	6.74	0.025	0.9	9.34	9.52
			31	6.78	0.026	1.2	9.33	9.46
			34	6.78	0.027	1.3	9.25	9.40
			37	6.76	0.026	1.0	9.32	9.29
			40	6.75	0.024	1.4	9.42	9.24
			43	6.75	0.022	1.5	9.41	9.19
			46	6.70	0.021	1.8	9.47	9.14
			49	6.71	0.023	1.6	9.43	9.13
			52	6.71	0.022	1.7	9.50	8.97
			55	6.64	0.020	2.5	9.55	8.87
			58	6.61	0.020	2.2	9.72	8.67
			61	6.61	0.020	2.3	9.71	8.65
			64	6.59	0.020	9.2	9.81	8.62
			66.7	Bottom				
	MP-2	11:50	0	7.14	0.025	1.0	8.98	14.25
			1	6.95	0.024	1.3	8.98	13.85
			2	6.93	0.024	1.1	9.12	13.35
			3	6.89	0.023	1.5	9.10	13.17
			4	6.87	0.024	1.1	9.08	13.16
			5	6.87	0.024	1.1	9.07	13.14
			6	6.86	0.024	1.5	9.10	12.94
			7	6.73	0.021	1.7	9.31	11.80
			8	6.71	0.020	1.7	9.45	11.15
			9	6.65	0.020	1.6	9.47	11.04
			10	6.66	0.020	1.6	9.48	10.94
		11:50	13	6.65	0.020	3.0	9.64	10.24

Appendix G Table G-4
Mammoth Pool Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
			13.8	Bottom				
	MP-3	13:19	0	7.00	0.022	1.1	9.23	14.84
			1	6.88	0.022	1.9	9.17	14.32
			2	6.79	0.022	1.2	9.23	13.67
			3	6.76	0.021	1.1	9.19	13.65
			4	6.81	0.022	1.1	9.16	13.62
			5	6.78	0.022	1.0	9.11	13.57
			6	6.73	0.021	0.9	9.12	13.10
			7	6.71	0.022	1.5	9.37	12.23
			8	6.75	0.022	1.4	9.51	11.50
			9	6.74	0.022	1.5	9.56	11.38
			10	6.75	0.023	1.7	9.63	11.09
			13	6.78	0.023	1.7	9.95	9.70
			16	6.76	0.024	1.7	10.02	6.97
			17.7	Bottom				
July 2, 2002	MP-1	9:23-11:00	0	7.55	0.030	0.7	7.54	22.24
			1	7.48	0.031	0.7	7.35	22.06
			2	7.47	0.030	0.5	7.59	22.03
			3	7.43	0.030	0.8	7.55	21.97
			4	7.38	0.030	0.5	7.49	21.92
			5	7.38	0.030	0.4	7.58	21.90
			6	7.38	0.031	0.4	7.24	21.70
			7	7.43	0.030	0.8	6.92	21.24
			8	7.18	0.030	1.0	7.72	20.13
			9	7.06	0.030	0.7	7.93	19.20
			10	6.88	0.029	0.5	7.88	18.76
			11	6.85	0.028	0.5	7.89	18.55
			12	6.85	0.027	0.3	7.81	18.26
			13	6.78	0.026	0.6	7.91	17.84
			14	6.74	0.025	0.3	7.95	17.55
			15	6.74	0.024	0.5	7.93	17.12
			20	6.6	0.022	0.7	7.83	16.00
			25	6.58	0.021	0.5	7.97	15.03
			30	6.51	0.020	0.5	8.07	14.50
			35	6.65	0.019	0.4	8.49	14.12
			40	6.52	0.019	0.4	8.61	13.76
			45	6.47	0.019	0.6	8.46	13.51
			50	6.54	0.019	0.7	8.27	13.29
			55	6.49	0.019	0.6	8.42	13.14
			60	6.46	0.019	0.9	8.59	13.03
			65	6.43	0.019	1.5	8.55	12.78
			68	4.33	0.019		8.68	12.67
			69	Bottom				

Appendix G Table G-4
Mammoth Pool Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
	MP-2	13:55	0	7.46	0.028	0.5	8.82	22.36
			1	7.42	0.028	0.8	8.26	22.26
			2	7.38	0.028	0.1	8.22	22.05
			3	7.34	0.028	0.5	8.25	21.76
			4	7.27	0.027	0.1	8.29	21.53
			5	7.25	0.027	0.3	8.12	21.41
			6	7.27	0.027	0.5	8.22	20.73
			7	7.14	0.027	0.4	8.11	20.26
			8	7.06	0.027	0.3	8.24	19.74
			9	7.03	0.026	0.1	8.23	19.53
			10	6.91	0.026	0.5	8.39	19.32
			11	6.89	0.026	0.3	8.38	18.50
			12	6.83	0.025	0.5	8.43	18.53
			13	6.83	0.025	0.5	8.45	18.02
			14	6.83	0.026	0.1	8.44	17.55
			15	6.76	0.025	0.7	8.53	17.17
			18	6.58	0.023	0.4	8.53	16.21
			20	6.70	0.022	0.4	8.67	15.75
			25	6.59	0.021	0.1	8.72	15.11
			28	6.56	0.020		8.7	14.80
			29.5					
	MP-3	12:20	0	7.25	0.025	0.1	8.28	23.18
			1	7.27	0.025	0.3	7.99	23.21
			2	7.24	0.025	0.3	7.89	23.20
			3	7.17	0.025	0.2	7.91	23.15
			4	7.16	0.025	0.1	7.86	23.19
			5	7.13	0.025	0.3	7.84	22.95
			6	7.05	0.025	0.3	8.17	20.94
			7	6.99	0.026	0.4	8.33	19.67
			8	7.05	0.026		7.88	19.54
July 22, 2002	MP-1	1:15	0	7.10	0.037	0.0	6.12	24.05
			1	7.22	0.037	0.1	5.87	24.07
			2	7.22	0.037	0.0	5.76	24.04
			3	7.26	0.038	0.0	5.81	23.82
			4	7.23	0.037	0.0	5.81	23.62
			5	7.28	0.037	0.2	5.78	23.59
			6	7.28	0.036	0.0	5.83	23.56
			7	7.29	0.036	0.2	5.80	23.51
			8	7.25	0.036	0.3	5.82	23.36
			9	7.12	0.034	0.5	5.89	21.74
			10	6.85	0.033	0.0	5.66	21.21
			13	6.65	0.031	0.0	5.36	20.22
			16	6.58	0.029	0.0	5.40	19.14

Appendix G Table G-4
Mammoth Pool Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
			19	6.47	0.028	0.1	5.44	18.19
			22	6.44	0.026	0.1	5.61	17.37
			25	6.40	0.024	0.2	5.73	16.67
			28	6.39	0.023	0.0	5.78	16.06
			31	6.34	0.022	0.0	5.97	15.59
			34	6.34	0.023	0.2	5.97	15.28
			37	6.34	0.022	0.1	6.05	15.00
			40	6.35	0.022	0.3	6.05	14.82
			43	6.30	0.021	0.4	6.06	14.58
			46	6.30	0.021	0.5	6.09	14.50
			49	6.32	0.021	0.3	6.12	14.37
			52	6.29	0.020	0.2	6.13	14.26
			55	6.26	0.020	0.2	6.14	14.16
			57	Bottom				
	MP-2	11:40	0	7.13	0.034	0.0	6.07	24.42
			1	7.20	0.034	0.0	6.05	24.36
			2	7.24	0.034	0.0	5.88	24.18
			3	7.26	0.034	0.3	6.02	24.02
			4	7.23	0.034	0.3	5.94	23.94
			5	7.27	0.034	0.0	6.07	23.84
			6	7.21	0.035	0.0	6.02	23.65
			7	7.26	0.035	0.0	5.90	23.64
			8	7.22	0.034	0.2	5.95	23.60
			9	7.08	0.036	0.3	6.18	21.71
			10	7.00	0.036	0.2	6.15	21.57
			13	6.90	0.034	0.6	5.88	20.03
			16	6.62	0.028	0.6	5.24	18.90
			19	6.54	0.026	8.9	5.15	18.16
			22	6.52	0.026	53.5	5.37	17.56
			25	Bottom				
	MP-3	09:00	0	7.14	0.032	1.1	5.30	24.40
			1	7.12	0.032	0.1	5.31	24.40
			2	7.18	0.032	1.1	5.45	24.38
			3	7.28	0.032	0.1	5.24	24.35
			4	7.20	0.032	0.1	5.40	24.34
			5	7.21	0.032	0.1	5.26	24.32
			6	7.17	0.032	0.8	5.24	24.32
			7	7.20	0.032	0.8	5.29	24.25
			8	7.14	0.040	0.7	5.33	22.10
			9	7.08	0.042	0.0	5.72	21.45
			10	7.03	0.043	0.7	5.93	21.15
			11	7.03	0.044	0.4	5.95	20.71
			13	7.00	0.041	0.1	5.93	20.11

Appendix G Table G-4
Mammoth Pool Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			16	6.77	0.033	0.9	5.74	18.68
			19	6.63	0.032	10.0	5.17	17.92
			22	6.55	0.031	0.8	5.53	17.22
			25	6.43	0.028	1.0	5.22	16.44
			26	Bottom				
August 21, 2002	MP-1	14:00	0	7.42	0.043	0.0	7.31	22.61
			1	7.43	0.042	0.0	7.13	22.61
			2	7.44	0.042	0.1	7.00	22.60
			3	7.41	0.042	0.3	7.08	22.56
			4	7.41	0.042	0.0	7.05	22.54
			5	7.41	0.042	0.0	7.08	22.54
			6	7.43	0.042	0.2	7.08	22.46
			7	7.42	0.042	0.2	7.06	22.43
			8	7.42	0.042	0.3	7.05	22.40
			9	7.44	0.042	0.4	7.04	22.38
			10	7.43	0.042	0.3	7.02	22.38
			13	7.42	0.042	0.0	7.00	22.37
			16	7.03	0.042	0.2	6.24	21.70
			19	6.90	0.038	0.2	5.93	20.88
			22	6.78	0.033	0.2	5.89	20.36
			25	6.67	0.031	0.0	5.77	19.70
			28	6.61	0.029	0.1	5.87	18.90
			31	6.56	0.028	0.0	6.08	18.41
			34	6.56	0.027	0.1	6.32	18.00
			37	6.54	0.027	0.5	6.43	17.68
			40	6.55	0.026	0.5	6.52	17.43
			43	6.54	0.026	0.2	6.57	17.18
			46	6.52	0.024	0.2	6.64	16.90
			49	6.50	0.025	0.3	6.66	16.82
			52	6.51	0.025	0.0	6.56	16.68
			55	6.50	0.024	0.5	6.71	16.45
			58	6.47	0.024	0.1	6.73	16.26
			61	6.46	0.023	0.5	6.77	15.94
			64	6.36	0.023	0.8	6.41	14.91
			67	6.16	0.026	6000	4.77	10.43
	MP-2	12:00	0	7.46	0.041	0.8	6.97	23.15
			1	7.49	0.041	0.0	7.00	23.14
			2	7.47	0.040	0.2	7.02	23.14
			3	7.49	0.041	0.5	6.94	23.06
			4	7.49	0.041	0.3	6.87	23.07

Appendix G Table G-4
Mammoth Pool Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
			5	7.50	0.041	0.0	6.93	22.95
			6	7.48	0.041	25.8	6.94	22.92
			7	7.48	0.040	0.6	6.85	22.90
			8	7.49	0.040	4.0	6.91	22.86
			9	7.48	0.041	0.1	6.87	22.85
			10	7.49	0.041	20.0	6.88	22.83
	MP-3	11:00	0	7.50	0.043	0.1	6.63	23.50
			1	7.48	0.043	0.1	6.77	23.44
			2	7.46	0.043	0.5	6.71	23.33
			3	7.44	0.043	0.2	6.73	23.28
			4	7.43	0.043	0.4	6.72	23.26
			5	7.46	0.043	0.4	6.78	23.24
			6	7.46	0.043	1.0	6.68	23.23
			7	7.43	0.043	0.5	6.66	23.22
			8	7.41	0.043	0.4	6.58	23.22
			9	7.45	0.044	0.4	6.52	23.13
			10	7.37	0.051	0.3	6.63	22.48
			13	7.30	0.055	0.8	6.63	21.81
			14	Bottom				
September 25, 2002	MP-1	14:15	0	7.14	0.049	0.1	7.26	20.97
			1	7.22	0.048	0.1	7.19	20.93
			2	7.30	0.049	0.4	7.18	20.80
			3	7.37	0.048	0.2	7.14	20.72
			4	7.40	0.048	0.3	7.90	20.69
			5	7.40	0.049	0.1	7.07	20.67
			6	7.40	0.048	0.6	6.76	20.67
			7	7.36	0.048	0.6	6.74	20.65
			8	7.38	0.049	0.2	6.73	20.64
			9	7.35	0.048	0.4	6.83	20.62
			10	7.33	0.048	0.3	6.97	20.61
			13	7.40	0.049	0.3	6.76	20.57
			16	7.36	0.048	0.3	6.69	20.56
			19	7.30	0.049	0.4	6.70	20.54
			22	7.25	0.049	0.3	6.51	20.50
			25	7.19	0.050	0.6	6.42	20.47
			28	7.11	0.050	0.5	5.88	20.42
			31	7.05	0.051	0.7	5.76	20.33
			34	6.93	0.052	1.1	4.91	20.13
			37	6.89	0.053	1.2	4.98	20.02
			38.1	Bottom				
	MP-2	13:30	0	7.13	0.049	0.0	7.23	21.21

Appendix G Table G-4
Mammoth Pool Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			1	7.31	0.048	0.1	7.26	21.19
			2	7.36	0.049	0.2	7.36	21.20
			3	7.41	0.049	0.5	7.29	21.01
			4	7.46	0.049	0.5	7.35	20.80
			5	7.51	0.049	0.4	7.19	20.77
			6	7.54	0.049	0.3	7.22	20.74
			7	7.55	0.049	0.1	7.20	20.74
			8	7.55	0.049	0.5	7.16	20.72
			9	7.42	0.049	0.7	6.98	20.70
			10	7.35	0.049	0.4	6.88	20.66
			13	7.36	0.049	0.4	6.70	20.59
			13.5	Bottom				
	MP-3	10:30	0	6.90	0.050	0.9	6.85	21.52
			1	7.00	0.050	0.8	6.16	21.28
			2	7.01	0.050	1.1	6.33	21.23
			3	7.01	0.049	1.0	6.38	21.20
			4	7.01	0.049	0.8	6.40	21.17
			5	7.05	0.049	1.1	6.16	21.13
			6	7.07	0.050	2.1	6.04	21.10
			7	7.19	0.062	2.3	7.03	19.70
			8	7.30	0.066	2.2	7.17	19.20
			9	7.42	0.076	2.3	7.50	18.15
			10	7.43	0.076	2.6	7.36	18.11
			13	7.46	0.076	2.8	7.47	18.09
			14.2	Bottom				

Appendix G Table G-5
Balsam Forebay Profile Data, June - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
June 5, 2002	BA-1	11:15	0	6.44	0.015	0.3	9.13*	10.83
			1	6.30	0.015	0.6	9.10*	10.79
			2	6.38	0.015	0.5	8.97*	10.60
			3	6.33	0.015	0.7	8.95*	10.69
			4	6.32	0.015	0.7	9.04*	10.47
			5	6.36	0.016	0.8	9.02*	10.67
			6	6.40	0.015	0.5	9.08*	10.34
			7	6.32	0.015	0.7	9.02*	10.45
			8	6.34	0.015		9.14*	10.40
			9	6.26	0.015		9.20*	10.21
			10	6.27	0.015		9.08*	10.23
			11	6.27	0.016		9.09*	10.23
			12	6.33	0.015		9.10*	10.29
			13	6.32	0.016		9.07*	10.30
			14	6.31	0.015		9.09*	10.60
			15	6.37	0.015		9.02*	10.20
			17.5	Bottom			0.00*	
July 6, 2002	BA-2	13:09	0	6.48	0.015		9.37*	11.21
			1	6.40	0.016		9.32*	11.21
			2	6.37	0.016		9.27*	11.23
			3	6.33	0.016		9.16*	11.17
			4	6.38	0.015		9.16*	10.99
			5	6.30	0.015		9.18*	10.91
			6	6.32	0.015		9.15*	11.09
			7	6.37	0.015		9.23*	11.15
			8	6.36	0.016		9.13*	11.04
			9	6.35	0.016		9.17*	11.05
			9.9	6.35	0.016		9.06*	10.78
June 27, 2002	BA-1	14:30	0	5.72	0.018	Faulty probe	8.03*	16.17
			1	5.76	0.016	Faulty probe	7.96*	14.54
			2	5.76	0.016	Faulty probe	7.82*	13.61
			3	5.69	0.016	Faulty probe	7.80*	13.17
			4	5.58	0.016	Faulty probe	7.75*	12.92
			5	5.49	0.016	Faulty probe	7.75*	12.57
			6	5.48	0.016	Faulty probe	7.72*	12.22
			7	5.53	0.016	Faulty probe	7.68*	12.35

Appendix G Table G-5
Balsam Forebay Profile Data, June - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
	BA-2	15:05	0	5.80	0.018	Faulty probe	9.01*	15.40
			1	5.70	0.017	Faulty probe	8.09*	14.52
			2	5.55	0.017	Faulty probe	8.10*	13.42
			3	5.47	0.017	Faulty probe	7.97*	13.37
			4	5.42	0.017	Faulty probe	7.91*	13.20
			5	5.40	0.017	Faulty probe	7.86*	12.82
		15:05	6	5.41	0.017	Faulty probe	7.80*	12.75
			7	5.40	0.017	Faulty probe	7.77*	12.71
			8	5.38	0.017	Faulty probe	7.75*	12.68
			9	5.40	0.018	Faulty probe	7.74*	12.67
			10	5.41	0.017	Faulty probe	7.75*	12.51
			12.3	Bottom		Faulty probe		
July 25, 2002	BA-1	13:30	0	6.86	0.016	0.5	5.33	20.99
			1	6.78	0.016	0.6	5.49	18.24
			2	6.61	0.016	0.9	5.61	18.00
			3	6.56	0.016	0.9	5.62	17.25
			4	6.54	0.016	0.9	5.62	17.28
			5	6.54	0.015	0.9	5.74	15.70
			6	6.47	0.015	0.9	5.87	15.20
			7	6.49	0.014	0.7	5.89	15.02
			8	6.41	0.014	0.4	6.01	14.07
			8.5	Bottom				
BA-2	BA-2	14:00	0	6.93	0.016	0.8	5.55	21.14
			1	6.88	0.016	0.6	5.53	19.75
			2	6.81	0.016	0.7	5.55	18.86
			3	6.68	0.016	0.8	5.60	18.13
			4	6.68	0.016	0.9	5.62	18.01
			5	6.69	0.016	1.2	5.62	17.57
			6	6.62	0.016	0.9	5.70	16.84
			7	6.55	0.015	0.5	5.72	16.30
			8	6.55	0.015	0.6	5.77	16.31
			9	6.57	0.014	1.3	5.77	16.24
			10	6.57	0.015	0.9	5.72	16.00

Appendix G Table G-5
Balsam Forebay Profile Data, June - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			13	6.54	0.015	0.9	5.79	15.88
			16	6.52	0.015	0.8	5.81	15.81
			16.5	Bottom				
August 23, 2002	BA-1	10:00	0	6.95	0.017	0.5	7.44	18.17
			1	6.86	0.017	0.3	7.20	18.05
			2	6.83	0.017	0.5	7.11	17.89
			3	6.81	0.016	0.5	7.04	17.45
			4	6.84	0.016	0.5	7.02	17.27
			5	6.72	0.016	0.8	6.81	17.26
			6	6.77	0.016	0.7	7.02	17.28
			7	6.76	0.016	0.7	6.86	17.27
			8	6.78	0.016	0.9	6.96	17.28
			9	6.75	0.016	0.3	6.99	17.26
			10	6.68	0.016	0.4	7.04	17.23
			11	6.76	0.015	0.6	6.80	17.02
			12	6.76	0.015	0.4	7.03	16.98
			13	6.75	0.016	0.7	6.89	16.97
			14	6.70	0.016	2.1	6.93	16.94
		10:00	15	6.75	0.016	1.5	6.75	16.85
			15.9	Bottom				
	BA-2	09:30	0	7.04	0.017	0.7	6.95	18.09
			1	6.99	0.017	0.6	7.05	17.92
			2	6.88	0.017	0.9	7.15	17.86
			3	6.92	0.016	0.8	6.82	17.52
			4	6.85	0.017	0.7	6.98	17.46
			5	6.81	0.017	0.7	7.01	17.36
			6	6.79	0.016	1.0	7.07	17.38
			7	6.79	0.016	1.0	7.11	17.34
			8	6.80	0.016	0.7	6.83	17.36
			9	6.74	0.015	0.5	7.07	17.00
			9.8	Bottom				
September 26, 2002	BA-1	10:10	0	6.89	0.016	0.2	7.41	16.27
			1	6.87	0.015	0.5	7.37	16.27
			2	6.86	0.016	0.3	7.36	16.23
			3	6.82	0.016	1.0	7.26	16.22
			4	6.73	0.016	0.5	7.25	16.21
			5	6.79	0.015	0.6	7.22	16.18
			6	6.83	0.016	0.3	7.25	16.18

Appendix G Table G-5
Balsam Forebay Profile Data, June - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			7	6.84	0.015	0.2	7.23	16.18
			8	6.84	0.015	0.3	7.30	16.18
			9	6.83	0.015	0.6	7.30	16.18
			10	6.85	0.015	0.5	7.27	16.18
			13	6.89	0.015	0.6	7.31	16.18
			16	6.91	0.015	0.7	7.28	16.18
			17	Bottom				
	BA-2	9:40	0	6.98	0.015	0.8	7.49	16.17
			1	6.88	0.015	0.4	7.44	16.17
			2	6.78	0.015	0.5	7.45	16.17
			3	6.75	0.016	0.2	7.45	16.17
			4	6.75	0.016	0.7	7.40	16.16
			5	6.79	0.015	0.8	7.28	16.17
			6	6.78	0.015	0.2	7.20	16.17
			7	6.81	0.015	0.7	7.18	16.17
			8	6.82	0.015	0.4	7.12	16.17
			8.7	Bottom				

* Adjusted DO to Altitude YSI meter used - was not able to adjust pressure (mm Hg) in the field

Appendix G Table G-6
Bear Forebay Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
June 6, 2002	BE-2	09:30	0	6.21	0.008	NA	8.90*	7.47
			1	6.16	0.008	NA	9.53*	6.79
			2	6.10	0.008	NA	9.56*	6.80
			3	6.12	0.008	NA	9.59*	6.64
			4	6.05	0.008	NA	9.59*	6.59
			4.6	Bottom				
June 28, 2002		10:00	0	6.07	0.013	Faulty Probe	7.98*	12.47
			1	5.98	0.013	Faulty Probe	7.89*	12.1
			2	5.95	0.013	Faulty Probe	7.87*	11.99
			2.3	Bottom				
July 25, 2002	BE-2	9:30	0	6.61	0.014	0.0	5.73	14.51
			1	6.45	0.014	0.3	5.59	14.03
			2	6.38	0.014	0.4	5.59	13.99
			2.2	Bottom				
August 27, 2002	BE-2	10:45	0	6.79	0.020	0.0	6.00	14.73
			1	6.75	0.020	0.0	6.00	14.07
			2	6.68	0.020	0.4	5.98	13.27
			2.2	Bottom				
September 24, 2002	BE-2	13:11	0	6.54	0.028	0.7	7.26	15.25
			1	6.61	0.028	0.1	6.98	13.96
			1.9	Bottom				

NA: Not available

* Adjusted DO to Altitude YSI meter used - was not able to adjust pressure (mm Hg) in the field

Appendix G Table G-7
Mono Forebay Profile Data, June - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
June 6, 2002	MO-1	11:45	0	6.74	0.023	NA	7.25*	17.22
			1	6.73	0.024	NA	7.79*	13.41
			2	6.74	0.024	NA	8.19*	12.22
			2.2	Bottom				
June 28, 2002	MO-1	8:30	0	5.78	0.025	Faulty Probe	6.83*	15.75
			1	5.98	0.024	Faulty Probe	7.17*	14.25
			2	6.01	0.024	Faulty Probe	7.24*	13.09
			3	5.99	0.023	Faulty Probe	7.65*	10.18
			4	6.03	0.023	Faulty Probe	7.60*	9.75
July 25, 2002	MO-1	8:30	0	6.39	0.019	0.5	6.76	10.23
			1	6.49	0.019	0.6	6.45	10.21
			2	6.48	0.019	0.9	6.44	10.20
			3	6.48	0.019	0.6	6.34	10.22
			4	6.54	0.019	1.1	6.13	10.22
			4.3	Bottom				
August 26, 2002	MO-1	10:15	0	6.85	0.019	0.8	7.54	12.07
			1	6.81	0.019	0.8	7.58	12.04
			2	6.77	0.019	0.4	7.47	12.01
			3	6.73	0.019	0.5	7.39	12.02
			4	Bottom				
September 24, 2002	MO-1	14:10	0	6.73	0.019	0.2	7.26	16.12
			1	6.73	0.019	0.4	7.38	16.12
			1.9	Bottom				

NA: Not available

* Adjusted DO to Altitude YSI meter used - was not able to adjust pressure (mm Hg) in the field

Appendix G Table G-8
Dam 4 Profile Data, May – September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
May 20, 2002	BC-4	10:00	0	7.06	0.022	1.3	7.09	6.44
			1	6.92	0.021	1.1	6.99	6.36
			2	6.88	0.022	0.9	6.97	6.37
			3	6.79	0.022	0.7	7.04	6.35
			4	6.73	0.021	1.1	7.04	6.37
			5	6.74	0.021	1.2	6.99	6.35
			6	6.74	0.021	1.0	6.96	6.35
			7	6.71	0.022	1.1	7.07	6.36
			8	6.75	0.021	0.9	7.03	6.36
			9	6.72	0.021	1.2	6.99	6.36
			10	6.61	0.021	1.1	6.96	6.37
			11	6.66	0.021	0.9	7.07	6.33
			12	6.70	0.021	1.4	7.08	6.35
			13	6.68	0.021	0.9	7.04	6.34
			14	6.66	0.021	1.0	7.06	6.34
			15	6.65	0.022	1.2	7.08	6.35
			16	6.69	0.021	0.8	7.05	6.34
			17	6.65	0.022	1.0	6.94	6.35
			18	6.65	0.021	1.2	6.92	6.35
			19	6.64	0.022	1.1	6.86	6.35
			20	6.63	0.021	103.0	6.90	6.36
June 27, 2002	BC-4	07:45	0	5.39	0.018	Bad sensor	8.83*	10.23
			1	5.47	0.017	Bad sensor	8.80*	10.22
			2	5.44	0.018	Bad sensor	8.81*	10.22
			3	5.46	0.018	Bad sensor	8.74*	10.23
			4	5.44	0.018	Bad sensor	8.71*	10.23
			5	5.46	0.017	Bad sensor	8.67*	10.22
			6	5.43	0.018	Bad sensor	8.69*	10.22
			7	5.47	0.018	Bad sensor	8.69*	10.23
			8	5.44	0.018	Bad sensor	8.69*	10.23
			9	5.43	0.018	Bad sensor	8.67*	10.23
			10	5.44	0.018	Bad sensor	8.66*	10.24
			11	5.43	0.018	Bad sensor	8.64*	10.23
			13	5.43	0.017	Bad sensor	8.69*	10.07
			16	5.46	0.017	Bad sensor	8.70*	10.07
			19	5.45	0.017	Bad sensor	8.66*	10.05
			20.03	Bottom		Bad sensor		
July 23, 2002	BC-4	17:00	0	6.38	0.014	0.2	6.98	11.56
			1	6.20	0.014	0.2	6.70	11.52
			2	6.26	0.014	0.2	6.76	11.53
			3	6.19	0.014	0.1	6.76	11.55
			4	6.21	0.014	0.2	6.72	11.54
			5	6.18	0.014	0.4	6.71	11.52

Appendix G Table G-8
Dam 4 Profile Data, May – September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (°C)
			6	6.12	0.014	0.2	6.69	11.52
			7	6.13	0.014	0.2	6.71	11.53
			8	6.14	0.014	0.2	6.67	11.53
			9	6.10	0.014	0.1	6.66	11.54
			10	6.16	0.013	0.2	6.67	11.52
			13	6.17	0.014	0.1	6.62	11.52
			16	6.14	0.014	0.3	6.76	11.52
			19	6.15	0.014	0.5	6.68	11.51
			20	Bottom				
August 26, 2002	BC-4	14:20	0	6.55	0.014	0.3	7.64	14.07
			1	6.51	0.015	0.3	7.46	13.99
			2	6.47	0.014	0.3	7.42	13.99
			3	6.46	0.015	0.3	7.43	13.99
			4	6.46	0.015	0.2	7.42	13.99
			5	6.49	0.015	0.4	7.28	13.98
			6	6.42	0.015	0.7	7.27	13.98
			7	6.42	0.015	0.1	7.45	13.98
			8	6.46	0.015	0.6	7.38	13.98
			9	6.40	0.015	0.1	7.41	13.98
			10	6.38	0.015	0.6	7.23	13.98
			13	6.40	0.015	0.3	7.49	13.98
			16	6.40	0.015	0.3	7.39	13.97
			19	6.34	0.014	0.6	7.31	13.97
			20	Bottom				
September 23, 2002	BC-4	15:45	0	6.94	0.016	0.7	7.81	16.00
			1	6.80	0.016	0.5	7.94	15.71
			2	6.80	0.016	0.1	8.19	15.66
			3	6.85	0.016	0.4	8.15	15.66
			4	6.90	0.016	0.3	8.18	15.66
			5	6.92	0.016	0.3	8.17	15.66
			6	6.94	0.016	0.3	8.22	15.67
			7	6.93	0.016	0.5	8.29	15.65
			8	6.92	0.016	0.7	8.04	15.67
			9	6.94	0.016	0.5	8.00	15.65
			10	6.95	0.015	0.1	8.22	15.65
			13	6.97	0.015	0.7	7.93	15.66
			16	6.93	0.016	0.8	7.94	15.64
			19	6.94	0.016	0.7	7.71	15.64
			19.7	Bottom				

* Adjusted DO to Altitude YSI meter used - was not able to adjust pressure (mm Hg) in the field

Appendix G Table G-9
Dam 5 Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
May 21, 2002	BC-8	08:04	0	7.16	0.022	1.3	10.16	6.88
			1	7.11	0.022	1.5	10.39	6.91
			2	7.03	0.022	1.3	10.37	6.92
			3	6.97	0.022	1.4	10.34	6.91
			4	6.95	0.021	1.3	10.32	6.91
			5	6.96	0.022	1.3	9.66	6.89
			6	6.95	0.022	1.4	10.07	6.88
			7	6.87	0.022	1.2	9.75	6.89
			8	6.83	0.022	1.4	10.03	6.91
			9	6.84	0.022	1.5	10.13	6.90
			10	6.85	0.022	0.9	10.09	6.88
			13	6.86	0.021	1.2	9.97	6.83
June 27, 2002		09:25	0	5.84	0.022	Bad sensor	9.95*	11.77
			1	5.74	0.021	Bad sensor	9.91*	11.18
			2	5.74	0.020	Bad sensor	9.87*	11.17
			3	5.72	0.020	Bad sensor	9.86*	11.15
			4	5.67	0.020	Bad sensor	9.88*	11.14
			5	5.61	0.020	Bad sensor	9.99*	11.08
			6	5.55	0.020	Bad sensor	9.89*	11.04
			7	5.50	0.020	Bad sensor	9.89*	11.02
			8	5.50	0.020	Bad sensor	9.95*	11.02
			9	5.50	0.020	Bad sensor	9.82*	11.02
			10	5.51	0.020	Bad sensor	9.80*	10.98
			13	5.46	0.022	Bad sensor	8.63*	10.74
July 23, 2002	07/23/ 02	18:10	0	6.45	0.017	0.4	7.28	12.42
			1	6.39	0.017	0.1	6.93	12.36
			2	6.36	0.017	0.3	7.00	12.36
			3	6.30	0.017	0.2	7.05	12.36
			4	6.33	0.017	0.2	7.06	12.34
			5	6.30	0.018	0.2	7.04	12.34
			6	6.30	0.017	0.4	7.08	12.34
			7	6.29	0.017	0.4	7.09	12.34
			8	6.24	0.017	0.5	7.11	12.35
			9	6.34	0.017	0.9	7.07	12.37
			10	6.25	0.017	0.6	7.09	12.35
			13	6.28	0.017	0.3	7.04	12.33
			13.5	Bottom				
August 27, 2002	08/27/ 02	15:00	0	6.79	0.017	0.6	7.15	15.60
			1	6.56	0.017	0.2	7.34	15.59
			2	6.55	0.017	0.4	7.27	15.56
			3	6.51	0.017	0.4	7.16	15.56

Appendix G Table G-9
Dam 5 Profile Data, May - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^{o}C)
			4	6.54	0.017	0.4	7.18	15.56
			5	6.51	0.017	0.3	7.18	15.55
			6	6.50	0.017	0.7	7.17	15.55
			7	6.52	0.017	0.6	7.20	15.55
			8	6.48	0.017	0.3	7.22	15.55
			9	6.52	0.017	0.2	7.17	15.55
			10	6.53	0.017	0.4	7.05	15.54
			13	6.47	0.017	0.5	7.30	15.53
			13.3	Bottom				
September 23, 2002	09/23/02	2:40	0	6.67	0.017	1.1	8.52	17.41
			1	6.62	0.017	1.1	8.49	17.32
			2	6.65	0.017	1.1	8.46	17.33
			3	6.73	0.017	1.4	8.46	17.31
			4	6.79	0.017	1.0	8.48	17.33
			5	6.86	0.017	1.2	8.48	17.32
			6	6.90	0.017	1.1	8.48	17.31
			7	6.90	0.017	0.9	8.48	17.29
			8	6.88	0.018	1.0	8.44	17.30
			9	6.89	0.017	1.2	8.50	17.30
			10	6.91	0.017	1.4	8.48	17.30
			13	Bottom				

* Adjusted DO to Altitude YSI meter used - was not able to adjust pressure (mm Hg) in the field

Appendix G Table G-10
Dam 6 Profile Data, May - September 2002

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
May 21, 2002	SJ-8	11:30	0	6.95	0.022	1.7	10.35	8.72
			1	6.86	0.022	1.3	10.37	8.49
			2	6.84	0.022	1.3	10.23	8.46
			3	6.79	0.022	1.4	10.16	8.43
			4	6.81	0.022	1.2	10.22	8.43
			5	6.78	0.022	1.4	10.09	8.42
			6	6.78	0.022	1.6	10.17	8.42
			7	6.70	0.022	1.4	10.11	8.42
			8	6.72	0.022	1.1	10.15	8.41
			9	6.74	0.022	1.4	10.14	8.41
			10	6.72	0.022	1.5	10.14	8.41
			13	6.68	0.022	13 @	10.22	8.40
			16	6.70	0.022	16 @	10.13	8.35
			19	6.71	0.022	17 @	10.06	8.34
			20.3	Bottom				
June 27, 2002	SJ-8	10:40	0	5.47	0.021	Bad sensor	10.19	13.19
			1	5.46	0.021	Bad sensor	9.94	13.19
			2	5.45	0.021	Bad sensor	9.83	13.21
			3	5.47	0.021	Bad sensor	9.77	13.19
			4	5.48	0.021	Bad sensor	9.72	13.19
			5	5.44	0.021	Bad sensor	9.67	13.08
			6	5.48	0.021	Bad sensor	9.70	13.02
			7	5.47	0.021	Bad sensor	9.69	12.94
			8	5.46	0.020	Bad sensor	9.66	12.97
			9	5.52	0.020	Bad sensor	9.83	12.34
			10	5.48	0.020	Bad sensor	9.84	12.16
			13	5.47	0.020	Bad sensor	9.86	12.14
			16	5.49	0.020	Bad sensor	9.83	12.09
			19	5.67	0.020	Bad sensor	10.06	12.04
			20.9	Bottom		Bad sensor		
July 25, 2002	SJ-8	16:15	0	6.46	0.021	0.2	6.22	15.00
			1	6.42	0.020	0.2	6.33	14.76
			2	6.35	0.021	0.4	6.36	14.71
			3	6.43	0.020	0.5	6.33	14.65
			4	6.37	0.020	0.4	6.31	14.42
			5	6.39	0.020	0.5	6.37	14.27
			6	6.30	0.020	0.3	6.41	14.17
			7	6.32	0.019	0.4	6.46	14.15
			8	6.32	0.020	0.4	6.45	14.11
			9	6.38	0.019	0.6	6.58	13.83
			10	6.37	0.019	1.0	6.50	13.66
			13	6.31	0.019	12.3	6.55	13.58
			16	6.30	0.019	10.0	6.69	13.54

Appendix G Table G-10
Dam 6 Profile Data, May - September 2002 (continued)

Date	Id#	Time	Depth (m)	pH	Conductivity (ms/cm)	Turbidity (NTU)	DO (mg/L)	Temperature (^oC)
			19	6.31	0.020	22.0	6.73	13.52
			20.4	Bottom				
August 28, 2002	SJ-8	10:00	0	6.55	0.030	0.7	5.75	17.95
			1	6.53	0.030	0.3	6.06	17.94
			2	6.49	0.030	0.2	5.99	17.93
			3	6.53	0.030	0.4	5.94	17.90
			4	6.47	0.030	0.4	6.03	17.93
			5	6.47	0.030	0.6	5.99	17.72
			6	6.45	0.029	0.7	6.02	17.63
			7	6.50	0.025	0.6	6.74	17.00
			8	6.54	0.024	0.5	6.72	16.93
			9	6.47	0.023	5.6	6.96	16.79
			10	6.58	0.022	7.1	6.96	16.64
			13	6.53	0.021	11.8	7.10	16.52
			16	6.49	0.021	24.0	6.96	16.46
			19	6.47	0.021	47.4	7.05	16.42
			19.2	Bottom				
September 23, 2002	SJ-8	13:35	0	7.05	0.051	0.7	6.86	19.79
			1	6.96	0.050	0.7	6.72	19.76
			2	6.95	0.046	0.8	6.85	19.38
			3	6.94	0.040	0.8	7.13	19.00
			4	6.95	0.038	0.8	7.29	18.90
			5	6.98	0.034	0.7	7.42	18.52
			6	6.99	0.034	1.2	7.47	18.50
			7	6.99	0.034	0.9	7.48	18.51
			8	6.99	0.034	1.3	7.45	18.50
			9	7.06	0.034	1.2	7.44	18.53
			10	6.98	0.034	1.4	7.46	18.50
			13	7.00	0.033	10.6	7.50	18.48
			16	7.06	0.033	5.0	7.55	18.39
			19	7.07	0.032	10.0	7.60	18.15
			20.7	Bottom				

* Adjusted DO to Altitude YSI meter used - was not able to adjust pressure (mm Hg) in the field

APPENDIX H

Summary Figures of In-situ Reservoir/Forebay Profile Measurements (by month)

Figure H-1. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-1, May 23, 2002

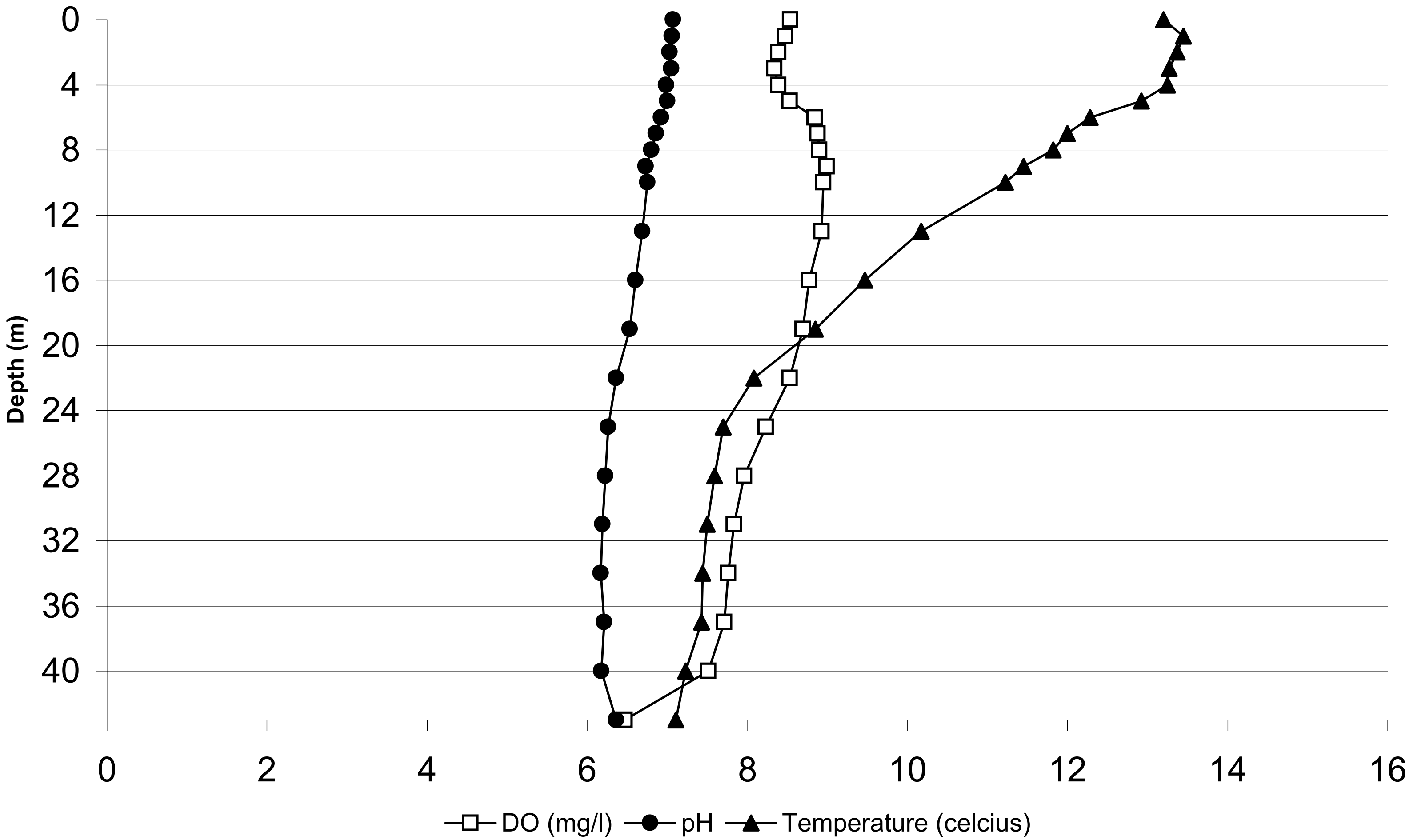


Figure H-2. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-2, May 23, 2002

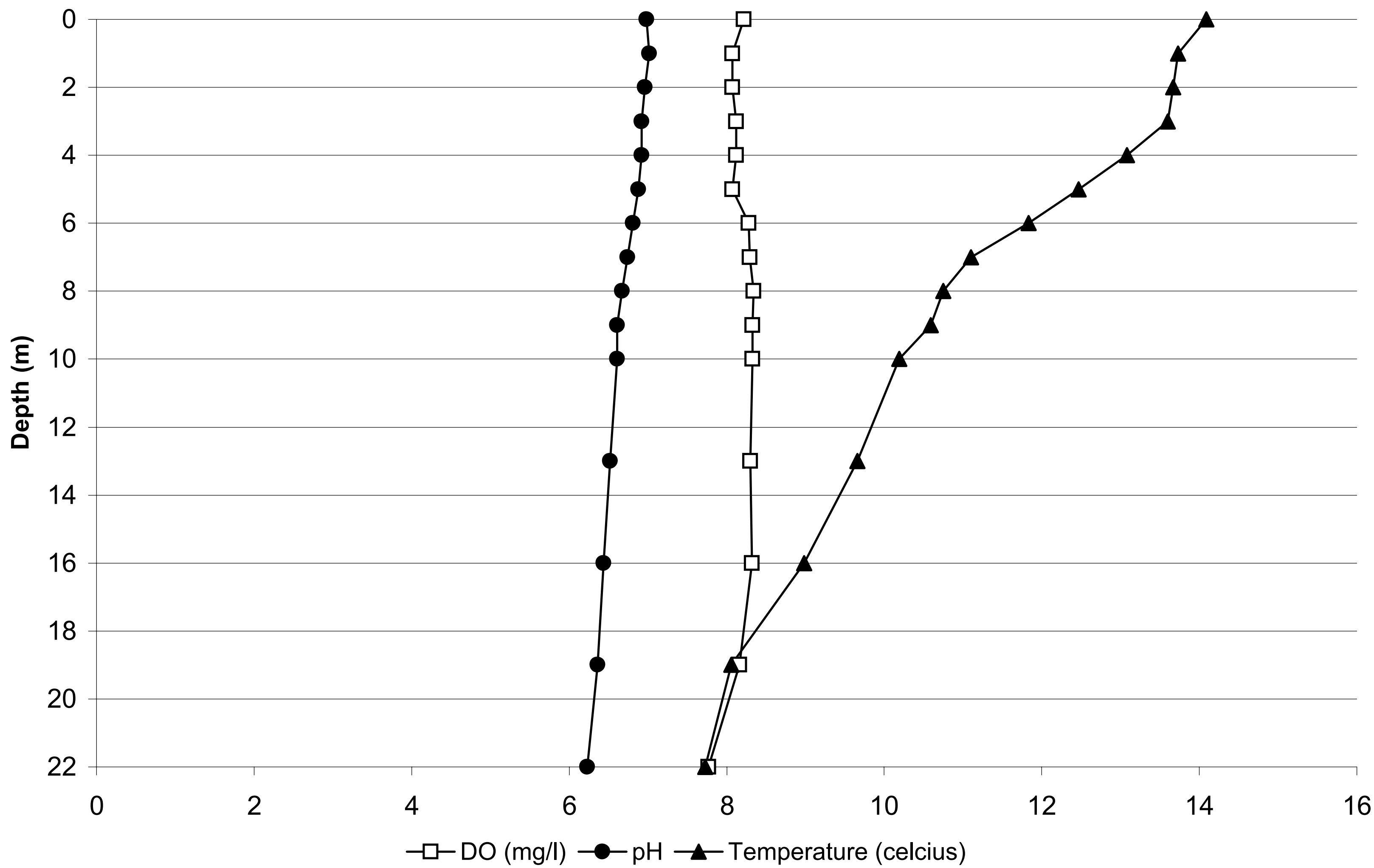


Figure H-3. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-3, May 23, 2002

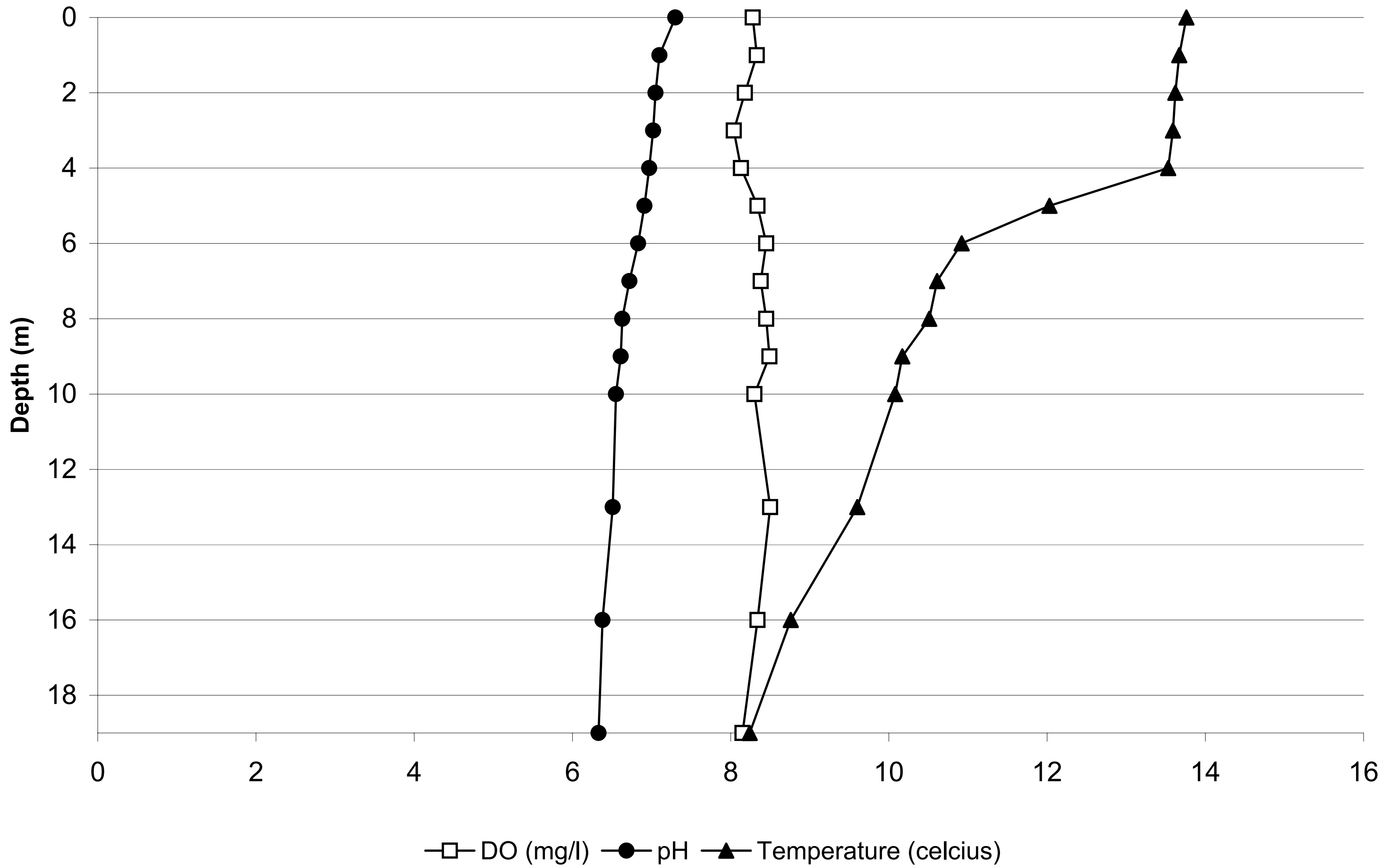


Figure H-4. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-1, June 24, 2002

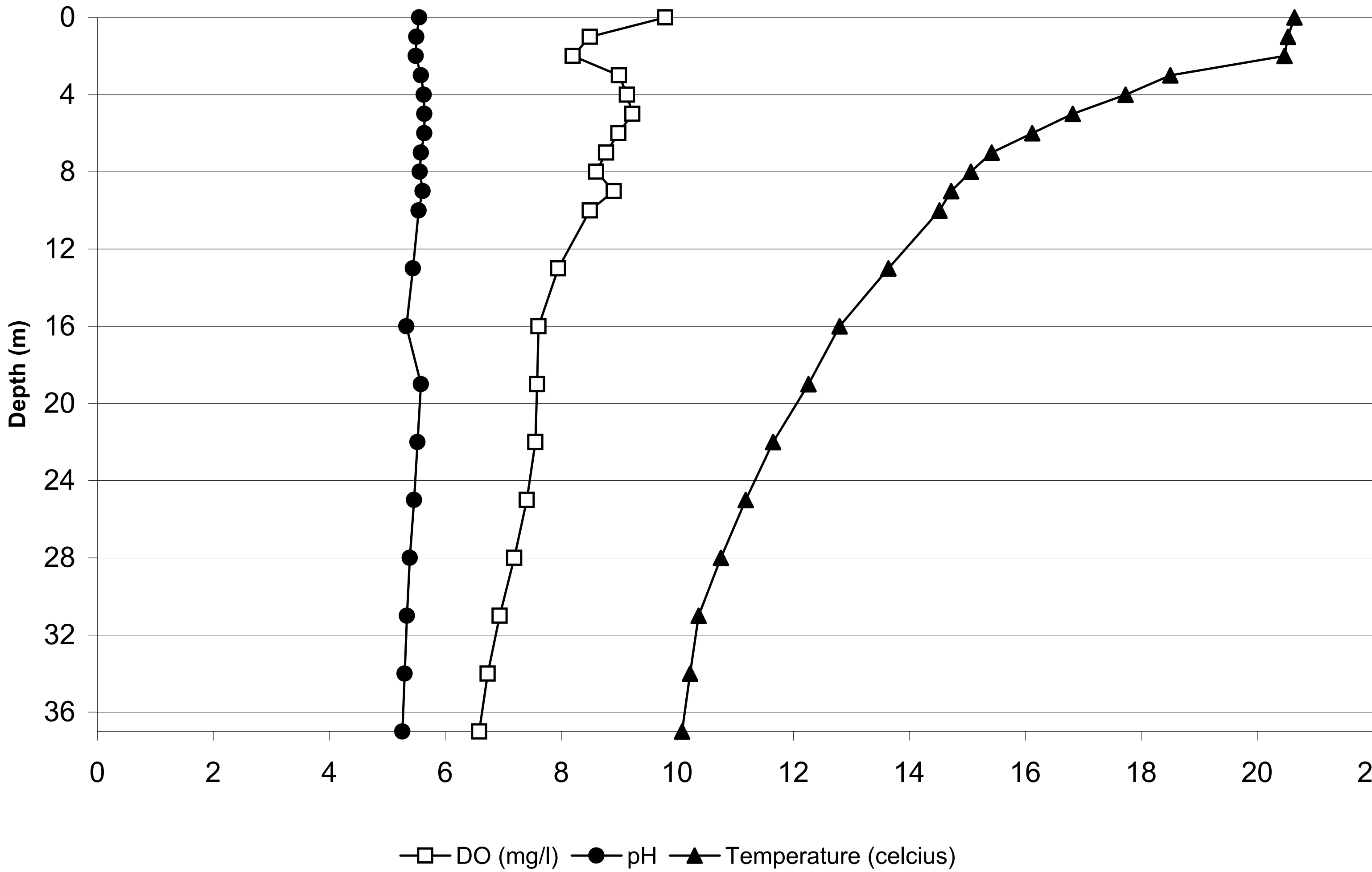


Figure H-5. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-2, June 24, 2002

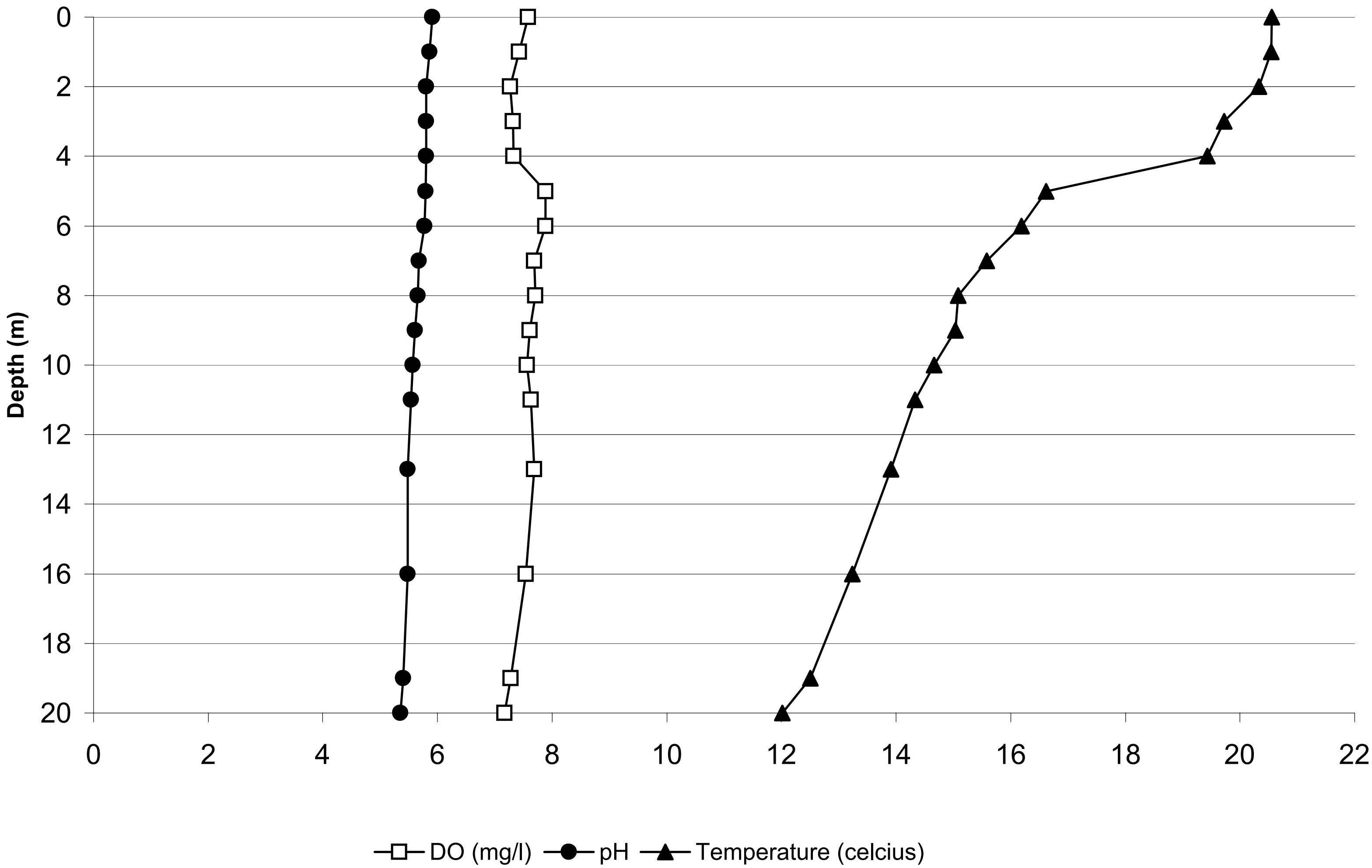


Figure H-6. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-3, June 24, 2002

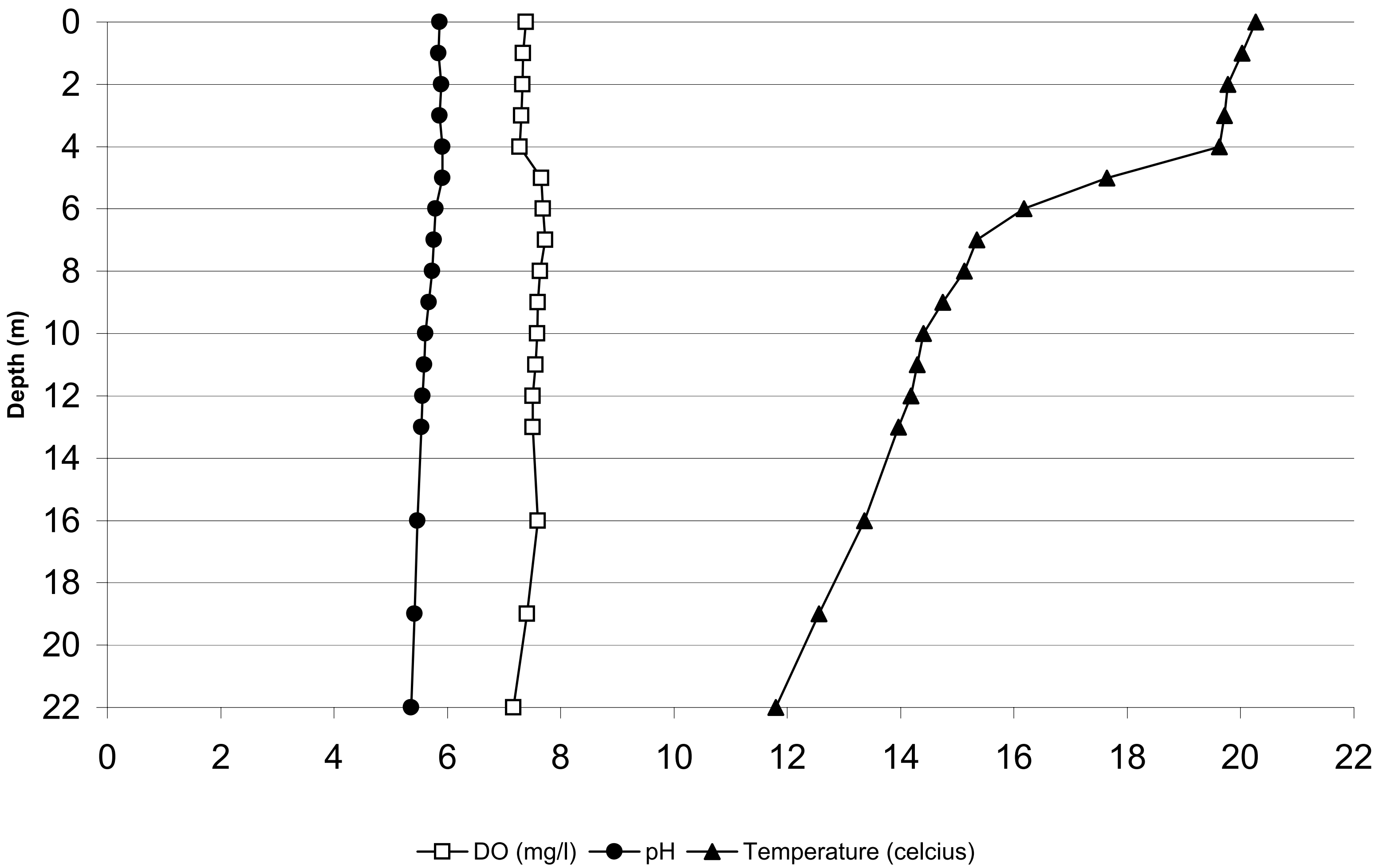


Figure H-7. Shaver Lake temperature, Dissolved Oxygen, pH Profiles, Station SL-1, July 26, 2002

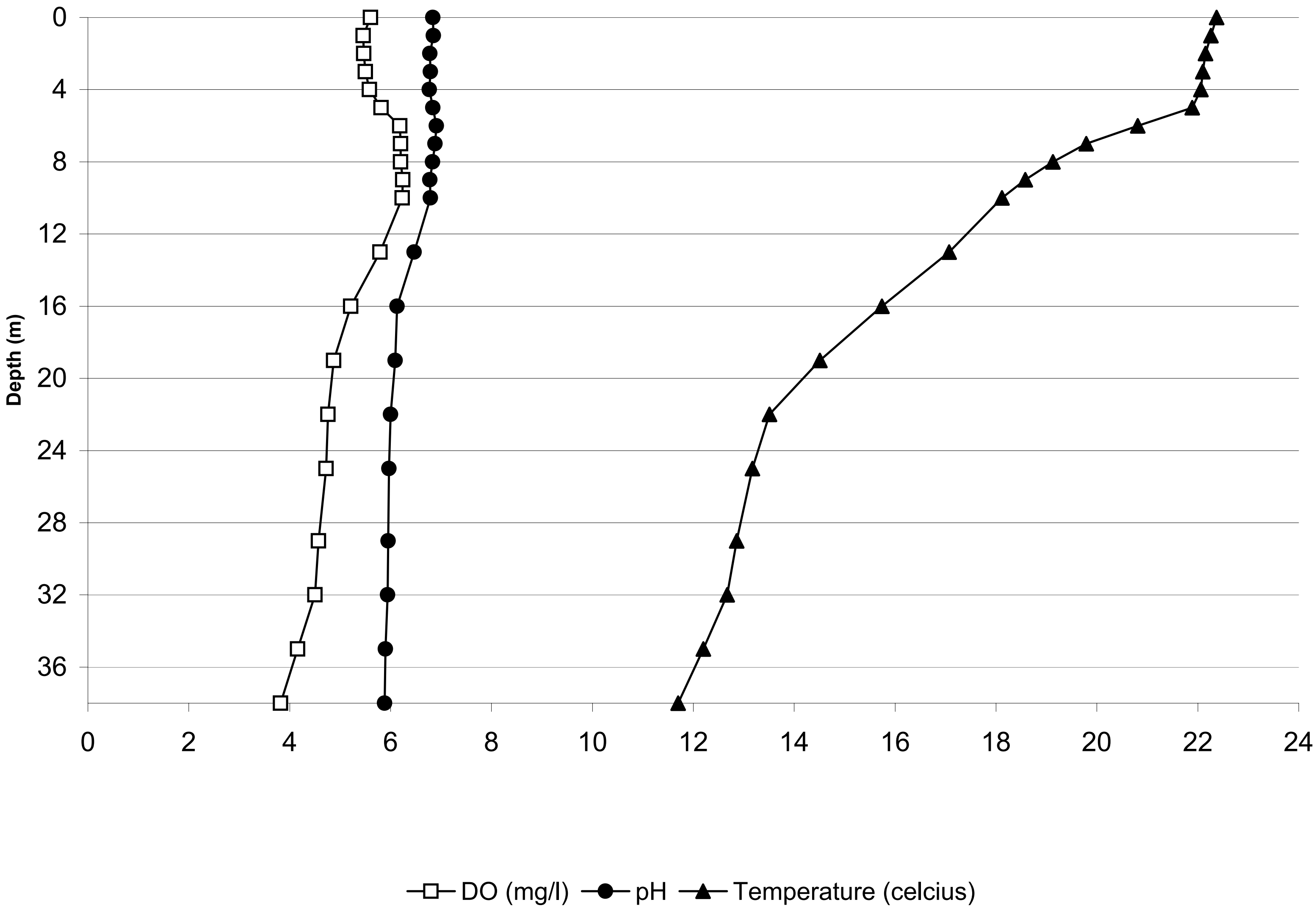


Figure H-8. Shaver LakeTemperature, Dissolved Oxygen, and pH Profiles, Station SL-2, July 26, 2002

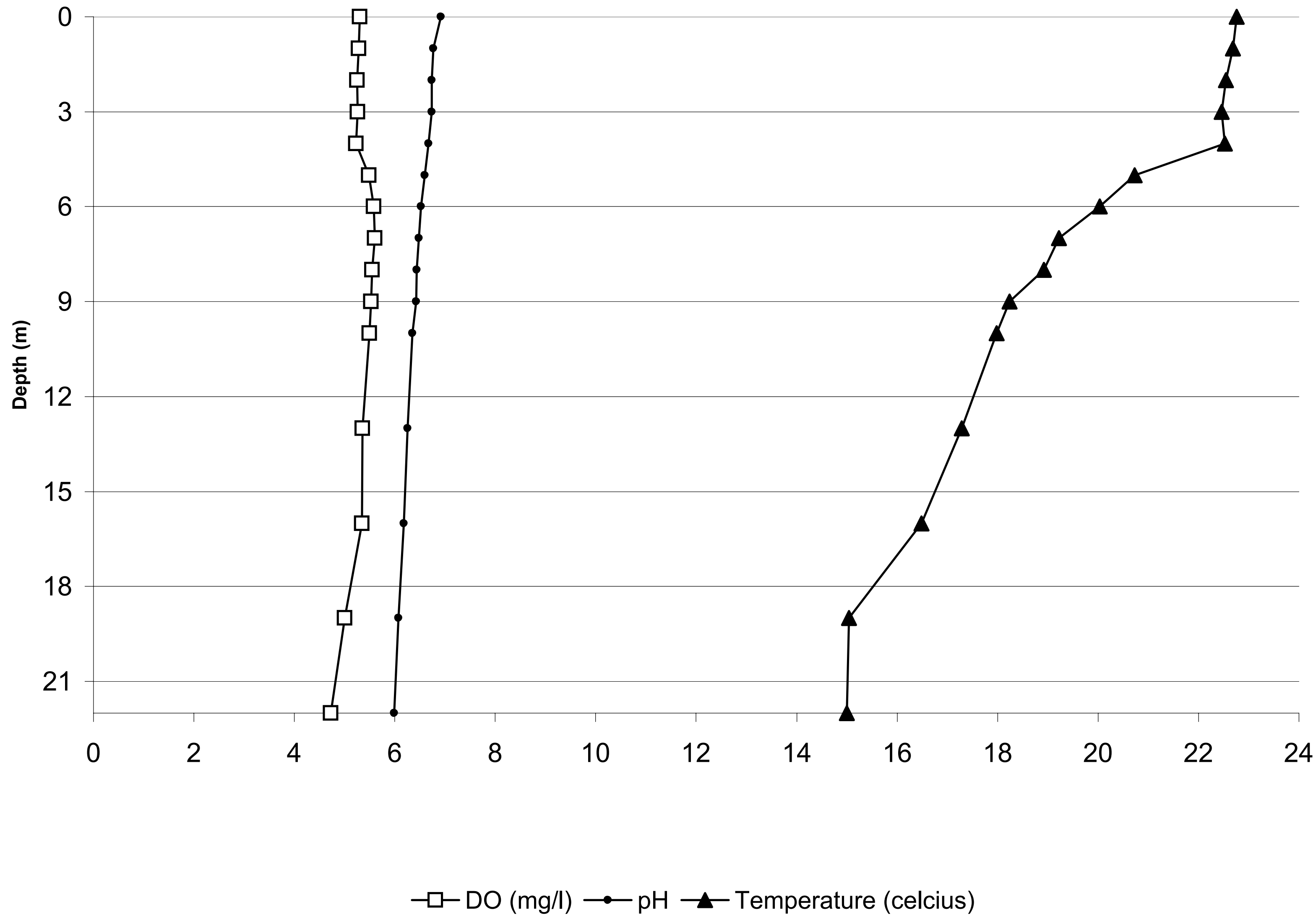


Figure H-9. Shaver LakeTemperature, Dissolved Oxygen, pH Profiles, Station SL-3, July 26, 2002

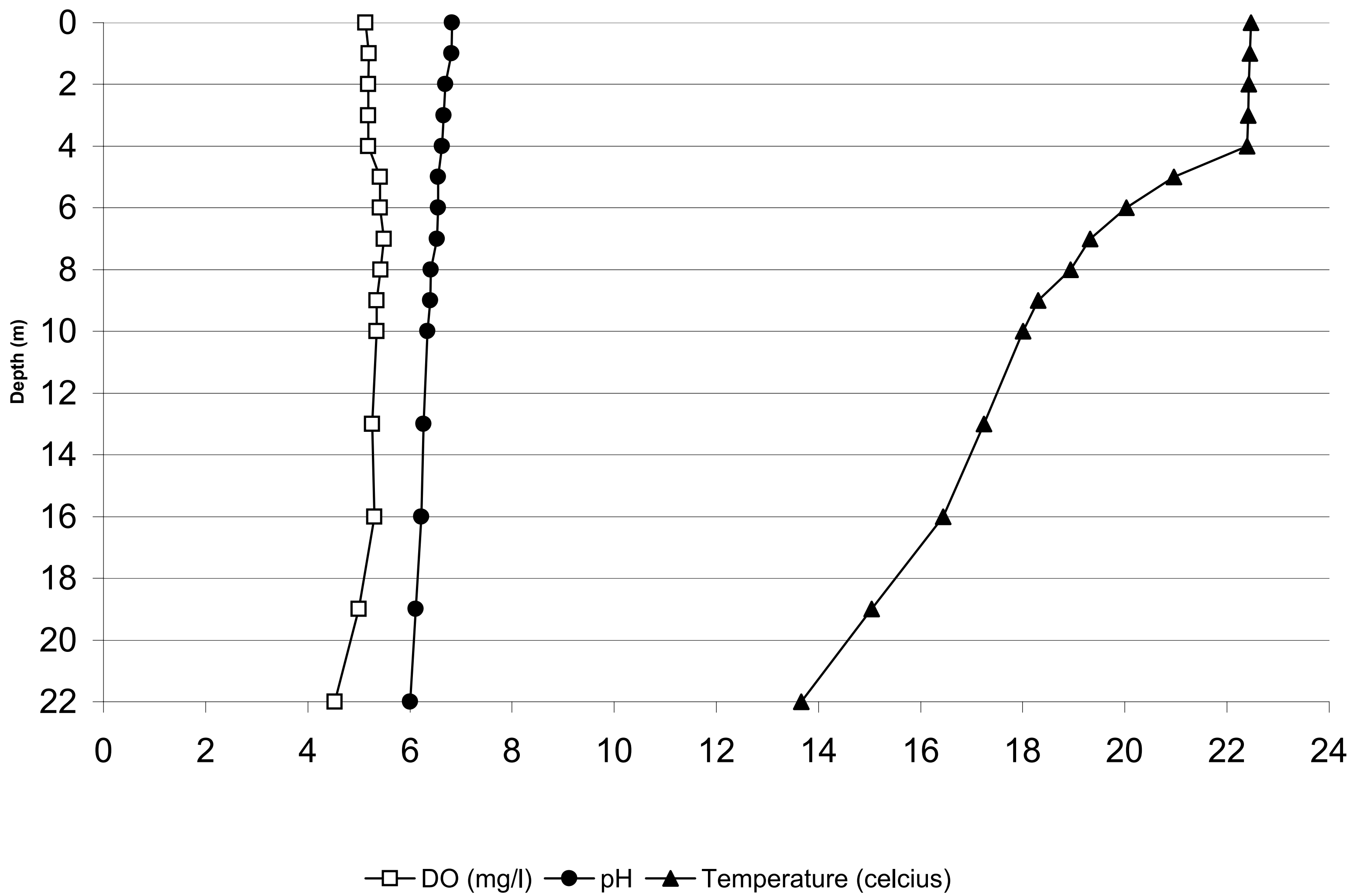


Figure H-10. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-1, August 22, 2002

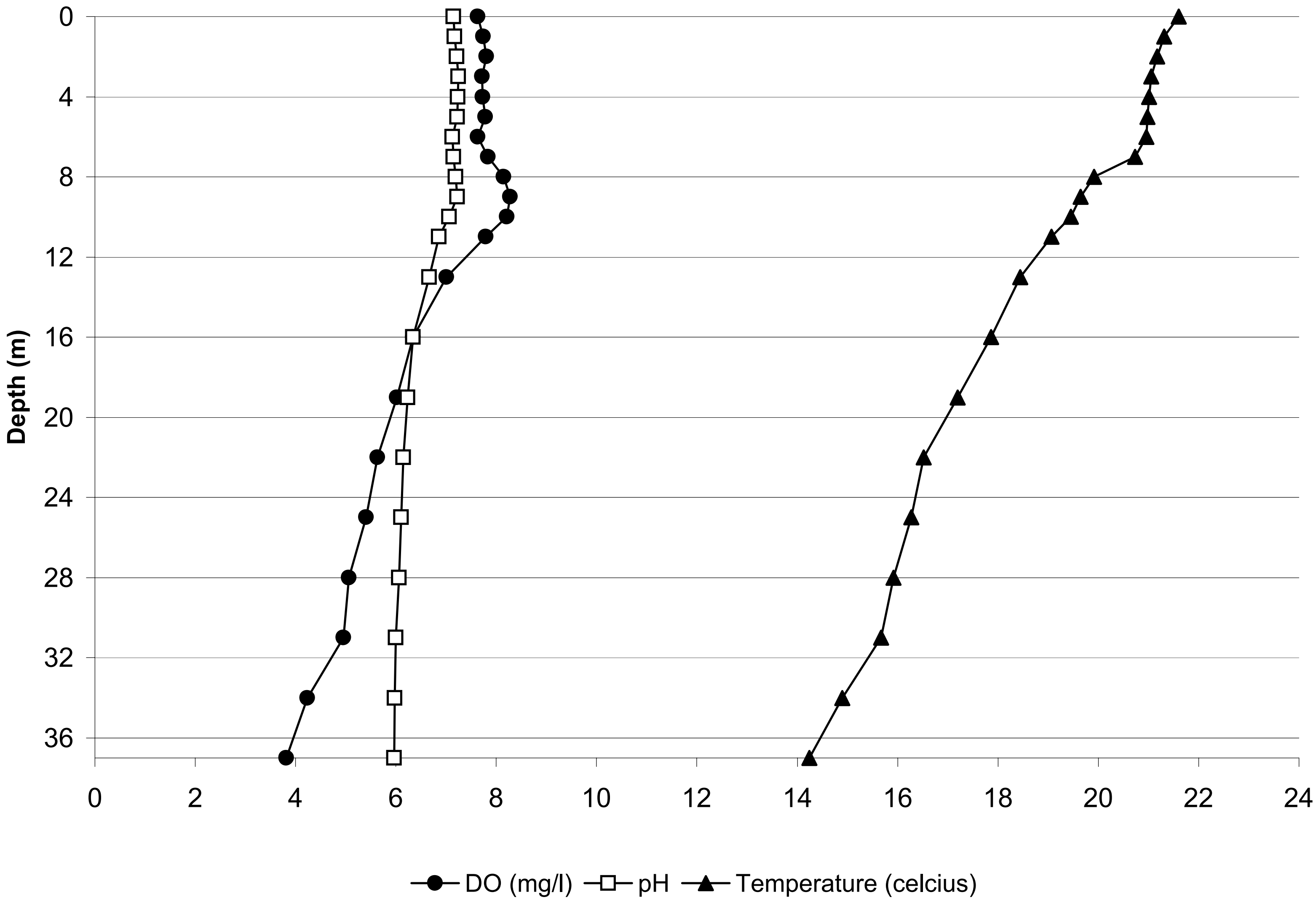


Figure H-11. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-2, August 22, 2002

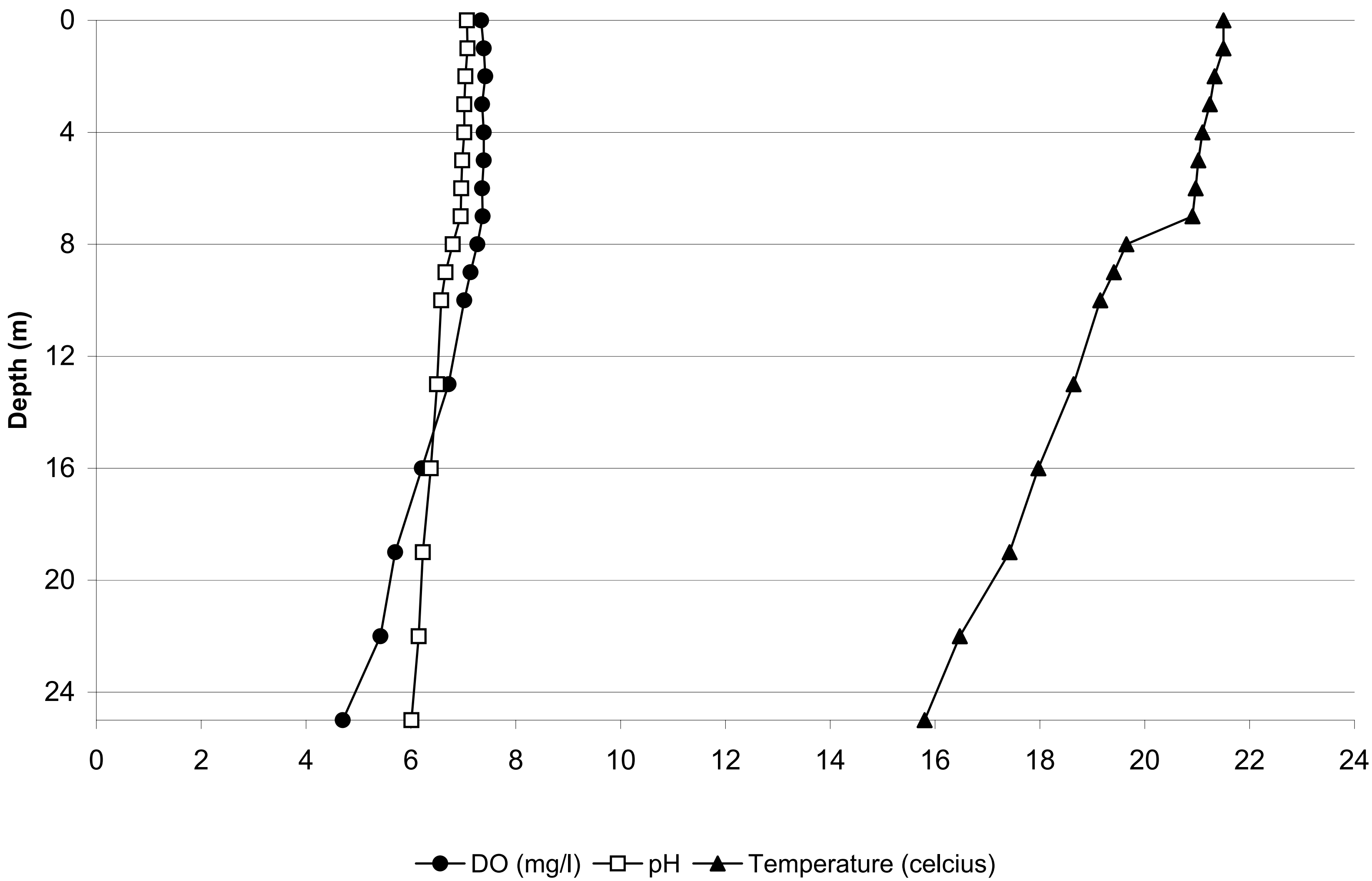


Figure H-12. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-3, August 22, 2002

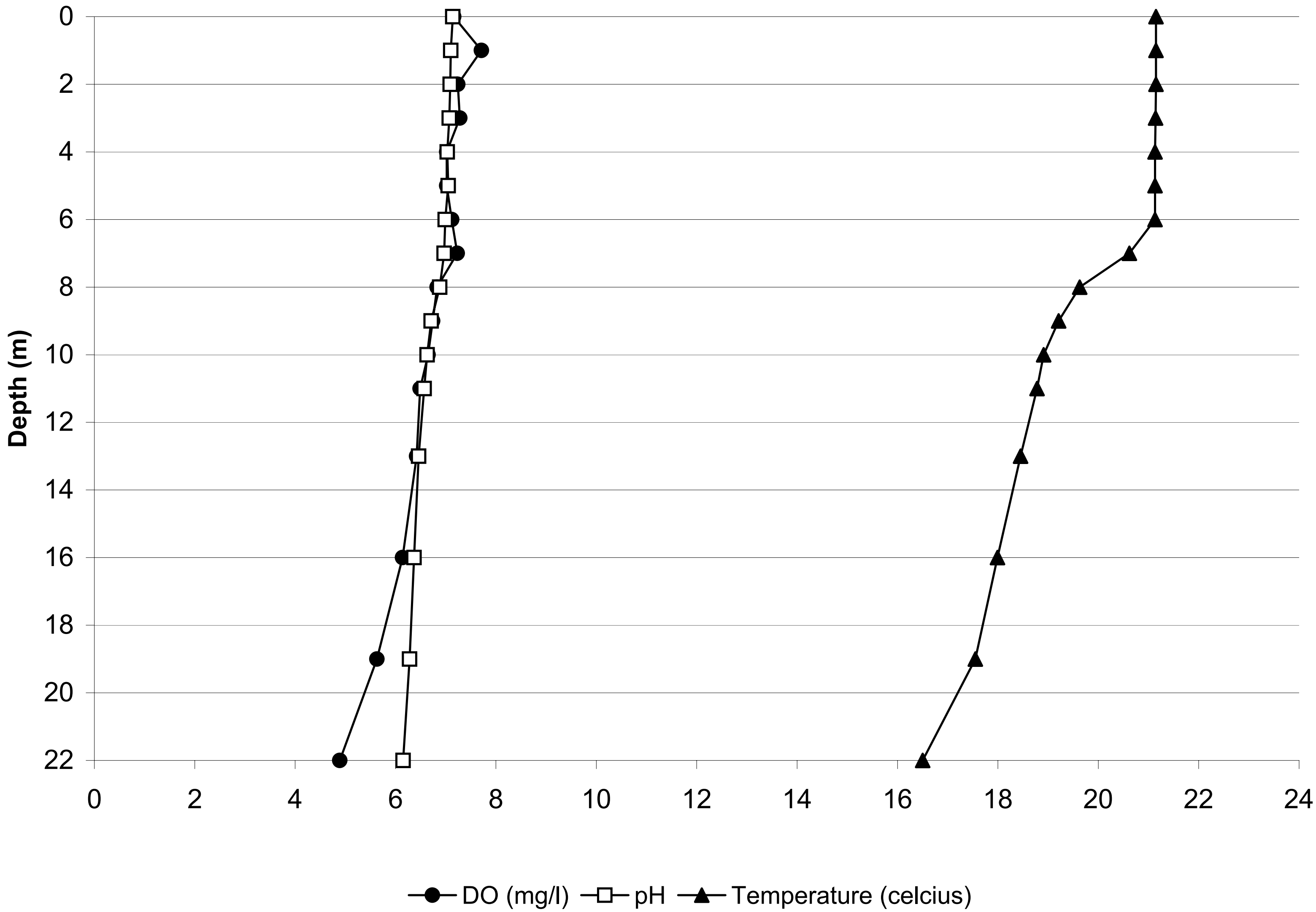


Figure H-13. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-1, September 26, 2002

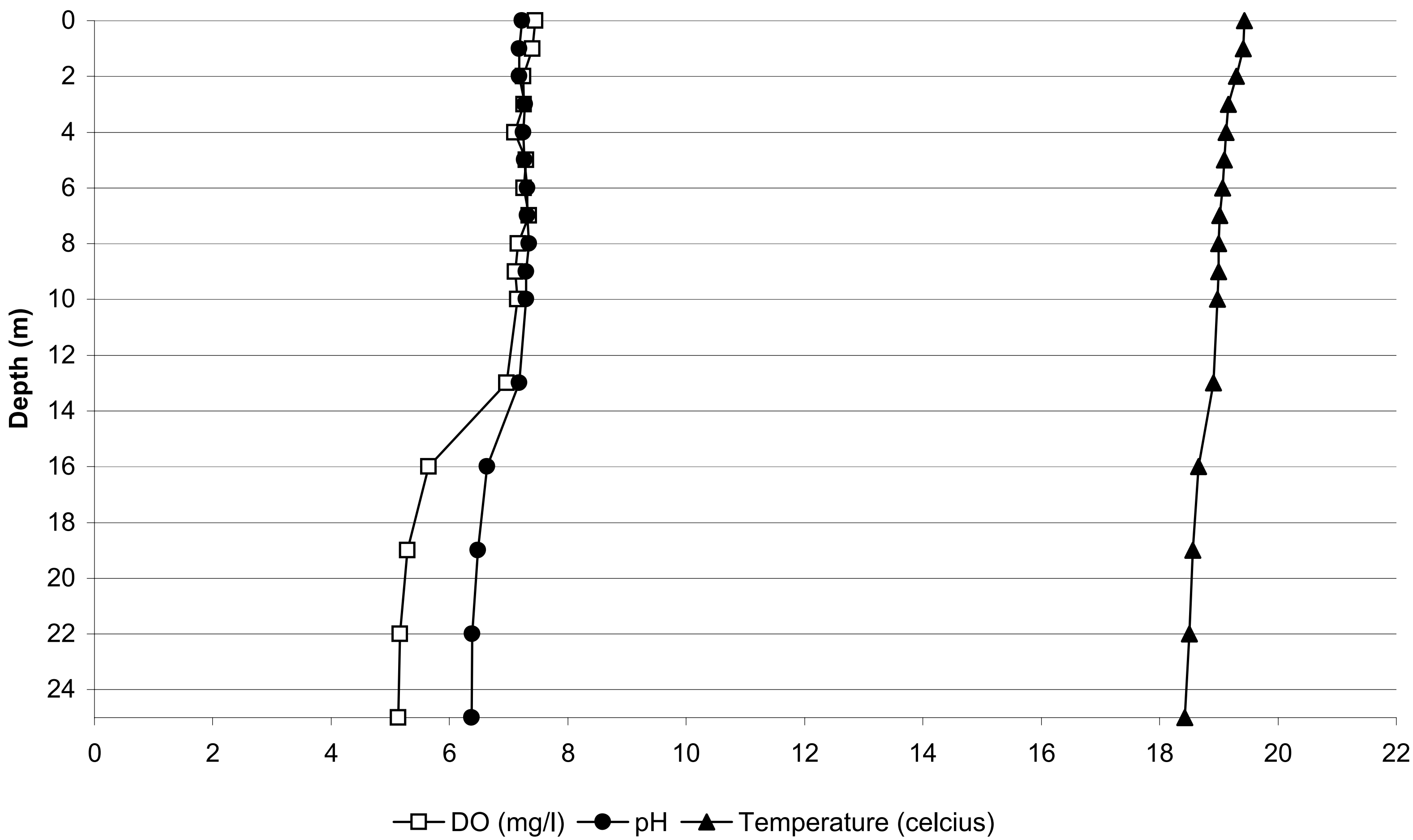


Figure H-14. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-2, September 26, 2002

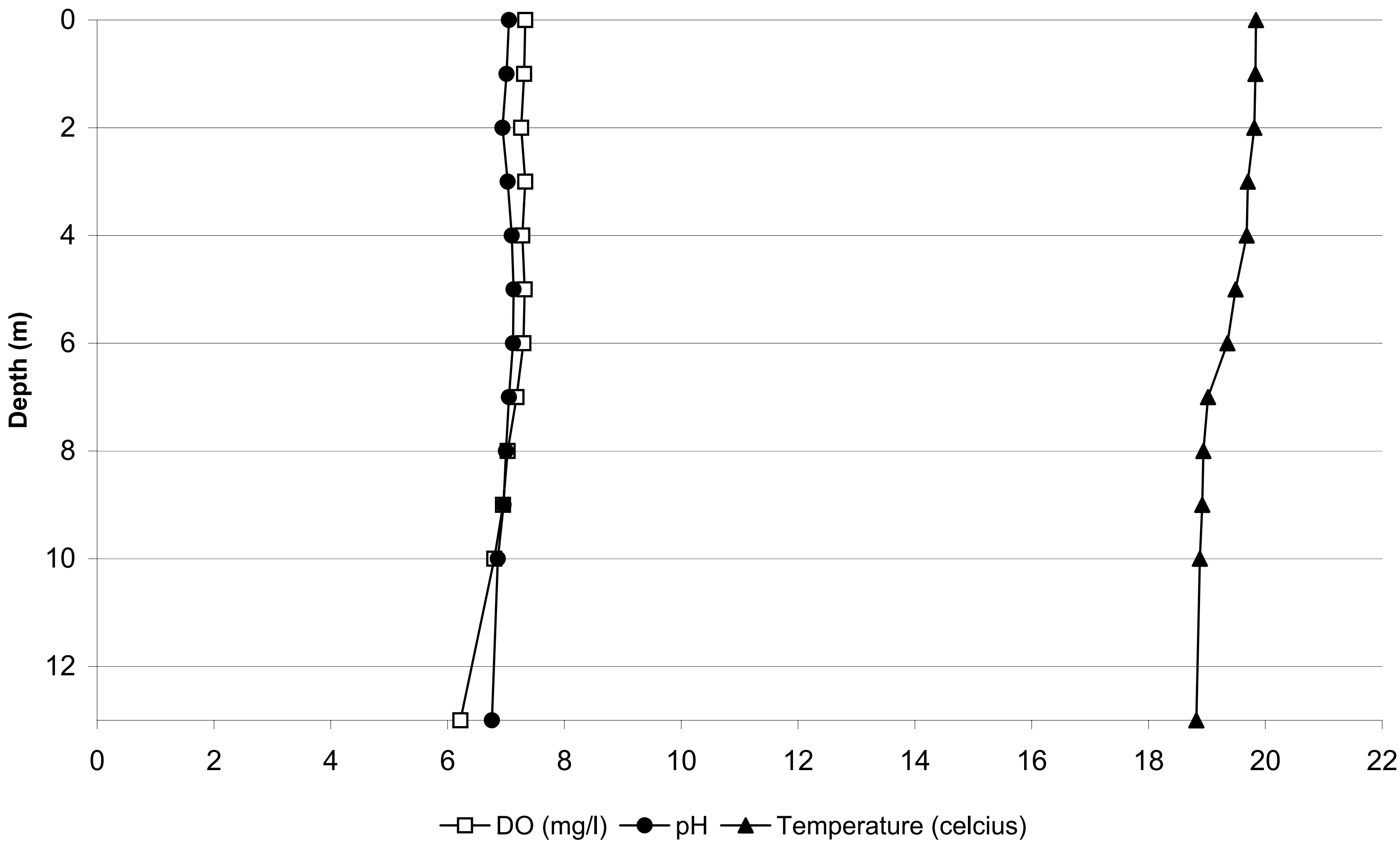


Figure H-15. Shaver Lake Temperature, Dissolved Oxygen, and pH Profiles, Station SL-3, September 26, 2002

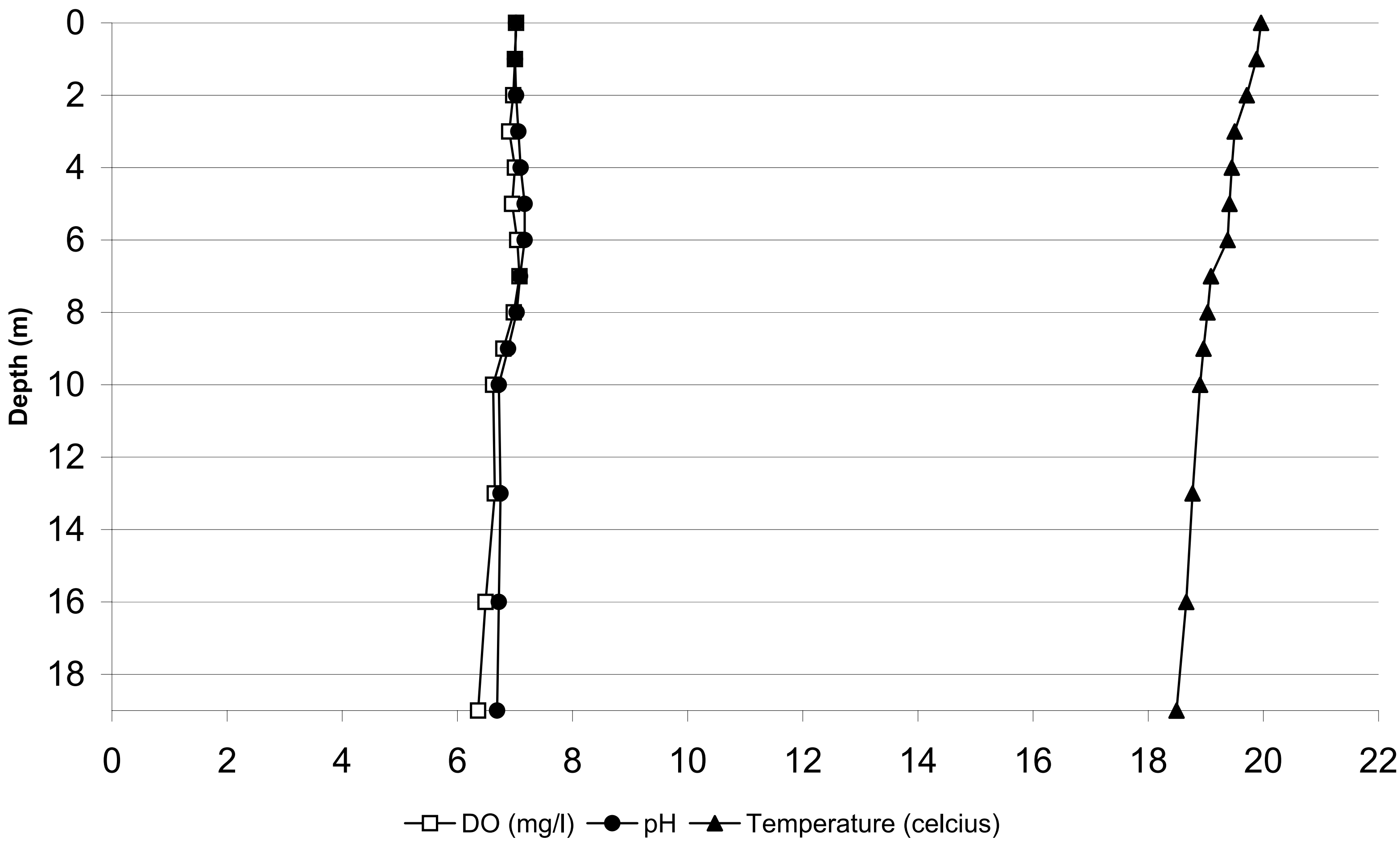


Figure H-16. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-1, May 28, 2002

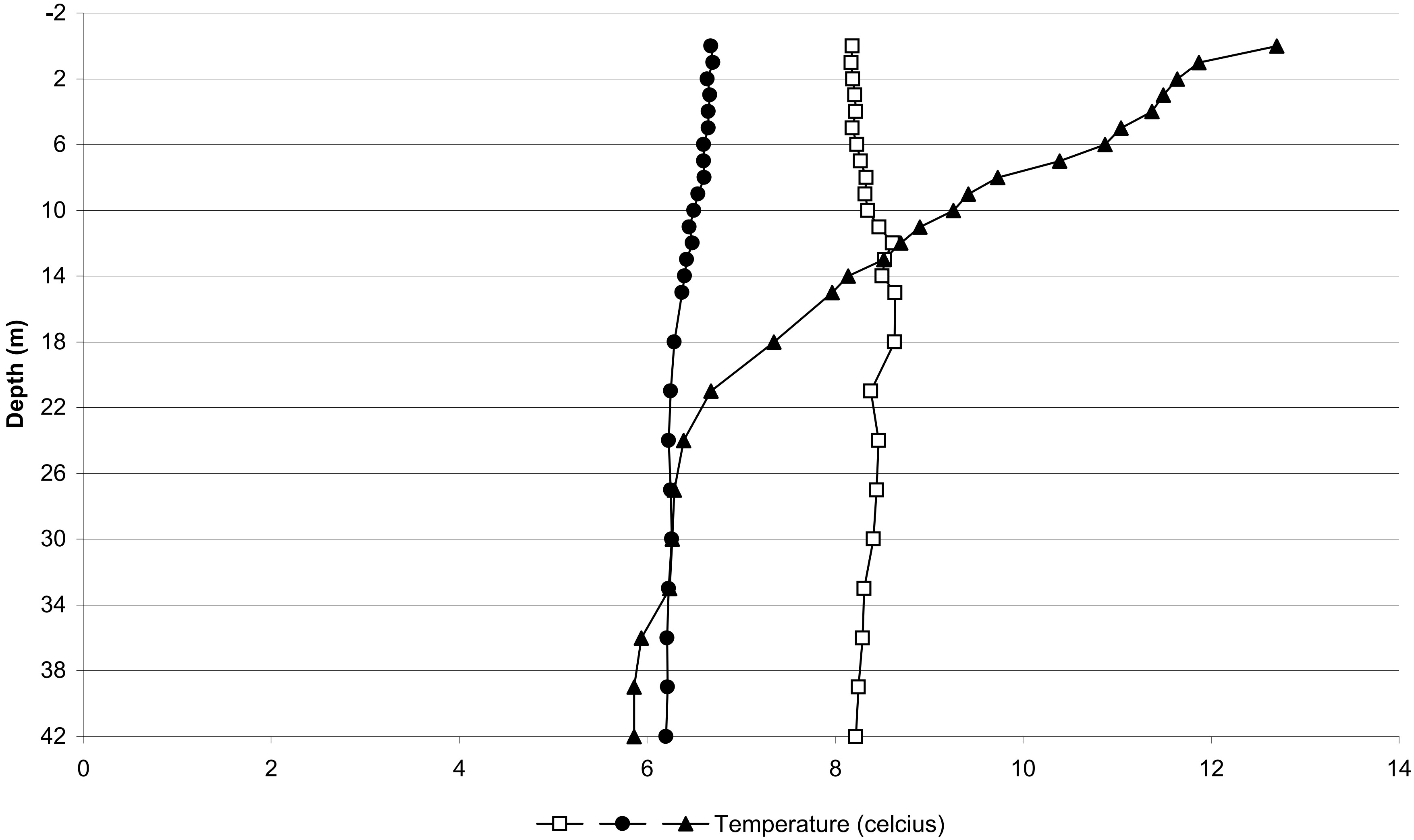


Figure H-17. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-2, May 28, 2002

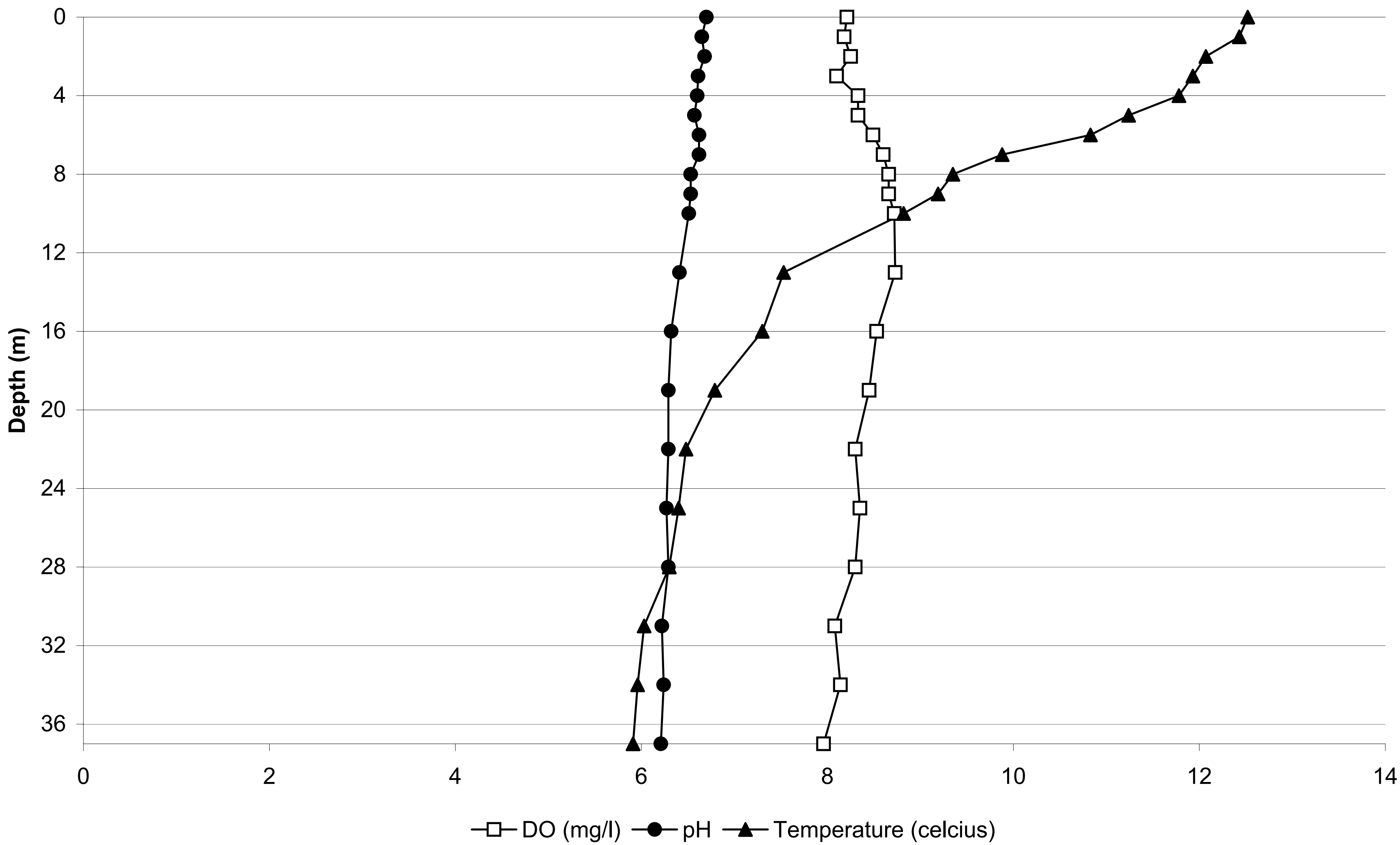


Figure H-18. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-3, May 28, 2002

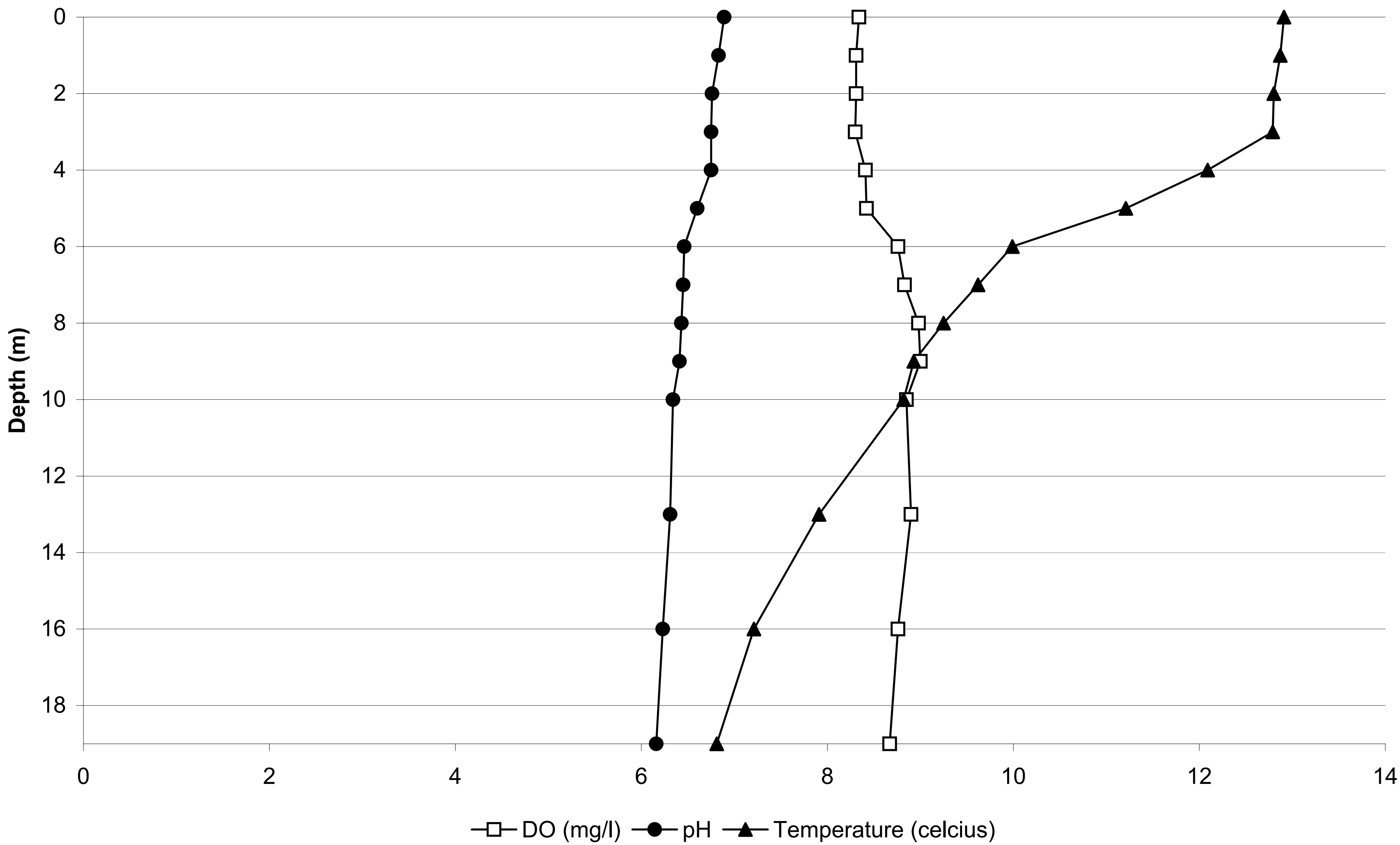


Figure H-19. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-1, June 25, 2002

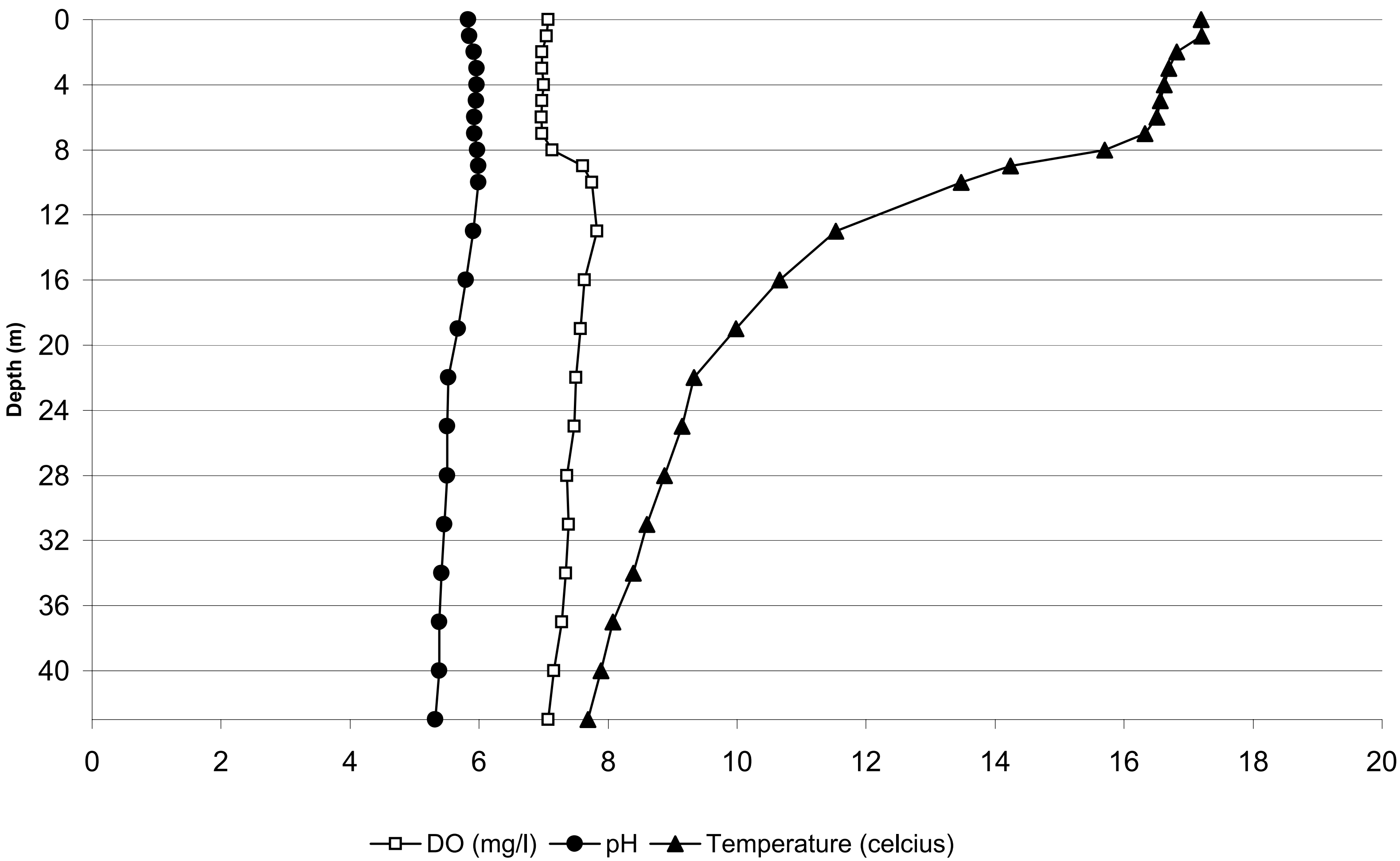


Figure H-20. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-2, June 25, 2002

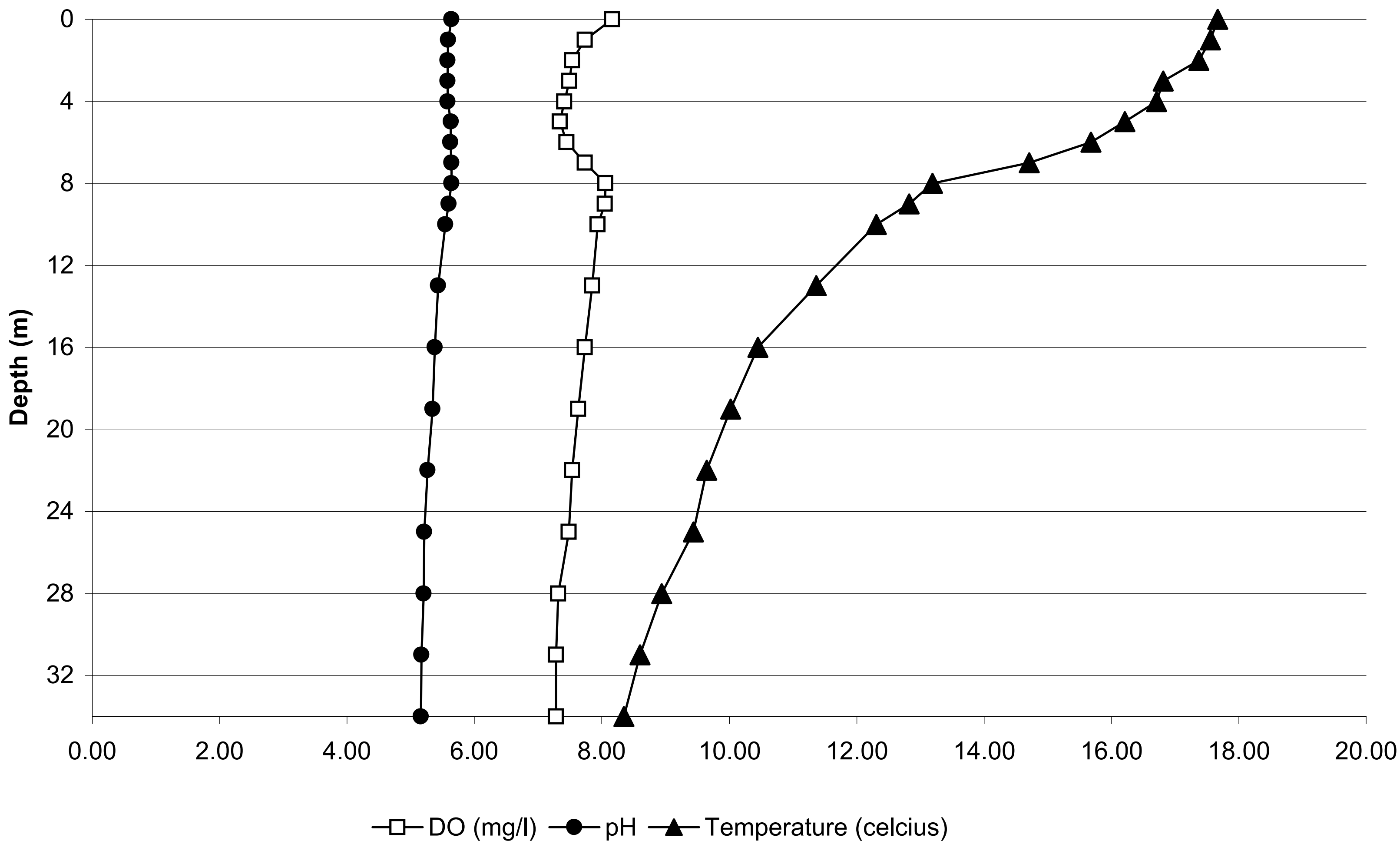


Figure H-21. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-3, June 252002

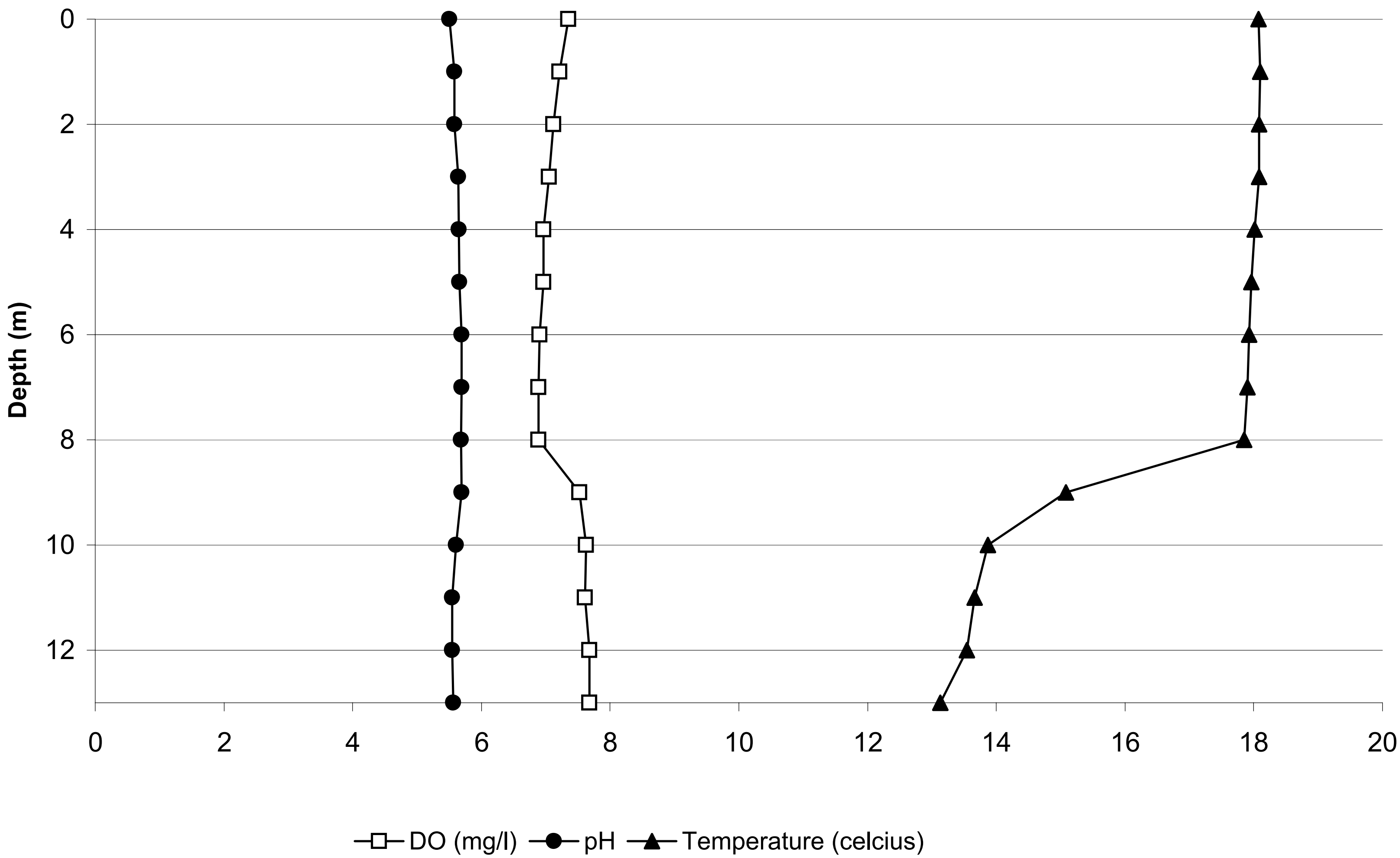


Figure H-22. Huntington Lake Temperature, Dissolved Oxygen, pH Profiles, Station HL-1, July 23, 2002

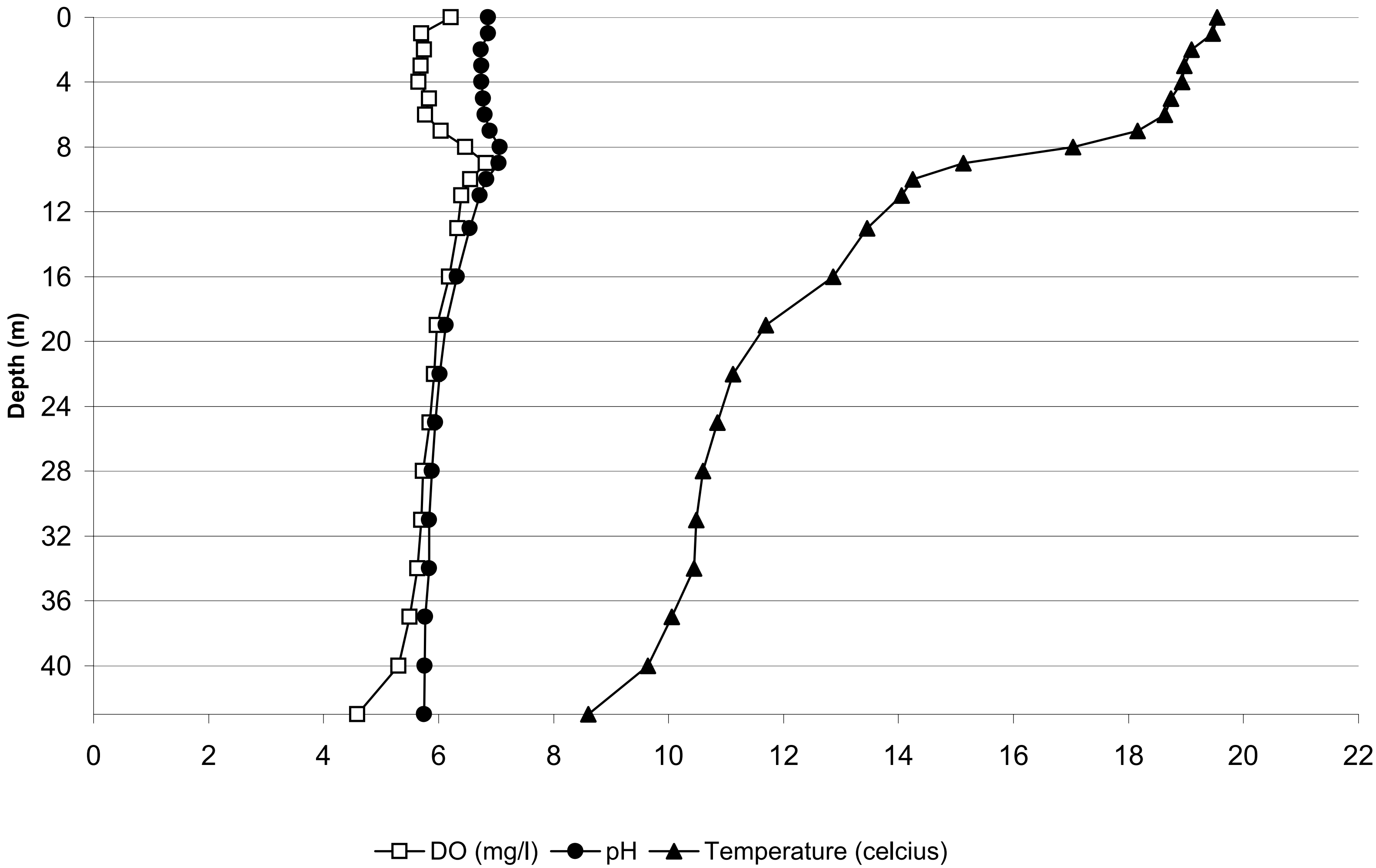


Figure H-23. Huntington Lake Temperature, Dissolved Oxygen, pH Profiles, Station HL-2, July 23, 2002

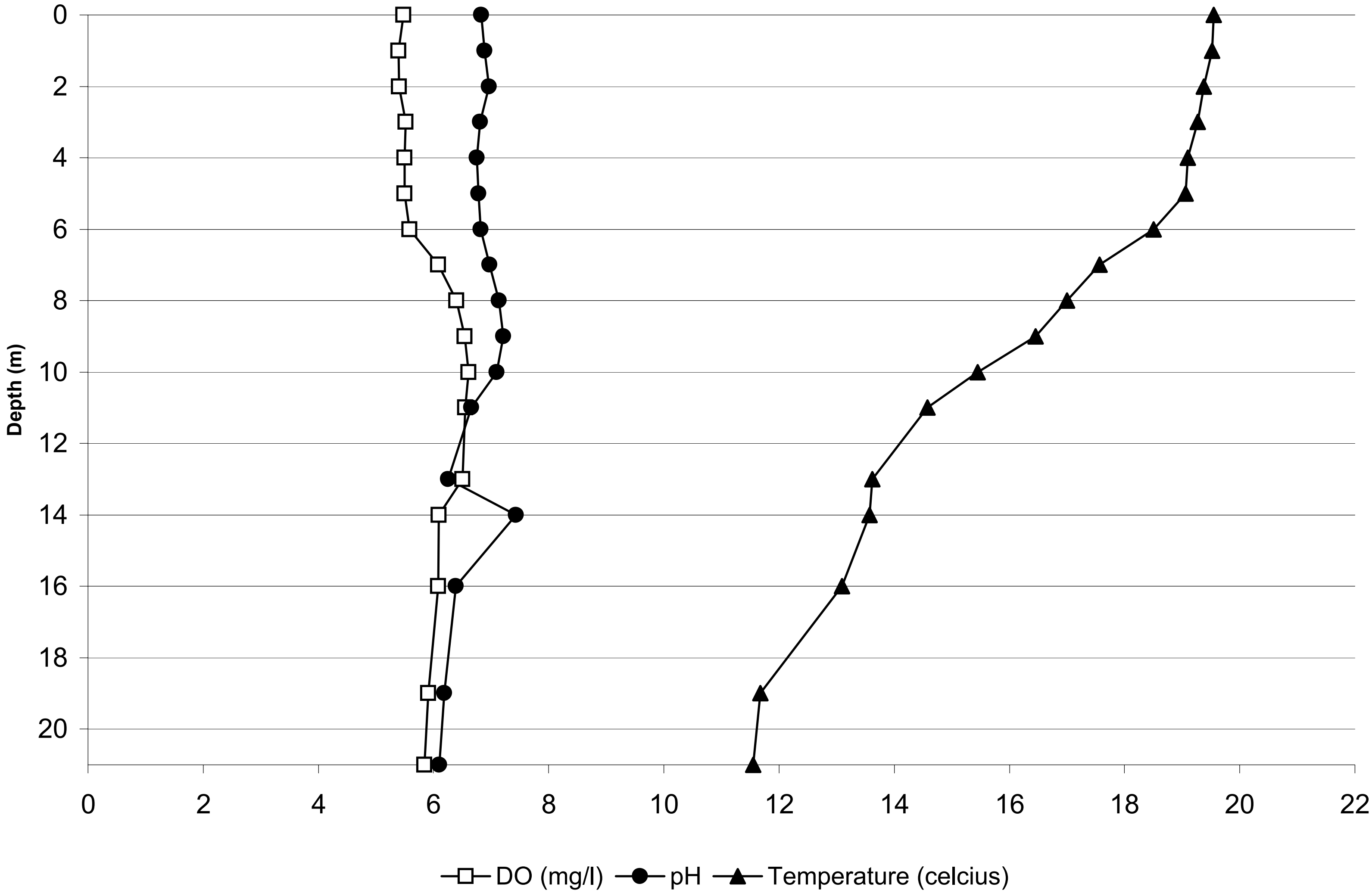


Figure H-24. Huntington Lake Temperature, Dissolved Oxygen, pH Profiles, Station HL-3, July 23, 2002

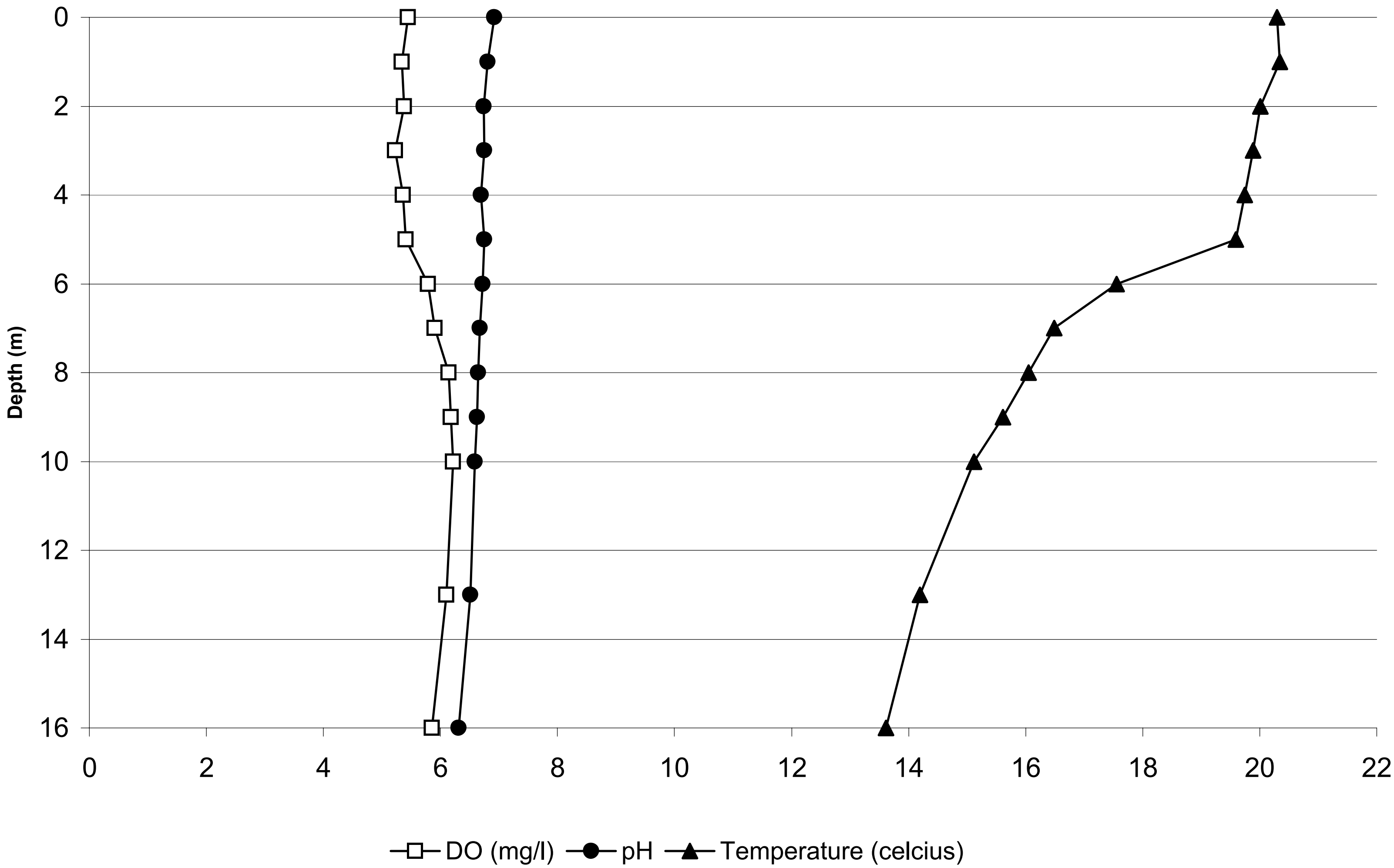


Figure H-25. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-1, August 19, 2002

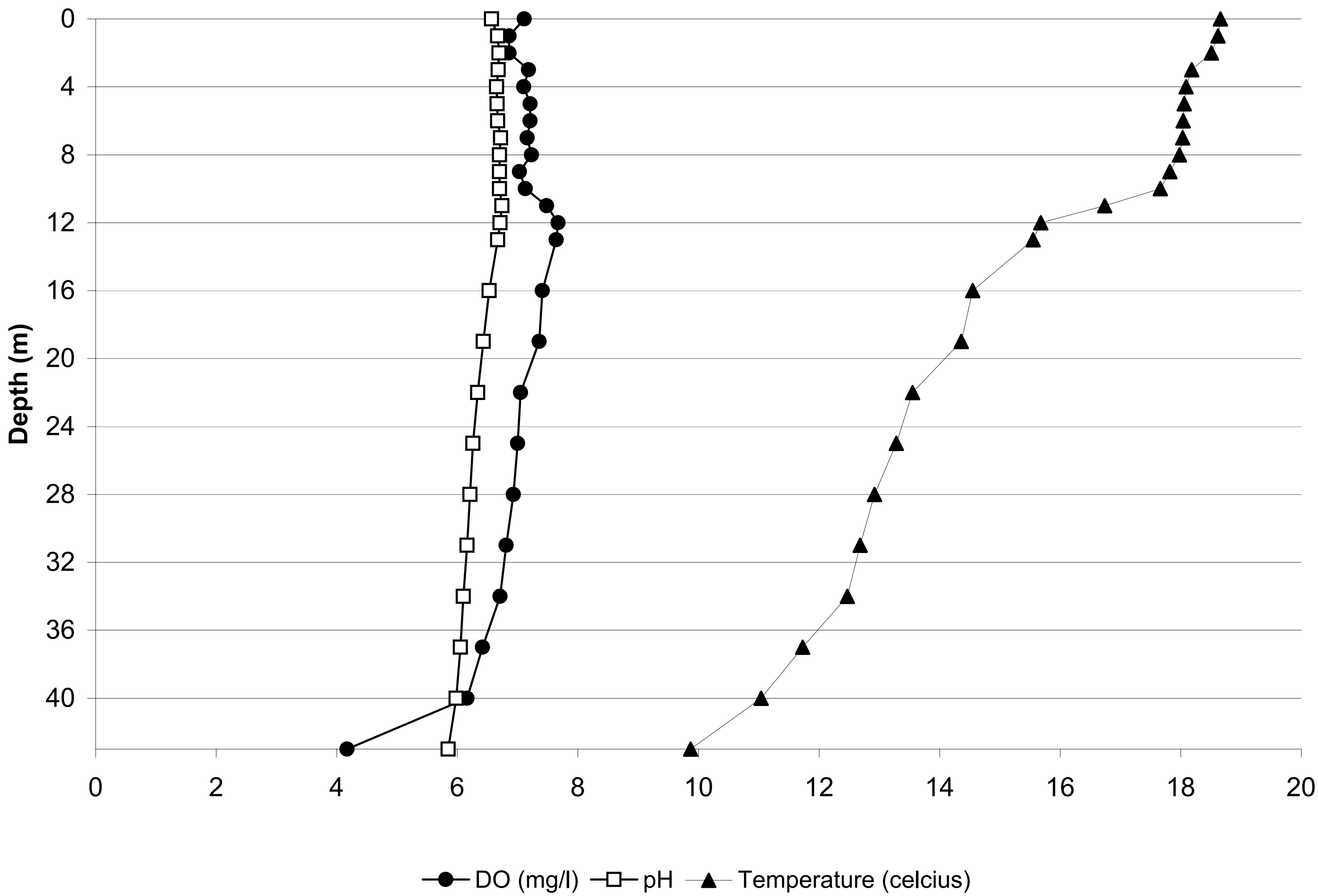


Figure H-26. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-2, August 19, 2002

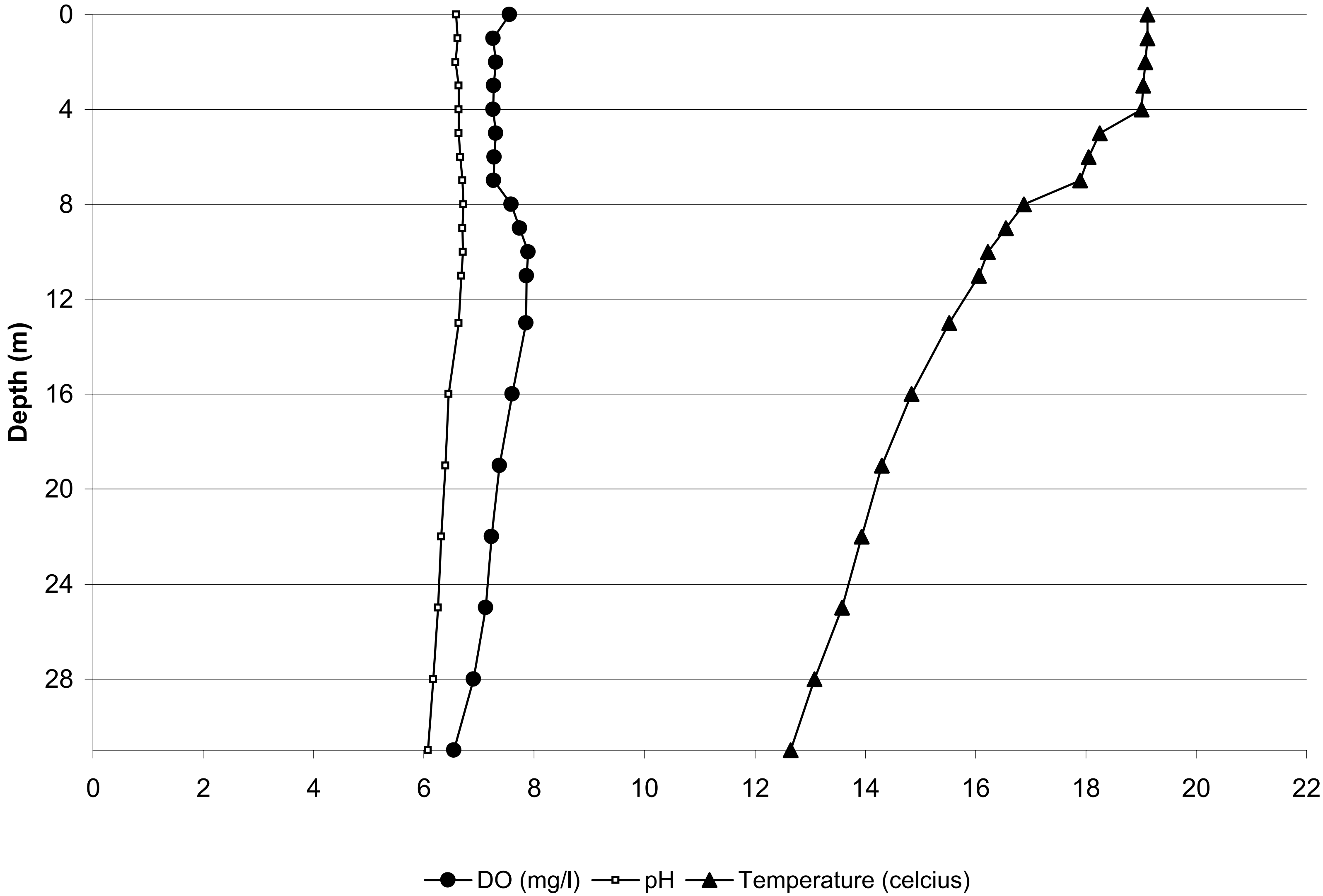


Figure H-27. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-3, August 19, 2002

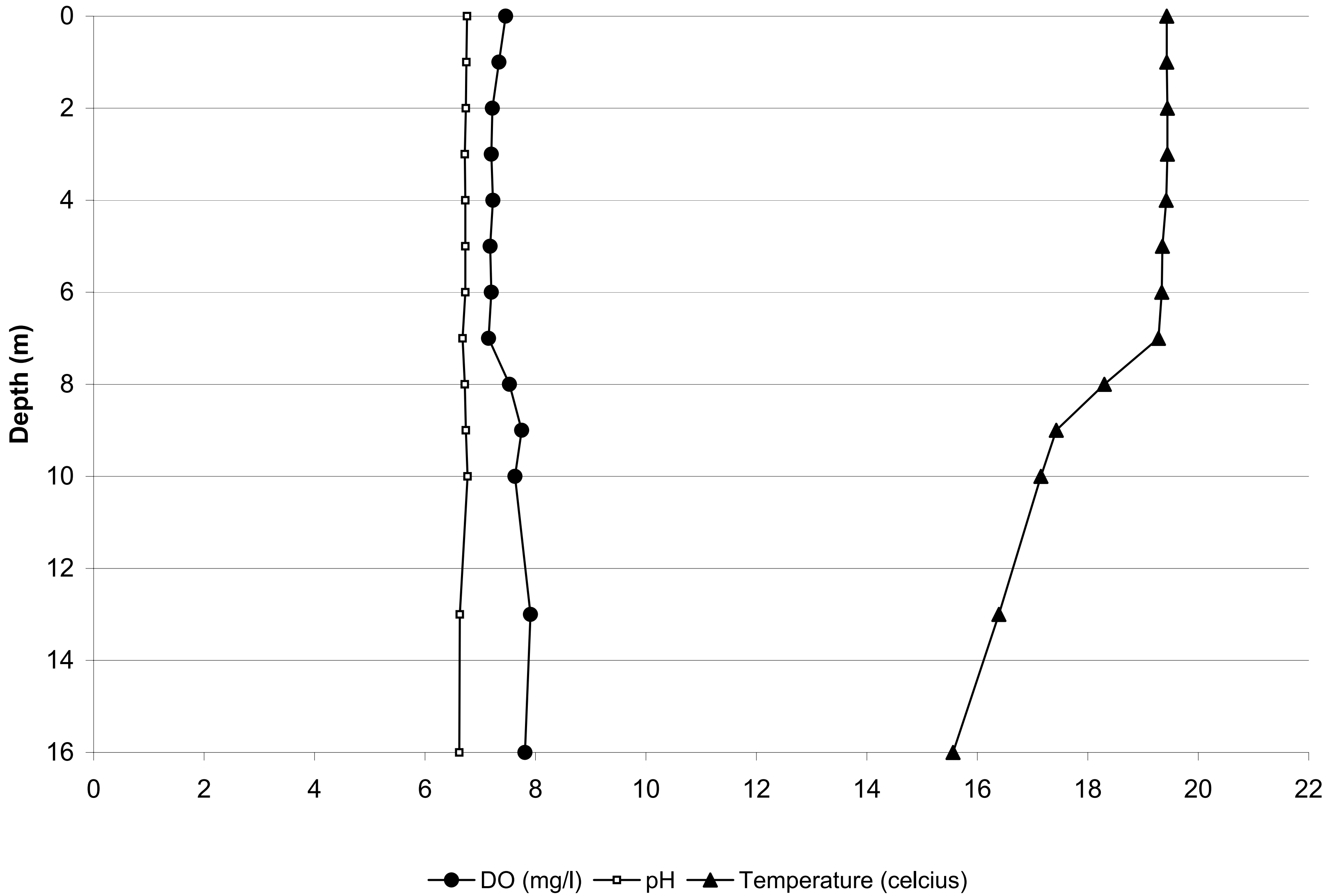


Figure H-28. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-1, September 23, 2002

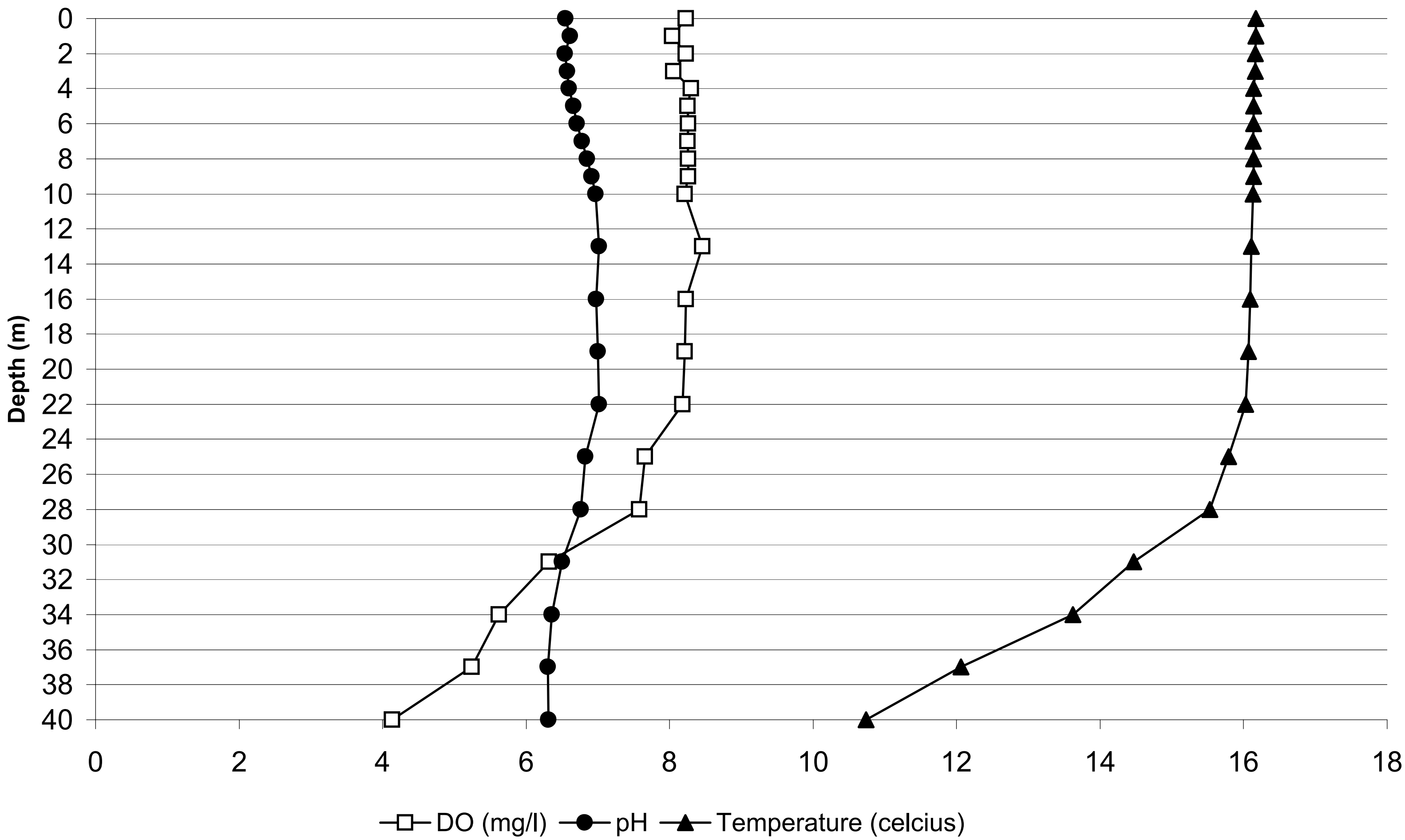


Figure H-29. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-2, September 23, 2002

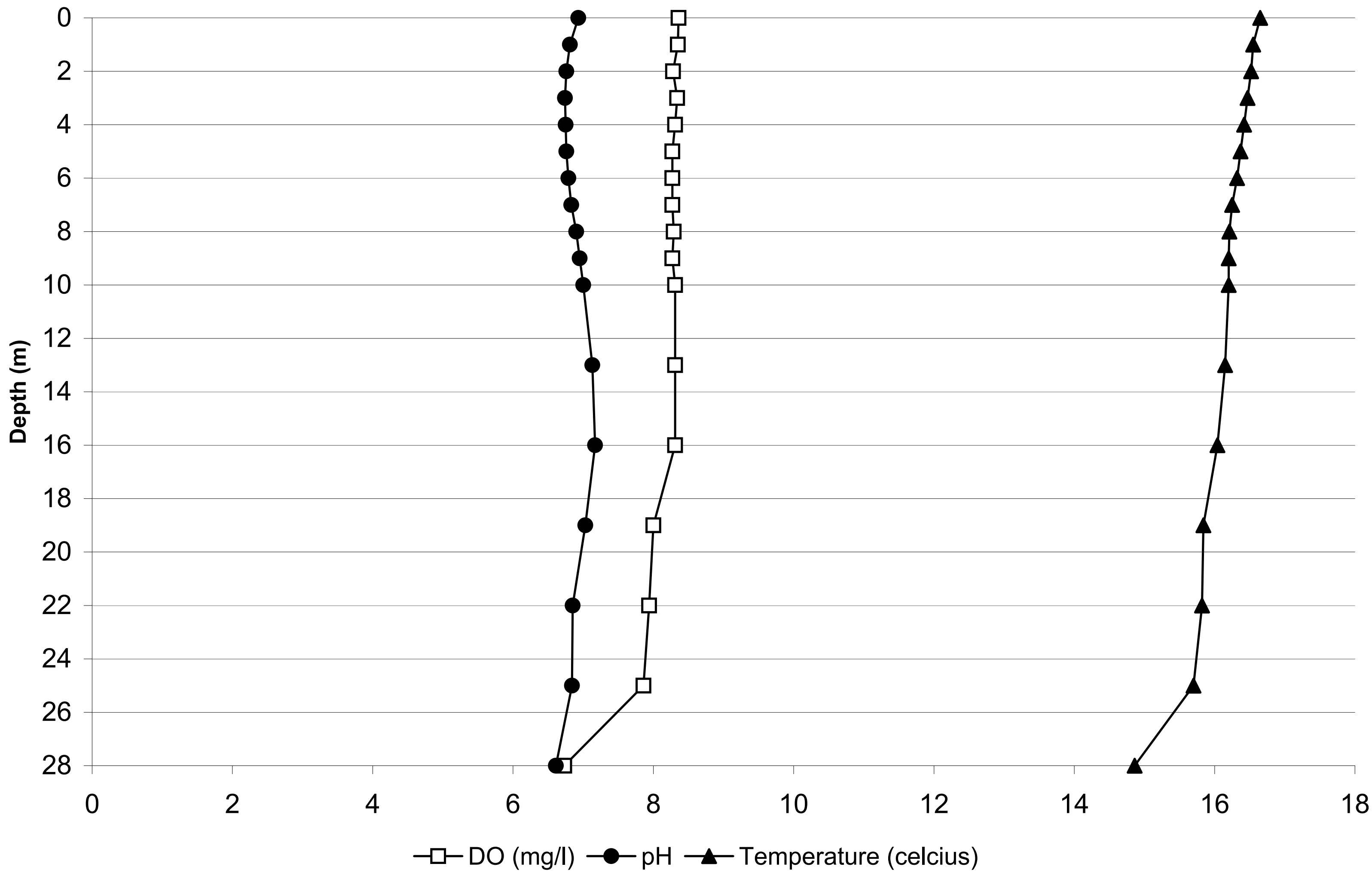


Figure H-30. Huntington Lake Temperature, Dissolved Oxygen, and pH Profiles, Station HL-3, September 23, 2002

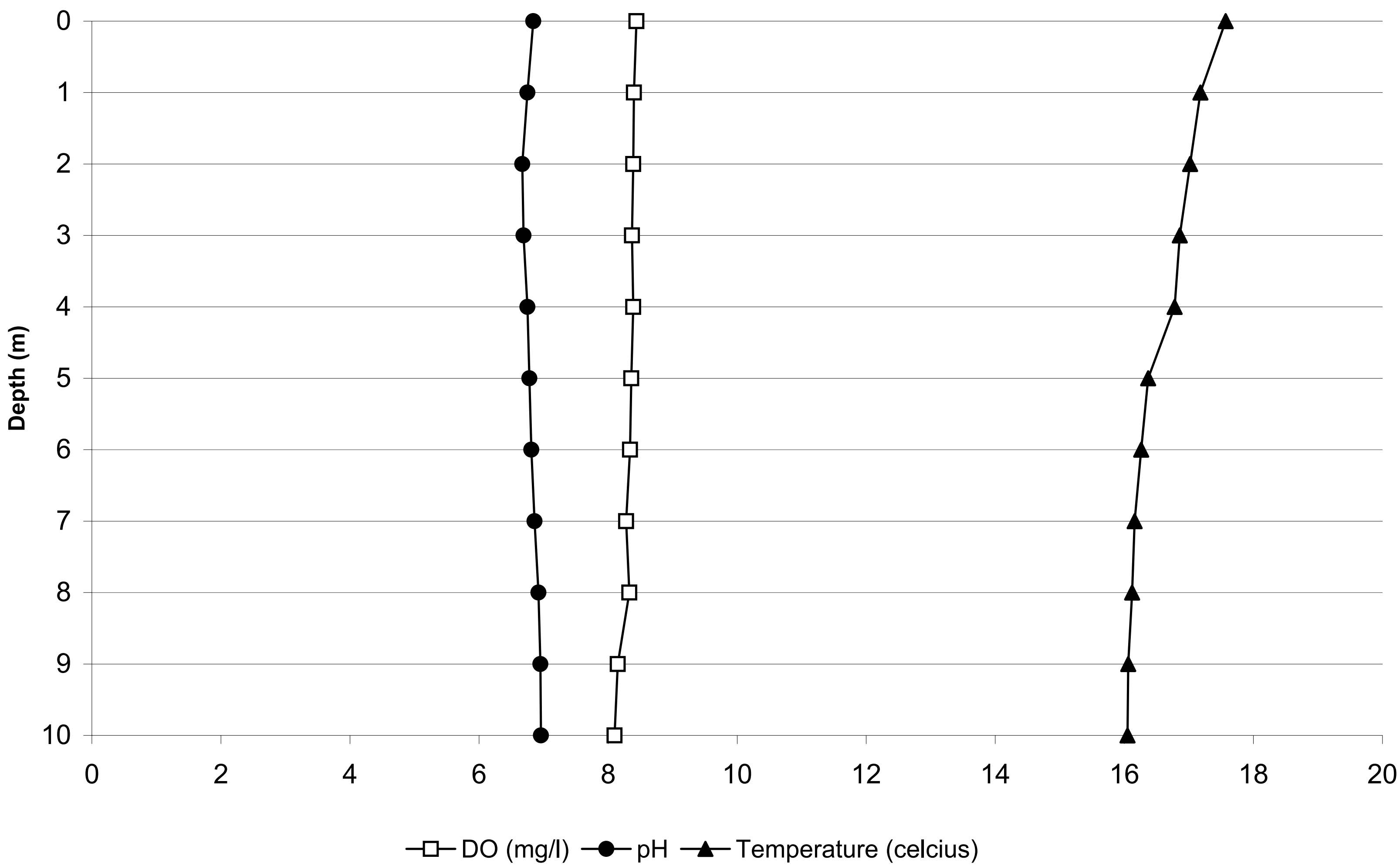


Figure H-31. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-1, May 29, 2002

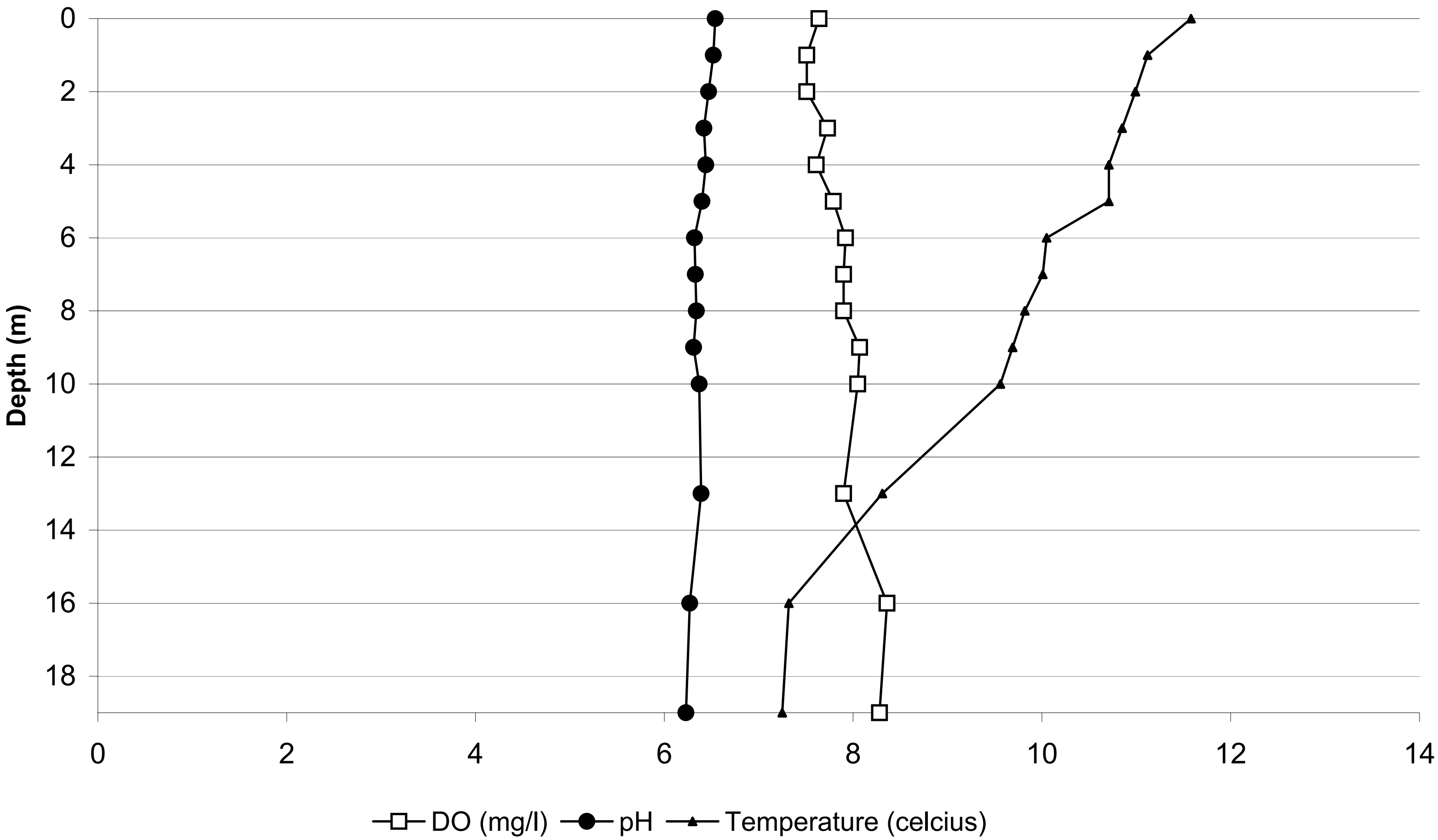


Figure H-32. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-2, May 29, 2002

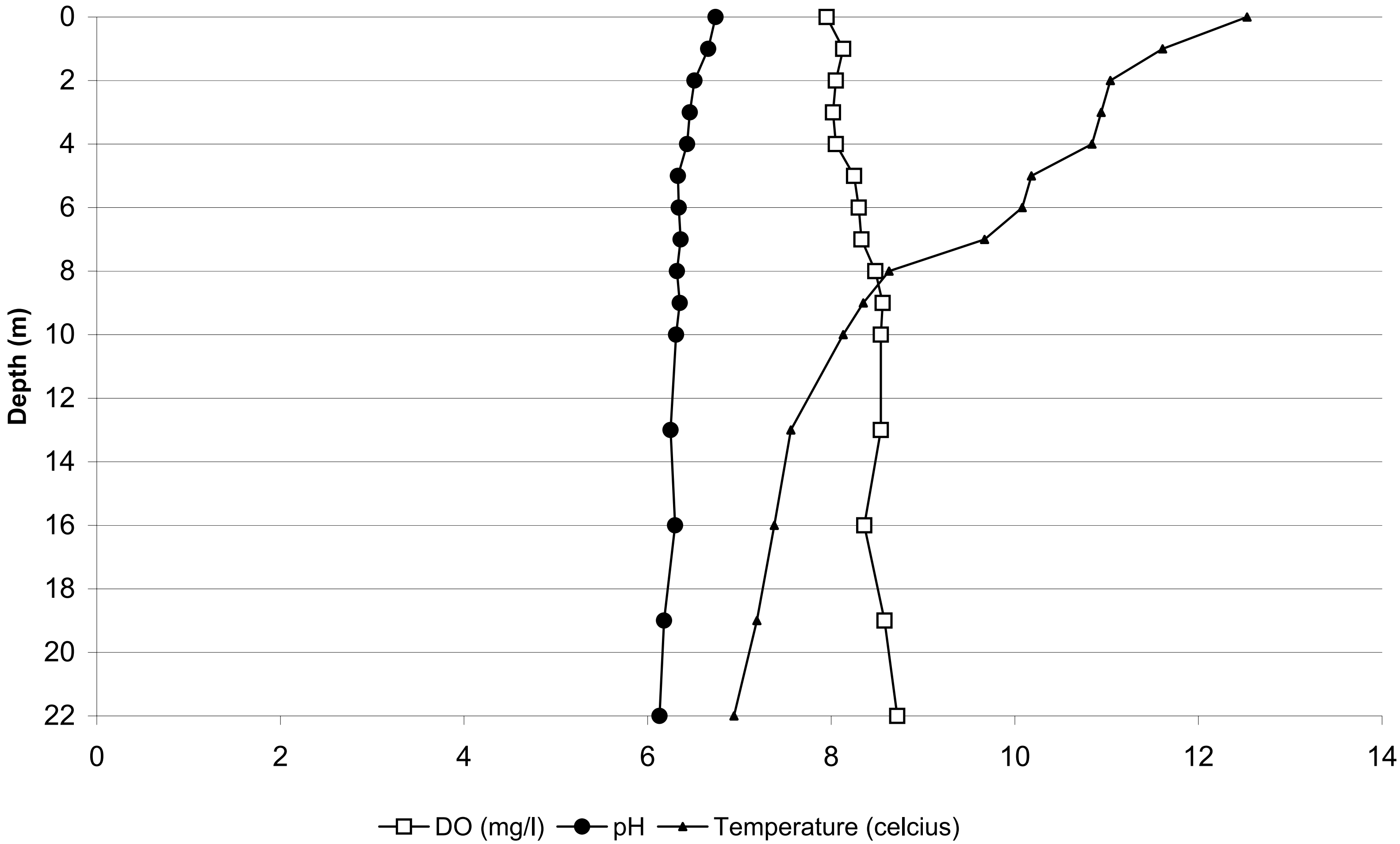


Figure H-33. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-3, May 29, 2002

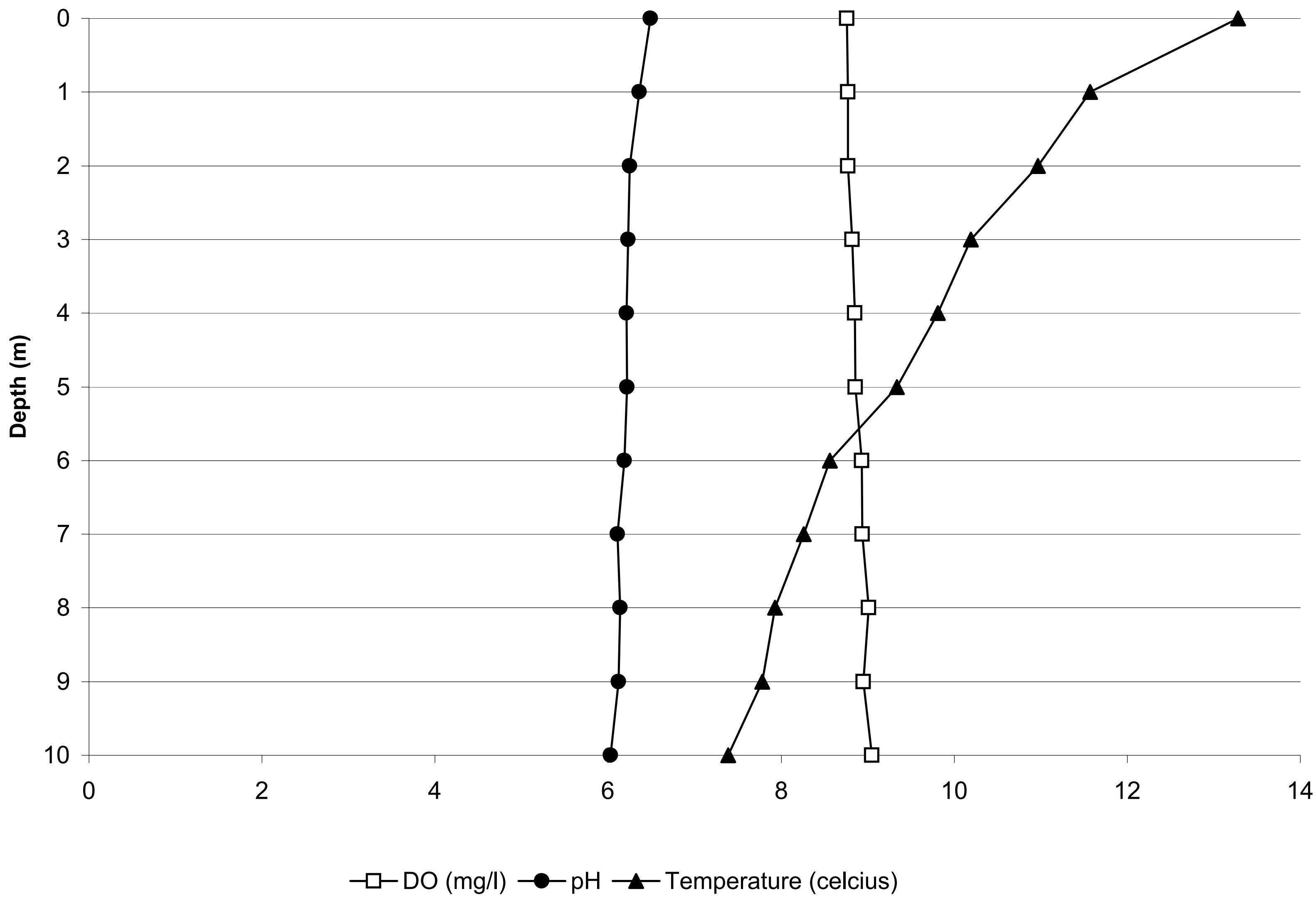


Figure H-34. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-1, June 26, 2002

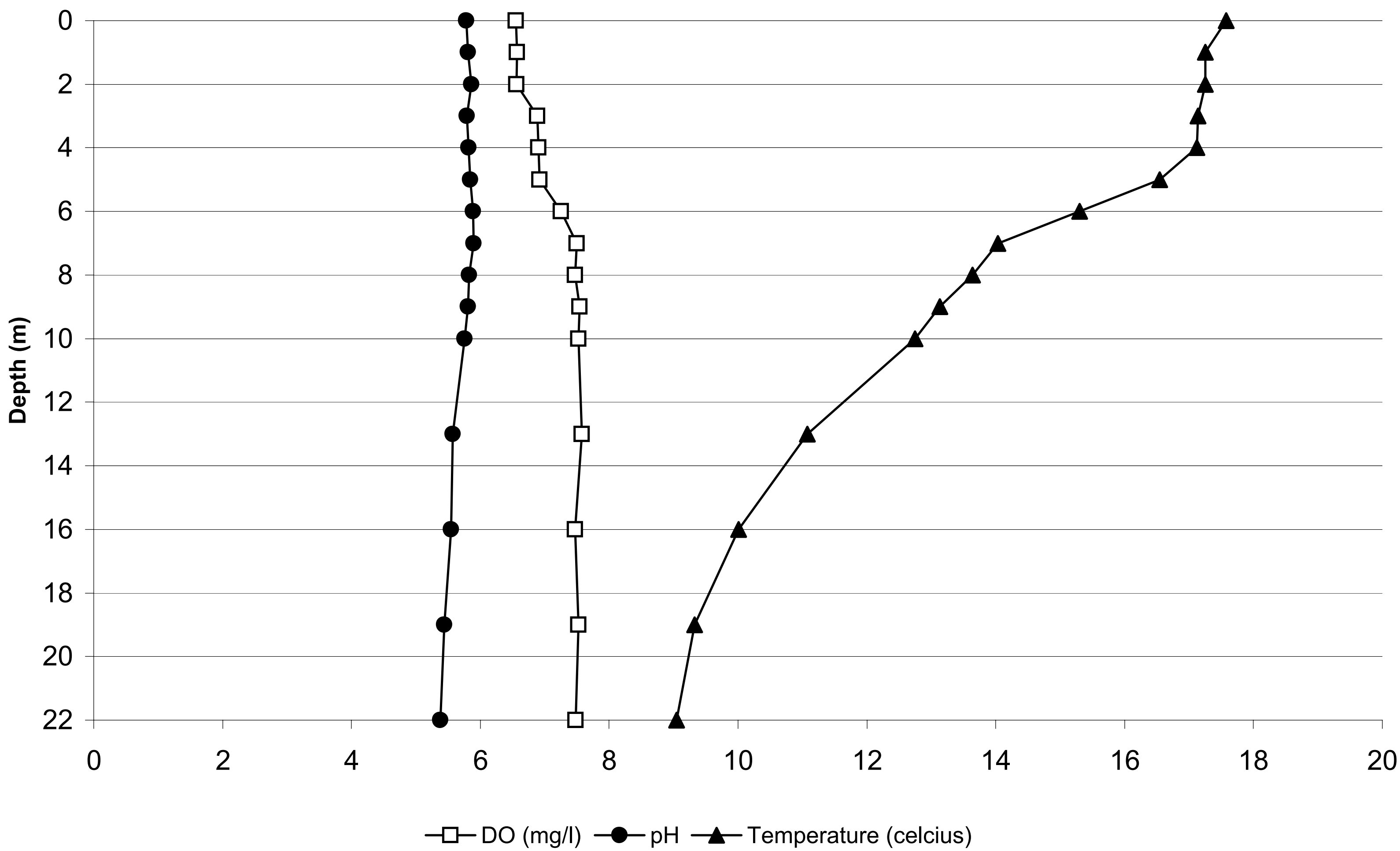


Figure H-35. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-2, June26, 2002

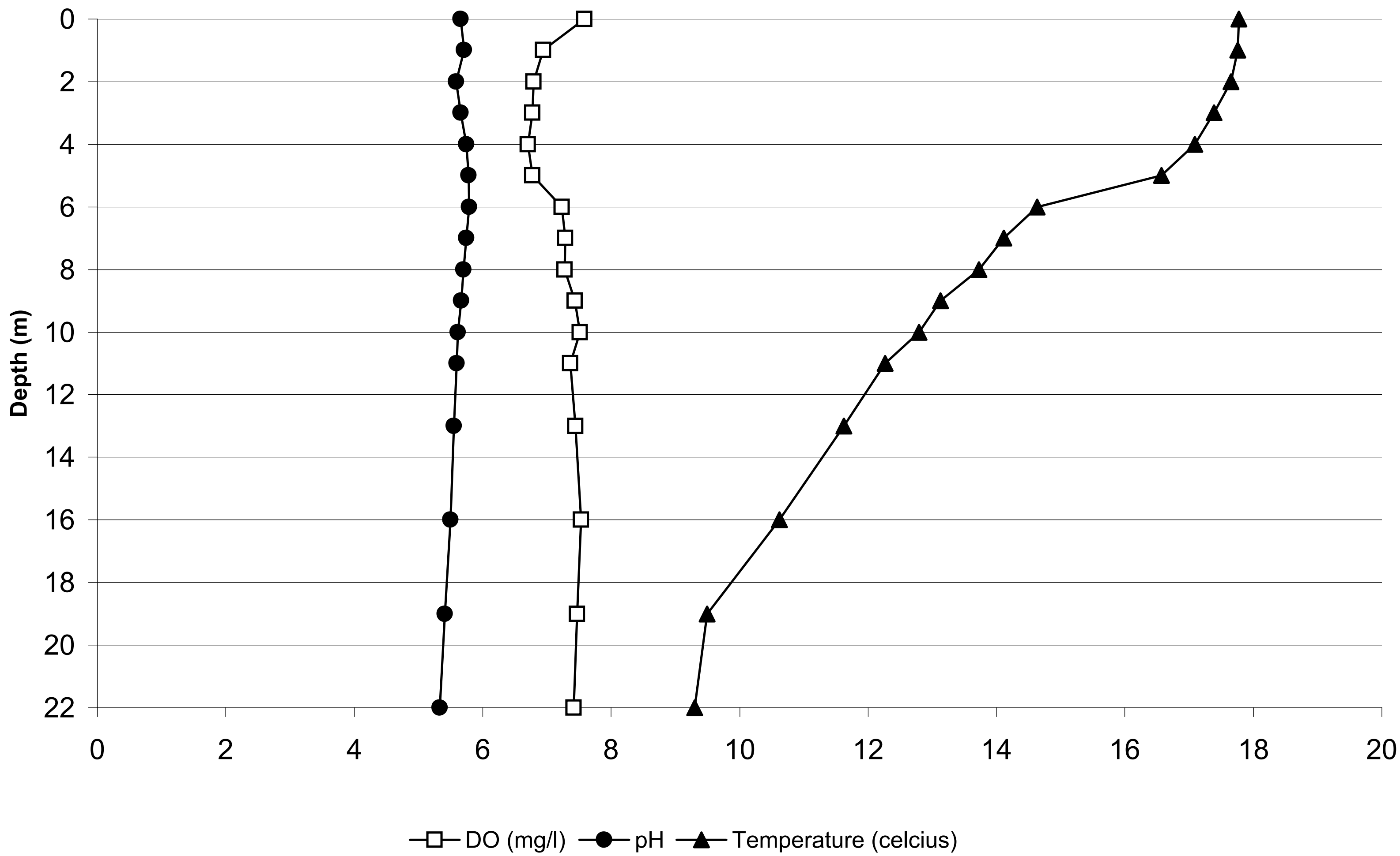


Figure H-36. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-3, June 26, 2002

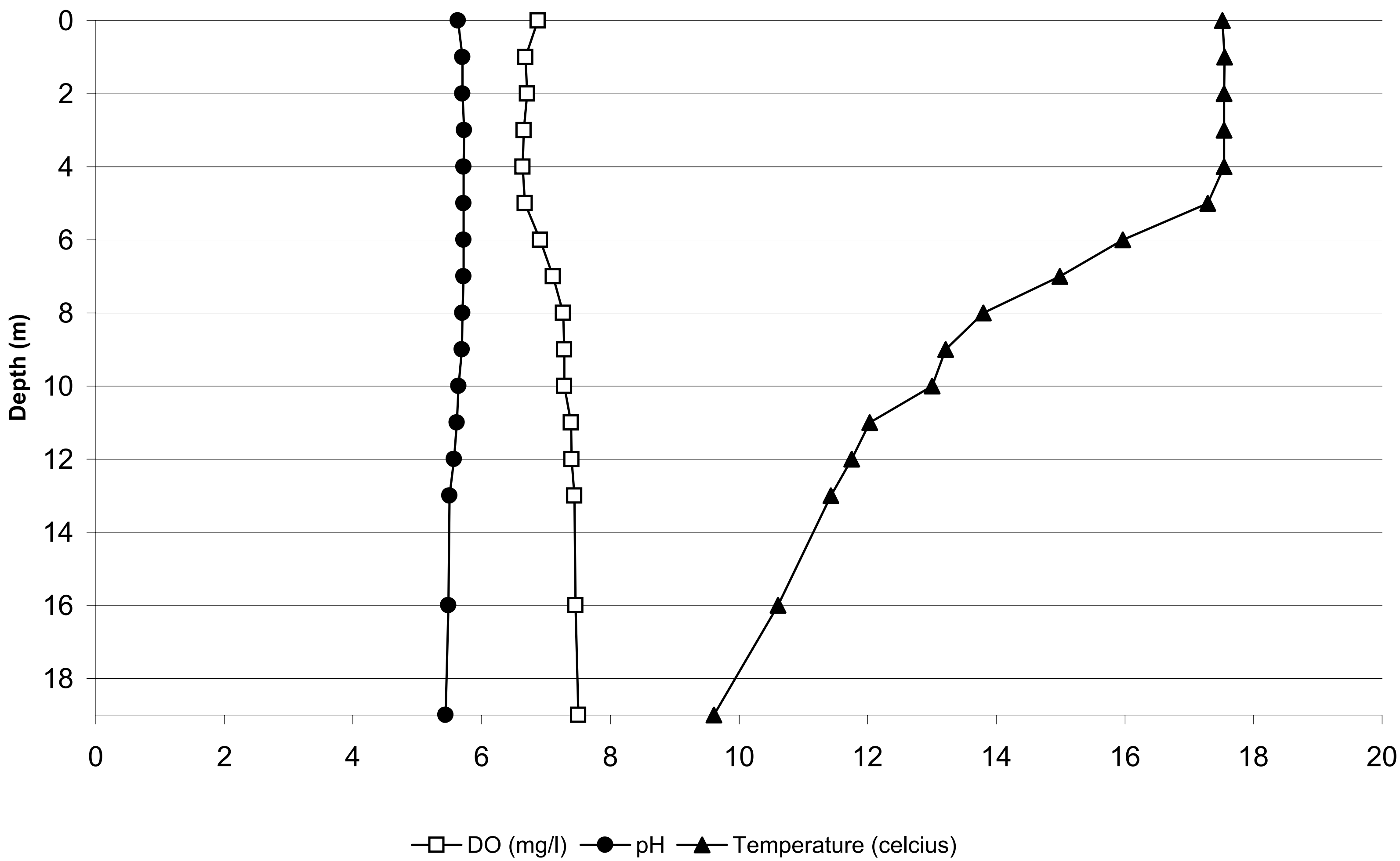


Figure H-37. Florence LakeTemperature, Dissolved Oxygen, pH Profiles, Station FL-1, July 24, 2002

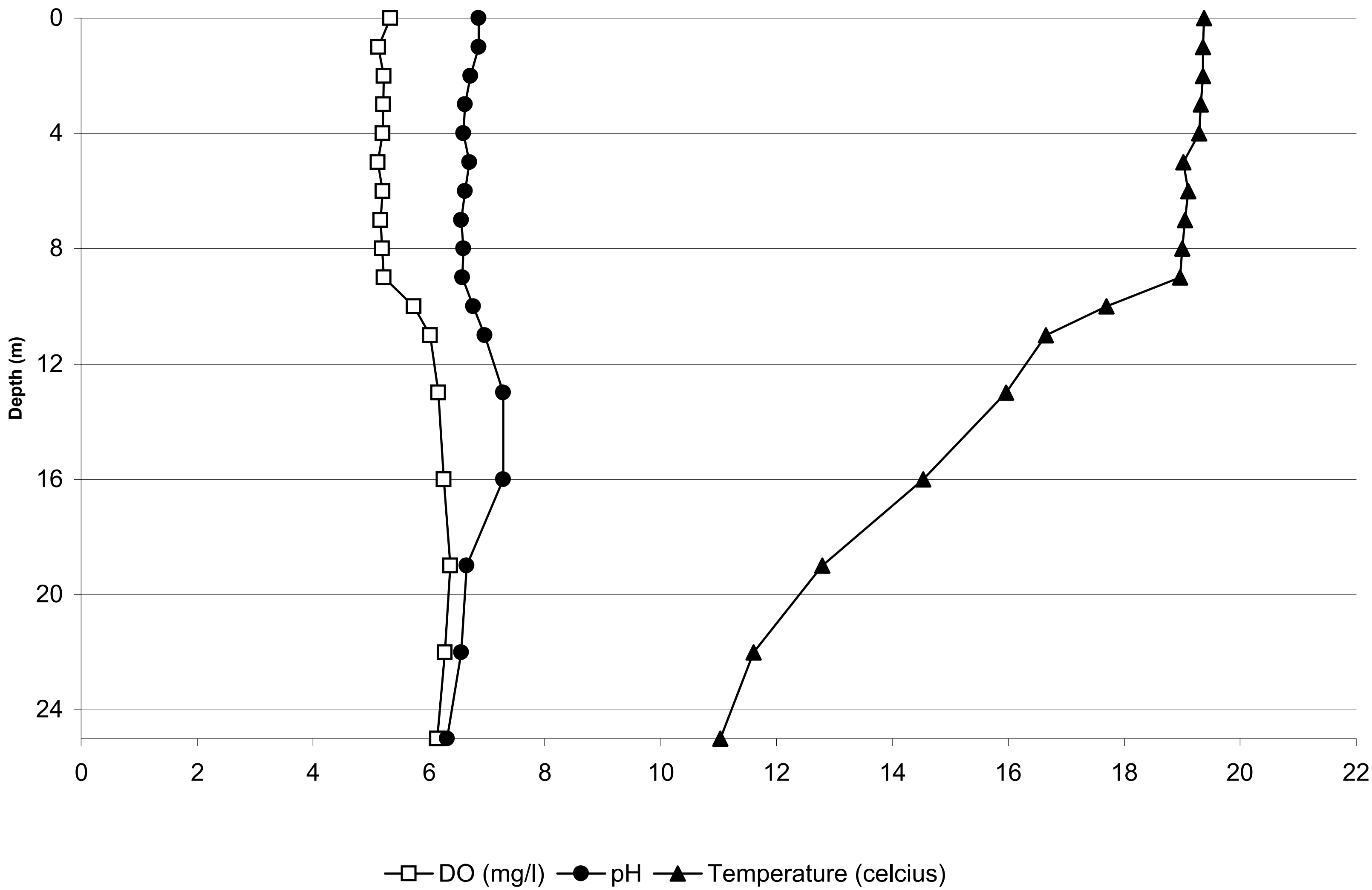


Figure H-38. Florence Lake Temperature, Dissolved Oxygen, pH Profiles, Station FL-2, July 24, 2002

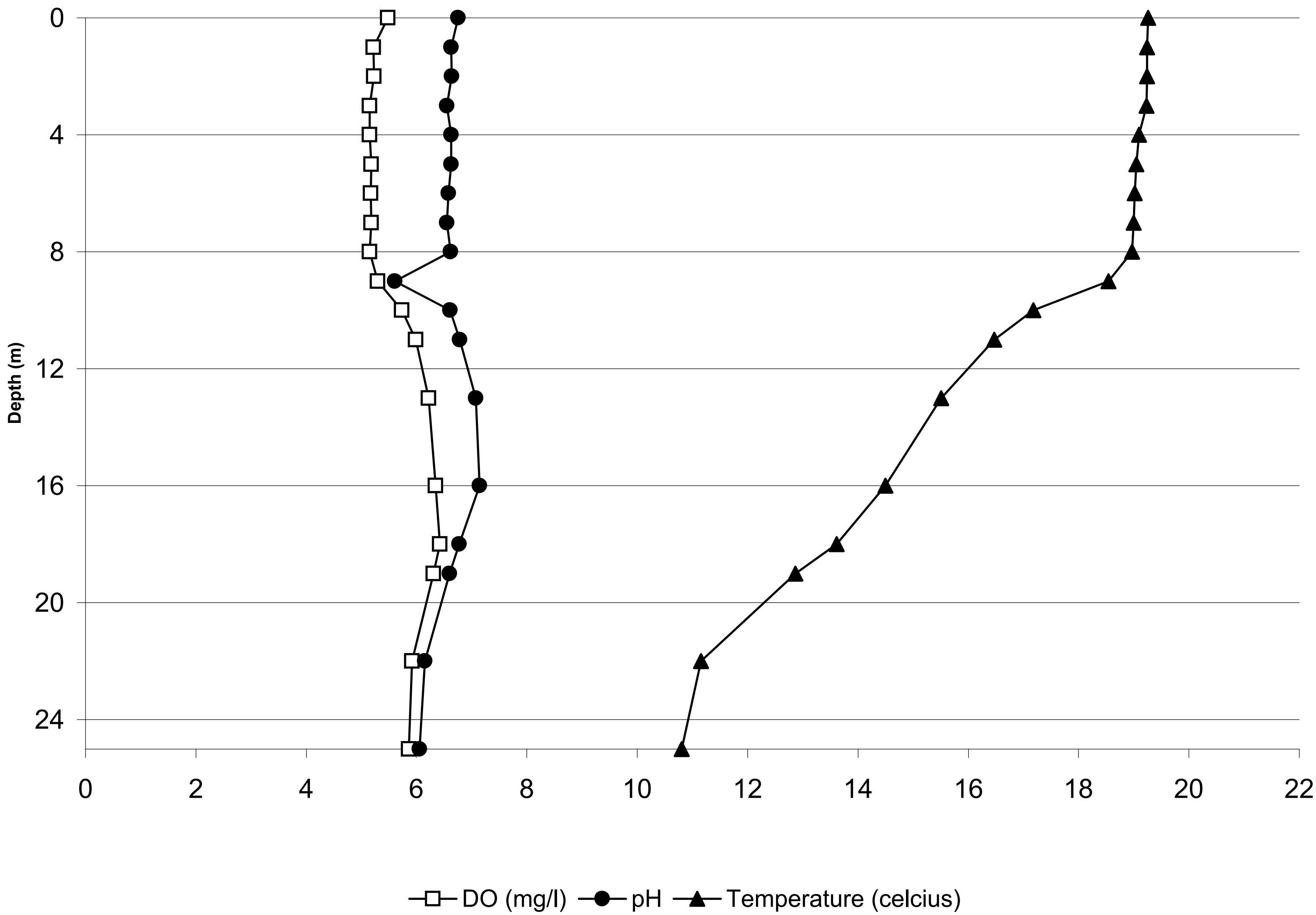


Figure H-39. Florence Lake Temperature, Dissolved Oxygen, pH Profiles, Station FL-3, July 24, 2002

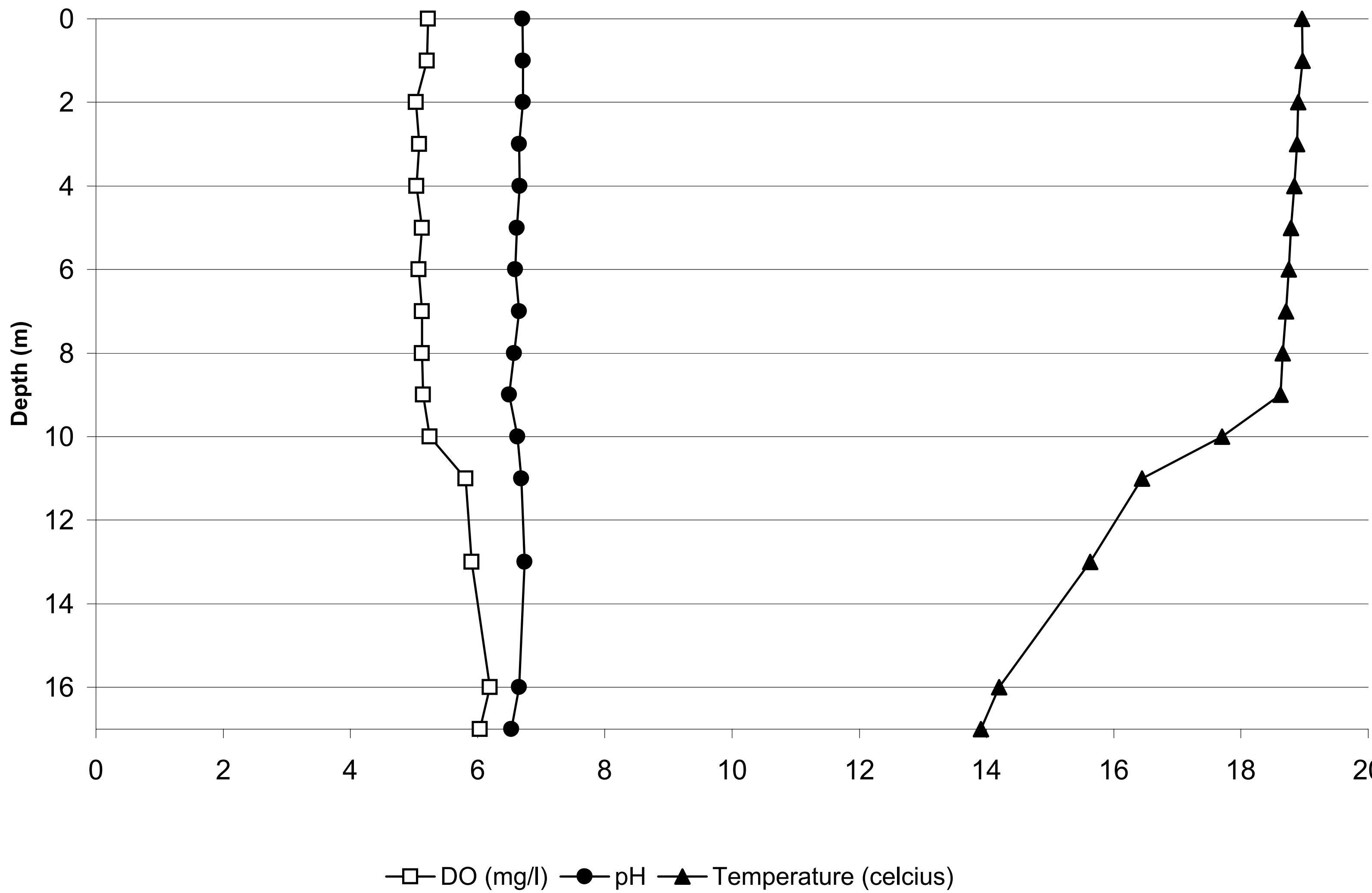


Figure H-40. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-1, August 20, 2002

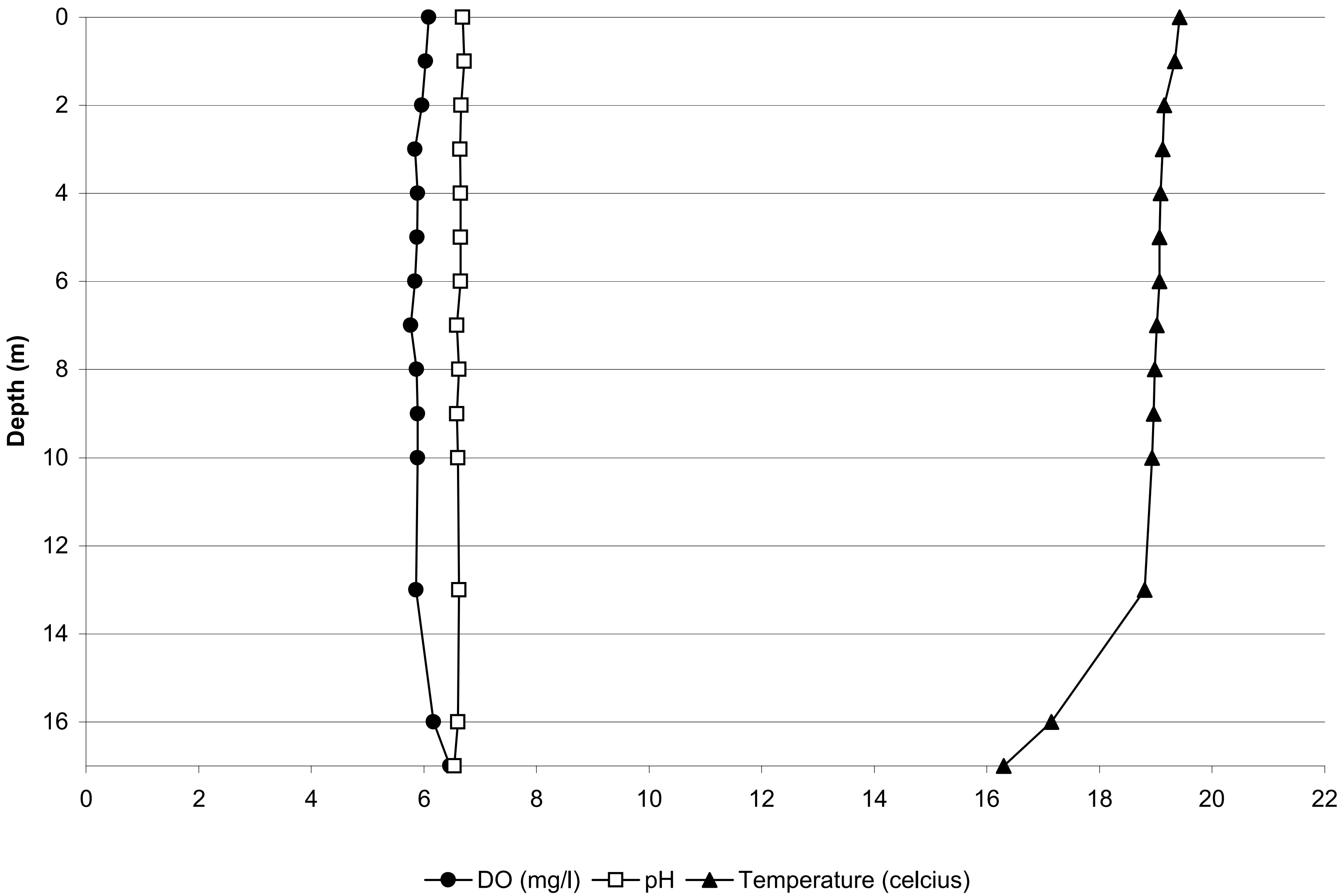


Figure H-41. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-2, August 20, 2002

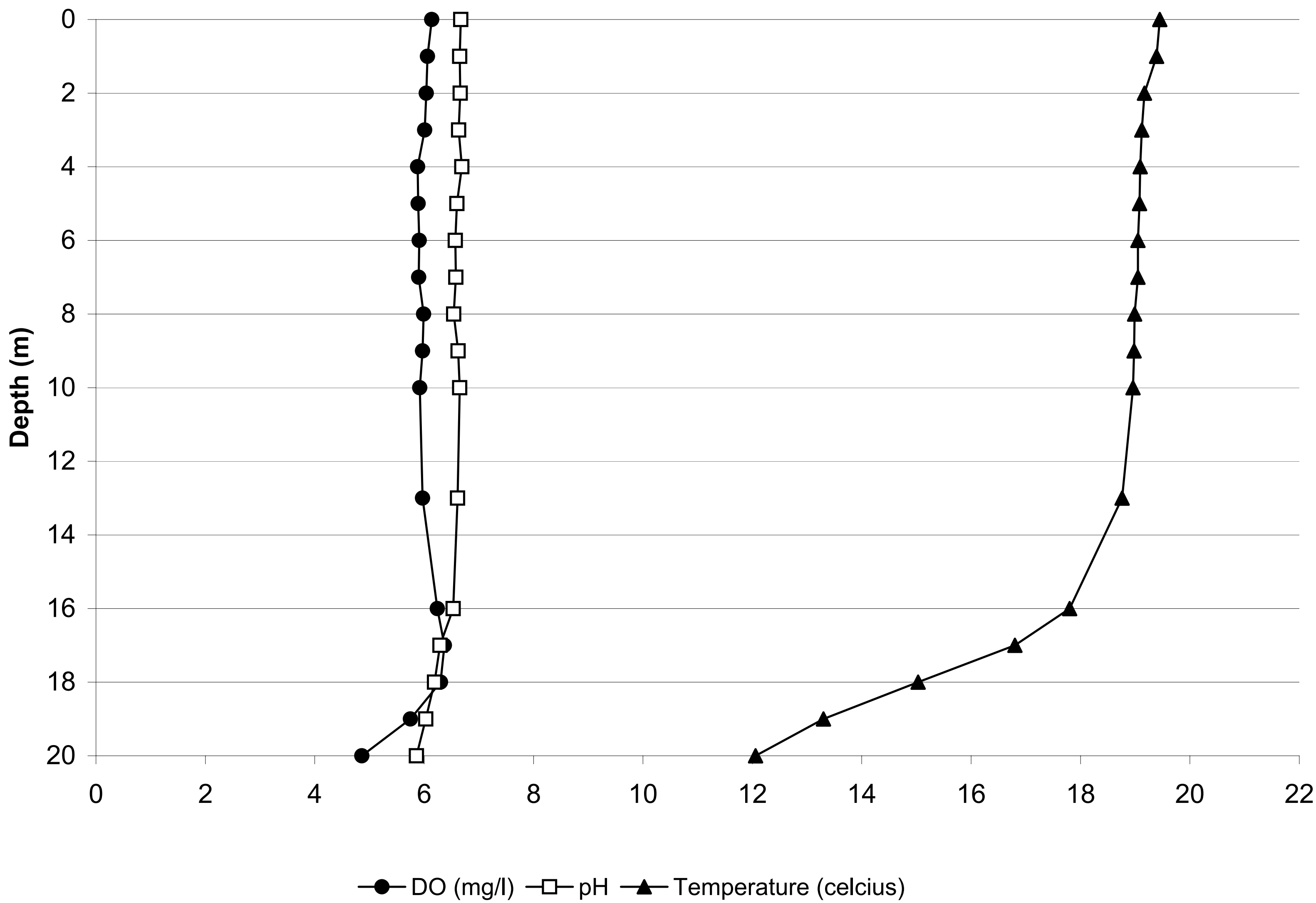


Figure H-42. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-3, August 20, 2002

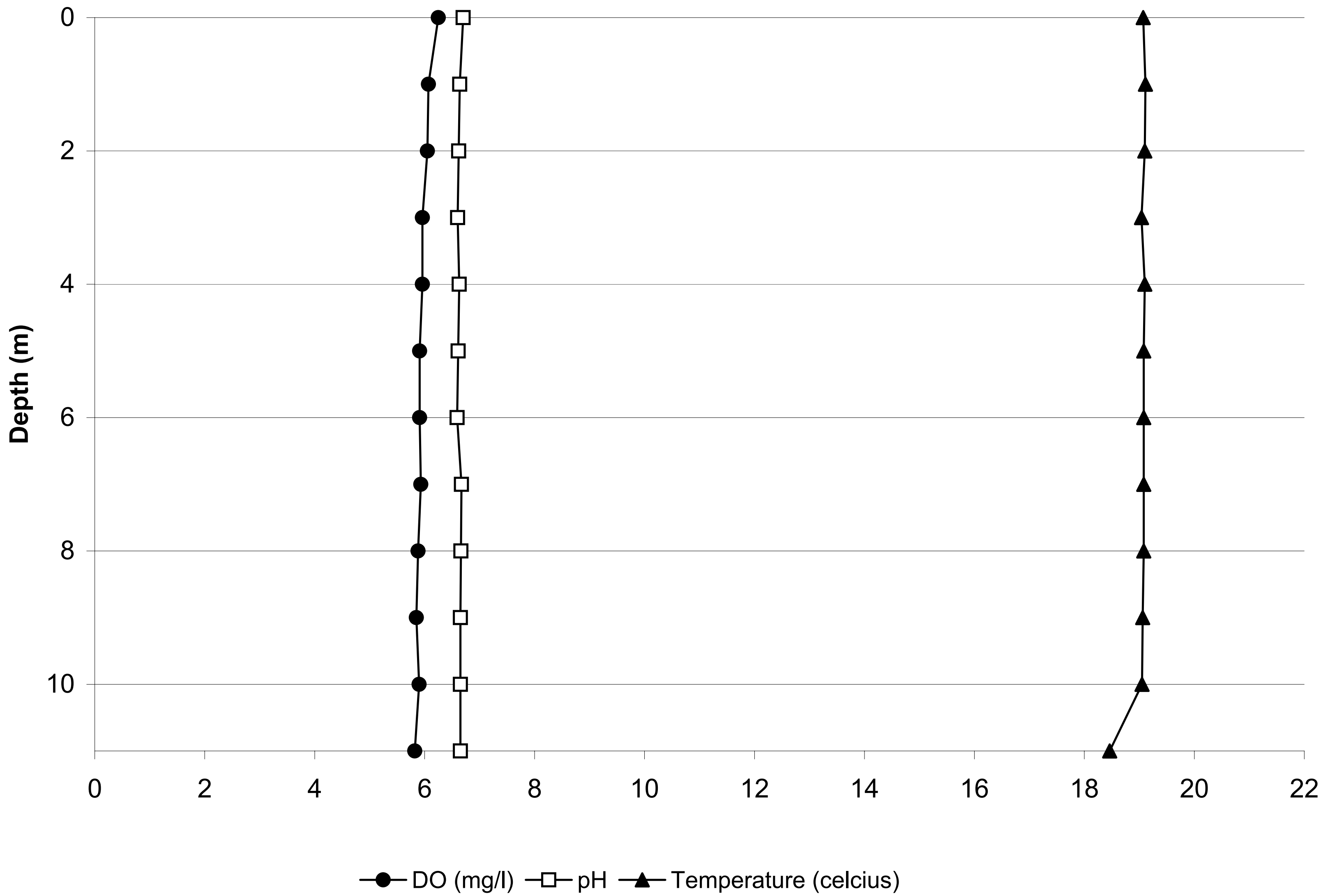


Figure H-43. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-1, September 24, 2002

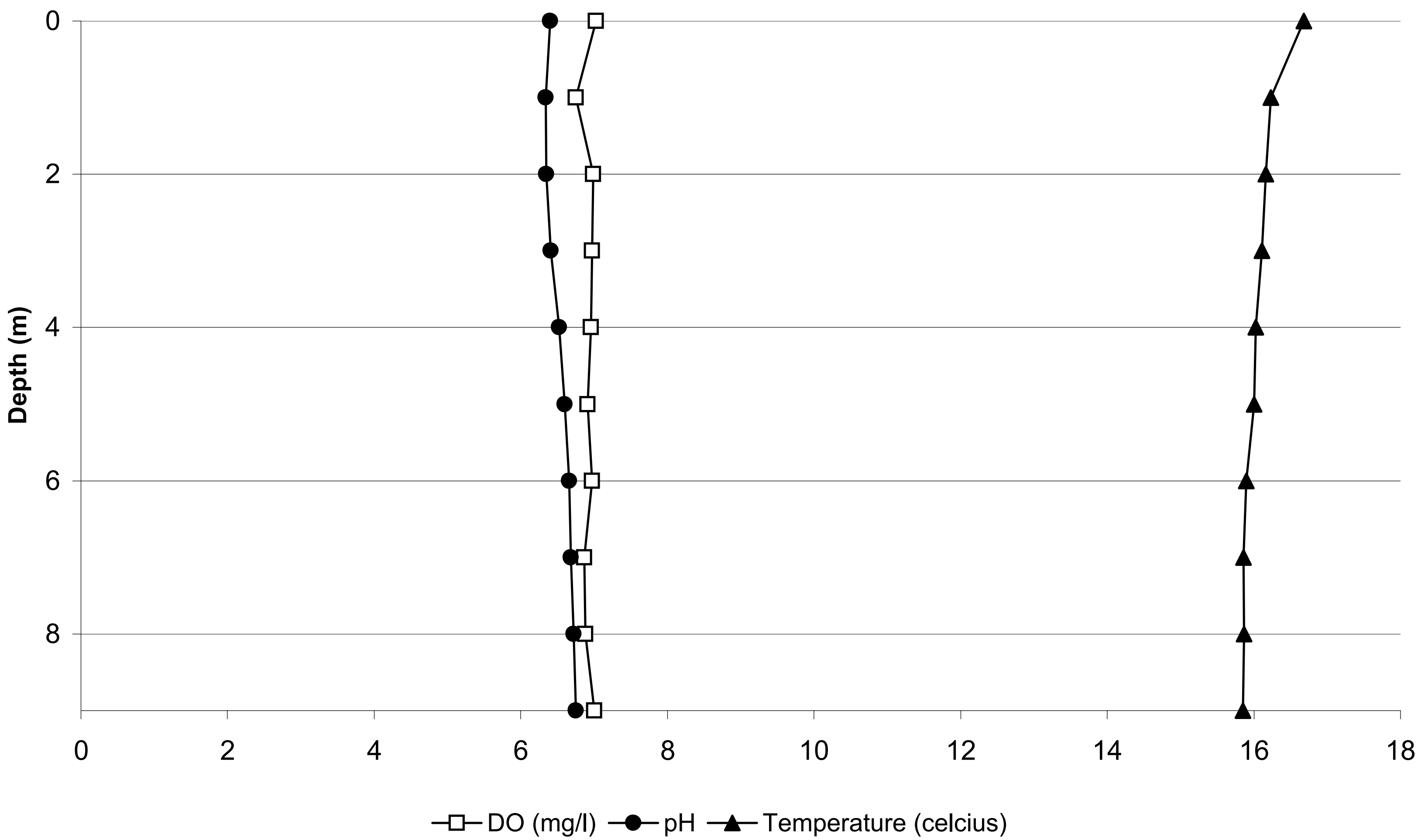


Figure H-44. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-2, September24, 2002

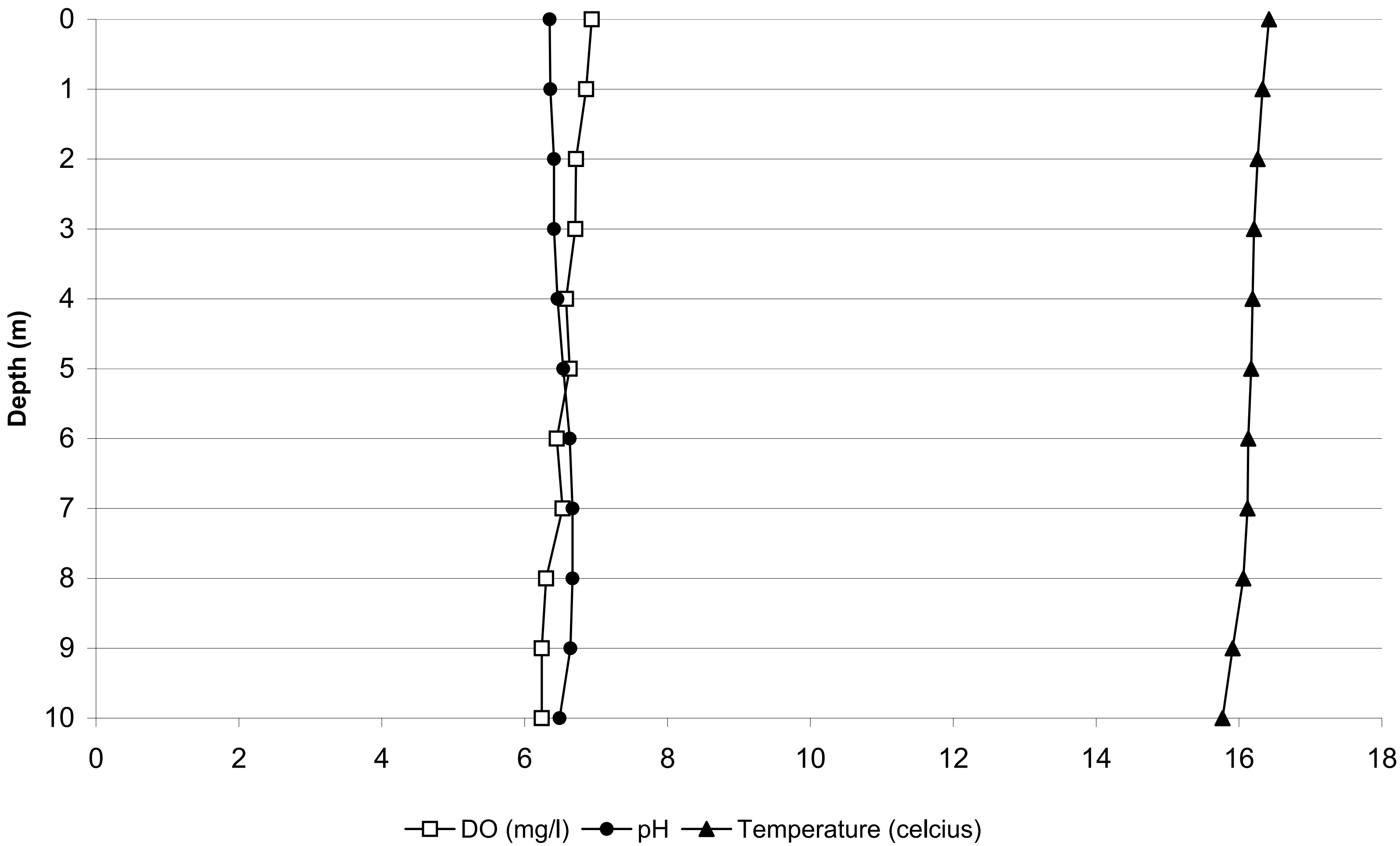


Figure H-45. Florence Lake Temperature, Dissolved Oxygen, and pH Profiles, Station FL-3, September 24, 2002

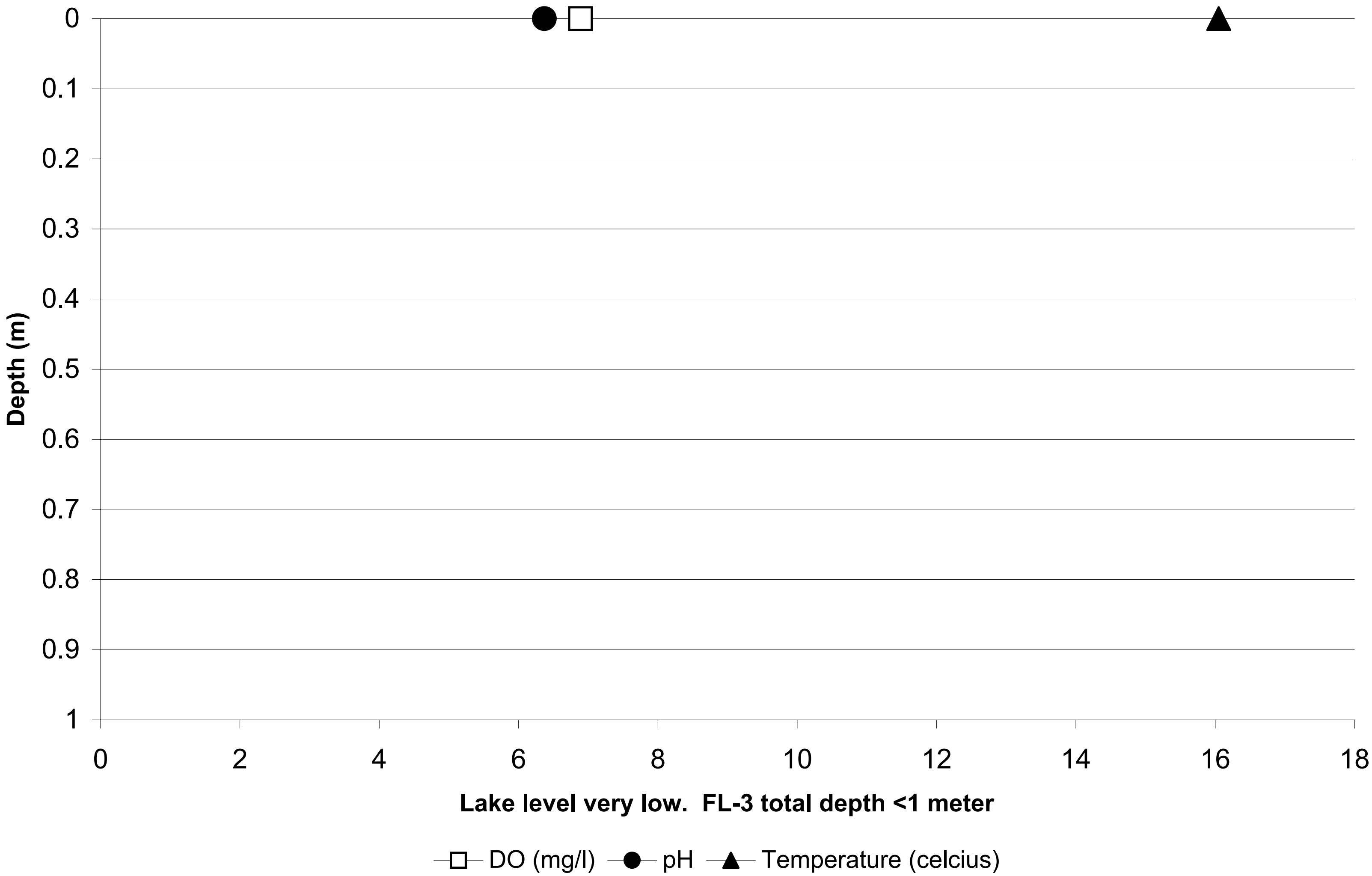


Figure H-46. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-1, May 22, 2002

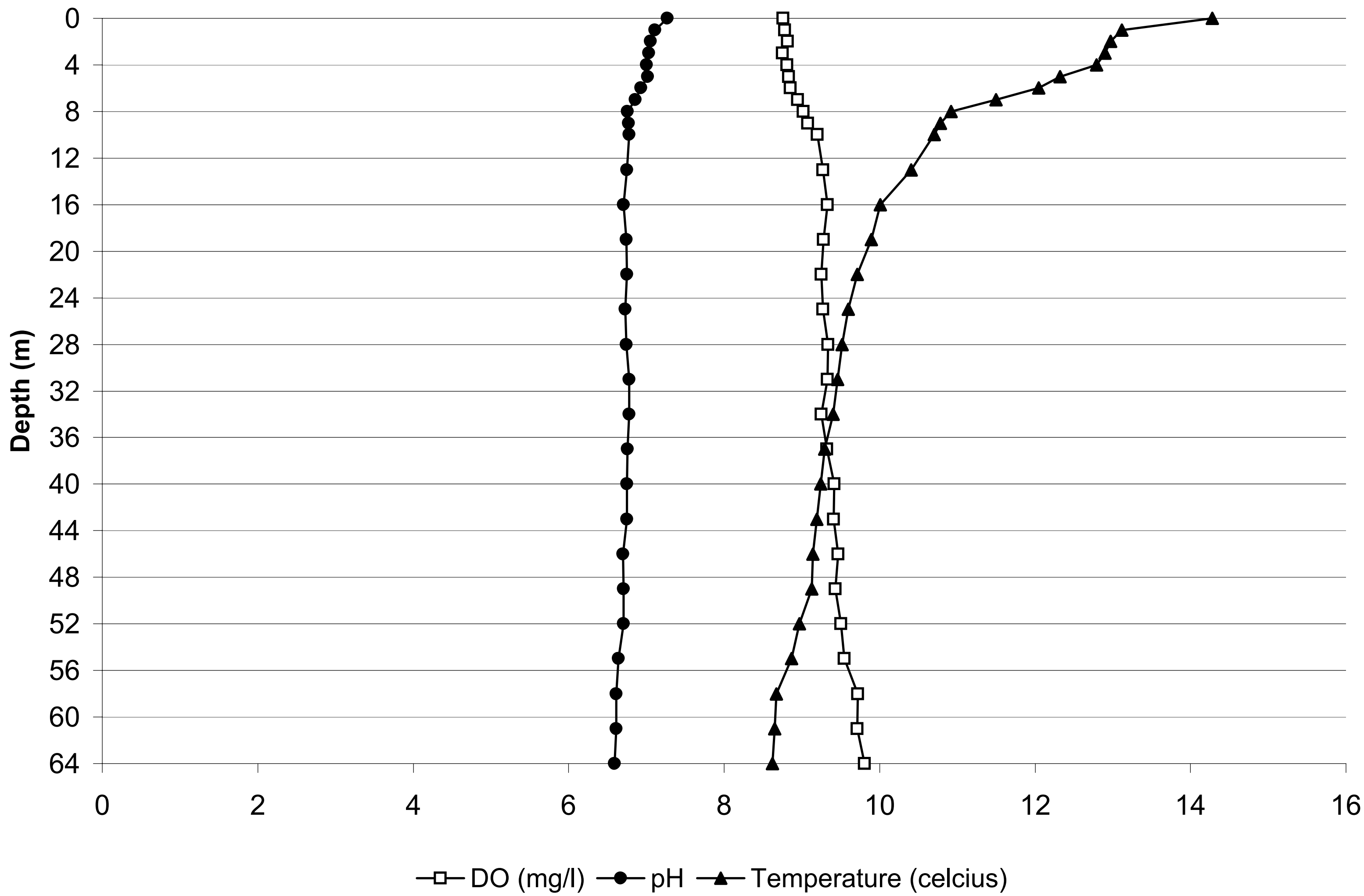


Figure H-47. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-2, May 22, 2002

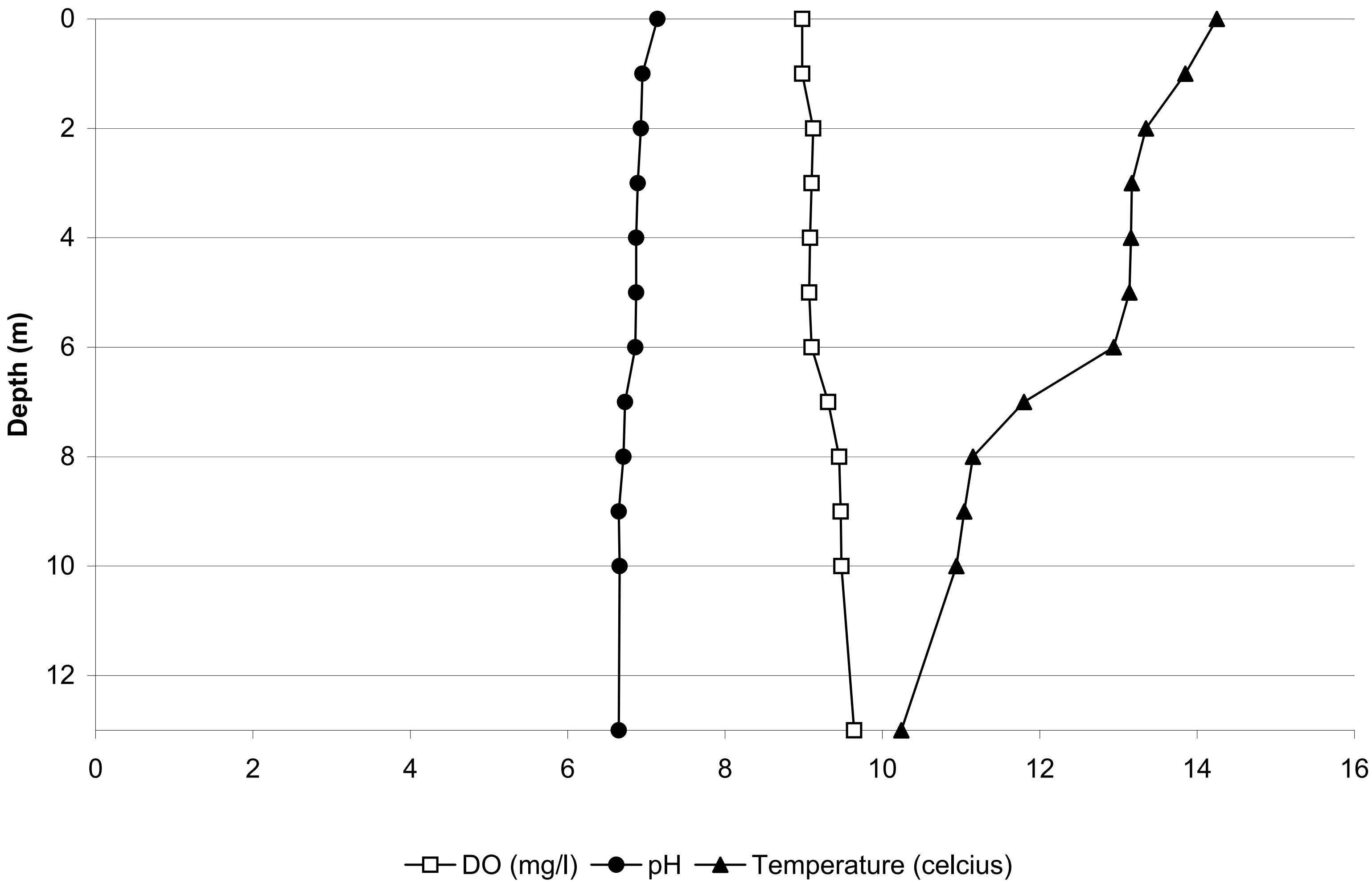


Figure H-48. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-3, May 22, 2002

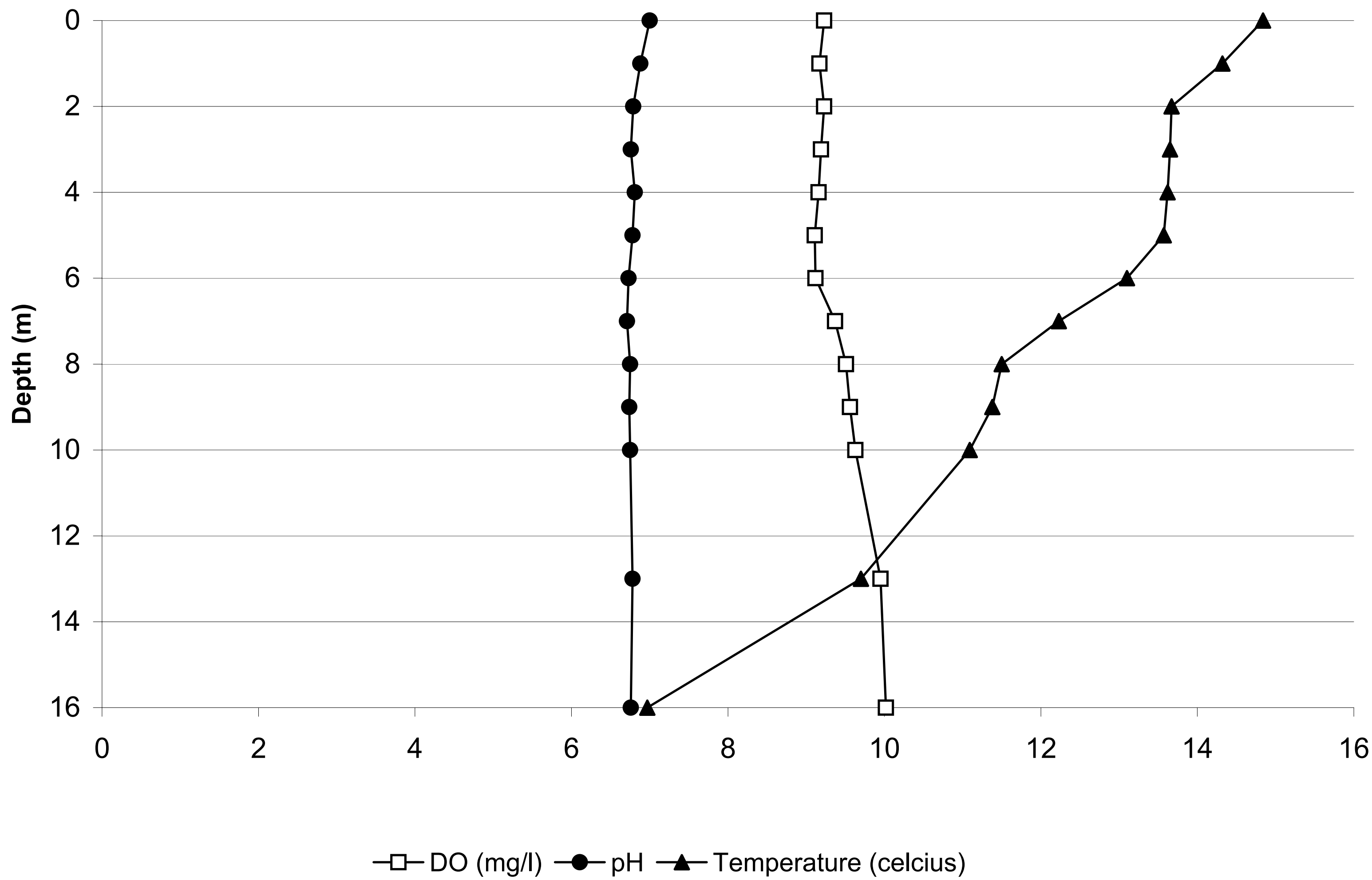


Figure H-49. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-1, July 2, 2002

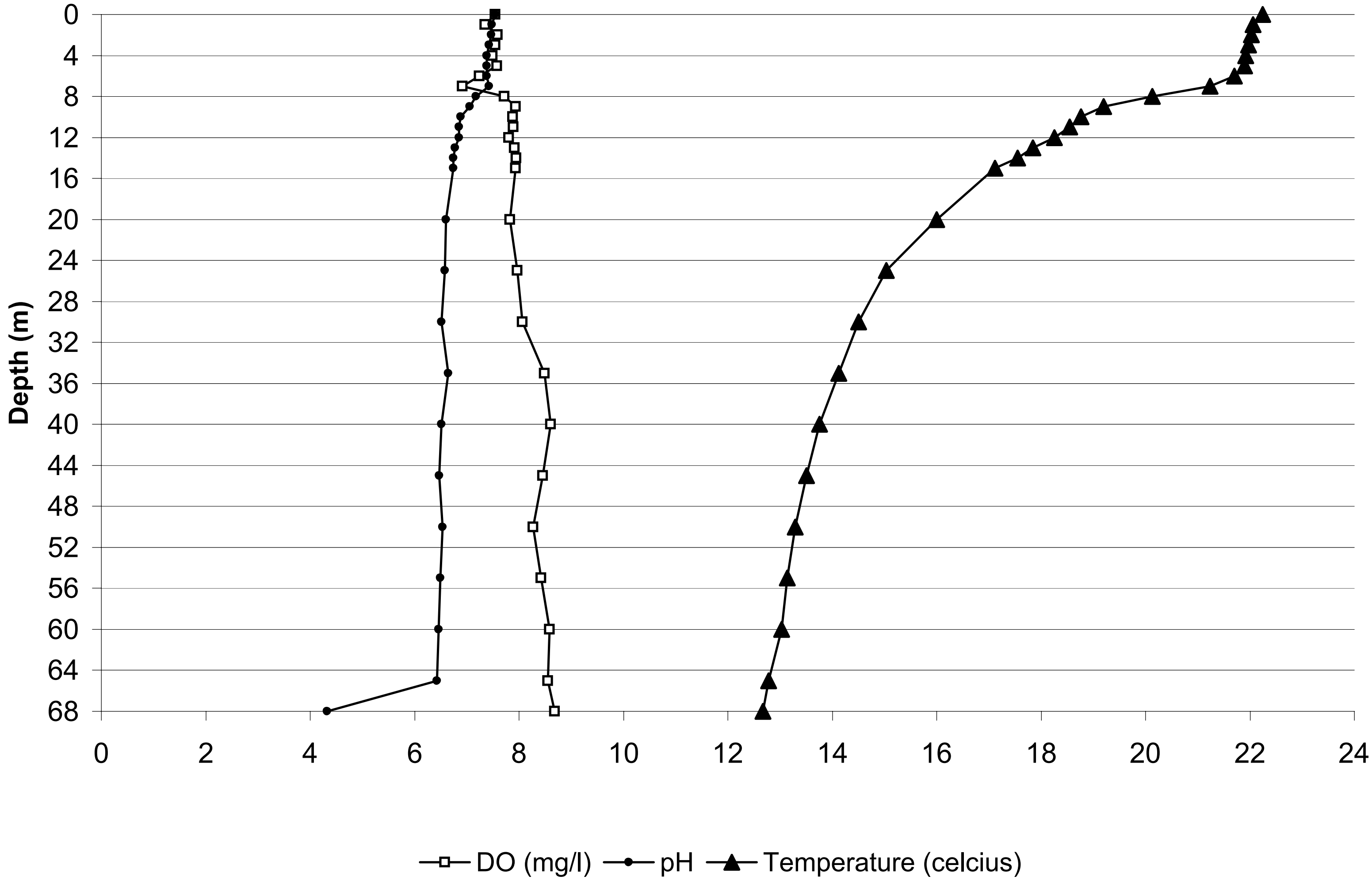


Figure H-50. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-2, July 2, 2002

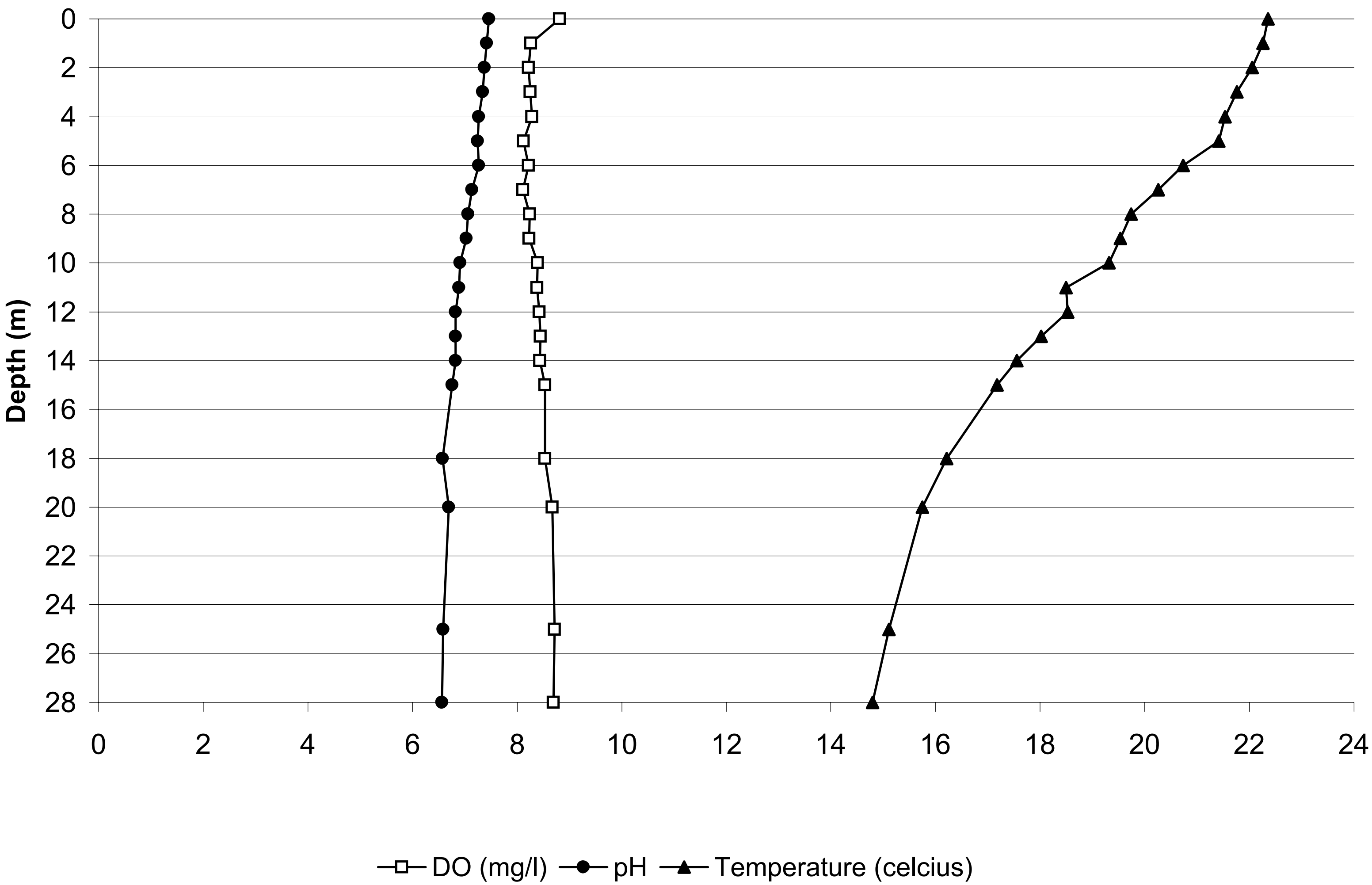


Figure H-51. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-3, July 2, 2002

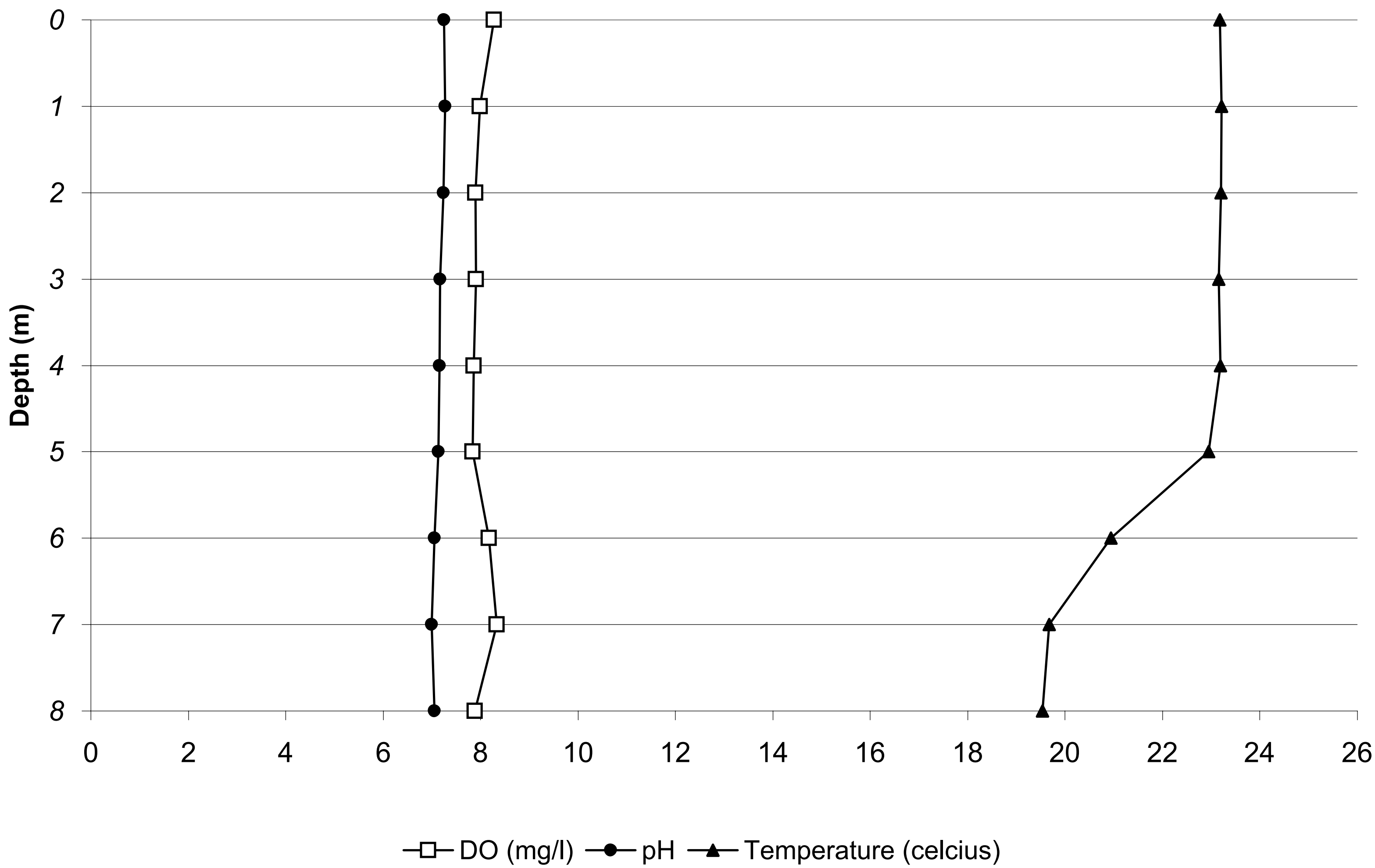


Figure H-52. Mammoth Pool Temperature, Dissolved Oxygen, pH Profiles, Station MP-1, July 22, 2002

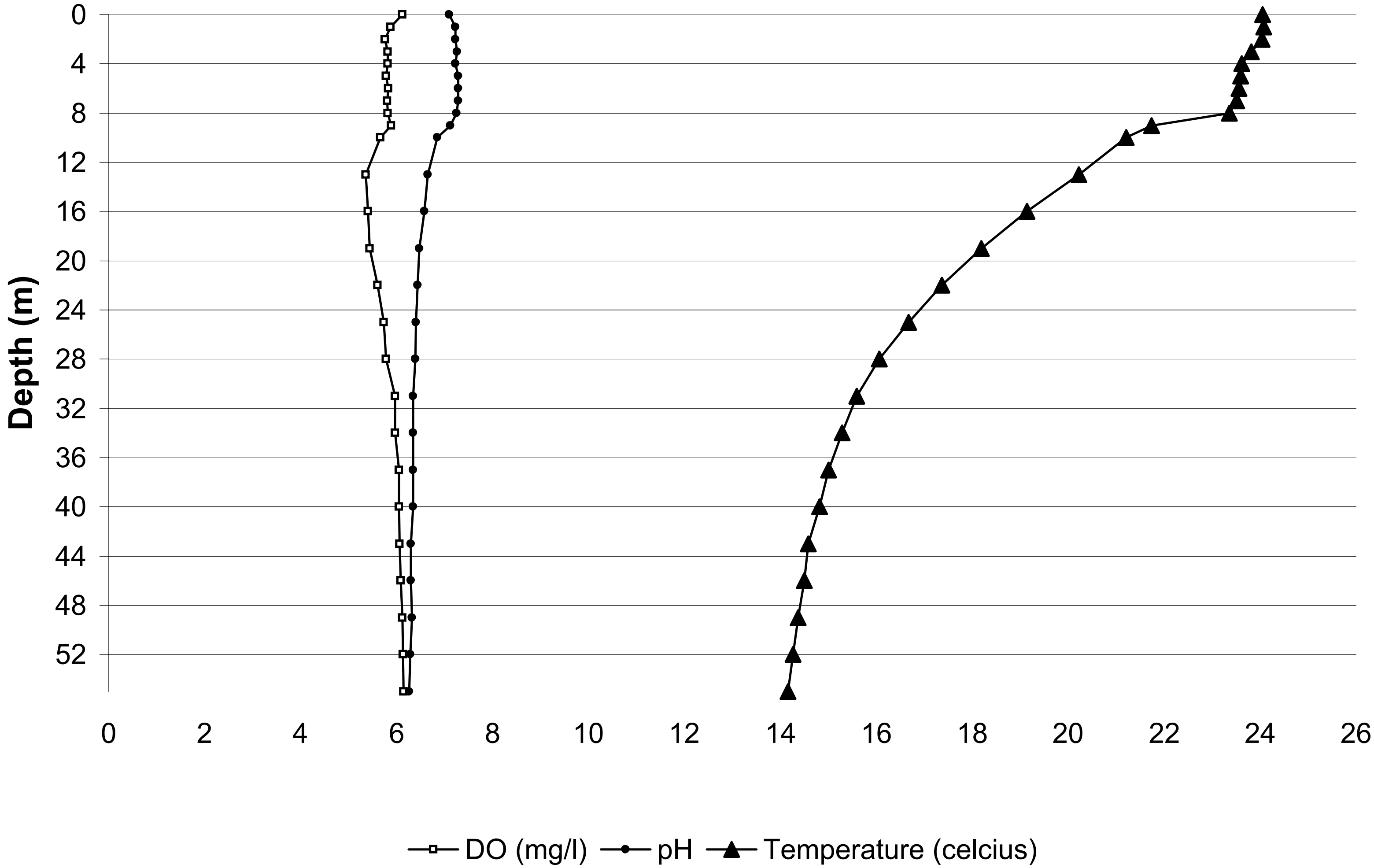


Figure H-53. Mammoth Pool Temperature, Dissolved Oxygen, pH Profiles, Station MP-2, July 22, 2002

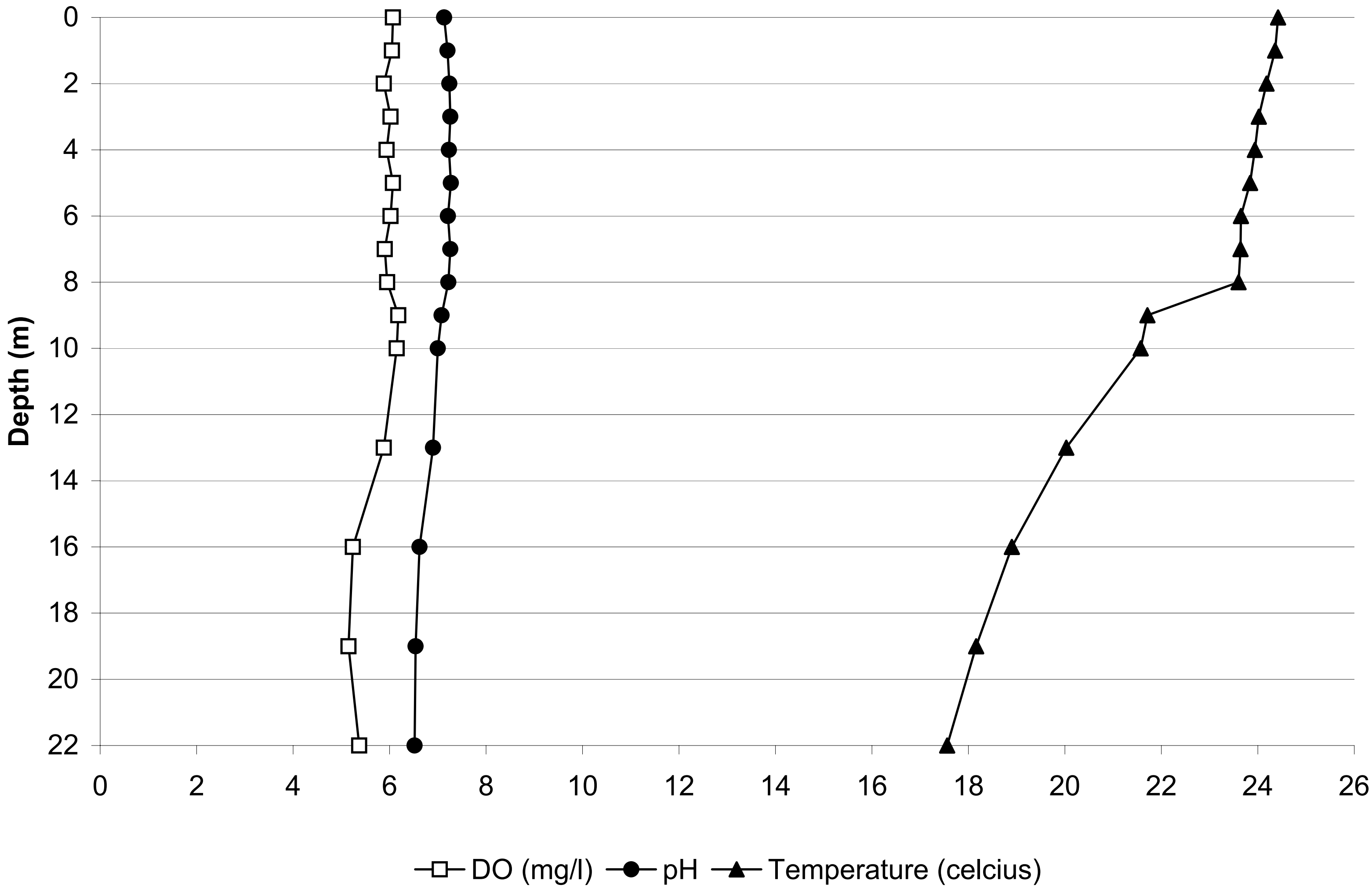


Figure H-54. Mammoth Pool Temperature, Dissolved Oxygen, pH Profiles, Station MP-3, July 22, 2002

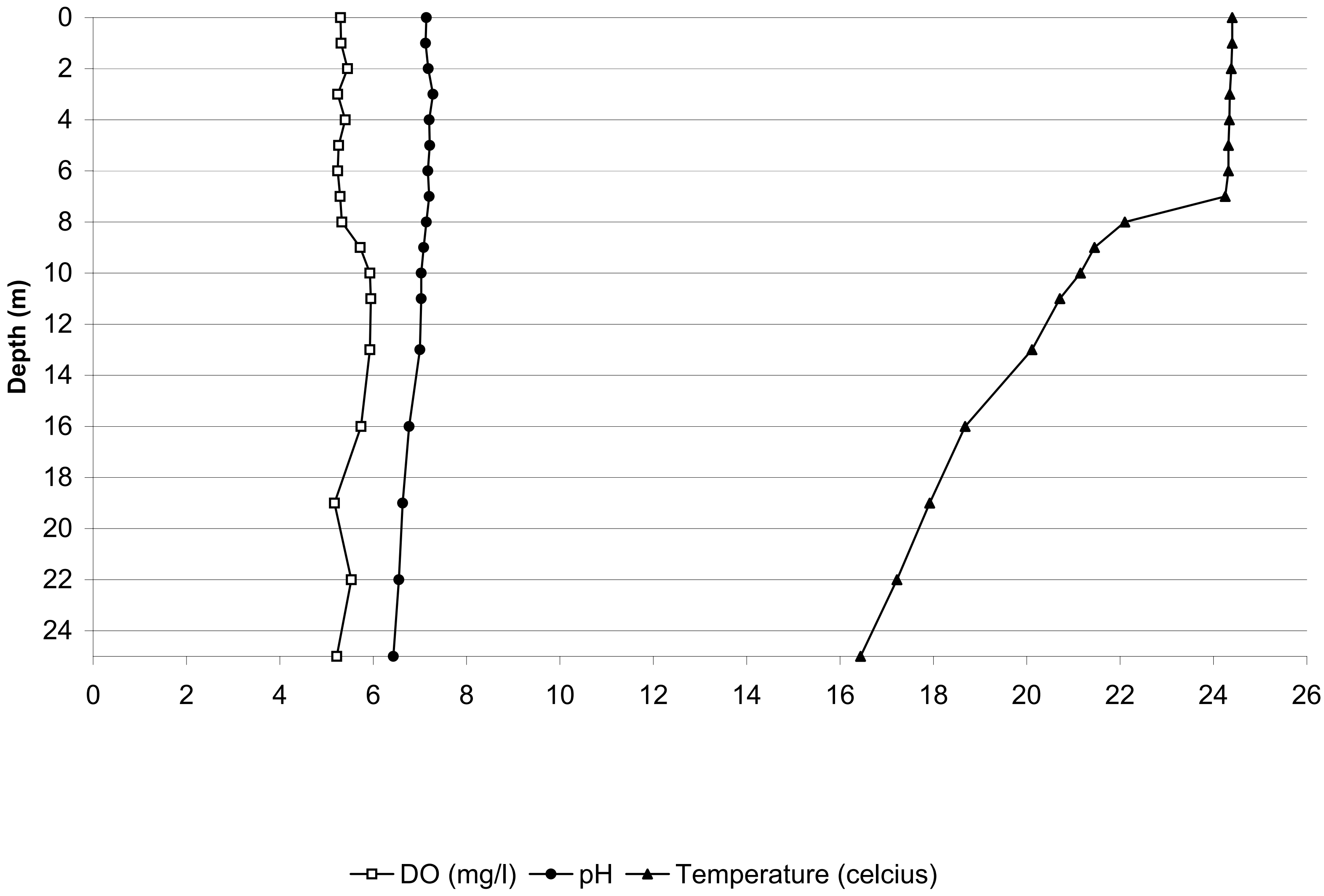


Figure H-55. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-1, August 21, 2002

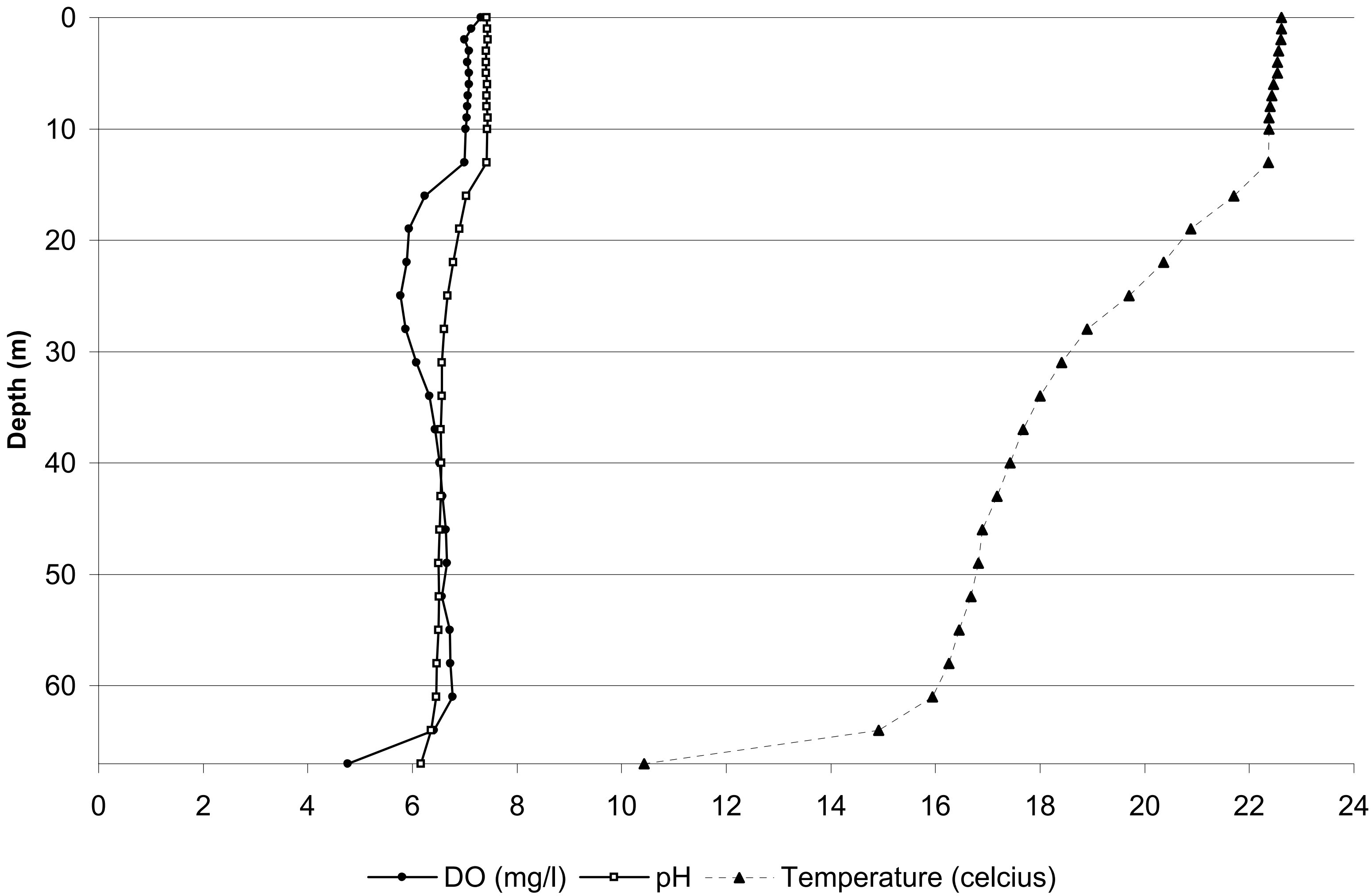


Figure H-56. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-2, August 21, 2002

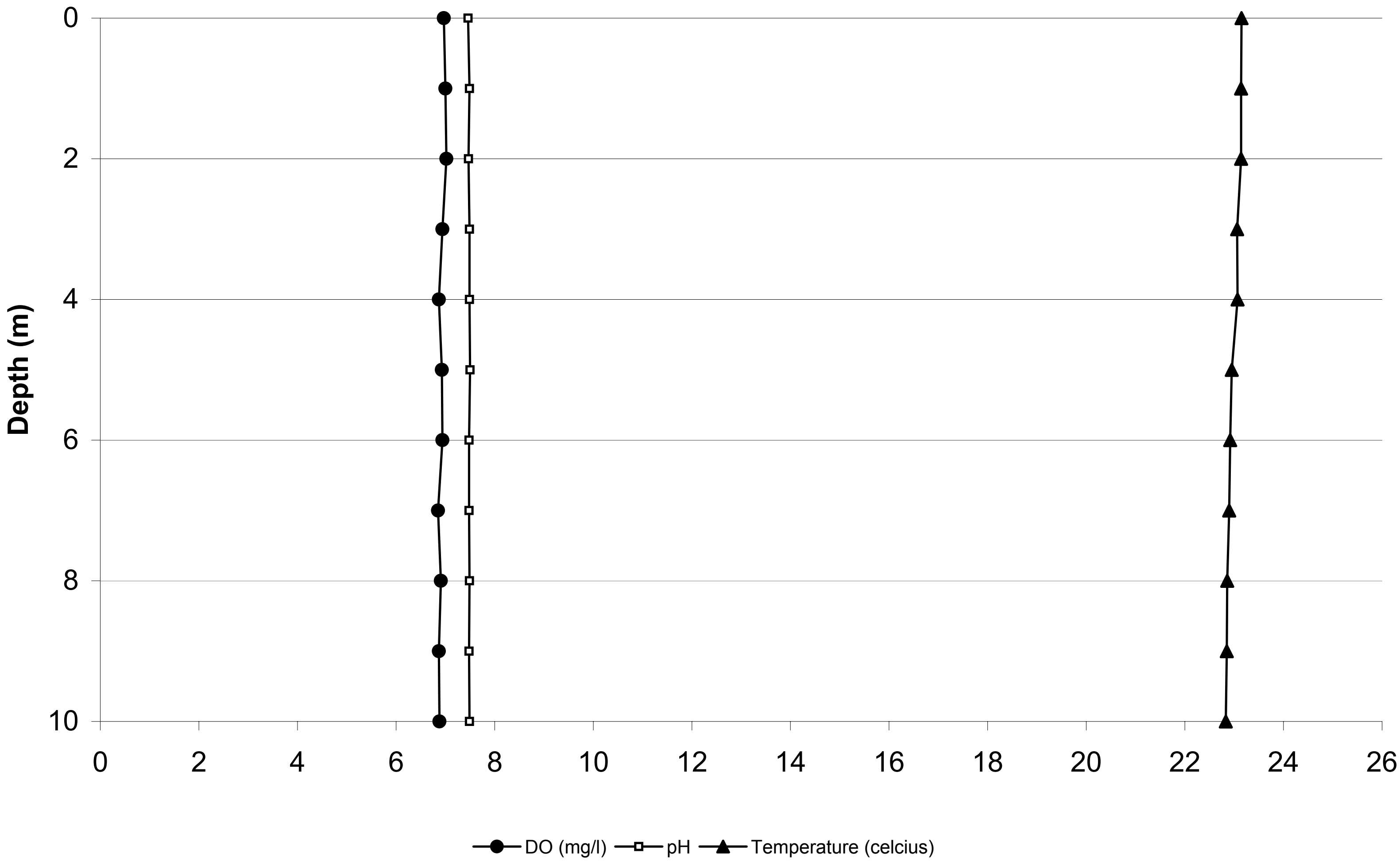


Figure H-57. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-3, August 21, 2002

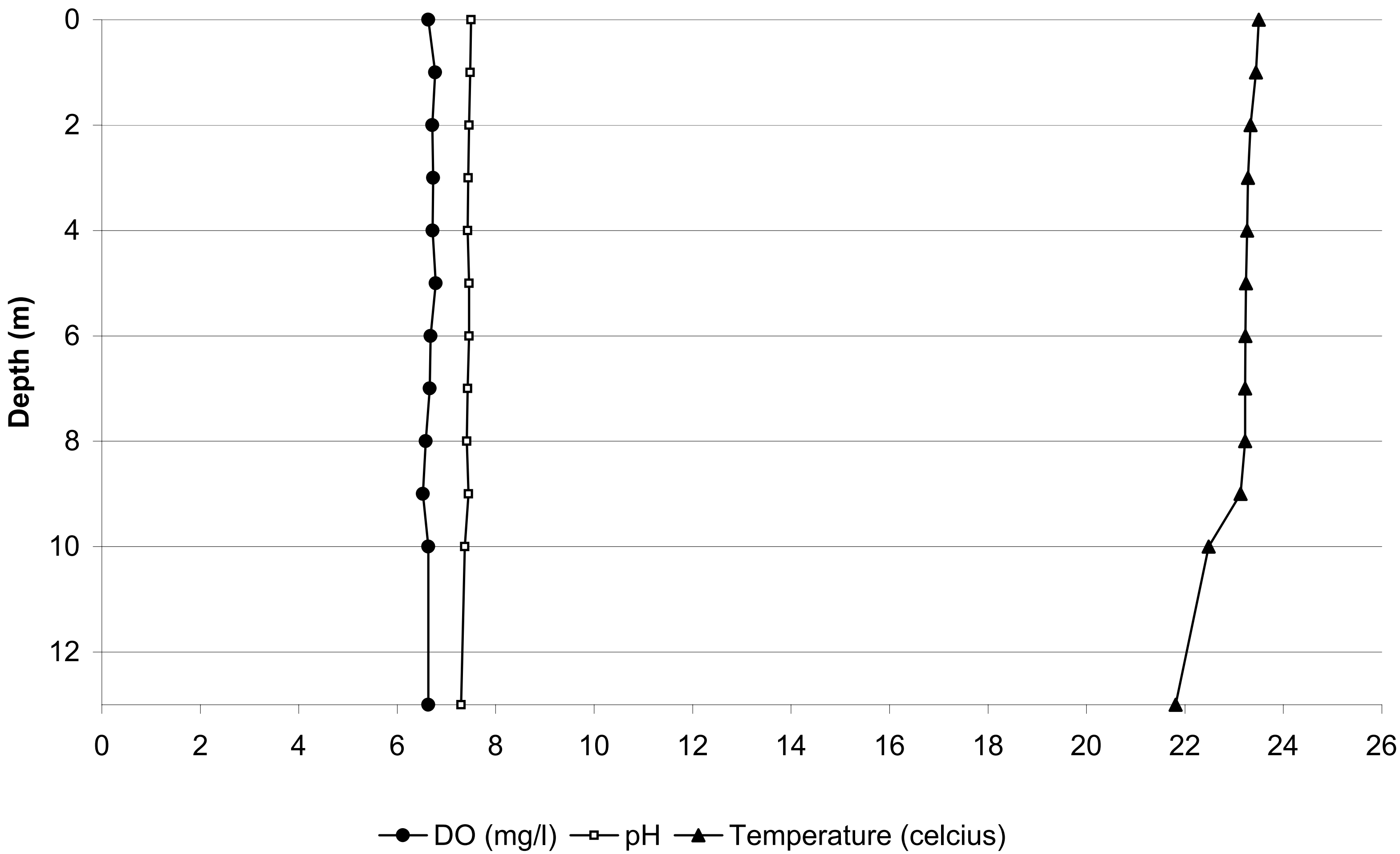


Figure H-58. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-1, September 25, 2002

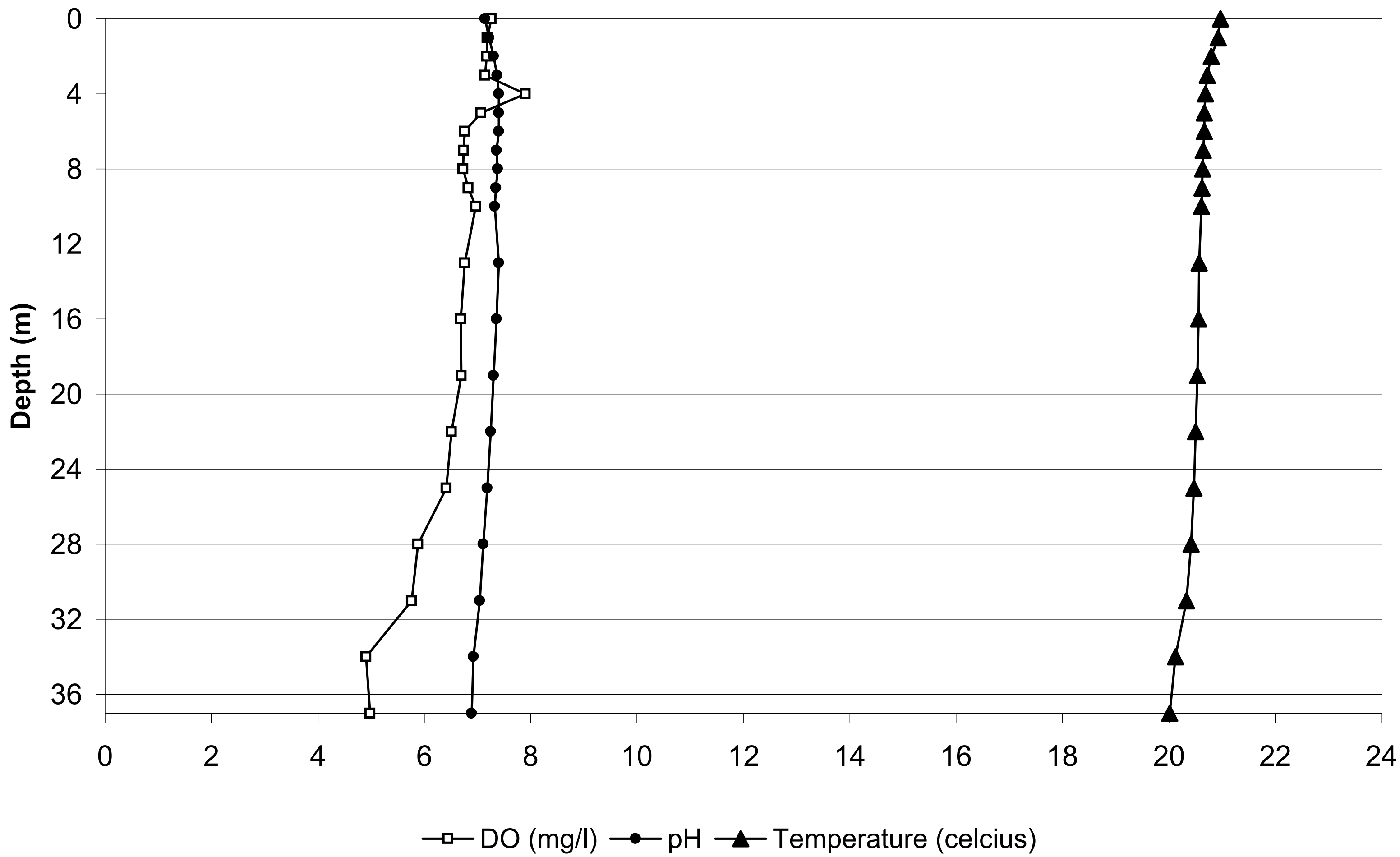


Figure H-59. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-2, September 25, 2002

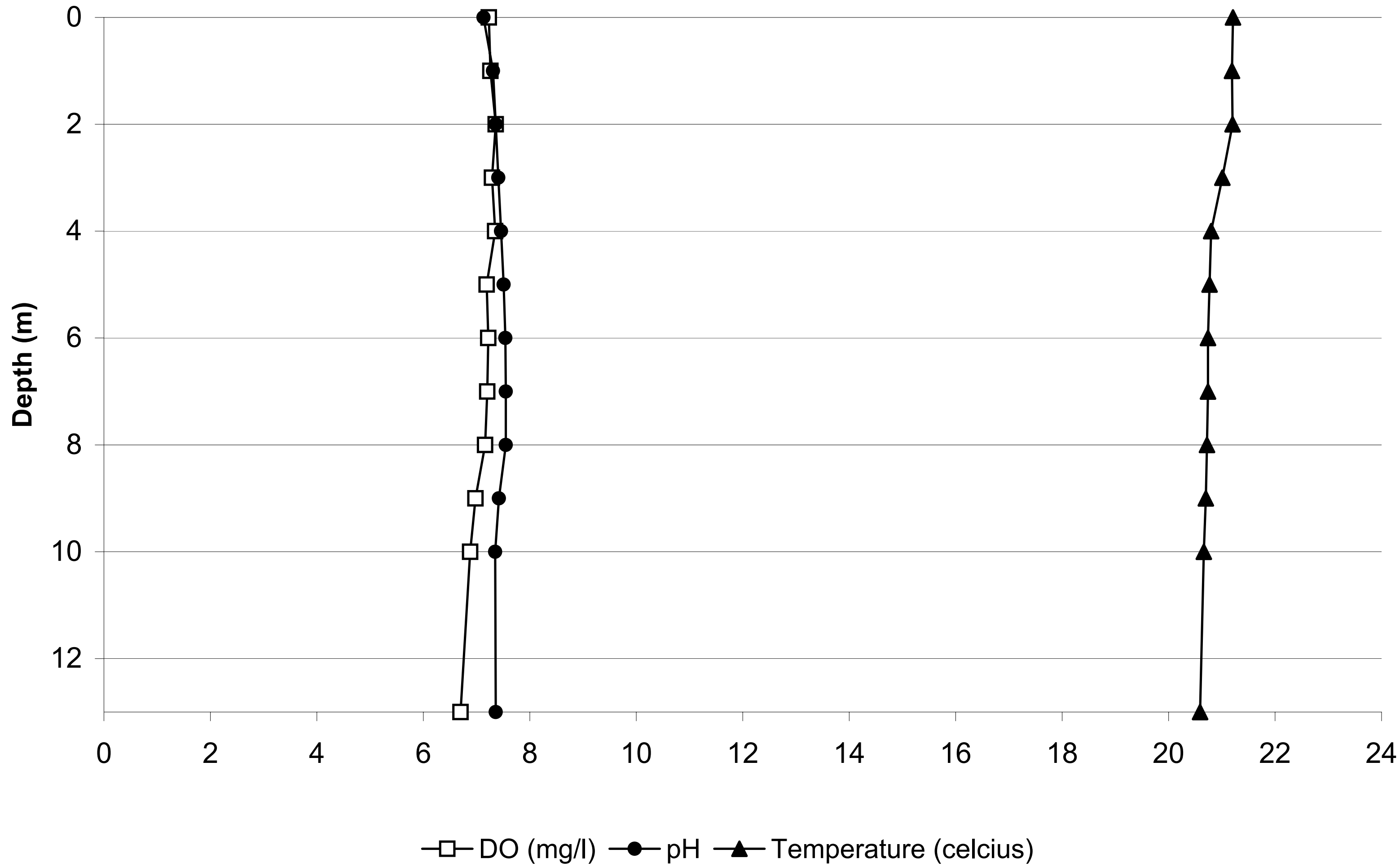


Figure H-60. Mammoth Pool Temperature, Dissolved Oxygen, and pH Profiles, Station MP-3, September 25, 2002

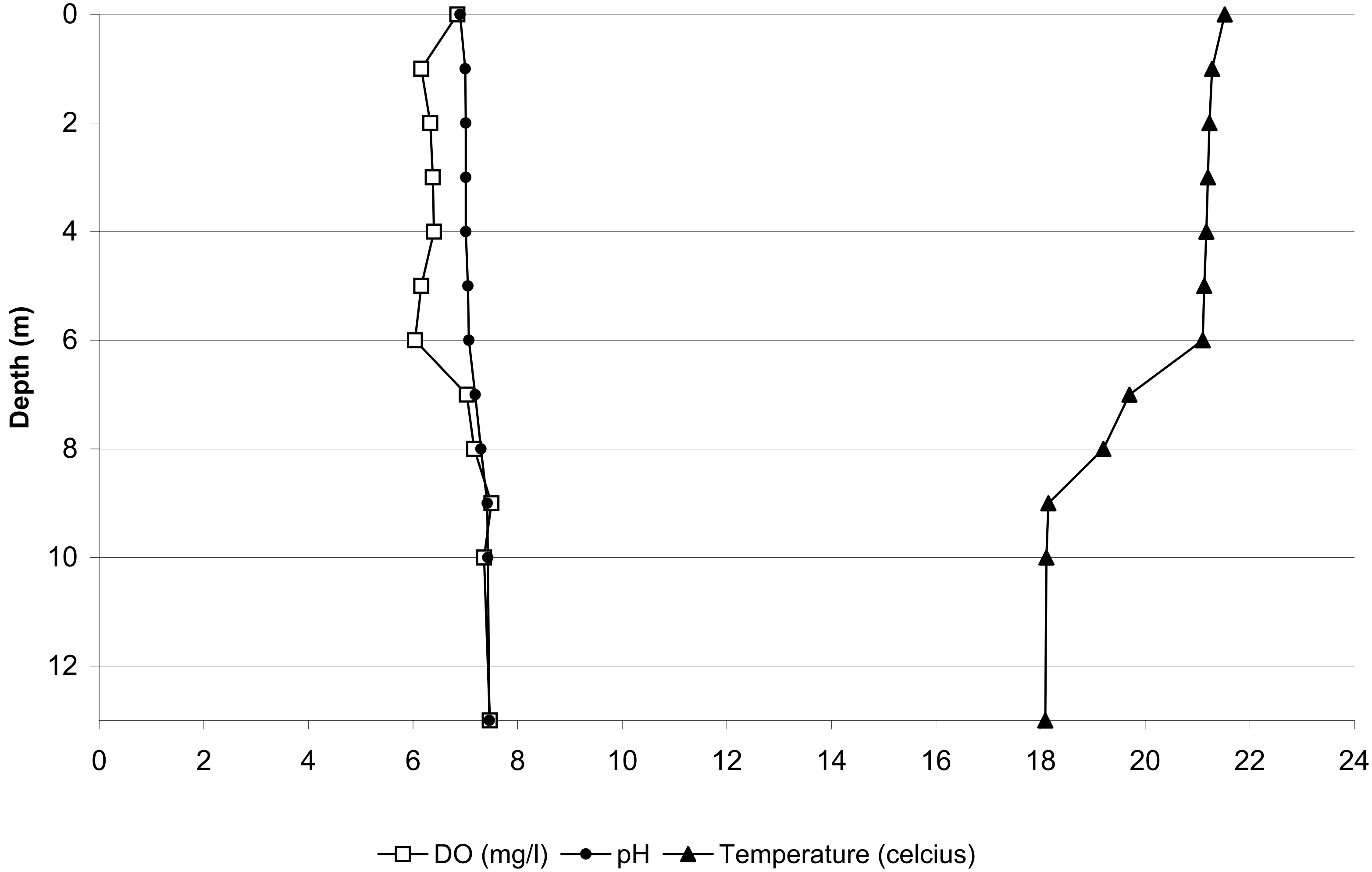


Figure H-61. Balsam Forebay Temperature, Dissolved Oxygen, and pH Profiles, Station BA-1, June 5, 2002

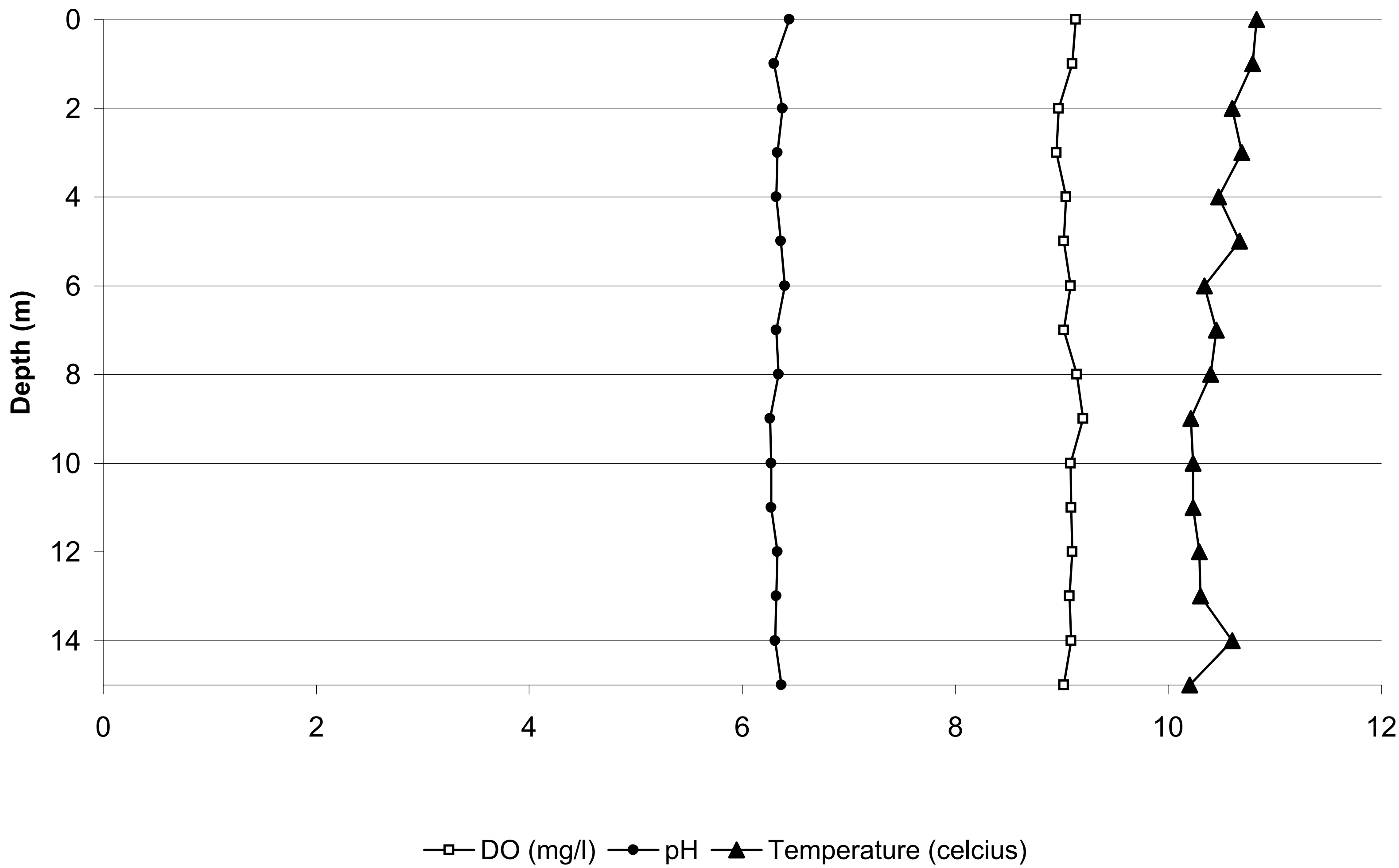


Figure H-62. Balsam Forebay Temperature, Dissolved Oxygen, and pH Profiles, Station BA-2, June 5, 2002

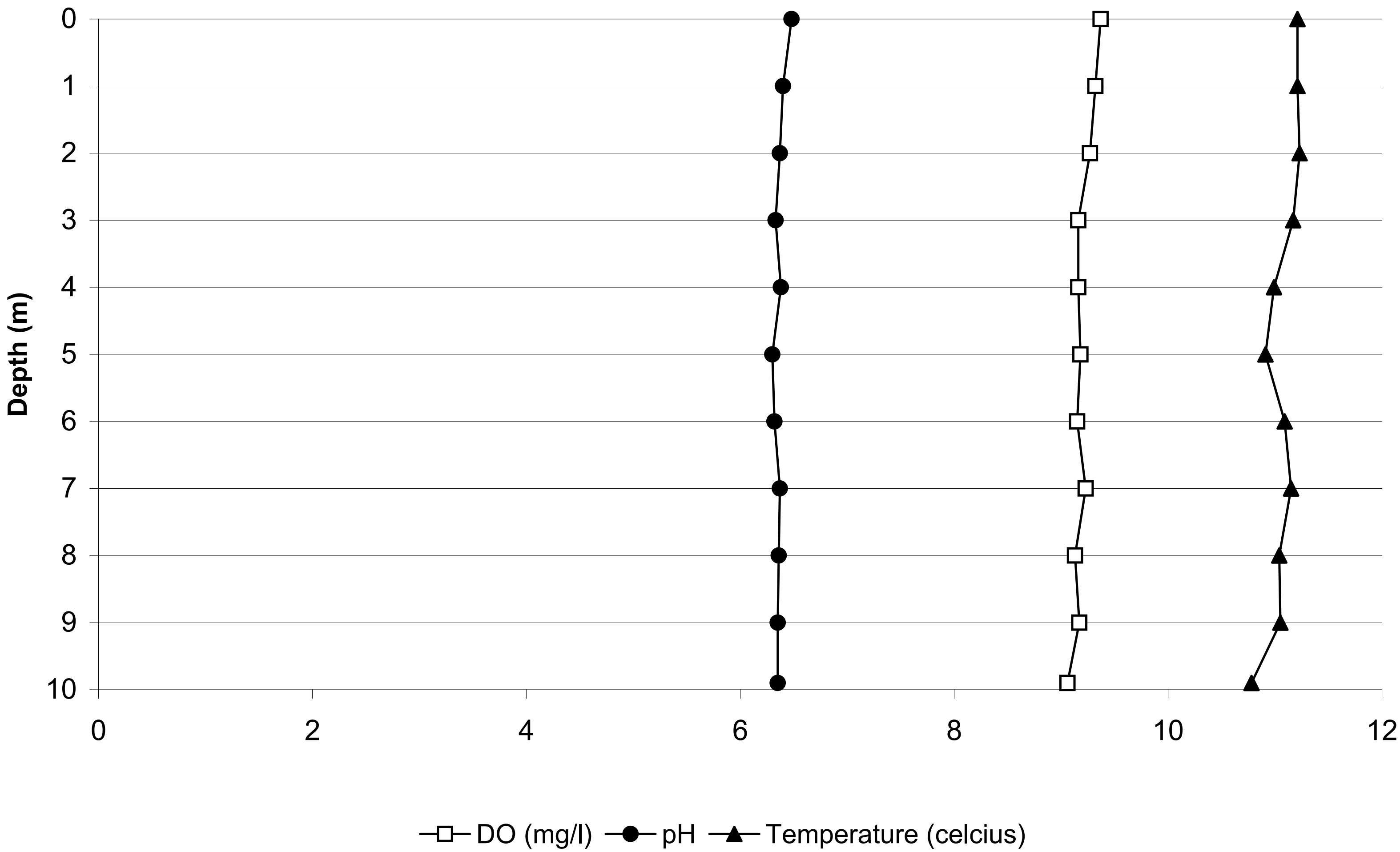


Figure H-63. Balsam Forebay Temperature, Dissolved Oxygen, and pH Profiles, Station BA-1, June 27, 2002

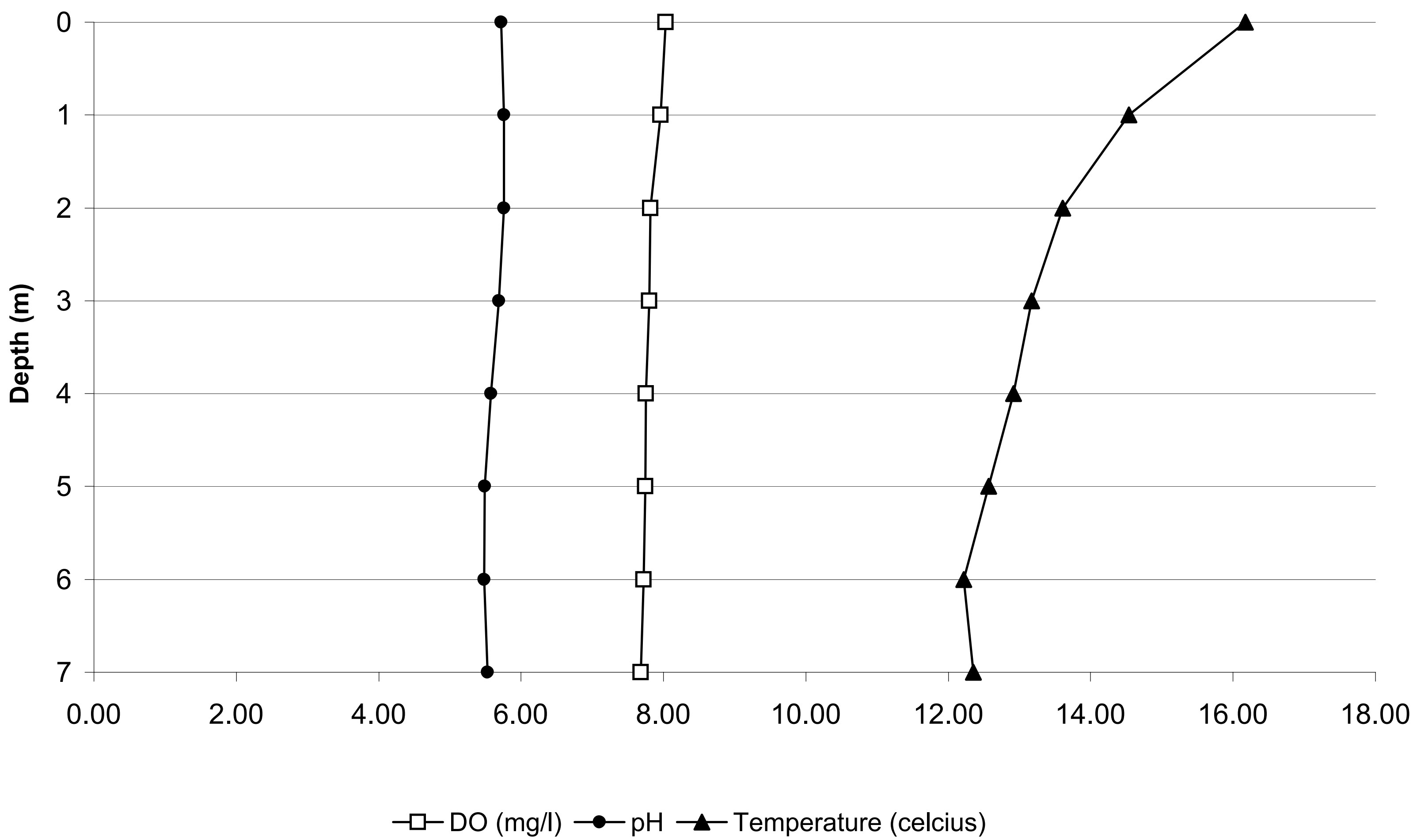


Figure H-64. Balsam Forebay Temperature, Dissolved Oxygen, and pH Profiles, Station BA-2, June 27, 2002

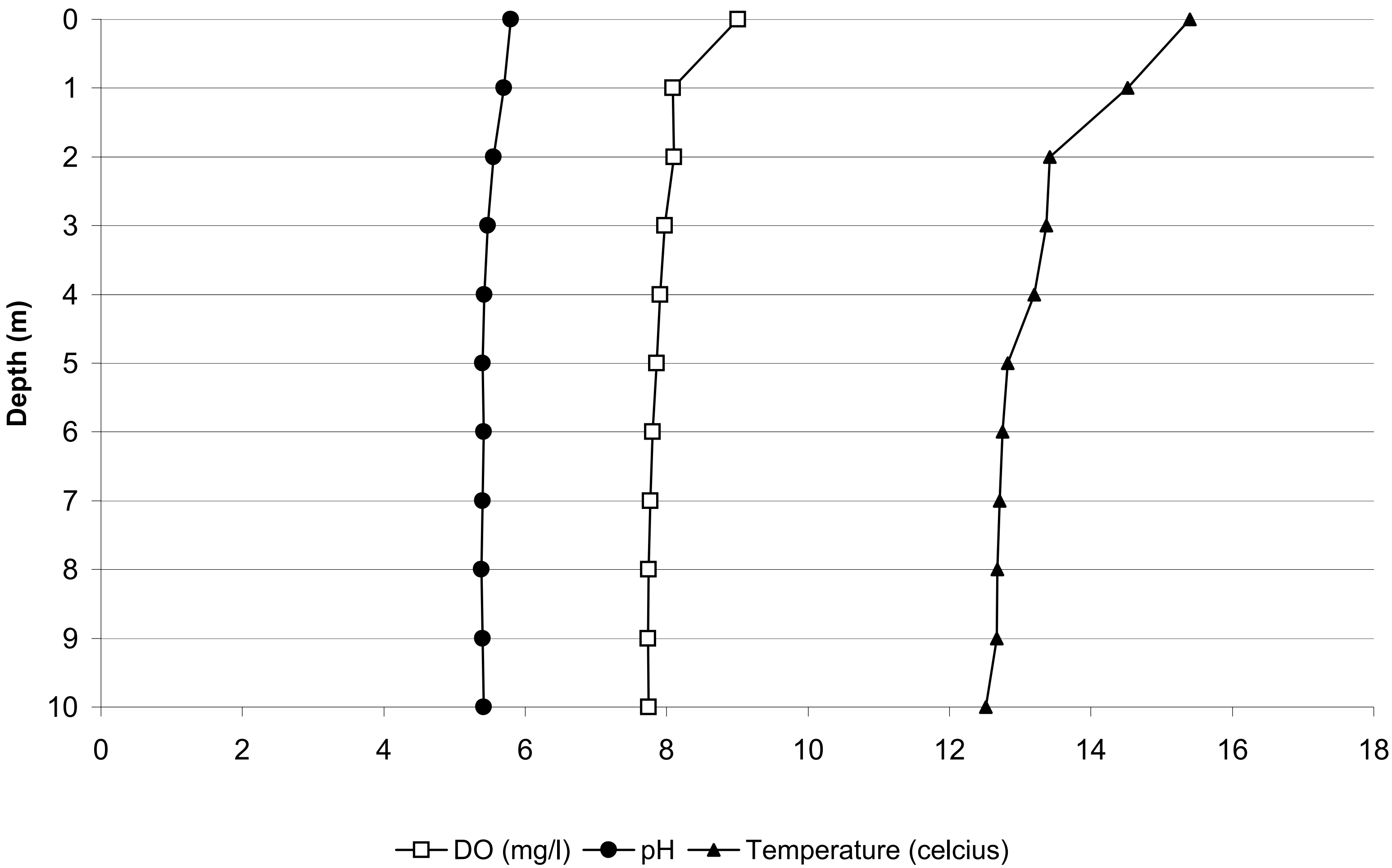


Figure H-65. Balsam Forebay Temperature, Dissolved Oxygen, pH Profiles, Station BA-1, July 25, 2002

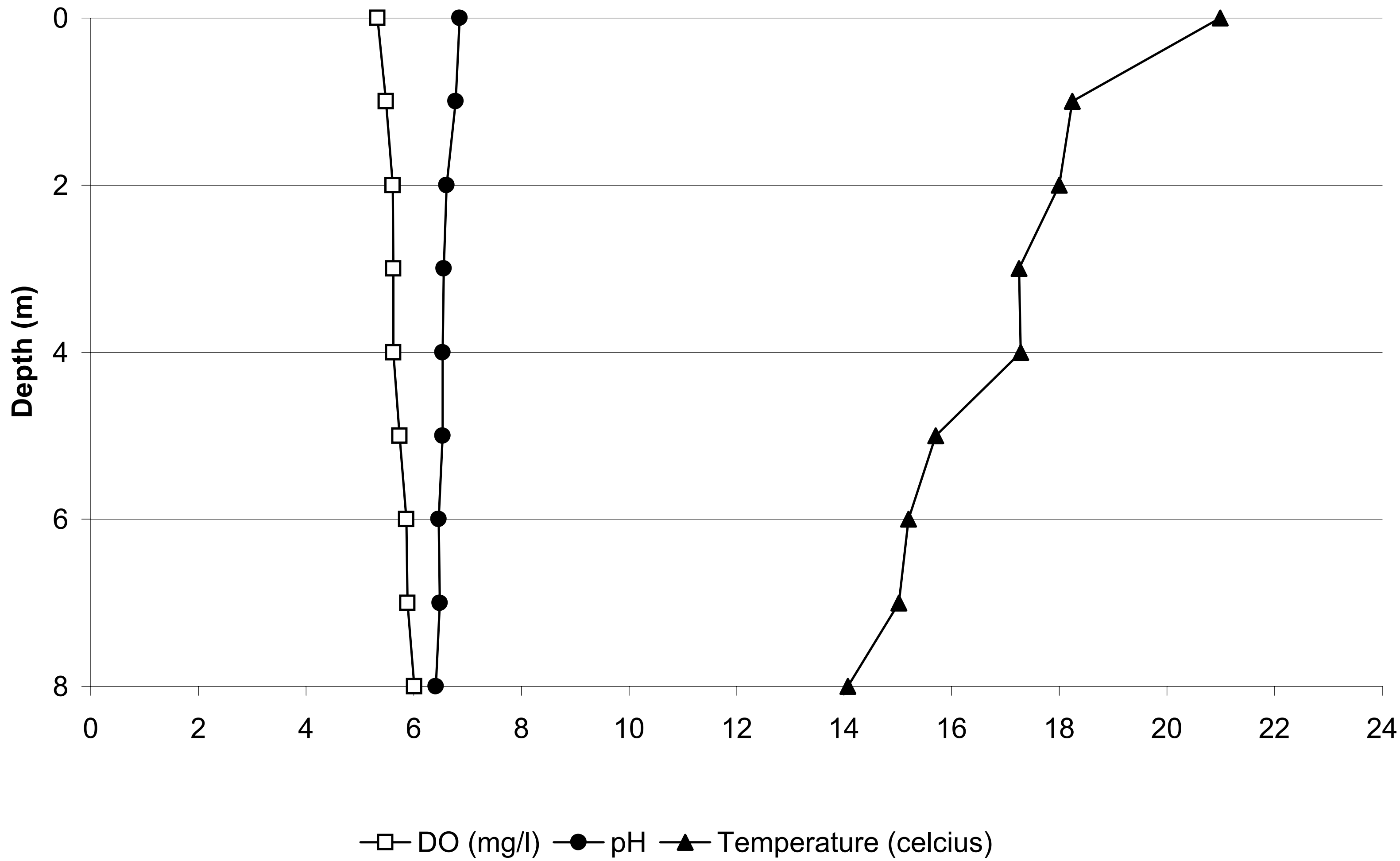


Figure H-66. Balsam Forebay Temperature, Dissolved Oxygen, pH Profiles, Station BA-2, July 25, 2002

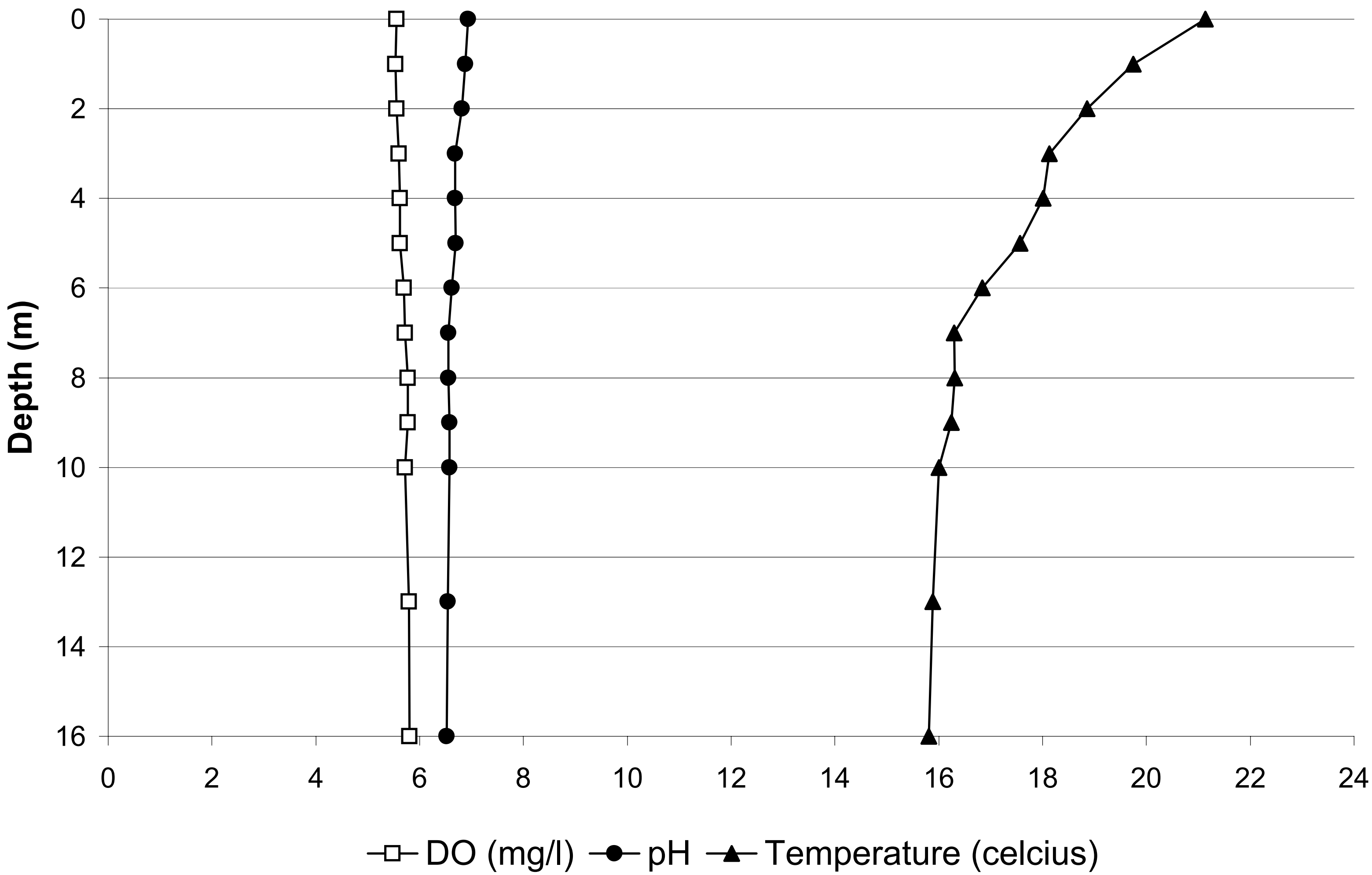


Figure H-67. Balsam Forebay Temperature, Dissolved Oxygen, and pH Profiles, Station BA-1, August 23, 2002

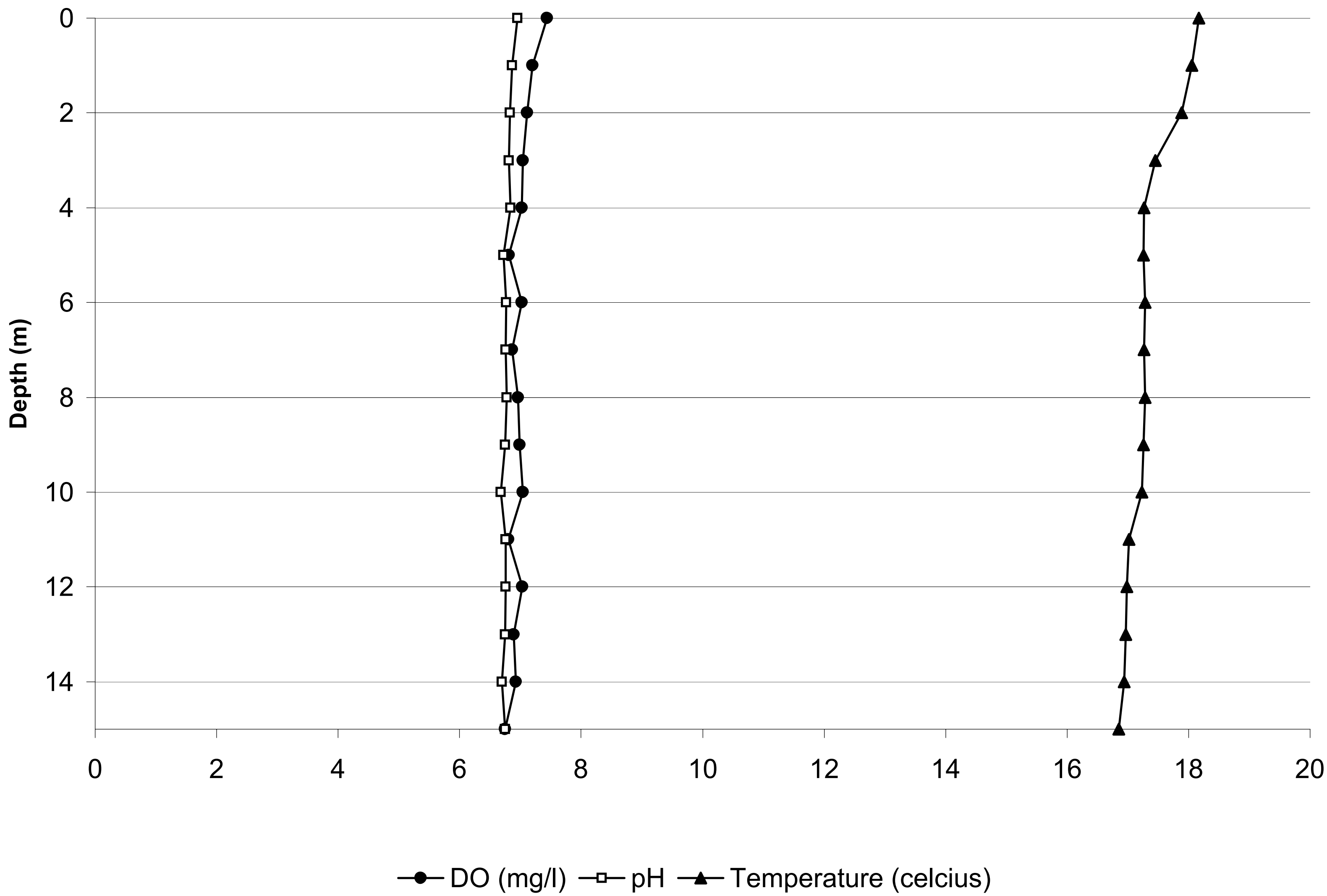


Figure H-68. Balsam Forebay Temperature, Dissolved Oxygen, and pH Profiles, Station BA-2, August 23, 2002

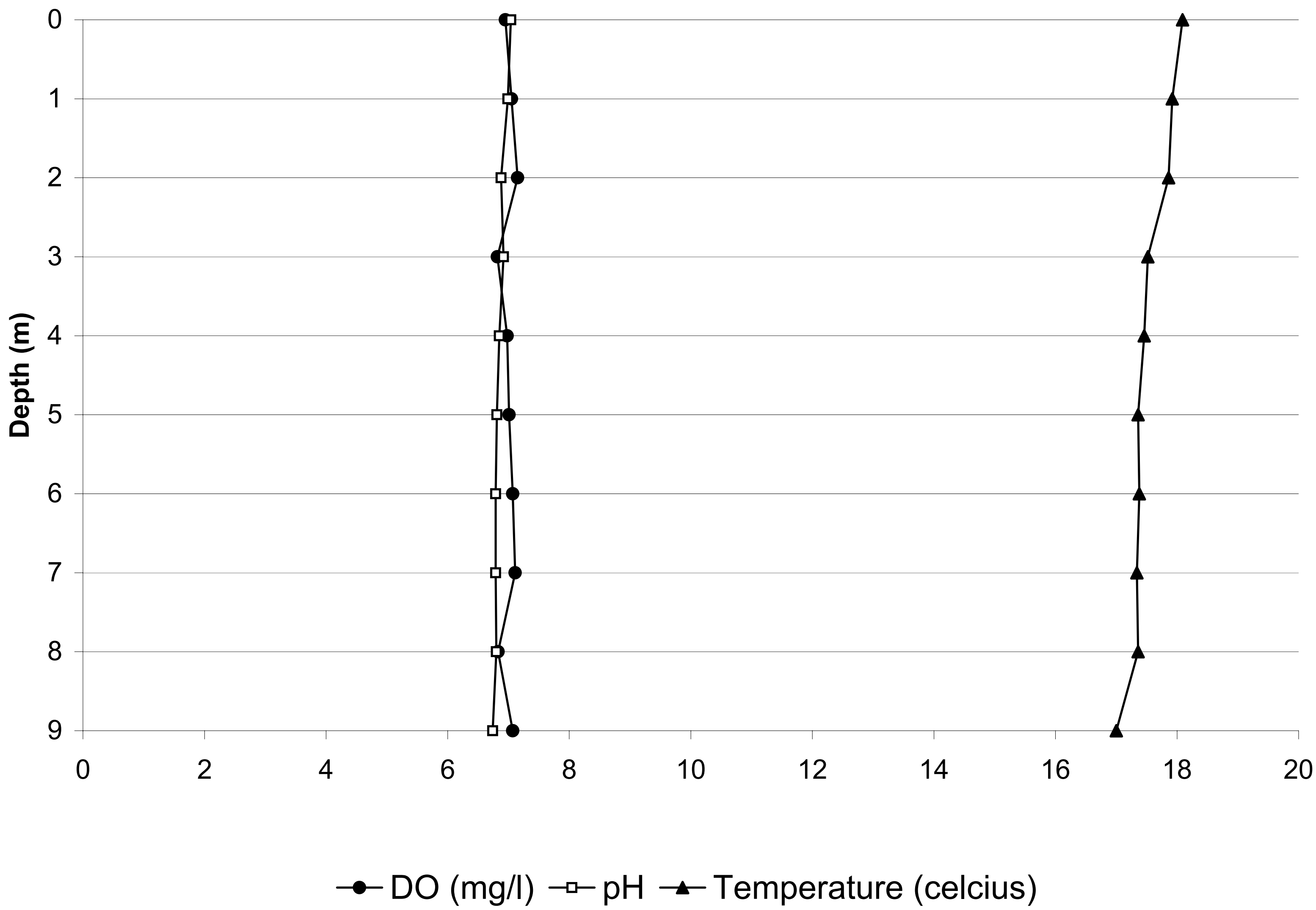


Figure H-69. Balsam Forebay Temperature, Dissolved Oxygen, and pH Profiles, Station BA-1, September 26, 2002

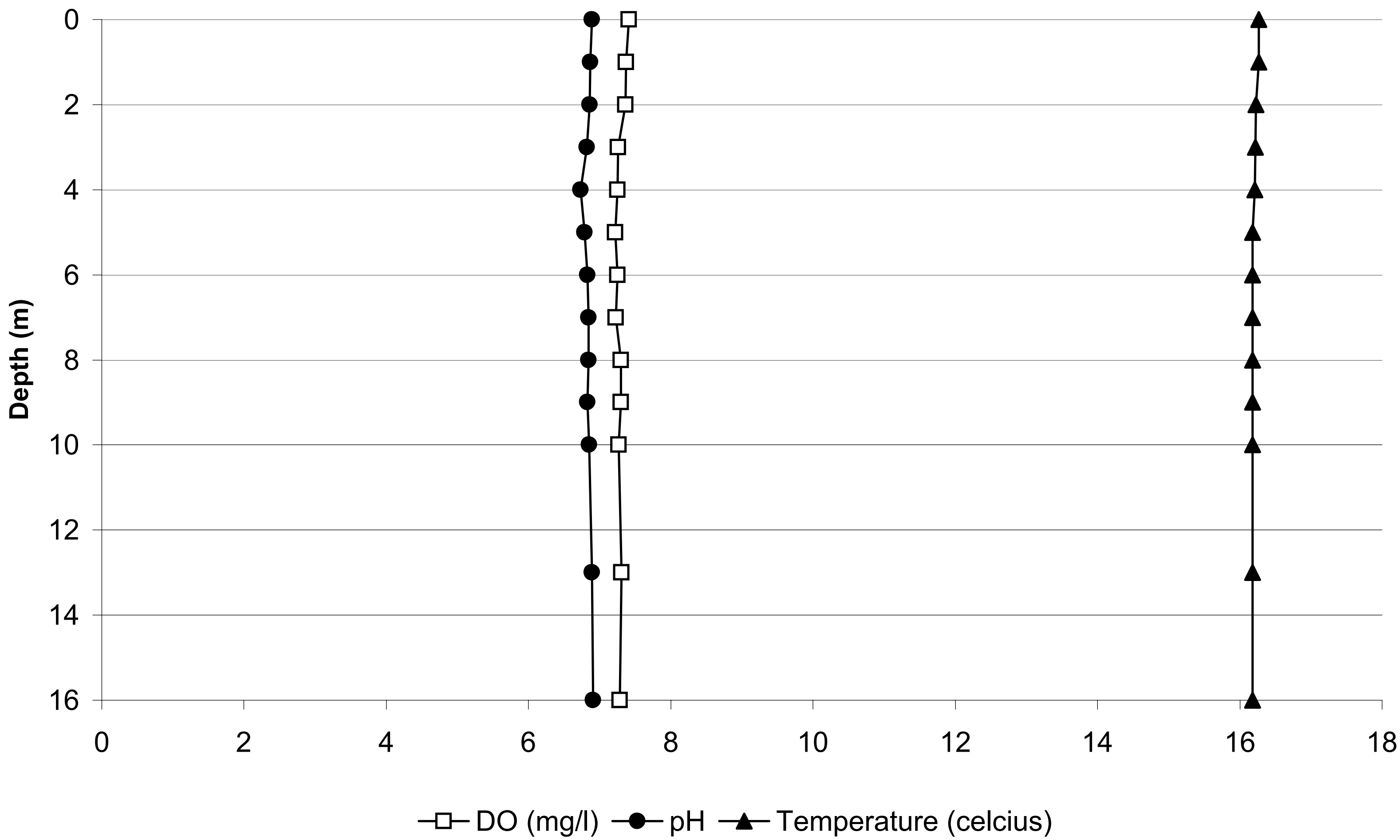


Figure H-70. Balsam Forebay Temperature, Dissolved Oxygen, and pH Profiles, Station BA-2, September 26, 2002

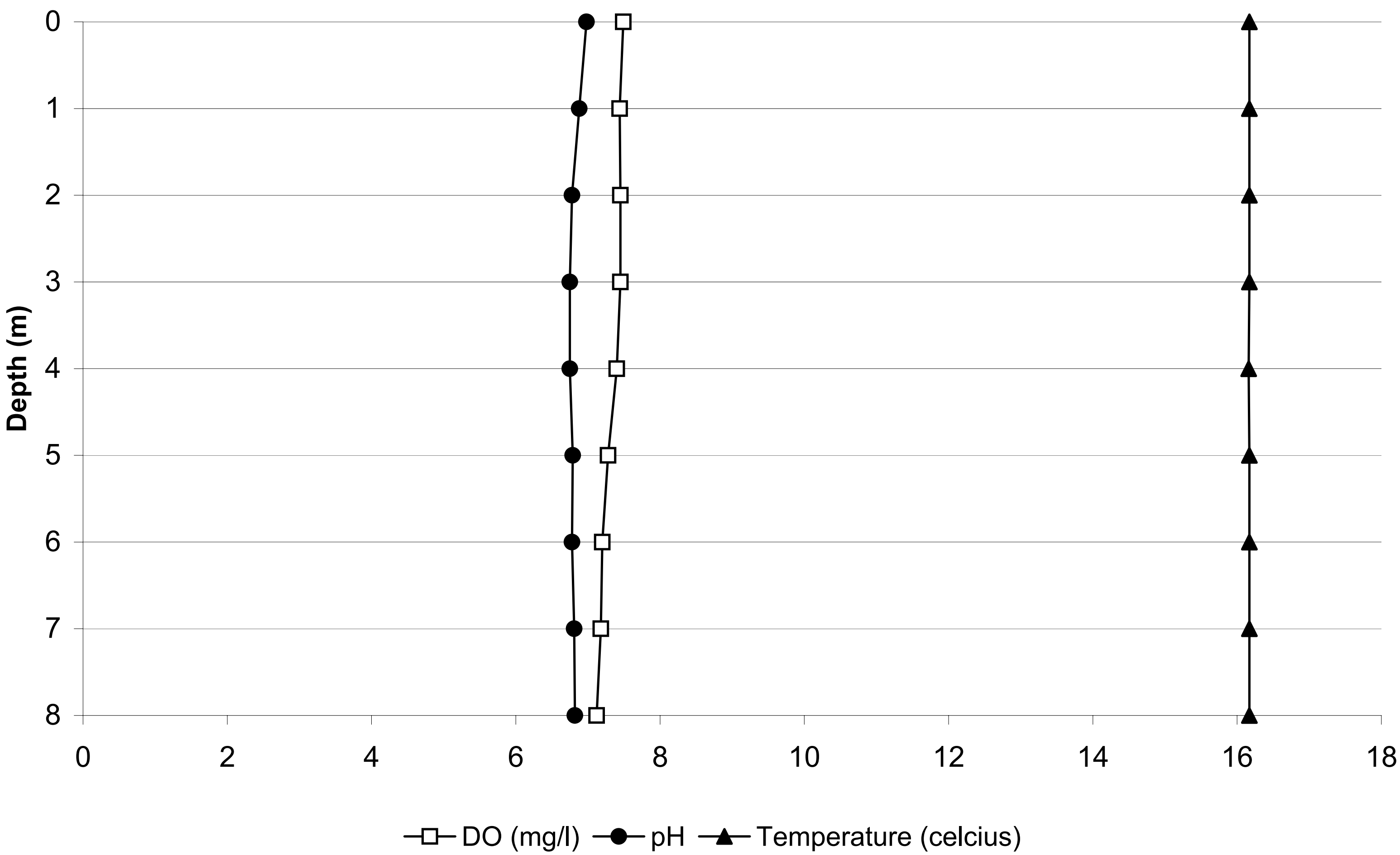


Figure H-71. Bear Diversion Temperature, Dissolved Oxygen, and pH Profiles, Station BE-2, June 6, 2002

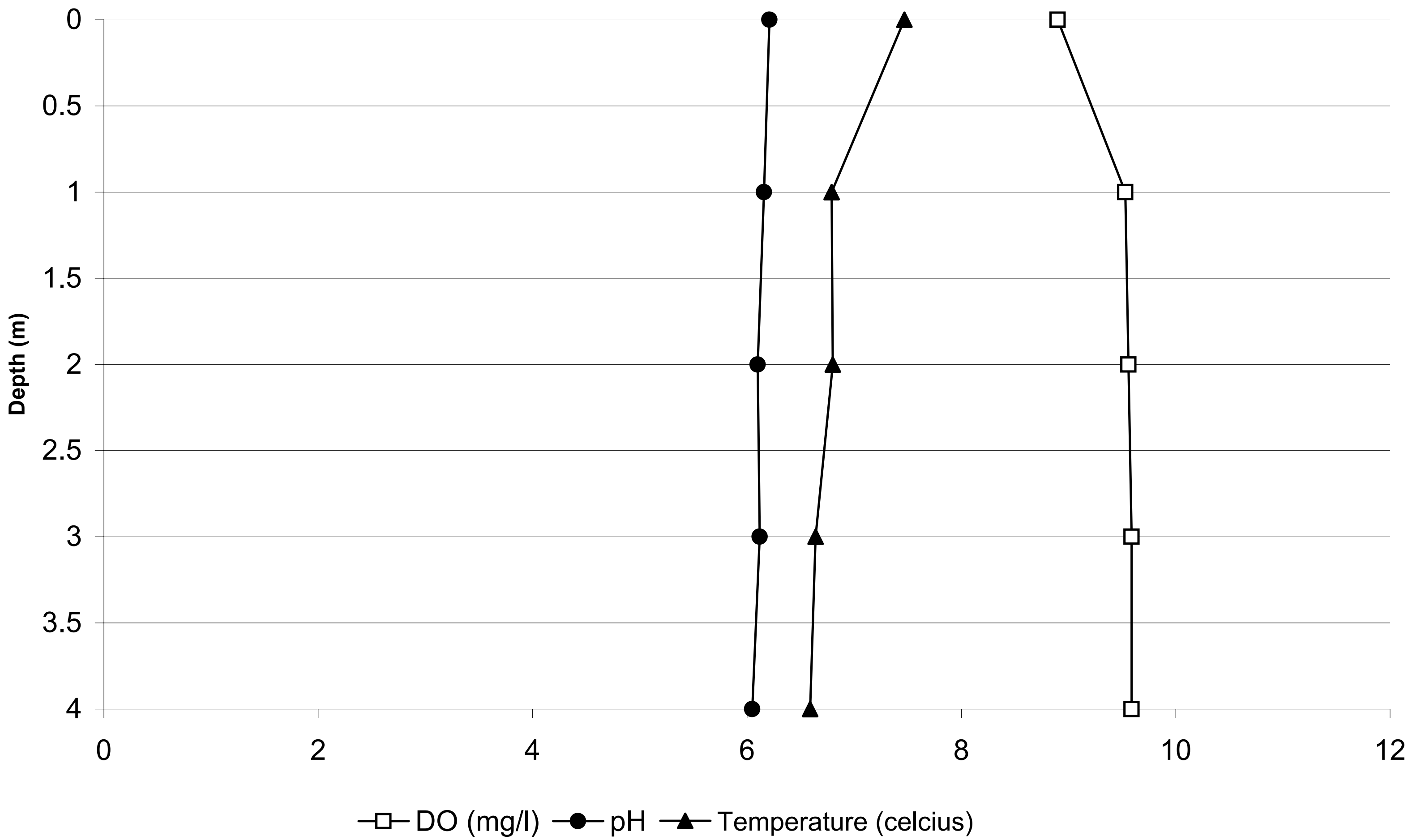


Figure H-72. Bear Diversion Temperature, Dissolved Oxygen, and pH Profiles, Station BE-2, June 28, 2002

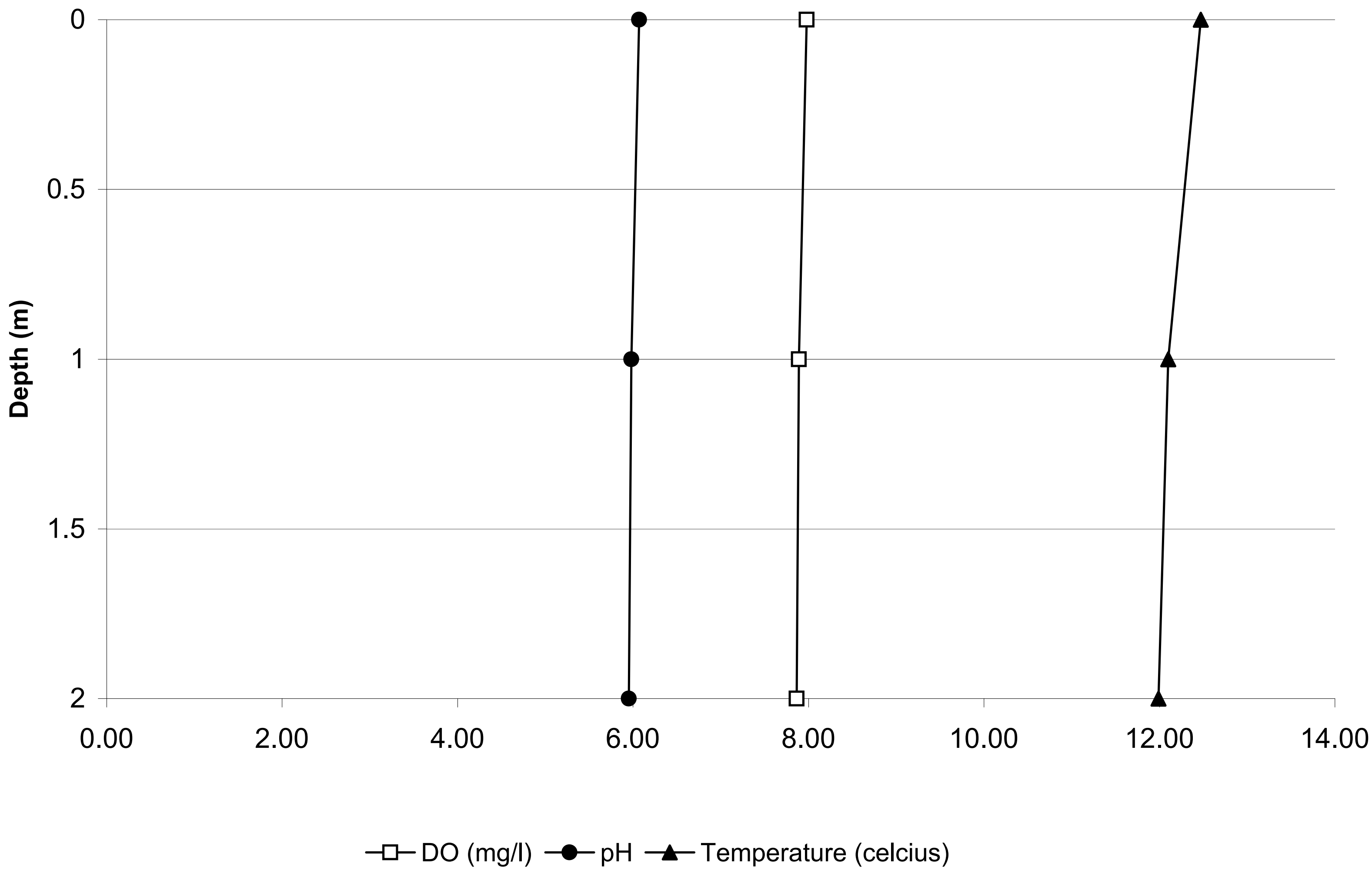


Figure H-73. Bear Diversion Temperature, Dissolved Oxygen, and pH Profiles, Station BE-2, July 25, 2002

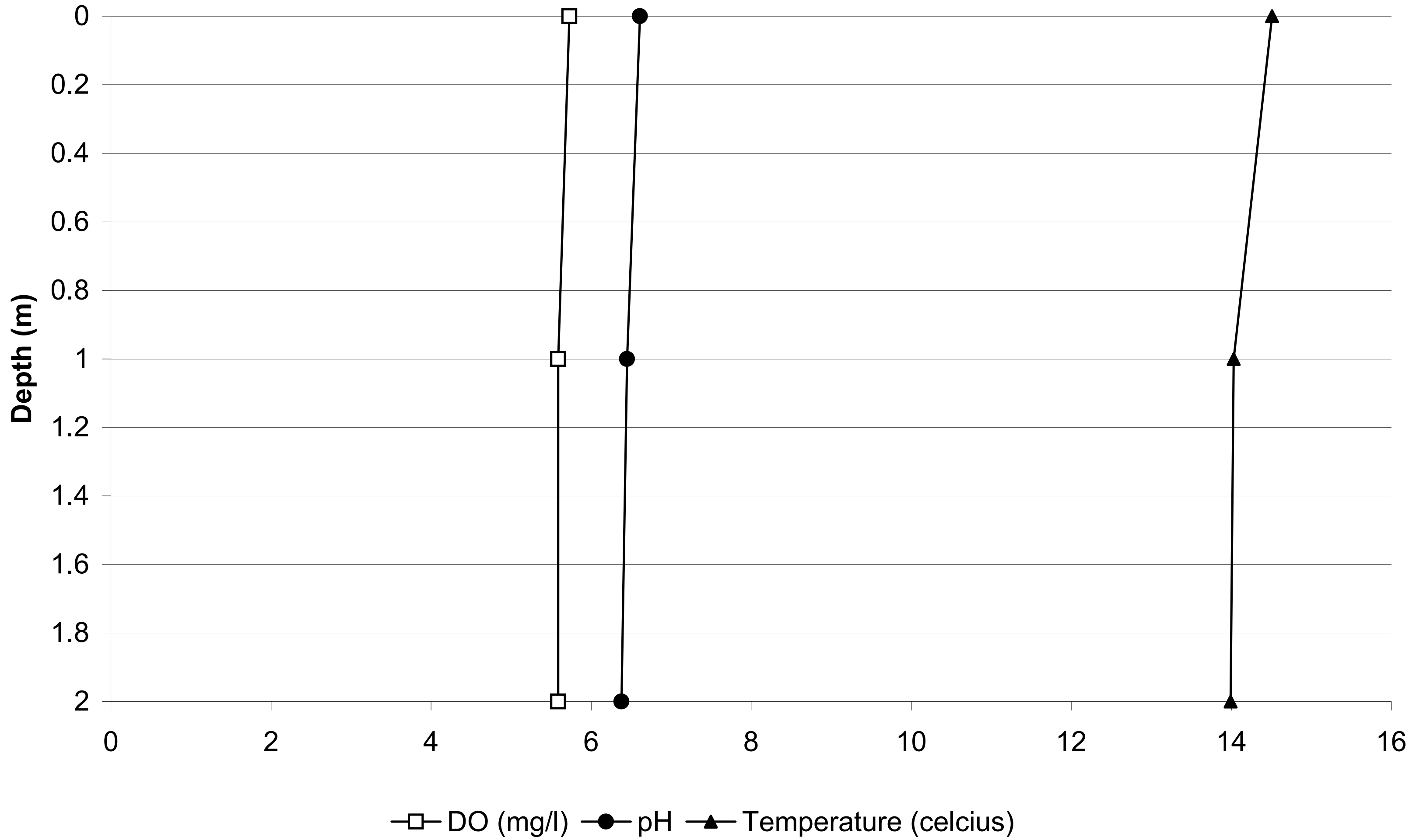


Figure H-74. Bear Diversion Temperature, Dissolved Oxygen, and pH Profiles Station BE-2, August 27, 2002

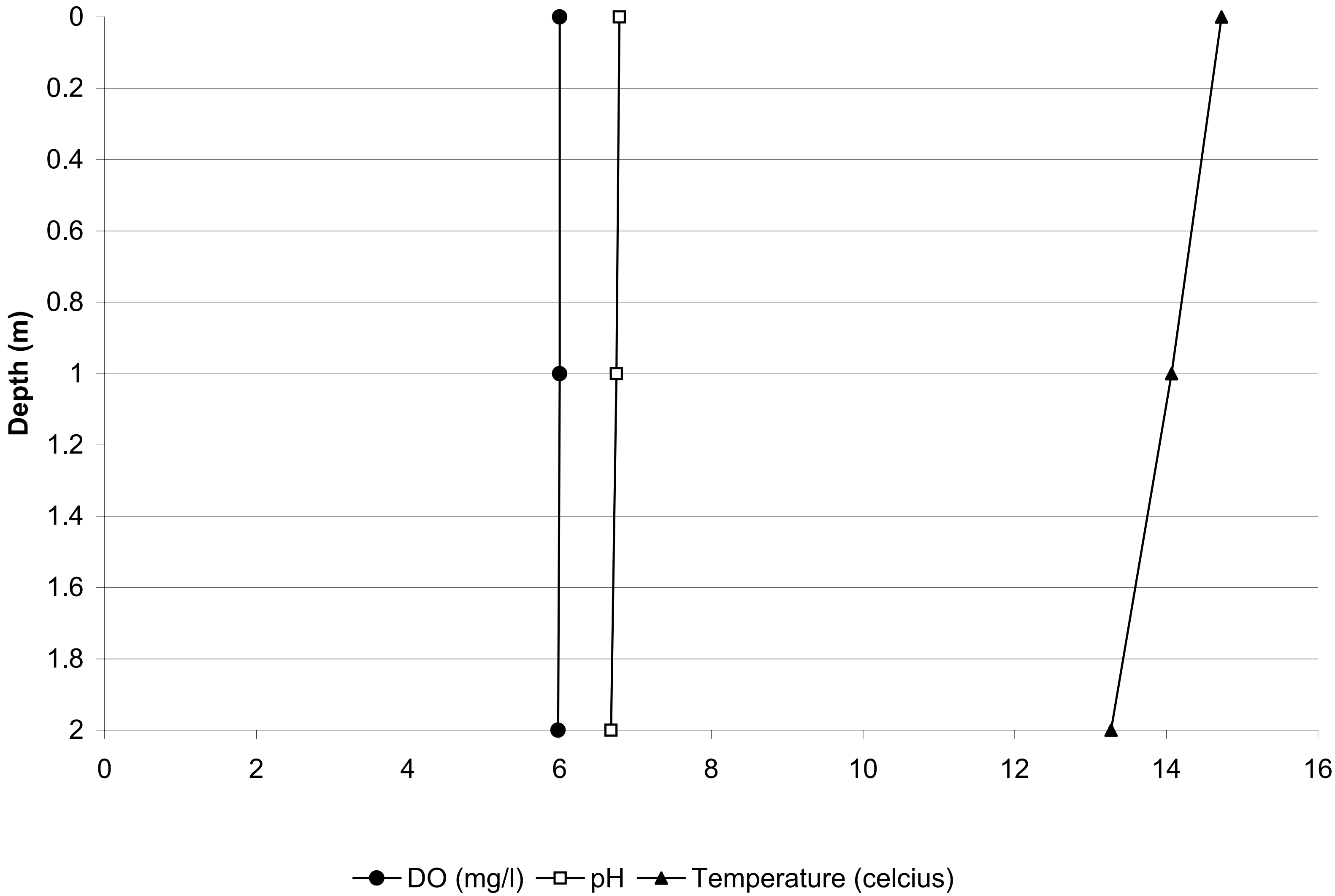


Figure H-75. Bear Diversion Temperatue, Dissolved Oxygen, and pH Profiles, Station BE-2, September 24, 2002

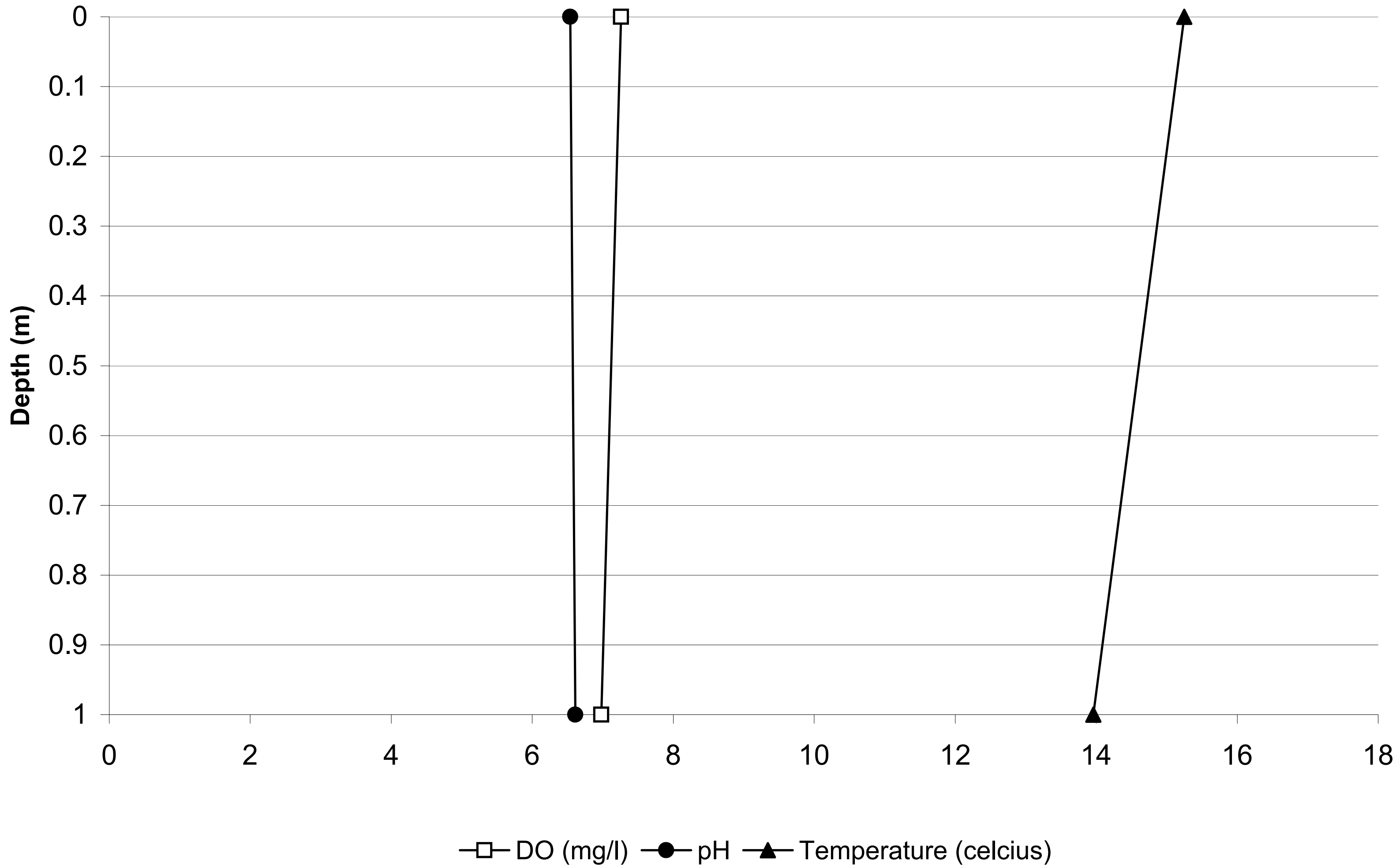


Figure H-76. Mono Diversion Temperature, Dissolved Oxygen, and pH Profiles, Station MO-1, June 6, 2002

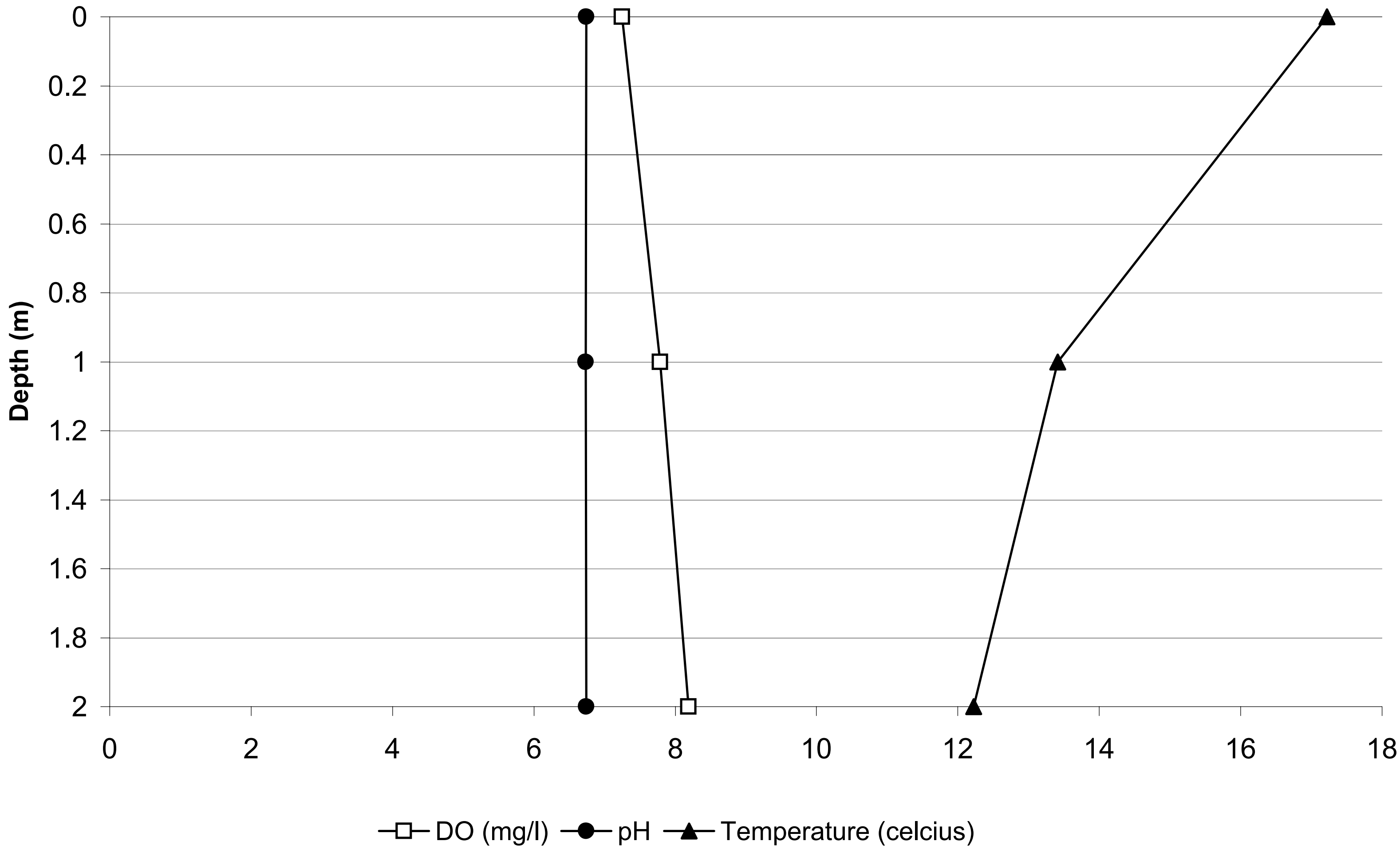


Figure H-77. Mono Diversion Temperature, Dissolved Oxygen, and pH Profiles, Station MO-1, June 28, 2002

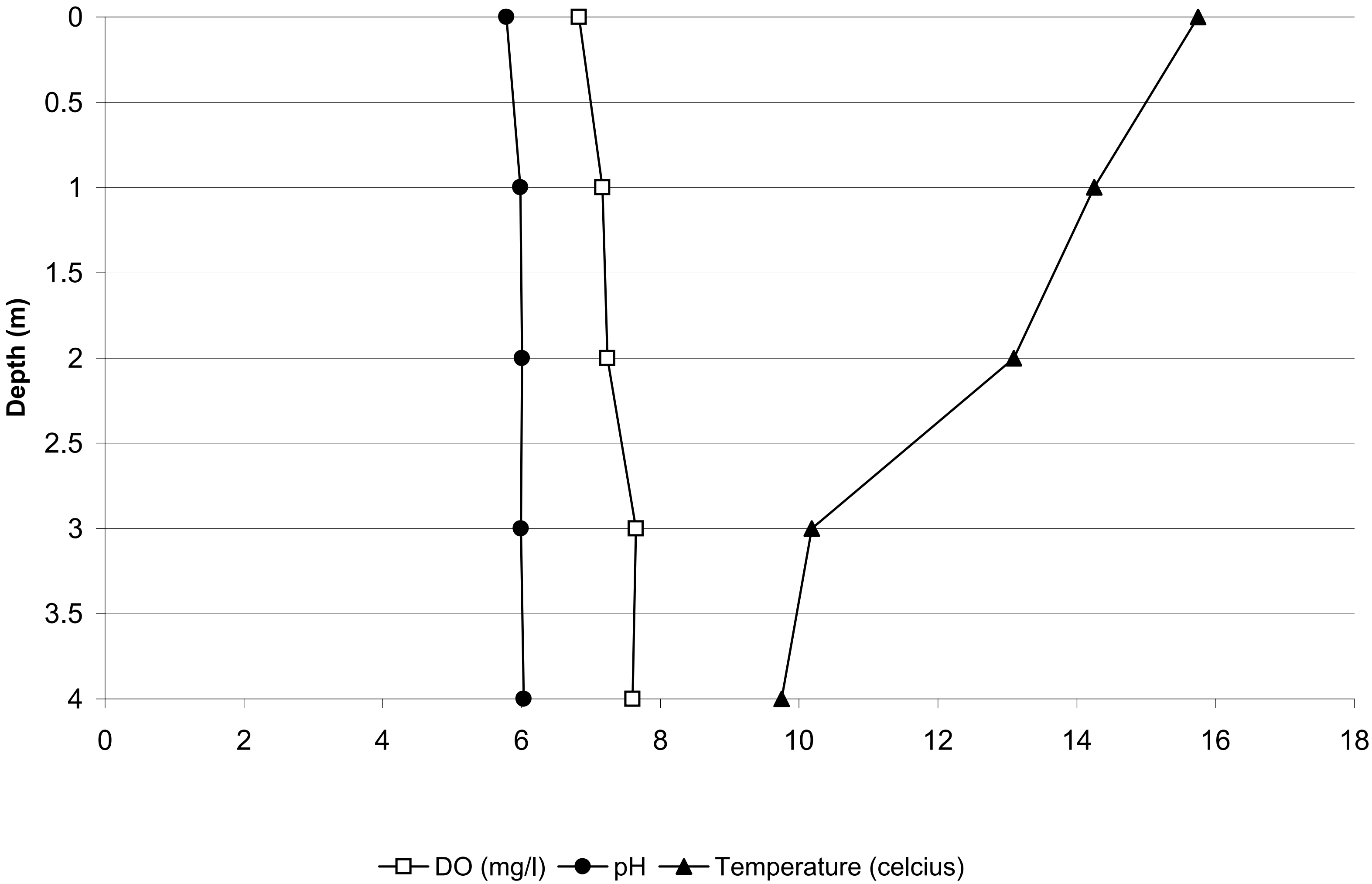


Figure H-78. Mono Diversion temperature, Dissolved Oxygen, pH Profiles, Station MO-1, July 25, 2002

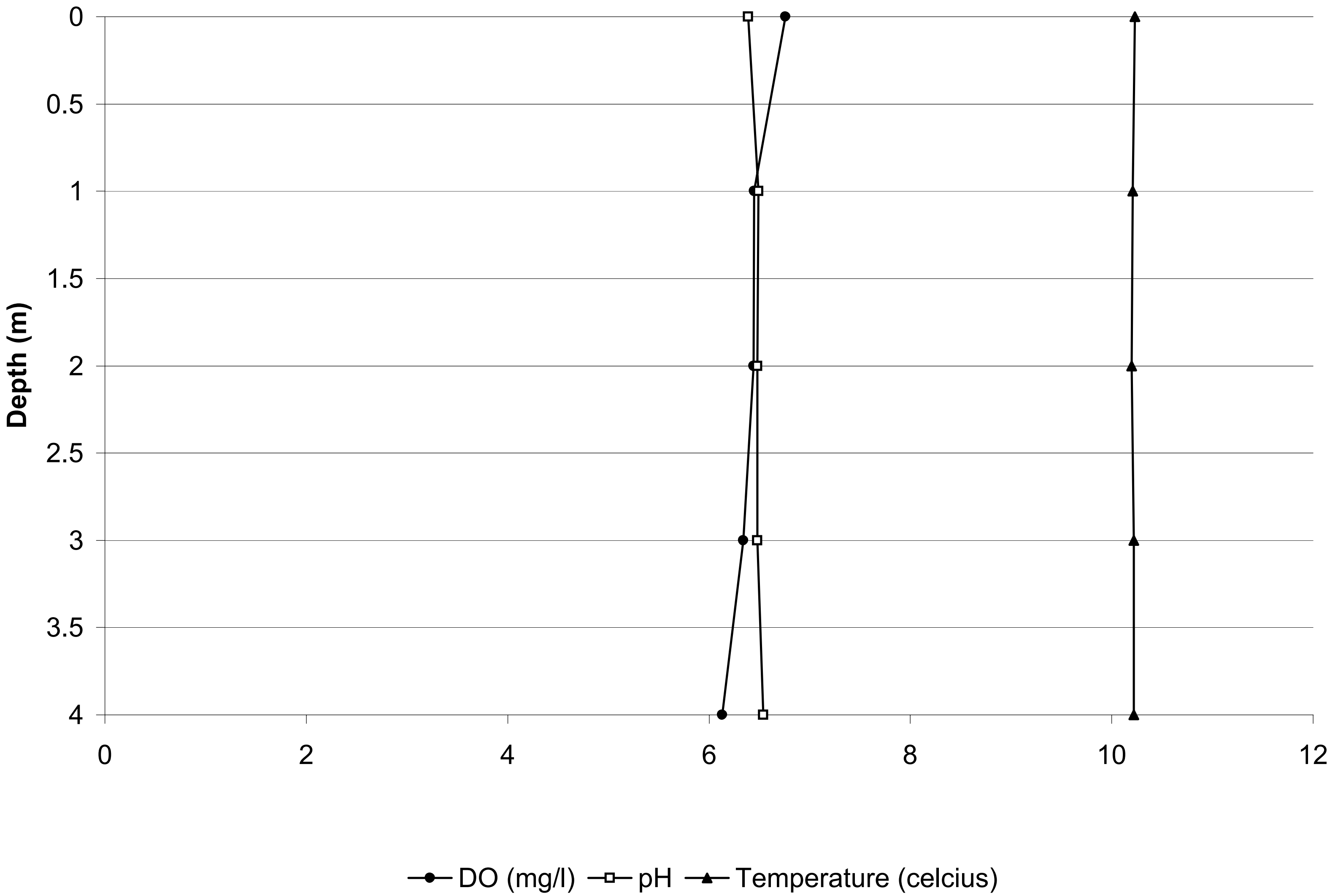


Figure H-79. Mono Diversion Temperature, Dissolved Oxygen and pH Profiles, Station MO-1, August 26, 2002

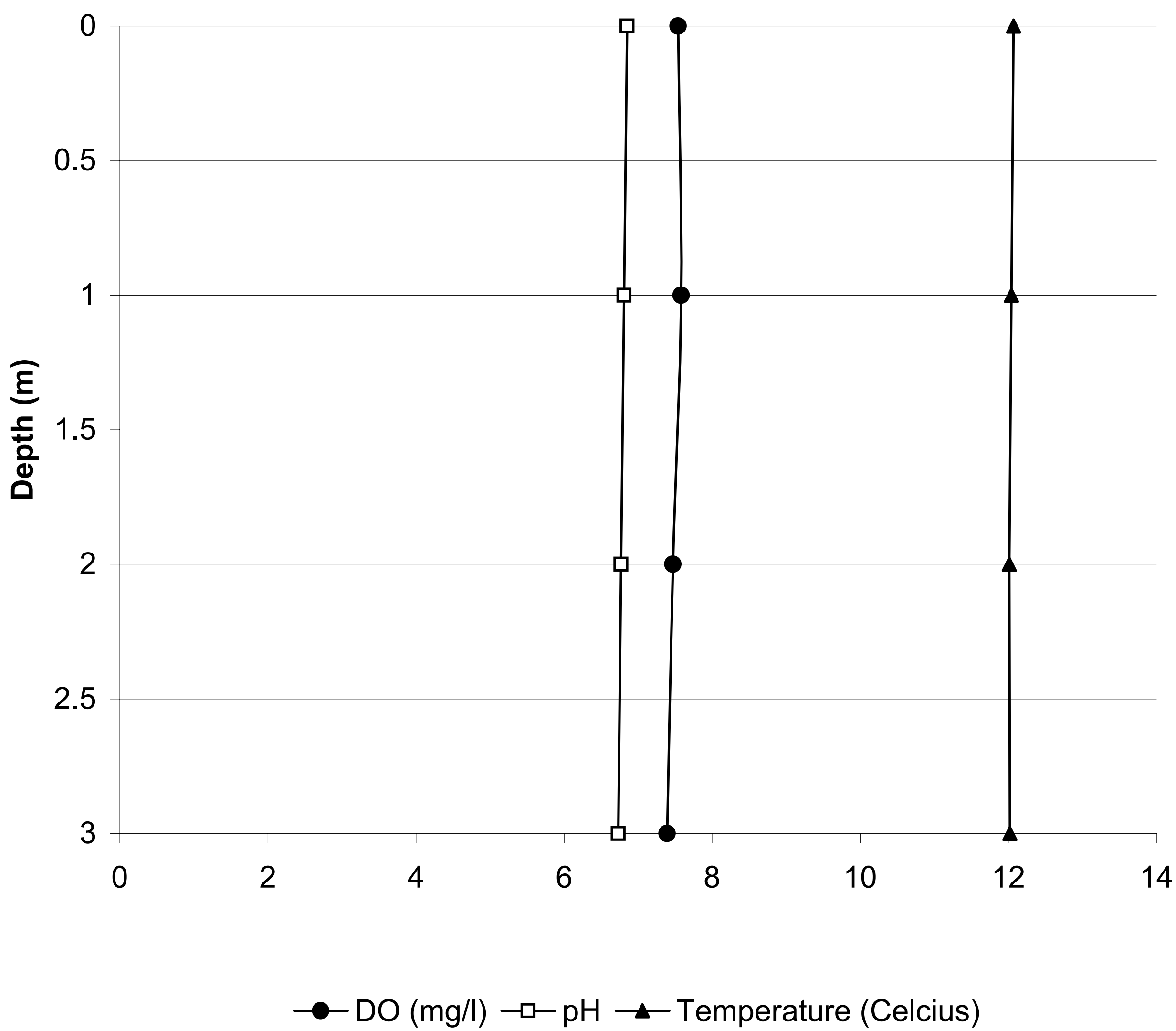


Figure H-80. Mono Diversion Temperature, Dissolved Oxygen, and pH Profiles, Station MO-1, September 24, 2002

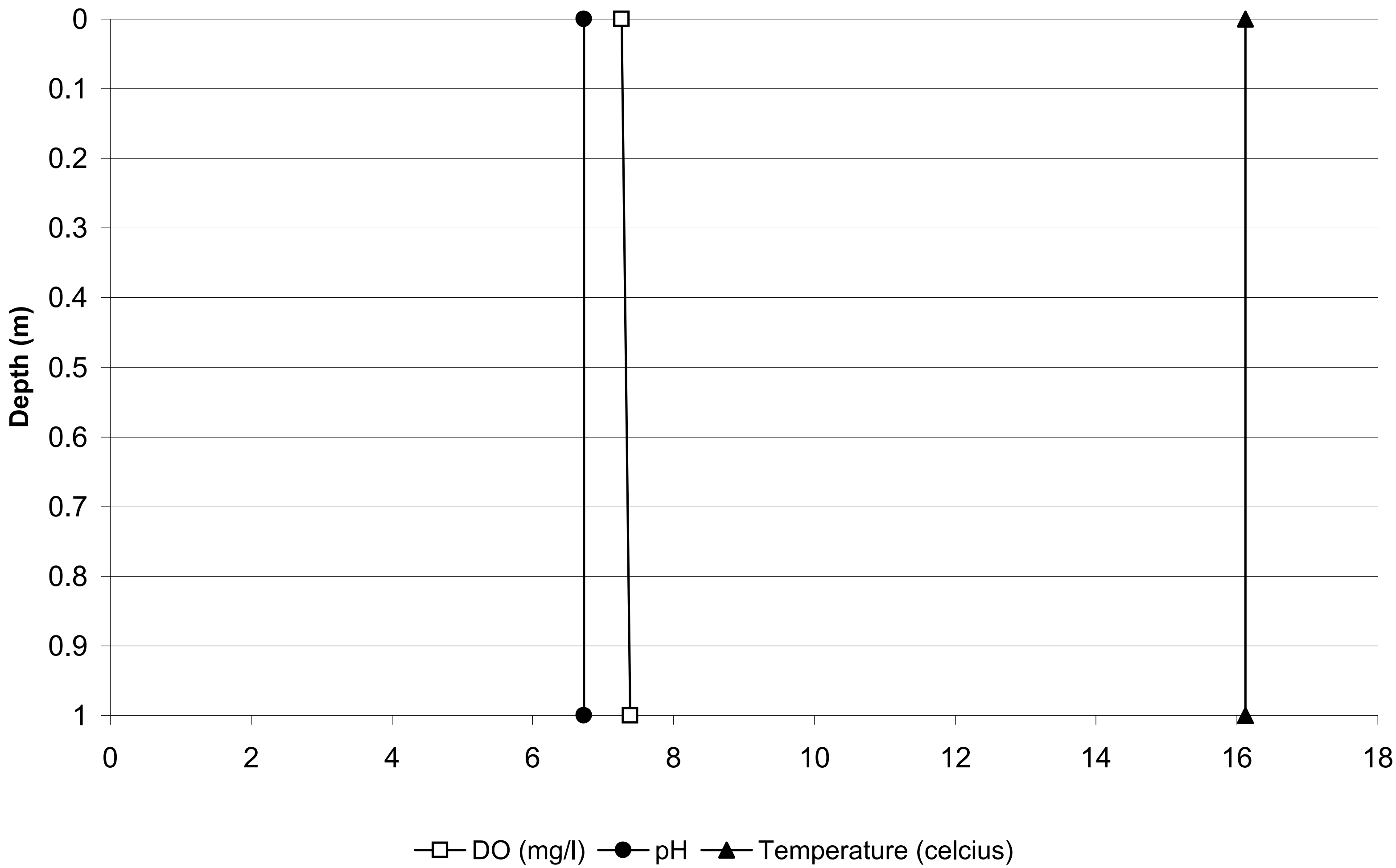


Figure H-81. Dam 4 (BC-4) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, May 20, 2002

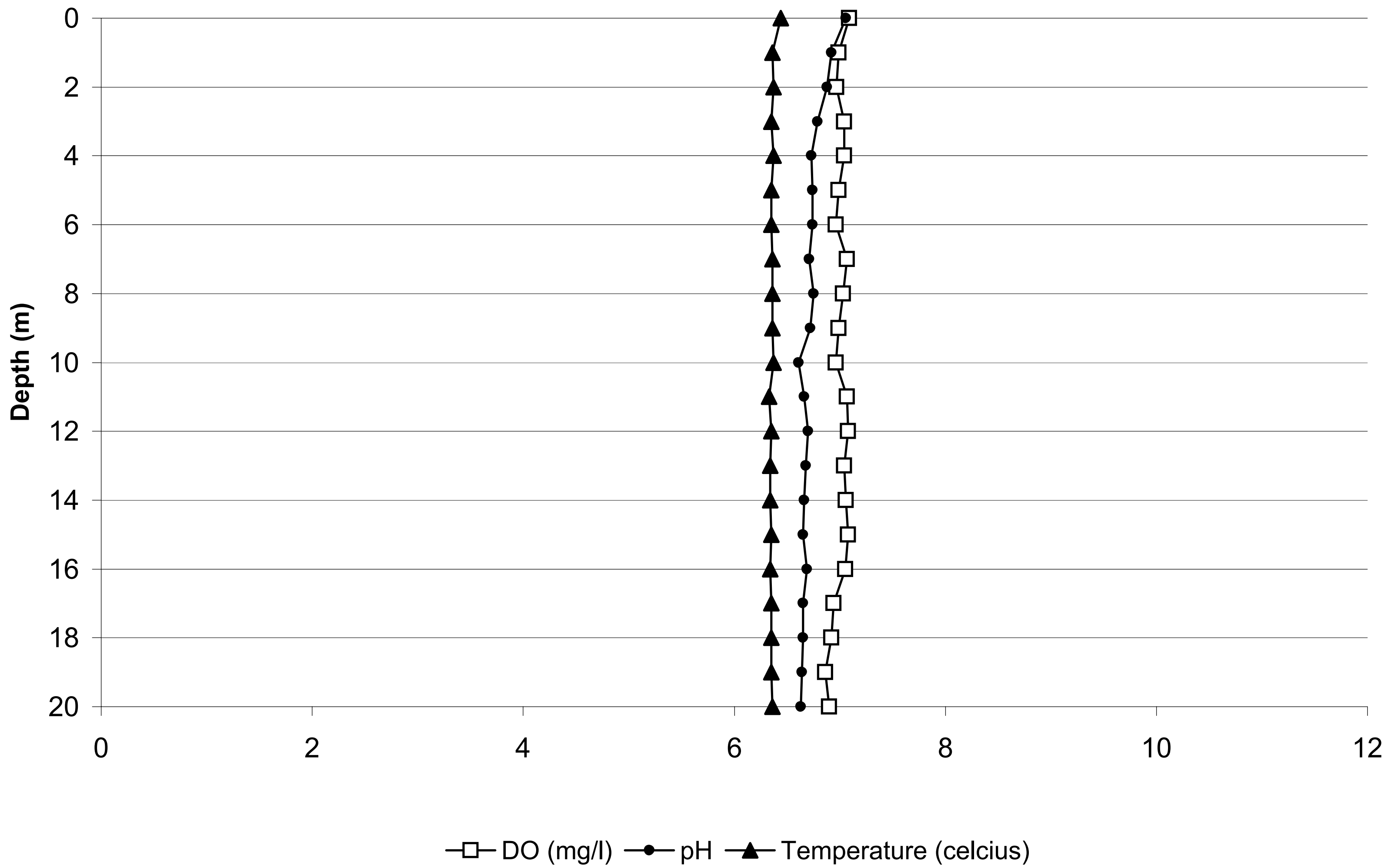


Figure H-82. Dam 4 (BC-4) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, June 27, 2002

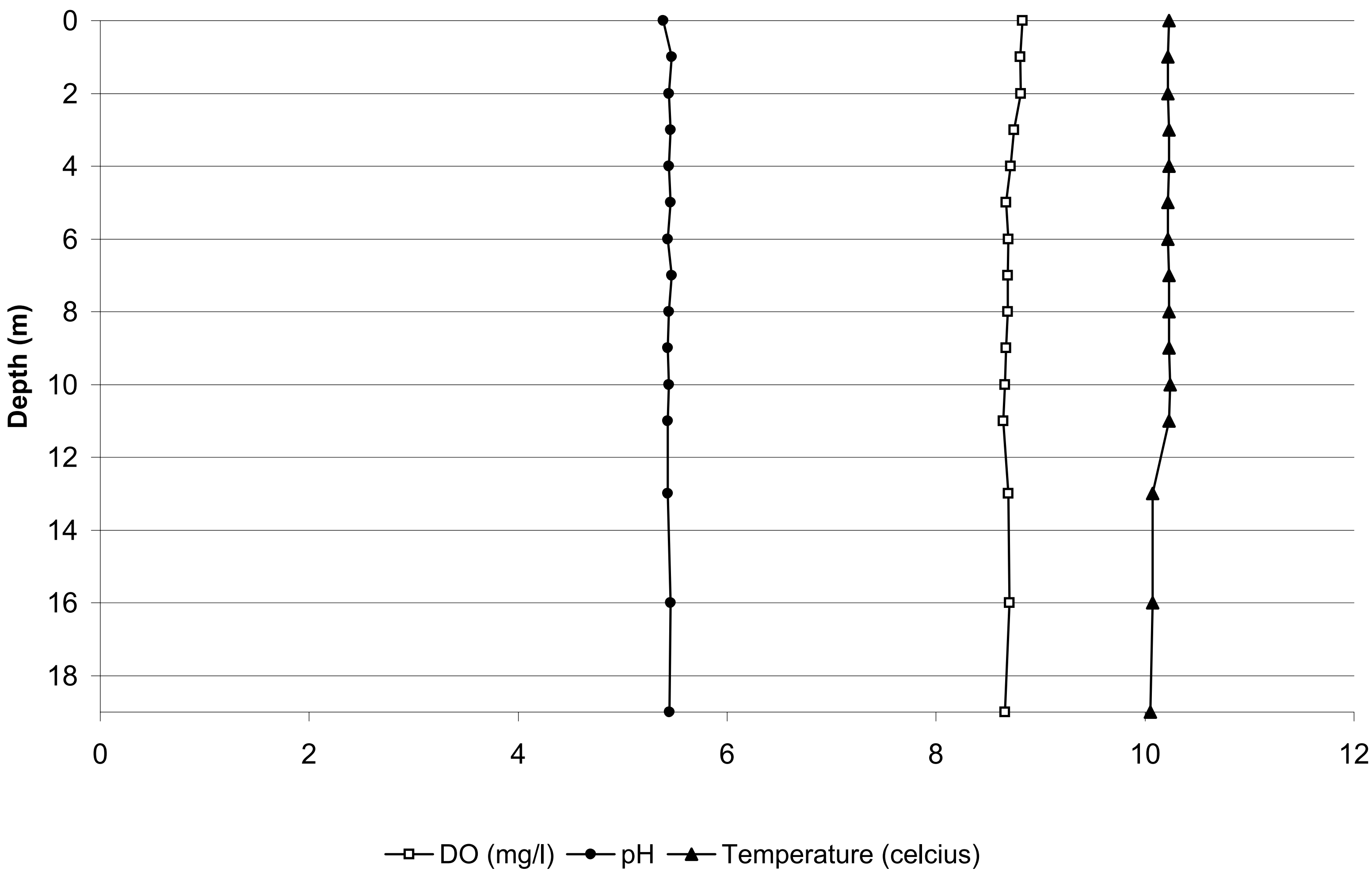


Figure H-83. Dam 4 (BC-4) Temperature, Dissolved Oxygen, pH Profiles, Station 1, July 23, 2002

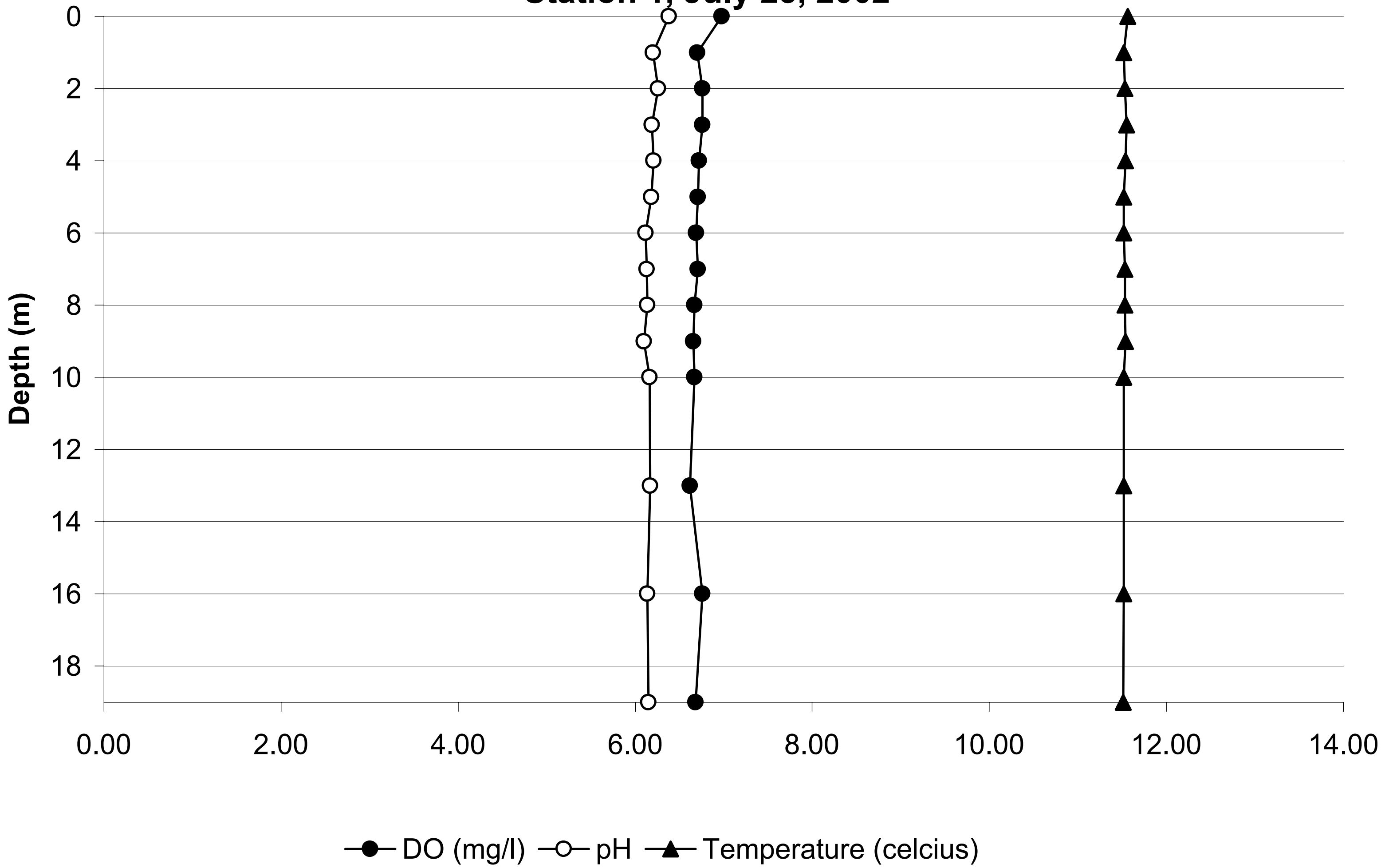


Figure H-84. Dam 4 (BC-4) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, August 26, 2002

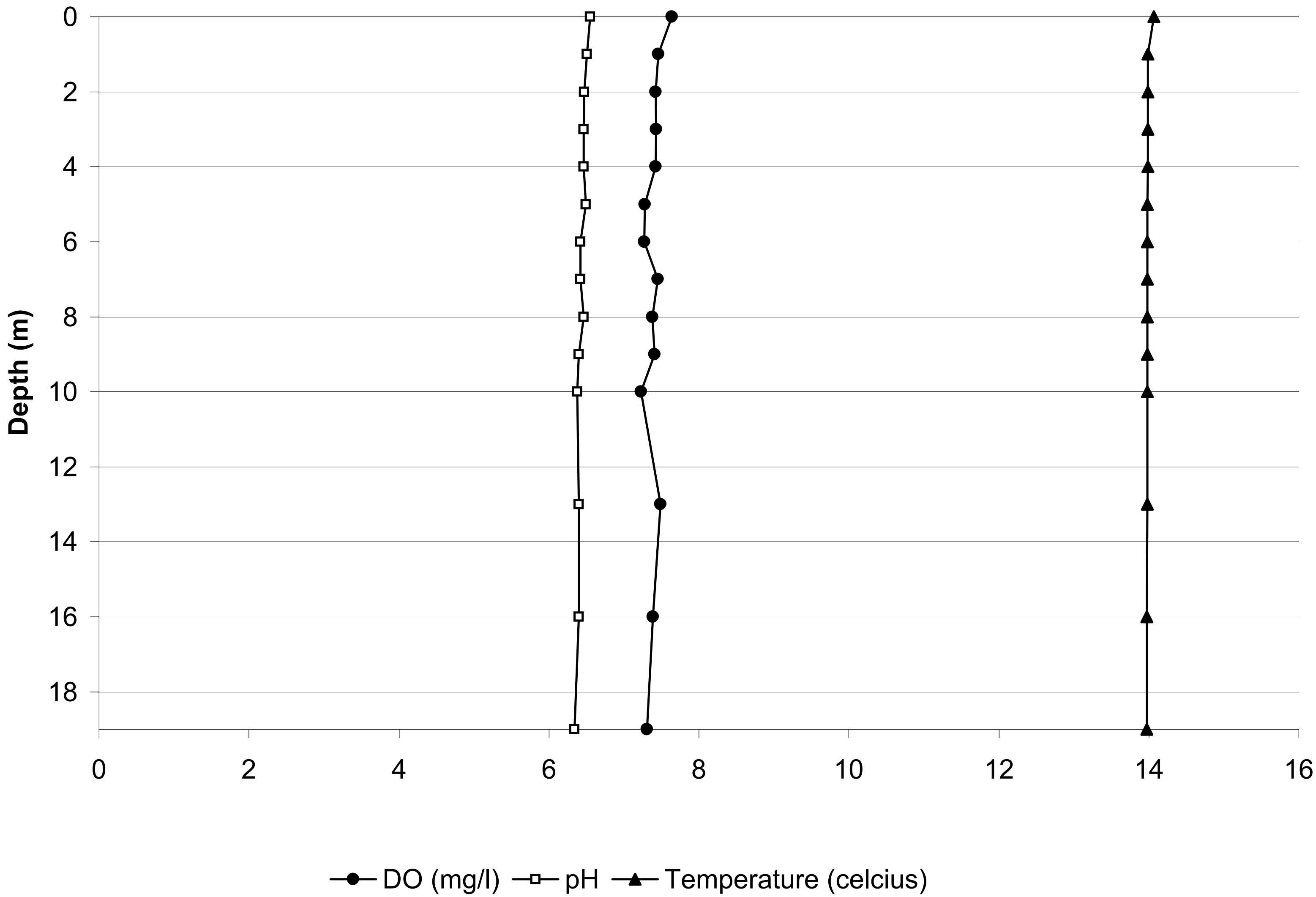


Figure H-85. Dam 4 (BC-4). Temperature, Dissolved Oxygen, and pH Profiles, Station 1, September 23, 2002

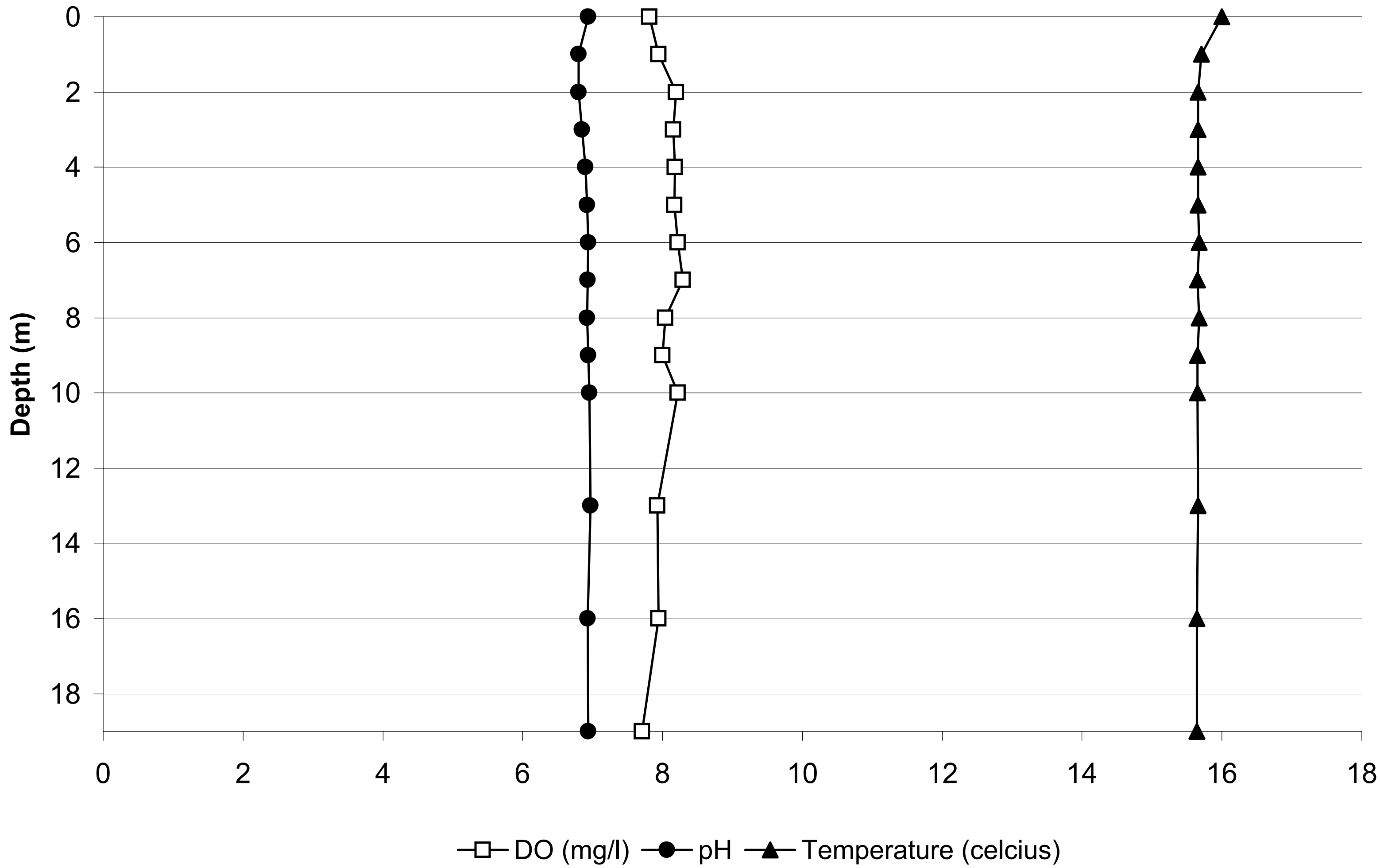


Figure H-86. Dam 5 (BC-8) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, May 21, 2002

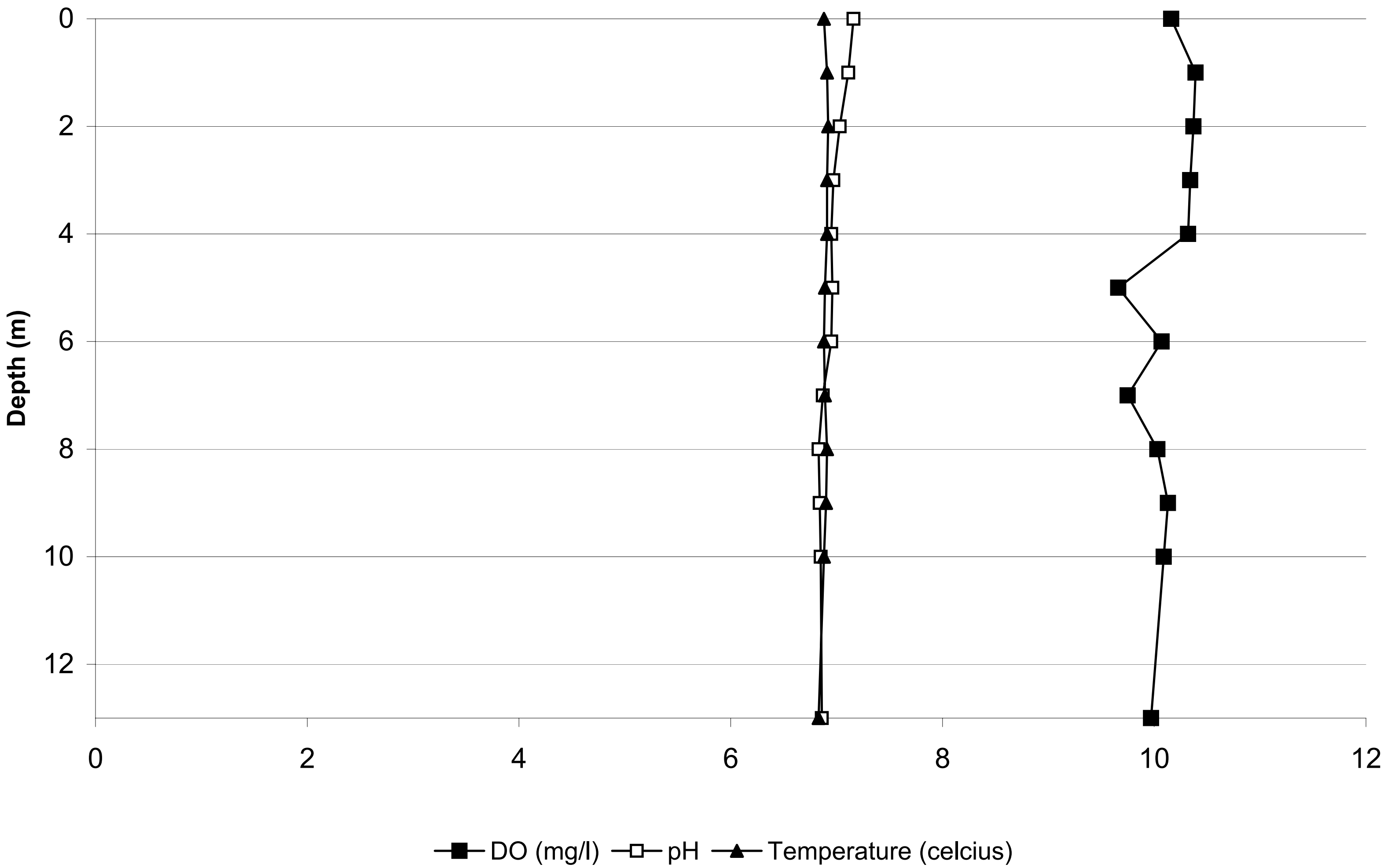


Figure H-87. Dam 5 (BC-8) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, June 27, 2002

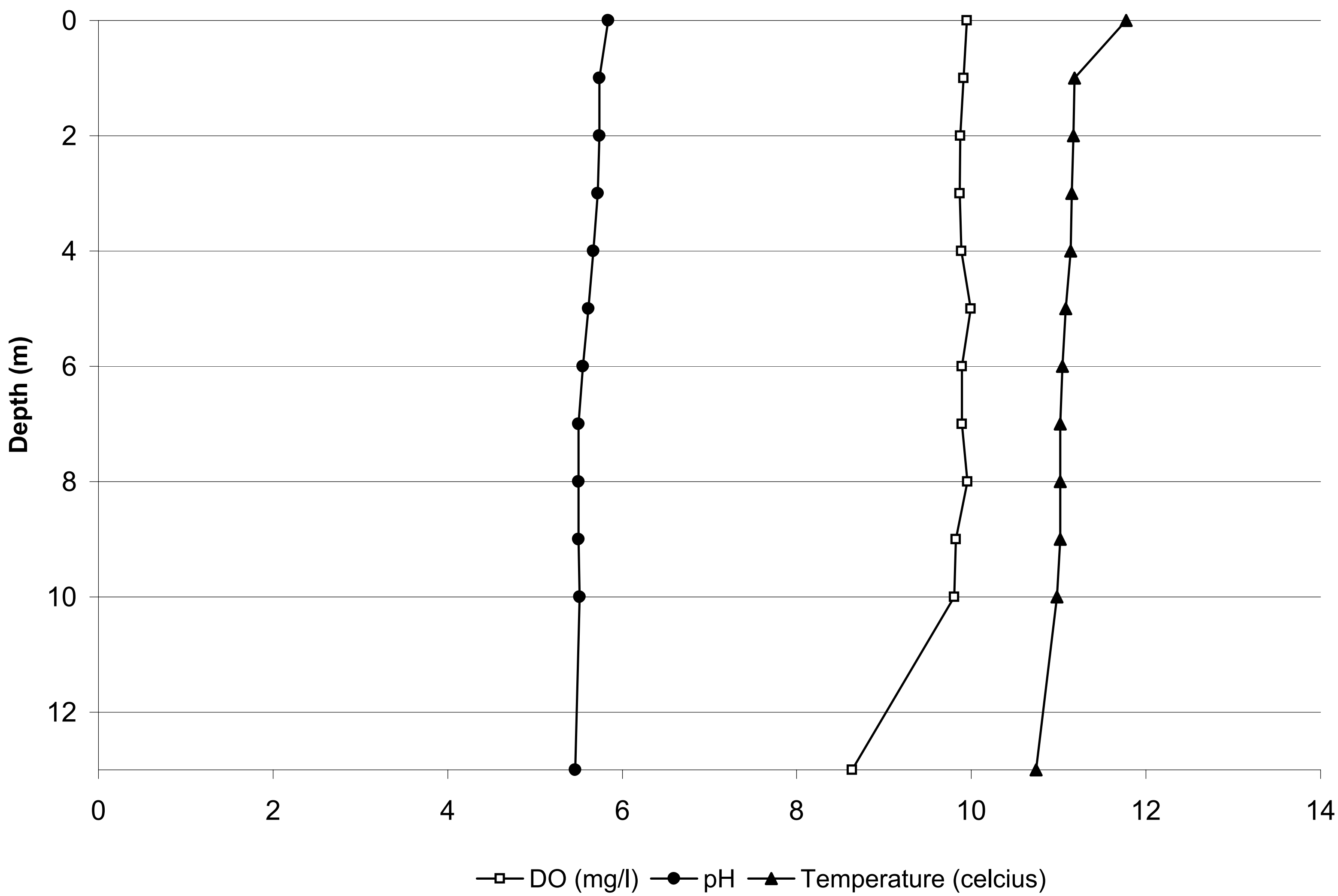


Figure H-88. Dam 5 (BC-8) Temperature, Dissolved Oxygen, pH Profiles, Station 1, July 23, 2002

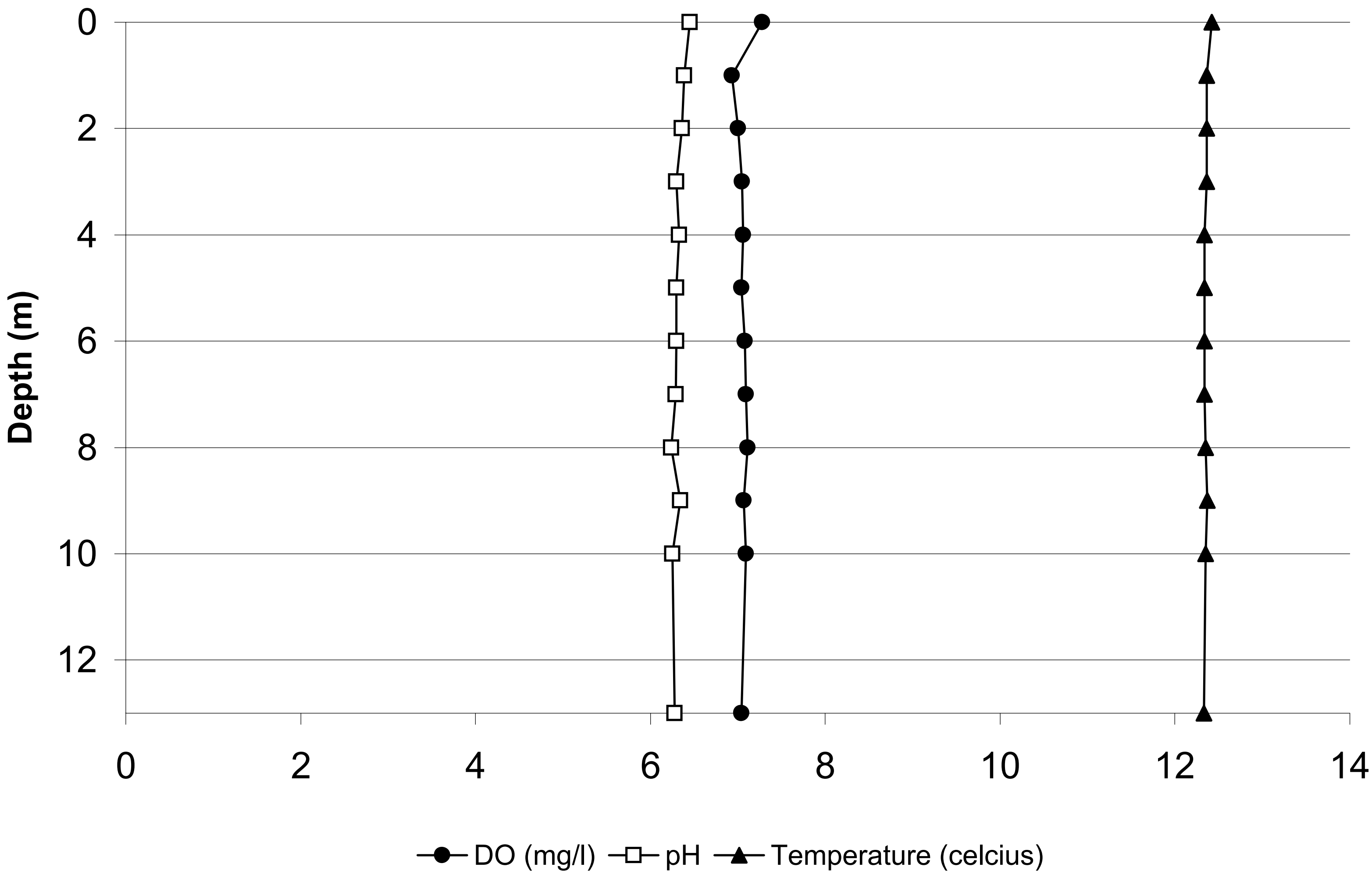


Figure H-89. Dam 5 (BC-8) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, August 27, 2002

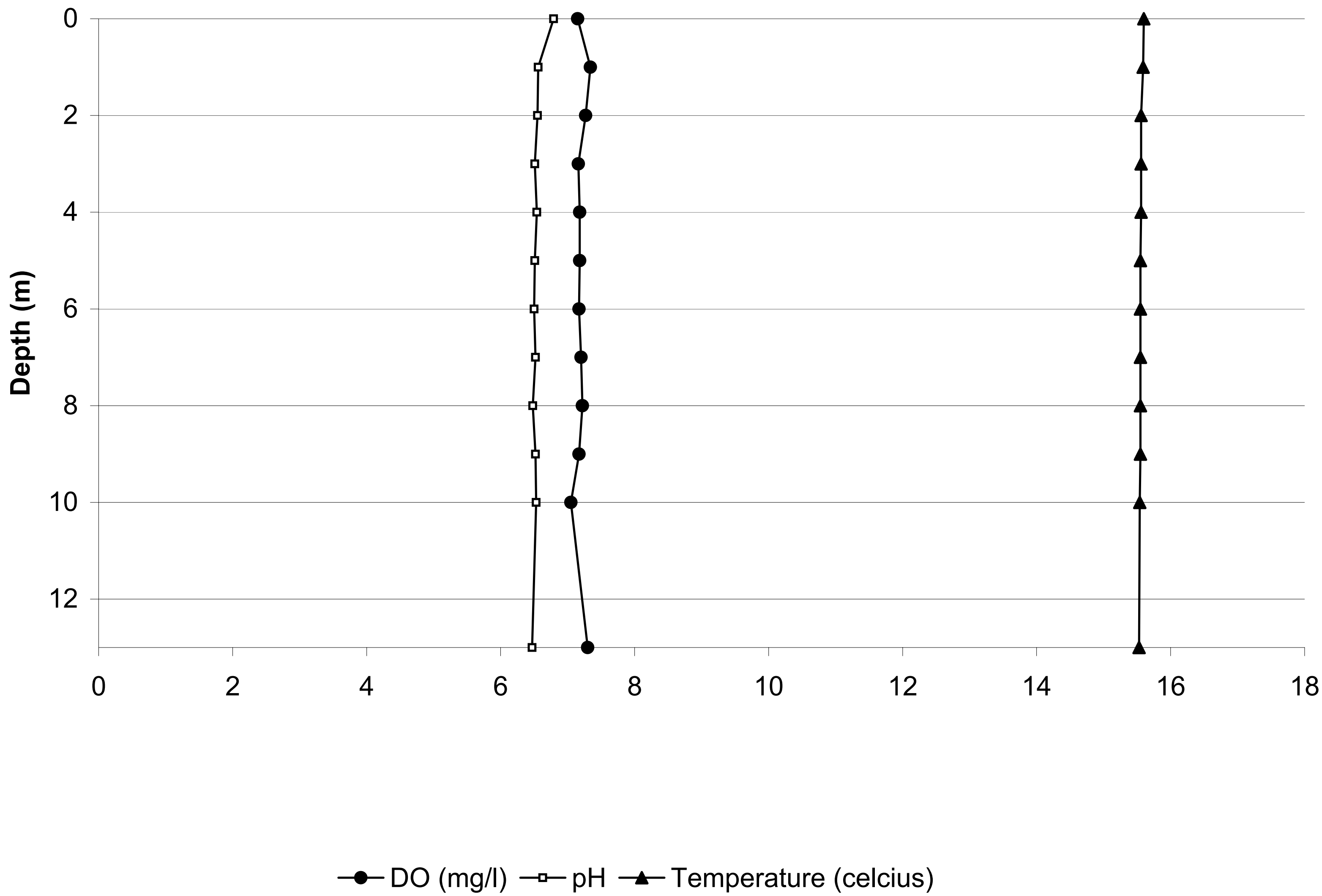


Figure H-90. Dam 5 (BC-8) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, September 23, 2002

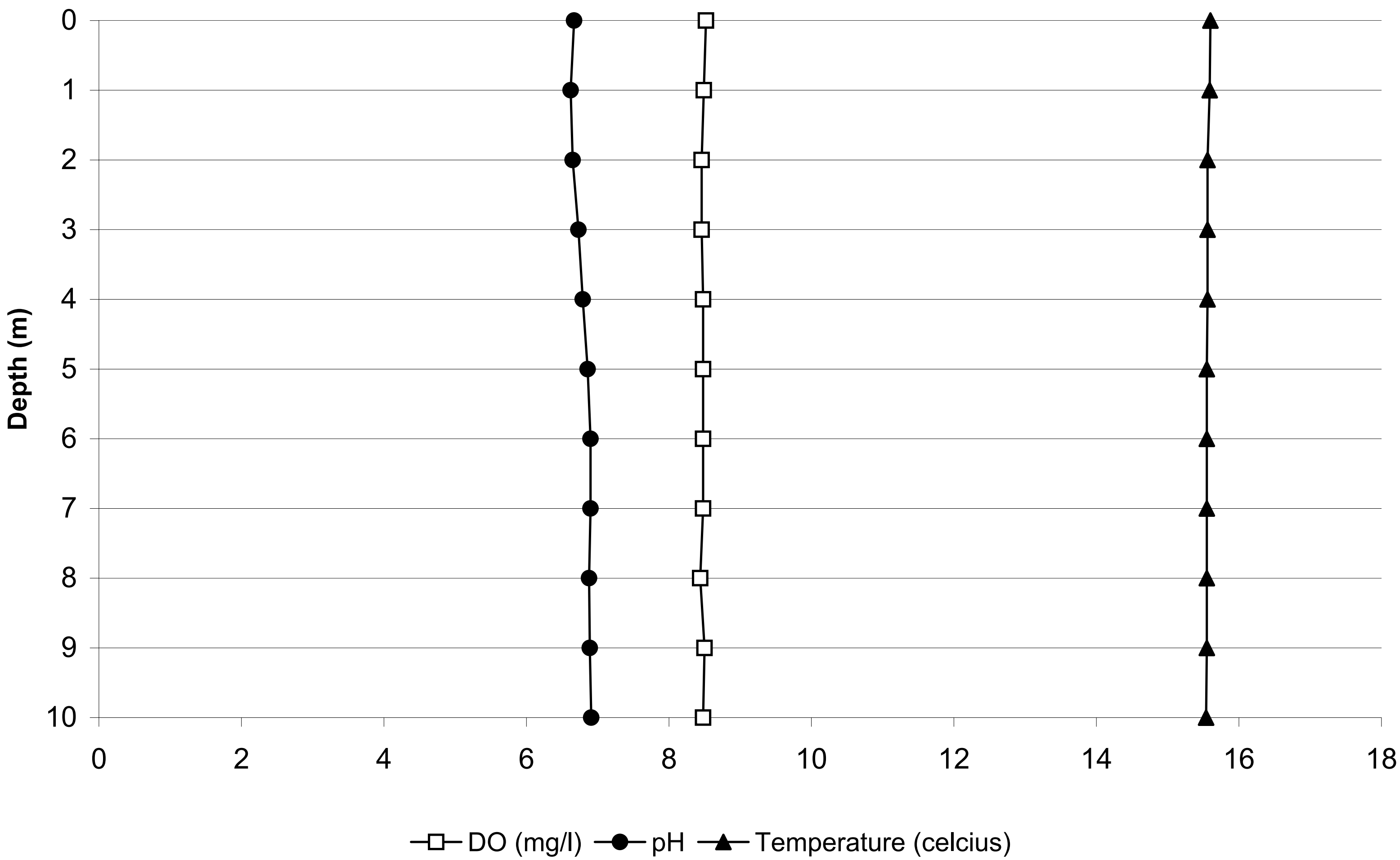


Figure H-91. Dam 6 (SJ-8) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, May 21, 2002

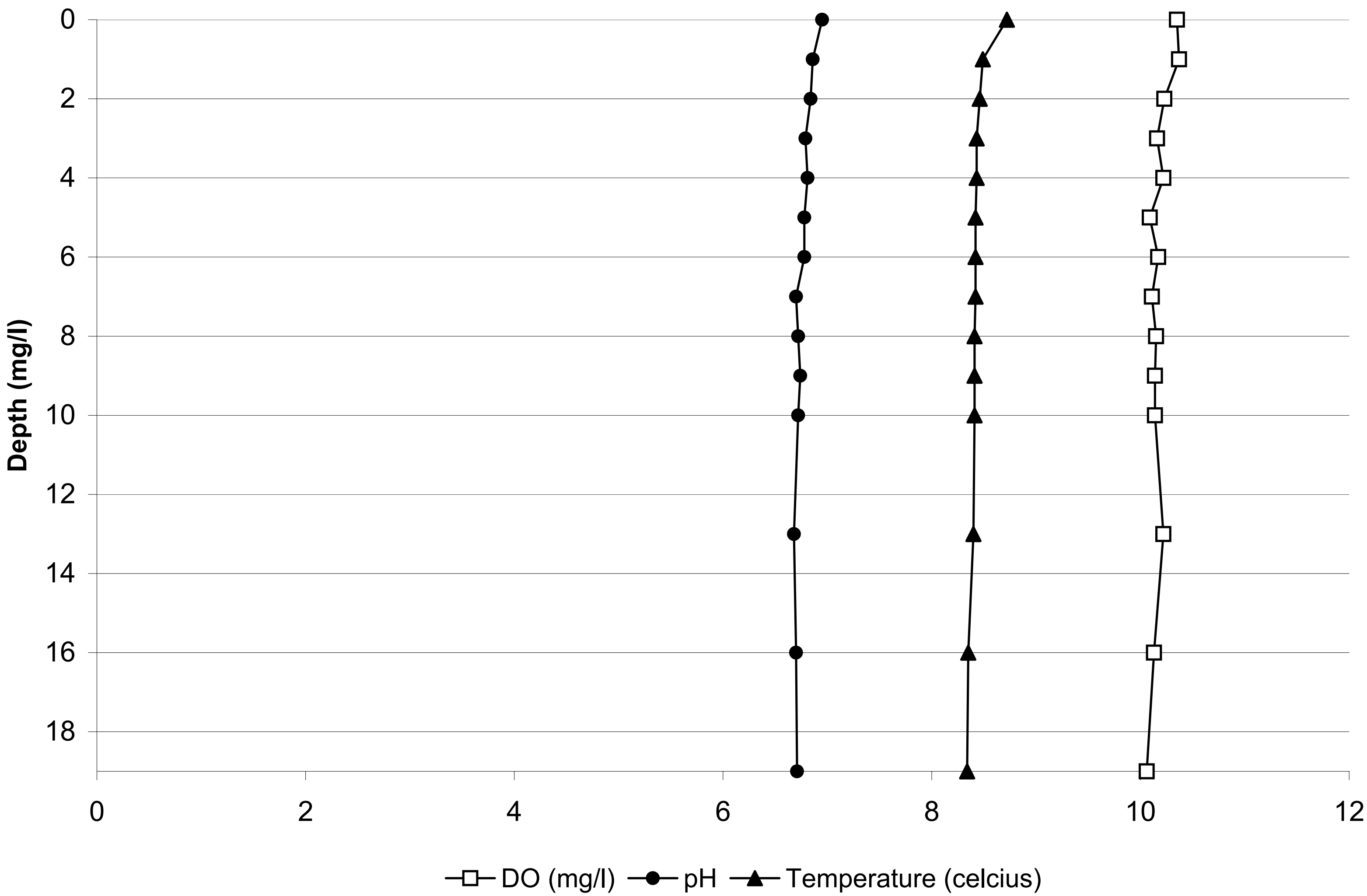


Figure H-92. Dam 6 (SJ-8) Temperature, Dissolved Oxygen, pH Profiles, Station 1, June 27, 2002

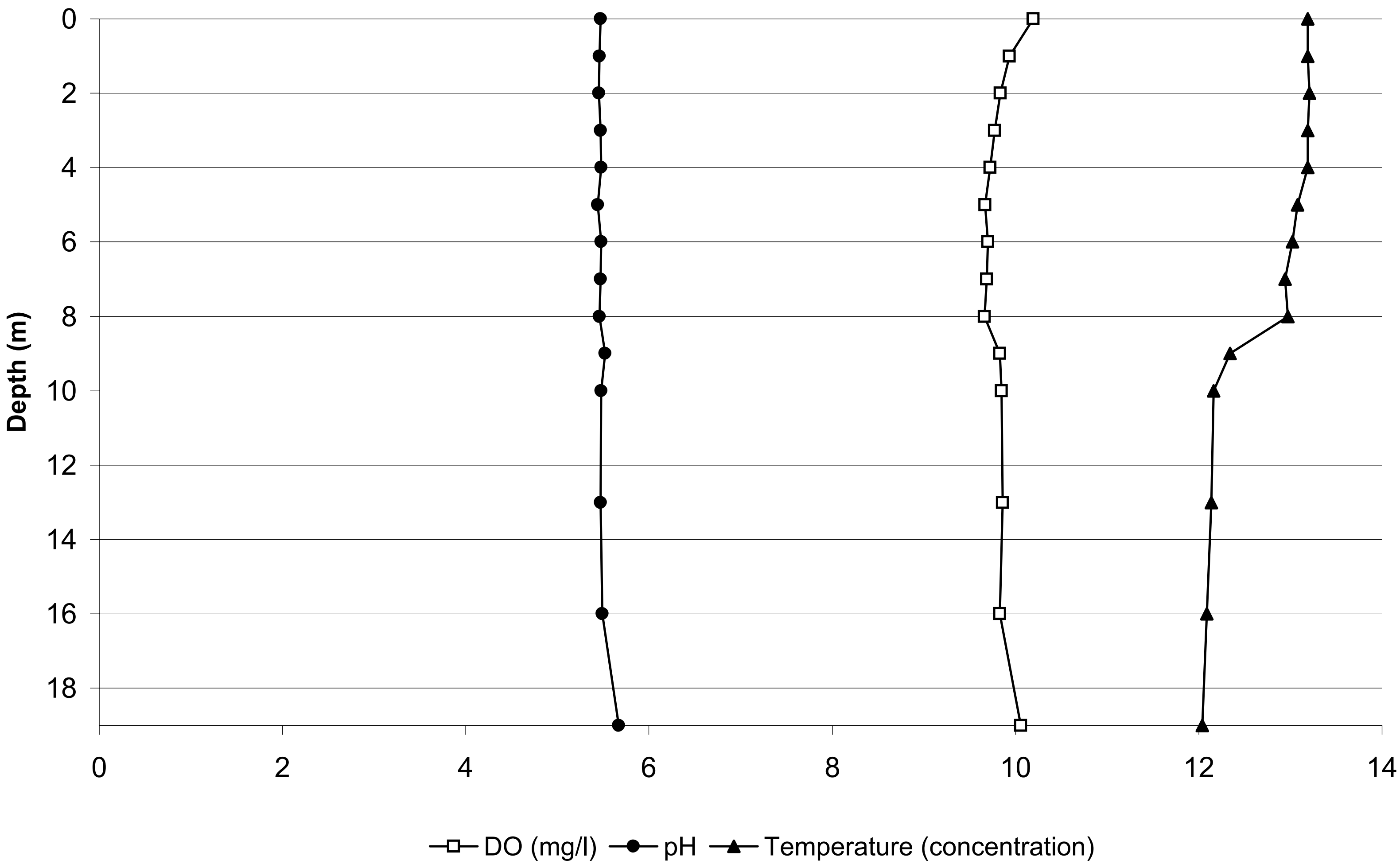


Figure H-93. Dam 6 (SJ-8) Temperature, Dissolved Oxygen, pH Profiles, Station 1, July 25, 2002

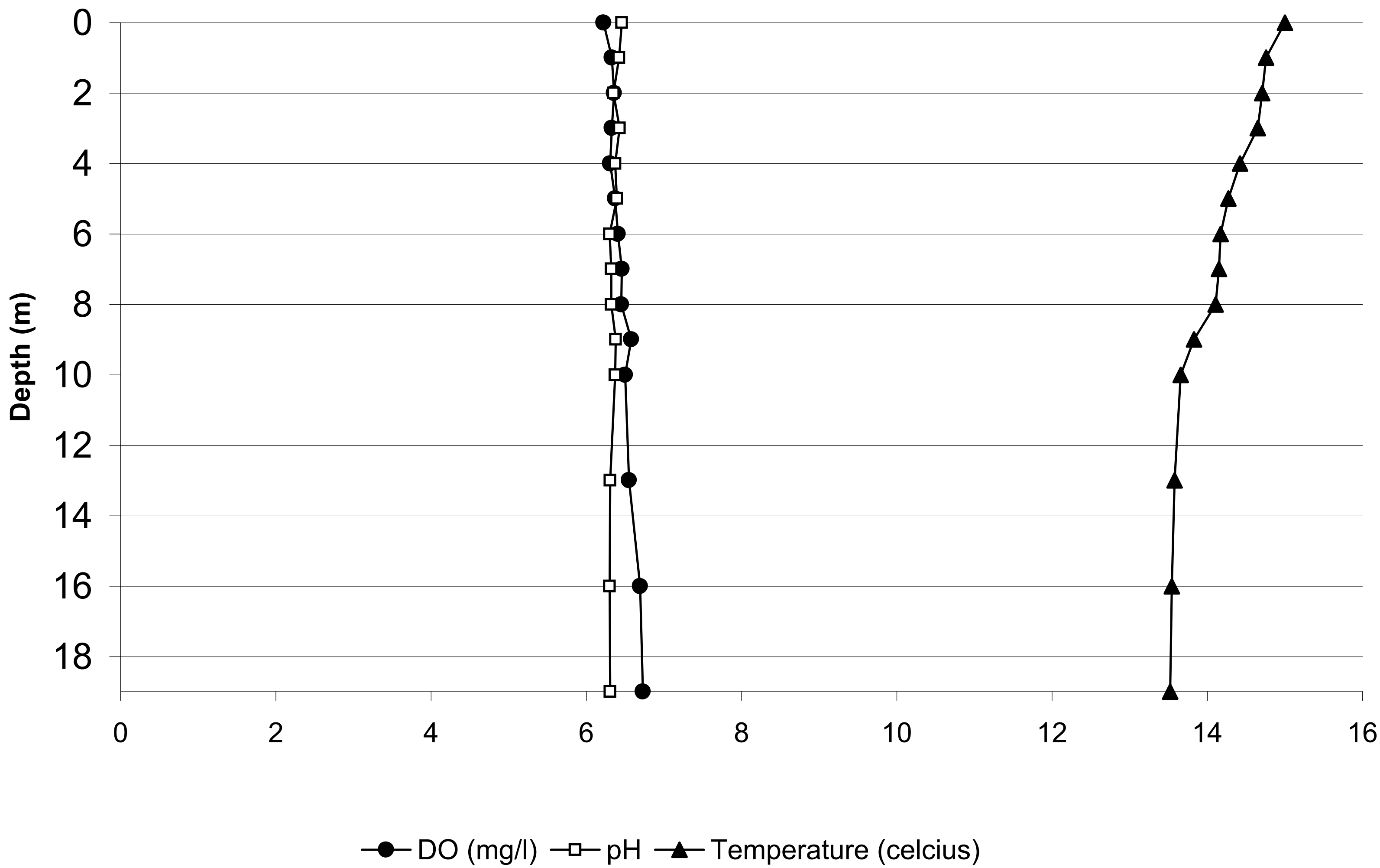


Figure H-94. Dam 6 (SJ-8) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, August28, 2002

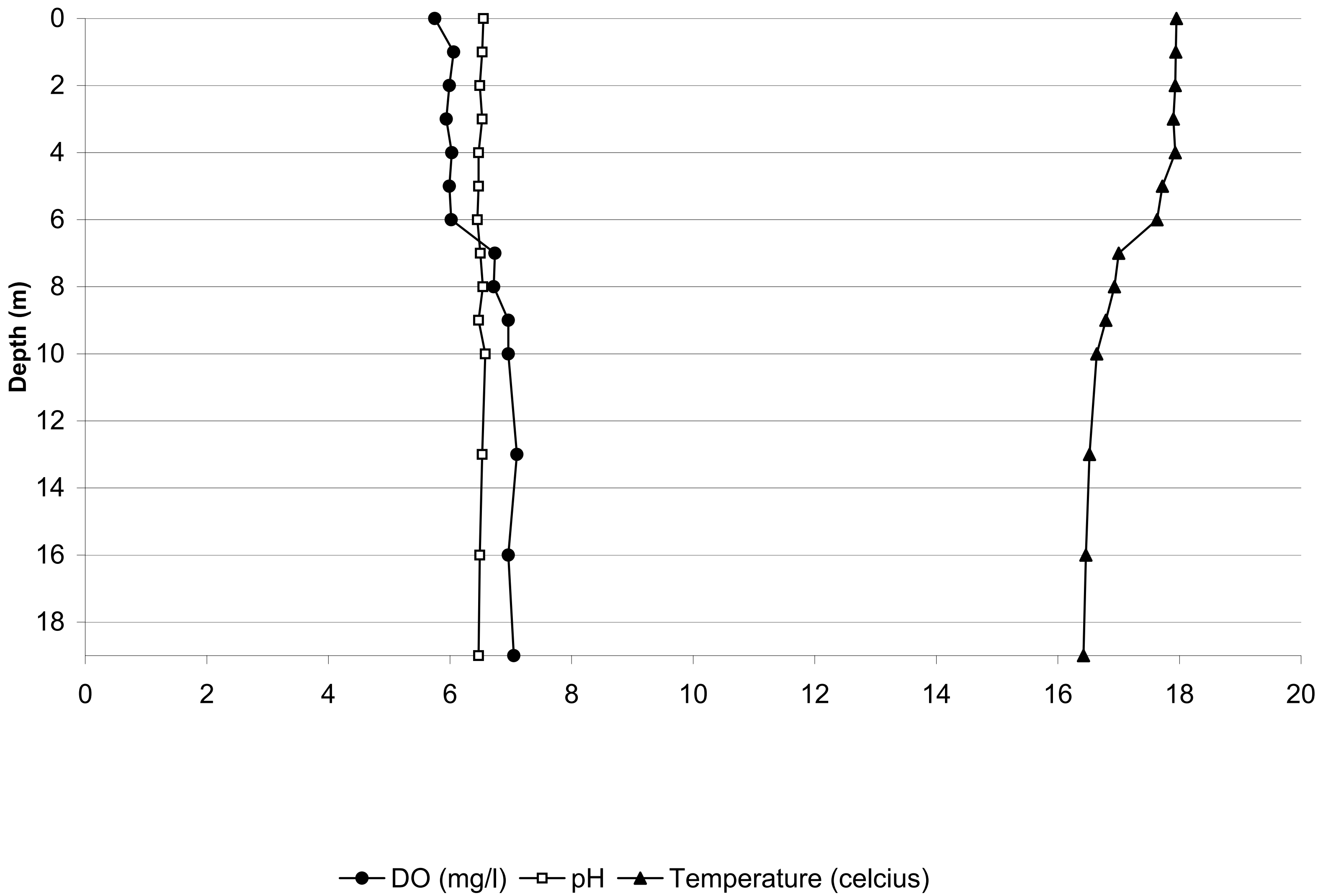
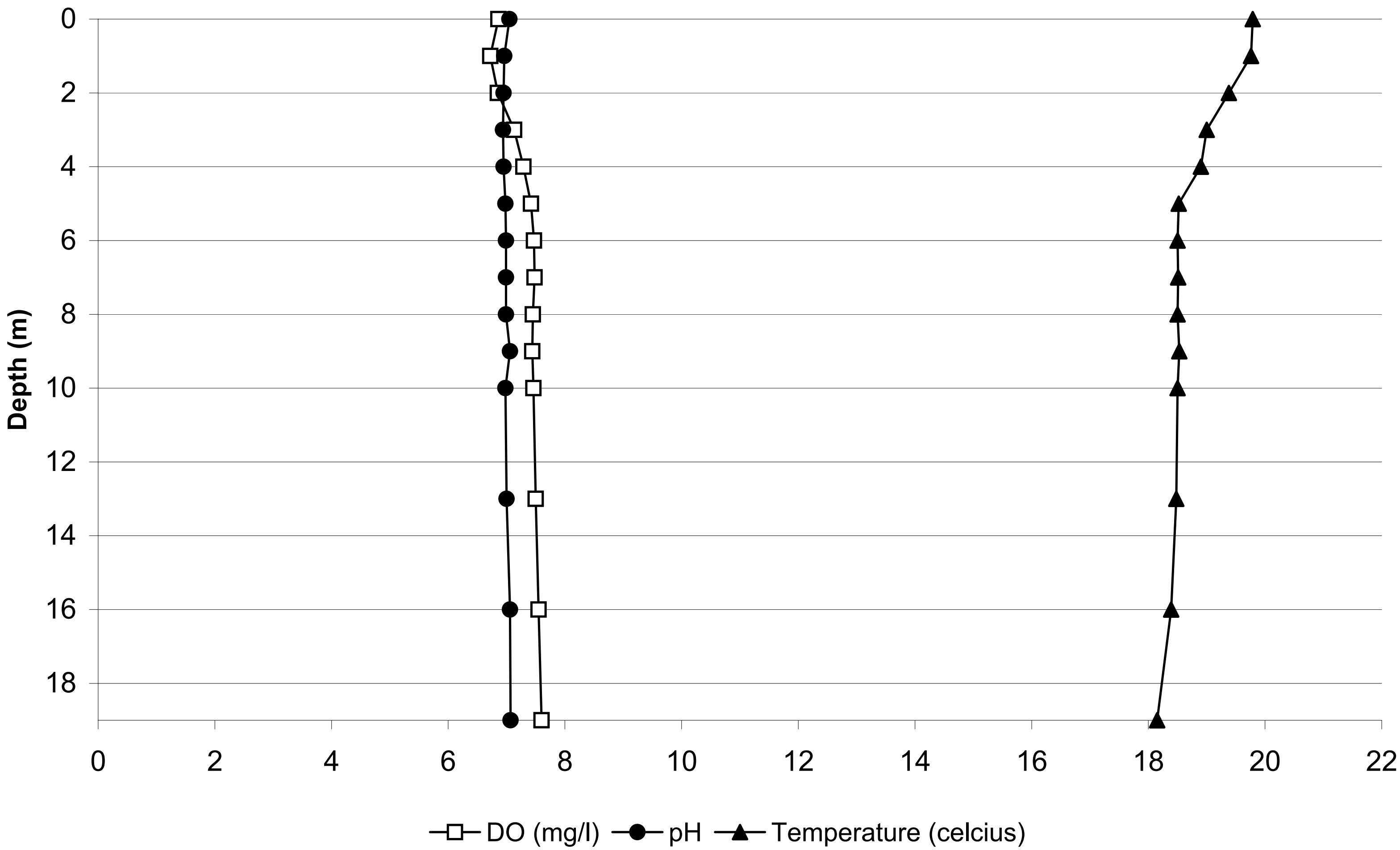


Figure H-95. Dam 6 (SJ-8) Temperature, Dissolved Oxygen, and pH Profiles, Station 1, September 23, 2002



APPENDIX I

Quality Assurance/Quality Control Summary Table of Laboratory Analytical Data

Appendix I Table 1. Quality Control/Quality Assurance Review of Spring (Baseflow) 2002 Sample Laboratory Analyses

Review Questions	**Laboratory Report Submission Numbers and Results**												
	2002051066	**2002051089**	**2002051135**	**2002051170**	**2002051248**	**2002051265**	**2002051311**	**2002051344**	**2002051436**	**2002051510**	**2002051624**	**2002051631**	**2002051725**
Sampling Event	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off
Locations	PI-2 & 3; BC-3, 4 & 5; EL-1 & 2; BA-4 & 5	ST-1; NF-3; BC-6; BA-6; EL-3	SJ-4, 5 & 6; BC-7, 8 & 9; RO-1 & 2	ST-2; SJ-7, 8, 9 & 10; BC-10	SJ-2; RK-1 & 2	MP-1, 2 & 3	SL-1, 2, 3A & 3B; SJ-11	NF-1 & 2	BC-1 & 2; PI-1 & 2; RA-1 & 2	BO-1 & 2; 62-1 & 2; HL-1, 2, 3A & 3B	TS-3; SF-1; CR-4; FL-1 & 2	SF-5; FL-3	HO-1, 2 & 3; SS-3; NS-3
Date Sampled	05/20/02	05/20/02	05/21/02	05/21/02	05/22/02	05/22/02	05/23/02	05/23/02	05/24/02	05/28/02	05/29/02	05/29/02	05/30/02
Analysis type (hydrocarbons, ALP, Coliform)	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP
Do all dates match COC?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is sample ID consistent throughout report?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were all sample holding times met?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	***No, o-Phosphate (re-analyzed outside of hold time due to instrument failure)***	Yes	Yes
Were all ALP quality control data *acceptable*?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	***No, Bicarbonate and QC result >upper control limit (UCL)***	Yes	Yes

Review Questions	**Laboratory Report Submission Numbers and Results**											
	2002051750	**2002051819**	**2002060185**	**2002060240**	**2002060310**	**2002060321**	**2002060410**	**2002060477**	**2002060507**	**2002060573**	**2002060721**	**2002061243**
Sampling Event	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off	Spring Run-off & Fall Baseflow	Spring Run-off
Locations	NS-1 & 2; C62-3; SS-1 & 2	BO-3; C62-4	CH-1 & 2	BA-1, 2 & 3	BE-1, 2 & 3	MO-1 & 2	TS-1 & 2	CR-1 & 2	CR-3	BE-4; SF-2; MO-3	SF-3; RO-1 & 2	SJ-1
Date Sampled	05/30/02	05/31/02	06/05/02	06/05/02	06/06/02	06/06/02	06/07/02	06/10/02	06/10/02	06/11/02	06/12/02	06/20/02
Analysis type (hydrocarbons, ALP, Coliform)	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP
Do all dates match COC?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is sample ID consistent throughout report?	Yes	Yes	Yes	Yes	Yes	Yes	***No, should be TS on ALP instead of T5 (on COC it looked like a "5", Not an "S")***	Yes	Yes	Yes	Yes	Yes
Were all sample holding times met?	***No, o-Phosphate (re-analyzed outside of hold time due to instrument failure)***	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were all ALP quality control data *acceptable*?	Yes	Yes	Yes	Yes	Yes	Yes	***No, Silver (OOS-Low) & Ammonia QC result >UCL***	***No, Ammonia & TSS (QC result.UCL***	***No, Ammonia QC result.UCL***	***No, Alkalinity, Bicarbonate, & Ammonia (QC result.UCL***	***No, Iron QC result<lower control limit***	Yes

Appendix I Table 2. Quality Control/Quality Assurance Review of Fall (Baseflow) 2002 Sample Laboratory Analyses

Review Questions	**Laboratory Report Submission Numbers and Results**								
	2002070151	**2002070158**	**2002070208**	**2002070207**	**2002070587**	**2002070680**	**2002070679**	**2002070731**	**2002081319**
Sampling Event	Fall Baseflow	Fall Baseflow & Monthly	Fall Baseflow	Fall Baseflow	Fall Baseflow	Fall Baseflow	Fall Baseflow	Fall Baseflow	Fall Baseflow & Monthly
Locations	BO-1, 2 & 3; C62-1, 2, 3 & 4; CH-1 & 2	RK-1, 2 & 3; MP-1 (10M & 7M); MP-2; MP-3 (4M & 7M)	SS-1, 2 & 3; NS-1, 2 & 3	TS-1, 2 & 3	PI-1, 2 & 3; BA-3, 4 & 5; EL-1 & 3	CR-1 & 2; HO-1 & 2	BA-6	CR-3; HO-3	SL-1A & 1B; NF-3; ST-1
Date Sampled	07/02/02	07/02/02		07/03/02	07/10/02	07/11/02	07/11/02	07/12/02	08/22/02
Analysis type (hydrocarbons, ALP, Coliform)	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP
Do all dates match COC?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is sample ID consistent throughout report?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were all sample holding times met?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were all ALP quality control data *acceptable*?	No, Ammonia (OOS-High) QC result>Upper Control Limit (UCL)	No, Ammonia QC result>UCL	No, Ammonia (QC result>UCL	No, Ammonia QC result>UCL	Yes	Yes	Yes	Yes	No, Nitrate and Nitrogen QC result>upper Control Limit (UCL

Review Questions	**Laboratory Report Submission Numbers and Results**							
	2002081467	**2002081525**	**2002081612**	**2002081728**	**2002081691**	**2002090049**	**2002090125**	**2002090249**
Sampling Event	Fall Baseflow & Monthly	Fall Baseflow & Monthly	Fall Baseflow & Monthly	Fall Baseflow	Fall Baseflow	Fall Baseflow	Fall Baseflow	Fall Baseflow
Locations	BC-3, 4 & 5	BE-1, 2, 3 & 4	BC-7, 8, 9 & 10; SJ-4, 5, 6, 7, 8 & 9	SF-2 & 3; MO-3	BC-1 & 2; RA-1 & 2	ST-2; SJ-10, 11 & 12	SJ-3	SF-4; NF-1 & 2; BC-6
Date Sampled	08/26/02	08/27/02	8/27/02 - 8/28/02	08/29/02	08/29/02	09/03/02	09/04/02	9/4/02 - 9/5/02
Analysis type (hydrocarbons, ALP, Coliform)	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP
Do all dates match COC?	Yes	Yes (No time sampled on COC)	Yes	Yes	Yes	Yes	Yes	Yes
Is sample ID consistent throughout report?	Yes	Yes	Yes	Yes	Yes	No, should be ST on ALP instead of SJ (on COC it looked like a "J", Not a "T")	***Yes***	Yes
Were all sample holding times met?	***Yes***	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were all ALP quality control data *acceptable*?	No, Nitrogen (QC result.UCL	Yes	Yes	Yes	Yes	Yes	***No, Ammonia (QC result >UCL***	***No, Ammonia (QC result >UCL***

Appendix I Table 3. Quality Control/Quality Assurance Review of Monthly Reservoir/Forebay Sample 2002 Laboratory Analyses

Review Questions	**Laboratory Report Submission Numbers and Results**									
	2002061400	**2002061411**	**2002061512**	**2002061598**	**2002061696**	**2002061769**	**2002071330**	**2002071296**	**2002071384**	**2002071530**
Sampling Event	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir
Locations	SL-2A & 2B; SL-3A & 3B	SL-1	HL-1, 2, 3A & 3B	FL-1, 2A, 2B, 3A & 3B	BA-1 & 2; BC-4 & 8; SJ-8	MO-1A & 1B; BE-2	MP-1A, 1B, 2A & 2B	MP-3A & 3B	HL-2, 3A & 3B	BC-4 & 8; HL-1A & 1B; FL-2A, 2B, 3A & 3B
Date Sampled	06/24/02	06/24/02	06/25/02	06/26/02	06/27/02	06/28/02	07/22/02	07/22/02	07/23/02	7/23/02 - 7/24/02
Analysis type (hydrocarbons, ALP, Coliform)	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP
Do all dates match COC?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is sample ID consistent throughout report?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were all sample holding times met?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were all ALP quality control data *acceptable*?	Yes	Yes	Yes	No, Alkalinity & Bicarbonate QC result>upper control limit (UCL)	No, Alkalinity & Bicarbonate (QC result > UCL	Yes	No, Turbidity (QC result>UCL	No, Turbidity QC result>UCL	No, Turbidity QC result>UCL	Yes

Review Questions	**Laboratory Report Submission Numbers and Results**									
	2002071541	**2002071593**	**2002071629**	**2002071685**	**2002081061**	**2002081132**	**2002081220**	**2002081276**	**2002081368**	**2002081452**
Sampling Event	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir & Fall	Monthly Reservoir & Fall	Monthly Reservoir & Fall	Monthly Reservoir	Monthly Reservoir & Fall
Locations	FL-1A & 1B	MO-1, BE-2; Portal Forebay	BA-1A, 1B & 2; SJ-8	SL-1A, 1B, 2A, 2B, 3A & 3B	HL-1A & 1B	HL-2A, 2B, 3A & 3B; SJ-5; FL-3	FL-1 & 2; SF-1; SJ-1; MP-2 & 3	MP-1; SJ-2; SL-2A, 2B, 3A & 3B	BA-1 & 2	MO-1 & 2; PWQ-3
Date Sampled	07/24/02	07/25/02	07/25/02	07/26/02	08/19/02	8/19/02 - 8/20/02	8/20/02 - 8/21/02	8/21/02 - 8/22/02	08/23/02	08/26/02
Analysis type (hydrocarbons, ALP, Coliform)	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP
Do all dates match COC?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is sample ID consistent throughout report?	Yes	Yes	Yes	Yes	Yes	Yes	***No, should be SJ on ALP instead of ST***	Yes	Yes	Yes
Were all sample holding times met?	***Yes***	Yes	Yes	No, BOD sampled outside of hold time	Yes	No, BOD sampled outside of hold time	No, TDS sampled outside of hold time	Yes	Yes	Yes
Were all ALP quality control data *acceptable*?	Yes	Yes	Yes	No, Ammonia (QC result>upper control limit (UCL)	No, Nitrate (QC result >UCL	No, Alkalinity, Bicarbonate & Nitrate QC result>UCL	***No, Nitrate QC result >UCL***	***No, Nitrate QC result > UCL***	***No, Nitrogen QC results> upper control limit (UCL)***	***No, Nitrogen QC results>UCL***

Review Questions	**Laboratory Report Submission Numbers and Results**									
	2002091292	**2002091315**	**2002091382**	**2002091363**	**2002091484**	**2002091462**	**2002091569**	**2002091534**		
Sampling Event	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir	Monthly Reservoir		
Locations	HL-1, 2 & 3	SJ-8; BC-4 & 8	MO-1; BE-2	FL-1, 2 & 3	MP-1 & 2	MP-3A & 3B	SL-1, 2 & 3	BA-1 & 2		
Date Sampled	09/23/02	09/23/02	09/24/02	09/24/02	09/25/02	09/25/02	09/26/02	09/26/02		
Analysis type (hydrocarbons, ALP, Coliform)	ALP	ALP	ALP	ALP	ALP	ALP	ALP	ALP		
Do all dates match COC?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Is sample ID consistent throughout report?	Yes	Yes	Yes	Yes	Yes	Yes	***Yes***	Yes		
Were all sample holding times met?	***Yes***	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Were all ALP quality control data *acceptable*?	No, TSS QC results>UCL	No, TSS QC results>UCL	No, TSS Qcresults>UCL	No, TSS QC results>UCL	Yes	Yes	***No, Turbidity QC results>UCL***	***No, pH & Turbidity QC results>UCL***		

Appendix I Table 4. Quality Control Results for Parameters Outside of Quality Control Limits

Report #	Sample Station IDs	Sample Date	Constituent(s)	QC Comments*	
2051624	TS-3, SF-1, CR-4, FL-1, FL-2	05/29/2002	Bicarbonate, Total dissolved solids	LDUP result was >UCL	
2051624	TS-3, SF-1, CR-4, FL-1, FL-2	05/29/2002	Orthophosphate	Reanalyzed outside of hold time due to instrument failure	
2051750	SS-1, SS-2	05/30/2002	Orthophosphate	Reanalyzed outside of hold time due to instrument failure	
2060410	TS-1, TS-2	06/07/2002	Silver	MS and MSD are <LCL due to matrix effects	
2060410	TS-1, TS-2	06/07/2002	Ammonia	MSD3 was >UCL	
2060477	CR-1, CR-2	06/10/2002	Ammonia	MSD3 was >UCL	
2060477	CR-1, CR-2	06/10/2002	Total suspended sediment	LDUP result was >UCL	
2060507	CR-3	06/10/2002	Ammonia	MSD3 was >UCL	
2060573	BE-4, SF-2, MO-3	06/11/2003	Alkalinity, Bicarbonate	LDUP result was >UCL	
2060573	BE-4, SF-2, MO-3	06/11/2003	Ammonia	MSD3 was >UCL	
2060721	SF-3	06/12/2003	Iron	MS was < LCL due to matrix effects	
2070151	BO-1, BO-2, BO-3, C62-1, C62-2, C62-3, C62.4, CH-1, CH-2	07/02/2002	Ammonia	MS2, MS3 and MSD3 were >UCL due to matrix effects	
2070158	RK-1, RK-2, RK-3, MP-1, MP-2, MP-3	07/02/2002	Ammonia	MS2, MS3 and MSD3 were >UCL due to matrix effects	
2070208	SS-1, SS-2, SS-3, NS-1, NS-2, NS-3	07/02/2002	Ammonia	MS2, MS3 and MSD3 were >UCL due to matrix effects	
2070207	TS-1, TS-2, TS-3	07/03/2002	Ammonia	MS2, MS3 and MSD3 were >UCL due to matrix effects	
2081319	SL-1, NF-3, ST-1	08/22/2002	Nitrate (NO3+NO2)	MS was slightly >UCL	Yes
2081319	SL-1, NF-3, ST-1	08/22/2002	Total Kjeldahl Nitrogen	LCS was slightly >UCL, run was accepted as all other recoveries were within limits.	
2081467	BC-3, BC-4, BC-5	08/26/2002	Total Kjeldahl Nitrogen	LCS was slightly >UCL, run was accepted as all other recoveries were within limits.	
2090125	SJ-3	09/04/2002	Ammonia	MS2 & MSD2 were >UCL due to matrix effects	
2090249	SF-4, NF-1, NF-2, BC-6	09/05/2002	Ammonia	MS2 & MSD2 were >UCL due to matrix effects	
2061598	FL-1, FL-2, FL-3	06/26/2002	Alkalinity & Bicarbonate	LDUP was >UCL	
2061696	BA-1, BA-2, BC-4, BC-8, SJ-8	06/27/2002	Alkalinity & Bicarbonate	LDUP was >UCL	
2071330	MP-1, MP-2	07/22/2002	Turbidity	LDUP was >UCL	
2071296	MP-3	07/22/2002	Turbidity	LDUP was >UCL	

Appendix I Table 4. Quality Control Results for Parameters Outside of Quality Control Limits

Report #	Sample Station IDs	Sample Date	Constituent(s)	QC Comments*
2071384	HL-2, HL-3	07/23/2002	Turbidity	LDUP was >UCL
2071685	SL-1, SL-2, SL-3	07/26/2002	Biochemical oxygen demand	Analyzed outside of holding time
2071685	SL-1, SL-2, SL-3	07/26/2002	Ammonia	MS2 & MSD2 were >UCL due to matrix effects
2081061	HL-1	08/19/2002	Nitrate (NO3 + NO2)	MS was slightly > UCL
2081132	HL-2, HL-3	08/19/2002	Biochemical oxygen demand	Analyzed outside of holding time
2081132	HL-2, HL-3, SJ-5, FL-3	08/19/2002	Alkalinity & Bicarbonate	LDUP1 was slightly >UCL
2081132	HL-2, HL-3, SJ-5, FL-3	08/19/2002	Nitrate (NO3+NO2)	MS was slightly >UCL
2081220	ST-1, MP-2, MP-3	08/20/2002	Total dissolved solids	Analyzed outside of holding time
2081220	FL-1, FL-2, SF-1, SJ-1, MP-2, MP-3	08/20/2002	Nitrate (NO3+NO2)	MS was slightly > UCL
2081276	MP-1, SJ-2, SL-2, SL-3	08/21/2002	Nitrate (NO3+NO2)	MS was slightly > UCL
2081368	BA-1, BA-2	08/23/2002	Total kjeldahl nitrogen	LCS was slightly >UCL. Run was accepted as all other spike recoveries were within limits.
2081452	MO-1, MO-2	08/26/2002	Total kjeldahl nitrogen	LCS was slightly >UCL. Run was accepted as all other spike recoveries were within limits.
2091292	HL-1, HL-2, HL-3	09/23/2002	Total suspended solids	LDUP2 was slightly >UCL due to matrix effects
2091315	SJ-8, BC-4, BC-8	09/23/2002	Total suspended solids	LDUP2 was slightly >UCL due to matrix effects
2091382	MO-1, BE-2	09/24/2002	Total suspended solids	LDUP2 was slightly >UCL due to matrix effects
2091363	FL-1, FL-2, FL-3	09/24/2002	Total suspended solids	LDUP2 was slightly >UCL due to matrix effects
2091569	SL-1, SL-2, SL-3	09/26/2002	Turbidity	LDUP2 was slightly >UCL due to matrix effects
2091534	BA-1, BA-2	09/26/2002	Turbidity and pH	LDUP2 (pH) & LDUP (turbidity) were >UCL

* Explanation of Abbreviated Terms:

LDUP	laboratory duplicate
LCS	laboratory control spike
MS	Matrix spike
MSD	Matrix spike duplicate
UCL	upper control limit (if >, recovery was high)
LCL	lower control limit (if <, recovery was low)

Appendix I Table 5a. Hydrocarbon Data Review (May 2002)

1	Laboratory Submission number	2002051267	2002051313	2002051511	2002051626	2002051633
2	Sampling Event	May Reservoirs	May Reservoirs	May Reservoirs	May Reservoirs	May Reservoirs
3	Locations	MP	SL	HL	FL	FL
4	Date Sampled	5/22/2002	5/23/2002	5/28/2002	5/29/2002	5/29/2002
5	Analysis type (hydrocarbons, ALP, Coliform)	hydrocarbons	hydrocarbons	hydrocarbons	hydrocarbons	hydrocarbons
6	Do all dates match COC?	yes	yes	yes	yes	yes
7	Is sample ID consistent throughout report?	yes	yes	yes	yes	yes
8	Were all sample holding times met?	yes	yes	yes	yes	yes
9	Were all ALP quality control data *acceptable*?	NA	NA	NA	NA	NA
10	Do surrogate recoveries meet acceptance criteria?	yes	yes	yes	yes	yes
11	Do the concentration of all analytes in blanks fall below PQL?	yes	yes	yes	yes	yes
12	Do percent recoveries for Laboratory Control Spike (LCS) meet acceptance criteria?	yes	yes	yes	yes	yes
13	Do percent recoveries for Laboratory Control Spike duplicate (LCSD) meet acceptance criteria?	yes	yes	yes	yes	yes
14	Do the Relative Percent Differences (RPDs) of the LCS/LCSD meet acceptance criteria?	yes	yes	yes	yes	yes
15	Do percent recoveries for Matrix Spike (MS) meet acceptance criteria?	yes	yes	yes	yes	yes
16	comments					
					Yes	

Appendix I Table 5b. Hydrocarbon Data Review (June 2002)

1	Laboratory Submission number	2002061412	2002061511	2002061599	200207157
2	Sampling Event	June Reservoir	June Reservoir	June Reservoir	June Reservoir
3	Locations	SL	HL	FL	MP
4	Date Sampled	6/24/2002	6/25/2002	6/26/2002	7/2/2002
5	Analysis type (hydrocarbons, ALP, Coliform)	hydrocarbons	hydrocarbons	hydrocarbons	hydrocarbons
6	Do all dates match COC?	yes	yes	yes	yes
7	Is sample ID consistent throughout report?	yes	yes	yes	yes
8	Were all sample holding times met?	yes	yes	FL-1 diesel extracted on 8th day, all other diesels on 13th day	All diesel samples extracted on 10th day.
9	Were all ALP quality control data *acceptable*?	NA	NA	NA	NA
10	Do surrogate recoveries meet acceptance criteria?	Diesel surrogate high for SL-2B, SL-3B and MS	Diesel surrogate high for HL-3A, HL-3B, and MS	Diesel surrogate low for method blank associated with FL-1	yes
11	Do the concentration of all analytes in blanks fall below PQL?	yes	yes	yes	yes
12	Do percent recoveries for Laboratory Control Spike (LCS) meet acceptance criteria?	yes	yes	yes	yes
13	Do percent recoveries for Laboratory Control Spike duplicate (LCSD) meet acceptance criteria?	yes	yes	yes	yes
14	Do the Relative Percent Differences (RPDs) of the LCS/LCSD meet acceptance criteria?	yes	yes	yes	yes
15	Do percent recoveries for Matrix Spike (MS) meet acceptance criteria?	Diesel MS percent recovery high	Diesel MS percent recovery high	yes	yes
16	comments	High surrogates maybe due to matrix interfence. LCS's were within control. No action taken	High surrogates maybe due to matrix interfence. LCS's were within control. No action taken	Diesel method blank low surrogate, nothing detected in blank - no action taken. Lab cites 14 day hold time for diesel from the CA LUFT	Lab cites 14 day hold time for diesel from the CA LUFT
					Yes

Appendix I Table 5c. Hydrocarbon Data Review (July 2002)

1	Laboratory Submission number	2002071329	2002071383	2002071531	2002071540	2002071684
2	Sampling Event	July Reservoir	July Reservoir	July Reservoir	July Reservoir	July Reservoir
3	Locations	MP	HL	HL & FL	FL	SL
4	Date Sampled	7/22/2002	7/23/2002	7/23 & 7/24/02	7/24/2002	7/26/2002
5	Analysis type	hydrocarbons	hydrocarbons	hydrocarbons	hydrocarbons	hydrocarbons
6	Do all dates match COC?	yes	yes	yes	yes	yes
7	Is sample ID consistent throughout report?	yes	yes	yes	yes	yes
8	Were all sample holding times met?	All diesel samples extracted on 8th day.	yes	HL-1B and FL-3A extracted on 28th day due to lab error.	yes	yes
9	Were all ALP quality control data *acceptable* ?	NA	NA	NA	NA	NA
10	Do surrogate recoveries meet acceptance criteria?	yes	Diesel surrogate high for HL-3A and HL-3B	Diesel surrogate low for HL-1A	Diesel surrogate low for FL-1A.	yes
11	Do the concentration of all analytes in blanks fall below PQL?	yes	yes	yes	yes	yes
12	Do percent recoveries for Laboratory Control Spike (LCS) meet acceptance criteria?	yes	yes	yes	yes	yes
13	Do percent recoveries for Laboratory Control Spike duplicate (LCSD) meet acceptance criteria?	yes	yes	yes	yes	yes
14	Do the Relative Percent Differences (RPDs) of the LCS/LCSD meet acceptance criteria?	yes	yes	yes	yes	yes
15	Do percent recoveries for Matrix Spike (MS) meet acceptance criteria?	yes	yes	Diesel MS recovery high, no action taken.	Diesel MS recovery high, no action taken.	Diesel MS recovery high, no action taken.
16	comments	Lab cites 14 day hold time for diesel from the CA LUFT	High surrogates maybe due to matrix interfence. No action taken.	Diesel results for HL-1B and FL-3A are "J" qualified, meaning results are considered estimated values. HL-1A surrogate recovery was <10% with a result of "ND", therefore the diesel result is rejected.	FL-1A surrogate recovery was <10% with diesel result of 1800 ug/L, therefore the diesel result is "J" qualified, meaning the result is considered and estimated value. Yes	

Appendix I Table 5d. Hydrocarbon Data Review (August 2002)

1	Laboratory Submission number	2002081060	2002081130	2002081219	2002081318
2	Sampling Event	August Reservoir	August Reservoir	August Reservoir	August Reservoir
3	Locations	HL	HL & FL	FL & MP	MP & SL
4	Date Sampled	8/19/2002	8/19 & 8/20/2002	8/20 & 8/21/2002	8/21 & 8/22/2002
5	Analysis type	hydrocarbons	hydrocarbons	hydrocarbons	hydrocarbons
6	Do all dates match COC?	yes	yes	yes	yes
7	Is sample ID consistent throughout report?	yes	yes	yes	MP-1 extracted 8th day
8	Were all sample holding times met?	yes	yes	yes	yes
9	Were all ALP quality control data *acceptable*?	NA	NA	NA	NA
10	Do surrogate recoveries meet acceptance criteria?	yes	yes	yes	Diesel surrogate low for SL-2B and SL-1A.
11	Do the concentration of all analytes in blanks fall below PQL?	yes	yes	yes	yes
12	Do percent recoveries for Laboratory Control Spike (LCS) meet acceptance criteria?	yes	yes	yes	yes
13	Do percent recoveries for Laboratory Control Spike duplicate (LCSD) meet acceptance criteria?	yes	yes	yes	yes
14	Do the Relative Percent Differences (RPDs) of the LCS/LCSD meet acceptance criteria?	yes	yes	yes	yes
15	Do percent recoveries for Matrix Spike (MS) meet acceptance criteria?	yes	yes	yes	yes
16	comments				Lab cites 14 day hold time for diesel from the CA LUFT. Diesel surrogate recoveries were low but >10%, therefore diesel data for SL-2B and SL-1A results are "J" qualified. This means the results are considered estimated values.
					Yes

Appendix I Table 5e. Hydrocarbon Data Review (September 2002)

1	Laboratory Submission number	2002091284	2002091485
2	Sampling Event	Sept. Reservoir	Sept. Reservoir
3	Locations	HL	MP
4	Date Sampled	9/23/2002	9/25/2002
5	Analysis type	hydrocarbons	hydrocarbons
6	Do all dates match COC?	yes	yes
7	Is sample ID consistent throughout report?	yes	Diesel samples extracted on 9th day
8	Were all sample holding times met?	yes	yes
9	Were all ALP quality control data *acceptable* ?	NA	NA
10	Do surrogate recoveries meet acceptance criteria?	Diesel surrogate high for diesel MS	yes
11	Do the concentration of all analytes in blanks fall below PQL?	yes	yes
12	Do percent recoveries for Laboratory Control Spike (LCS) meet acceptance criteria?	yes	yes
13	Do percent recoveries for Laboratory Control Spike duplicate (LCSD) meet acceptance criteria?	yes	yes
14	Do the Relative Percent Differences (RPDs) of the LCS/LCSD meet acceptance criteria?	yes	yes
15	Do percent recoveries for Matrix Spike (MS) meet acceptance criteria?	yes	yes
16	comments	Diesel surrogate high for diesel MS. All other data acceptable, therefore no action taken.	Lab cites 14 day hold time for diesel from the CA LUFT.
			Yes

APPENDIX J

Tables of Trace Values and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc

Appendix J Table J-1. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Spring 2002

Station	BO-1	BO-2	BO-3	C62-1	C62-2	C62-3	C62-4	CH-1	CH-2	CR-1	CR-2	CR-3	CR-4			
Date Sampled	5/28/2002	5/28/2002	5/31/2002	5/28/2002	5/28/2002	5/30/2002	5/31/2002	6/5/2002	6/5/2002	6/10/2002	6/10/2002	6/10/2002	5/29/2002	MDL	PQL	Units
Time Sampled	1000	1030	0830	1115	1143	1250	0910	0800	0815	0945	1005	1326	1045			
Copper (Cu)**	0.05	0.30	0.50	ND	ND	0.17	**0.76**	0.12	0.45	0.06	0.09	0.49	ND	0.05	5.0	ug/L
Theoretical dissolved	0.05	0.29	0.48	na	na	0.16	0.73	0.12	0.43	0.06	0.09	0.47	na			ug/L
Acute Criterion	0.90	0.66	1.19	0.59	0.59	0.62	0.89	0.40	0.52	0.89	1.68	1.20	0.74			ug/L
Chronic Criterion	0.77	0.58	0.99	0.52	0.52	0.55	0.76	0.37	0.47	0.76	1.36	1.00	0.64			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	**0.7**	**0.61**	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	**0.7**	**0.61**	na	na	na	na	na	na			ug/L
Acute Criterion	2.57	1.76	3.58	1.51	1.51	1.61	2.52	0.94	1.32	2.52	5.47	3.64	2.01			ug/L
Chronic Criterion	0.10	0.07	0.14	0.06	0.06	0.06	0.10	0.04	0.05	0.10	0.21	0.14	0.08			ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.05**	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	0.04	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.02	0.01	0.04	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.08	0.04	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	10.34	7.82	13.20	7.01	7.01	7.34	10.19	4.97	6.34	10.19	18.06	13.35	8.63			ug/L
Chronic Criterion	10.43	7.89	13.31	7.07	7.07	7.40	10.27	5.01	6.39	10.27	18.20	13.46	8.70			ug/L
Hardness (Ca CO3)	5.7	4.1	7.6	3.6	3.6	3.8	5.6	2.4	3.2	5.6	11	7.7	4.6		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Appendix J Table J-1. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Spring 2002 (continued)

Station	**BE-1**	**BE-2**	**BE-3**	**BE-4**	**MO-1**	**MO-2**	**MO-3**	**SF-1**	**SF-2**	**SF-3**	**SF-5**			
Date Sampled	6/6/2002	6/6/2002	6/6/2002	6/11/2002	6/6/2002	6/6/2002	6/11/2002	5/29/2002	6/11/2002	6/12/2002	5/29/2002	**MDL**	**PQL**	**Units**
Time Sampled	0900	0950	0945	0815	1145	1210	1055	1000	1150	1025	1240			
Copper (Cu)**	0.09	0.19	0.05	0.09	0.15	0.07	0.77	ND	0.30	0.67	ND	0.05	5.0	ug/L
Theoretical dissolved	0.09	0.18	0.05	0.09	0.14	0.07	0.74	na	0.29	0.64	na			ug/L
Acute Criterion	0.37	0.37	0.37	0.68	1.16	1.16	1.54	0.63	1.42	1.48	0.42			ug/L
Chronic Criterion	0.34	0.34	0.34	0.60	0.97	0.97	1.25	0.56	1.17	1.21	0.38			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.85	0.85	0.85	1.81	3.47	3.47	4.91	1.66	4.46	4.68	0.99			ug/L
Chronic Criterion	0.03	0.03	0.03	0.07	0.14	0.14	0.19	0.06	0.17	0.18	0.04			ug/L
Mercury (Hg)	ND	**0.07**	ND	ND	**0.36**	**0.06**	ND	ND	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	na	**0.06**	na	na	**0.31**	**0.05**	na	na	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	**0.3**	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	**0.26**	na	na	na	na	na			ug/L
Acute Criterion	0.0049	0.0049	0.0049	0.01	0.04	0.04	0.07	0.01	0.06	0.06	0.01			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	4.62	4.62	4.62	7.99	12.90	12.90	16.66	7.50	15.52	16.09	5.15			ug/L
Chronic Criterion	4.66	4.66	4.66	8.05	13.01	13.01	16.79	7.56	15.65	16.22	5.19			ug/L
Hardness (Ca CO3)	2.2	2.2	2.2	4.2	7.4	7.4	10	3.9	9.2	9.6	2.5		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Appendix J Table J-1. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Spring 2002 (continued)

Station	**HO-1**	**HO-2**	**HO-3**	**NS-1**	**NS-2**	**NS-3**	**SS-1**	**SS-2**	**SS-3**	**TS-1**	**TS-2**	**TS-3**			
Date Sampled	5/30/2002	5/30/2002	5/30/2002	5/30/2002	5/30/2002	5/30/2002	5/30/2002	5/30/2002	5/30/2002	6/7/2002	6/7/2002	5/29/2002	**MDL**	**PQL**	**Units**
Time Sampled	0800	0815	0830	1045	1100	0910	1210	1230	0845	0930	0915	0930			
Copper (Cu)**	ND	ND	ND	0.13	0.27	0.10	ND	ND	0.11	0.14	**6.4**	ND	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	0.12	0.26	0.10	na	na	0.11	0.13	**6.1**	na			ug/L
Acute Criterion	0.37	0.40	1.27	0.69	0.69	0.74	0.52	0.48	0.54	0.69	0.77	0.66			ug/L
Chronic Criterion	0.34	0.37	1.06	0.61	0.61	0.64	0.47	0.43	0.49	0.61	0.67	0.58			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.85	0.94	3.91	1.86	1.86	2.01	1.32	1.18	1.37	1.86	2.11	1.76			ug/L
Chronic Criterion	0.03	0.04	0.15	0.07	0.07	0.08	0.05	0.05	0.05	0.07	0.08	0.07			ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	**0.05**	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	0.04	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.0049	0.01	0.05	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.01			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	4.62	4.97	14.08	8.15	8.15	8.63	6.34	5.84	6.51	8.15	8.94	7.82			ug/L
Chronic Criterion	4.66	5.01	14.19	8.21	8.21	8.70	6.39	5.88	6.56	8.21	9.02	7.89			ug/L
Hardness (Ca CO3)	2.2	2.4	8.2	4.3	4.3	4.6	3.2	2.9	3.3	4.3	4.8	4.1		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Appendix J Table J-1. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Spring 2002 (continued)

Station	**NF-1**	**NF-2**	**NF-3**	**RA-1**	**RA-2**	**RO-1**	**RO-2**	**RK-1**	**RK-2**	**RK-3**	**ST-1**	**ST-2**			
Date Sampled	5/23/2002	5/23/2002	5/20/2002	5/24/2002	5/24/2002	5/21/2002	5/21/2002	5/22/2002	5/22/2002	5/22/2002	5/20/2002	5/21/2002	**MDL**	**PQL**	**Units**
Time Sampled	1235	1245	1245	0810	0800	1007	1015	1115	1130	1225	1155	1301			
Copper (Cu)**	0.22	ND	0.70	0.30	0.18	0.72	0.67	0.34	0.32	0.31	ND	0.85	0.05	5.0	ug/L
Theoretical dissolved	0.21	na	0.67	0.29	0.17	0.69	0.64	0.33	0.31	0.30	na	0.82			ug/L
Acute Criterion	0.92	0.92	0.99	0.77	0.69	2.81	2.81	1.13	1.16	1.54	0.99	1.54			ug/L
Chronic Criterion	0.79	0.79	0.84	0.67	0.61	2.17	2.17	0.95	0.97	1.25	0.84	1.25			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.62	2.62	2.89	2.11	1.86	10.18	10.18	3.37	3.47	4.91	2.89	4.91			ug/L
Chronic Criterion	0.10	0.10	0.11	0.08	0.07	0.40	0.40	0.13	0.14	0.19	0.11	0.19			ug/L
Mercury (Hg)	ND	**0.06**	**0.15**	**0.17**	ND	ND	ND	ND	**0.05**	ND	ND	**0.06**	0.05	0.4	ug/L
Theoretical dissolved	na	**0.05**	**0.13**	**0.14**	na	na	na	na	0.04	na	na	**0.05**			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.03	0.03	0.03	0.02	0.02	0.20	0.20	0.04	0.04	0.07	0.03	0.07			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	10.50	10.50	11.26	8.94	8.15	28.69	28.69	12.61	12.90	16.66	11.26	16.66			ug/L
Chronic Criterion	10.58	10.58	11.35	9.02	8.21	28.93	28.93	12.71	13.01	16.79	11.35	16.79			ug/L
Hardness (Ca CO3)	5.8	5.8	6.3	4.8	4.3	19	19	7.2	7.4	10	6.3	10		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Appendix J Table J-1. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Spring 2002 (continued)

Station	**BC-1**	**BC-2**	**BC-3**	**BC-4**	**BC-5**	**BC-6**	**BC-7**	**BC-8**	**BC-9**	**BC-10**			
Date Sampled	5/24/2002	5/24/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/21/2002	5/21/2002	5/21/2002	5/21/2002	**MDL**	**PQL**	**Units**
Time Sampled	0830	0900	0815	1030	0945	1115	0730	0805	0745	1203			
Copper (Cu)**	ND	ND	0.50	0.48	**1.60**	0.95	0.89	0.44	0.41	0.71	0.05	5.0	ug/L
Theoretical dissolved	na	na	0.48	0.46	**1.54**	0.91	0.85	0.42	0.39	0.68			ug/L
Acute Criterion	0.40	0.92	1.35	0.89	1.52	2.11	2.81	0.96	0.99	2.25			ug/L
Chronic Criterion	0.37	0.79	1.11	0.76	1.24	1.67	2.17	0.82	0.84	1.77			ug/L
Lead (Pb)**	ND	ND	ND	ND	**0.63**	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	**0.63**	na	na	na	na	na			ug/L
Acute Criterion	0.94	2.62	4.18	2.52	4.85	7.20	10.18	2.78	2.89	7.79			ug/L
Chronic Criterion	0.04	0.10	0.16	0.10	0.19	0.28	0.40	0.11	0.11	0.30			ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	**0.06**	ND	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	na	**0.05**	na	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.01	0.03	0.05	0.02	0.06	0.12	0.20	0.03	0.03	0.13			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	6	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	5.10	na	na	na	na			ug/L
Acute Criterion	4.97	10.50	14.80	10.19	16.51	22.15	28.69	10.96	11.26	23.48			ug/L
Chronic Criterion	5.01	10.58	14.92	10.27	16.65	22.33	28.93	11.05	11.35	23.68			ug/L
Hardness (Ca CO3)	2.4	5.8	8.7	5.6	9.9	14	19	6.1	6.3	15		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Appendix J Table J-1. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Spring 2002 (continued)

Station	**BA-1**	**BA-2**	**BA-3**	**BA-4**	**BA-5**	**BA-6**	**EL-1**	**EL-2**	**EL-3**	**PI-1**	**PI-2**	**PI-3**			
Date Sampled	6/5/2002	6/5/2002	6/5/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/24/2002	5/24/2002	5/20/2002	**MDL**	**PQL**	**Units**
Time Sampled	1220	1330	1415	0830	0905	1200	0720	0756	1230	0750	0740	0735			
Copper (Cu)**	0.20	0.12	0.12	0.47	**1.60**	1.1	1.1	0.89	0.77	ND	ND	0.40	0.05	5.0	ug/L
Theoretical dissolved	0.19	0.12	0.12	0.45	**1.54**	1.06	1.06	0.85	0.74	na	na	0.38			ug/L
Acute Criterion	0.81	0.71	0.96	1.20	1.54	2.11	2.25	2.11	1.54	0.54	0.48	1.54			ug/L
Chronic Criterion	0.70	0.62	0.82	1.00	1.25	1.67	1.77	1.67	1.25	0.49	0.43	1.25			ug/L
Lead (Pb)**	ND	ND	ND	ND	**0.34**	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	**0.34**	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.26	1.91	2.78	3.64	4.91	7.20	7.79	7.20	4.91	1.37	1.18	4.91			ug/L
Chronic Criterion	0.09	0.07	0.11	0.14	0.19	0.28	0.30	0.28	0.19	0.05	0.05	0.19			ug/L
Mercury (Hg)	**0.07**	**0.08**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	**0.06**	**0.07**	na	na	na	na	na	na	na	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.02	0.02	0.03	0.04	0.07	0.12	0.13	0.12	0.07	0.01	0.01	0.07			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	6.85	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	9.41	8.31	10.96	13.35	16.66	22.15	23.48	22.15	16.66	6.51	5.84	16.66			ug/L
Chronic Criterion	9.49	8.38	11.05	13.46	16.79	22.33	23.68	22.33	16.79	6.56	5.88	16.79			ug/L
Hardness (Ca CO3)	5.1	4.4	6.1	7.7	10	14	15	14	10	3.3	2.9	10		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Appendix J Table J-1. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Spring 2002 (continued)

Station	SJ-1	SJ-2	SJ-3	SJ-4	SJ-5	SJ-6	SJ-7	SJ-8	SJ-9	SJ-10	SJ-11	SJ-12	MDL	PQL	Units
Date Sampled	6/20/2002	5/22/2002	5/22/2002	5/21/2002	5/21/2002	5/21/2002	5/21/2002	5/21/2002	5/21/2002	5/21/2002	5/23/2002	5/22/2002			
Time Sampled	1210	0725	1210	0910	0930	0902	1217	1130	1126	1345	1030	1415			
Copper (Cu)**	0.09	0.68	0.39	0.69	0.69	0.67	0.34	**1.70**	0.40	0.73	0.65	0.15	0.05	5.0	ug/L
Theoretical dissolved	0.09	0.65	0.37	0.66	0.66	0.64	0.33	**1.63**	0.38	0.70	0.62	0.14			ug/L
Acute Criterion	0.96	1.33	1.54	1.68	1.68	0.96	0.92	0.98	1.02	1.68	1.54	0.98			ug/L
Chronic Criterion	0.82	1.10	1.25	1.36	1.36	0.82	0.79	0.83	0.87	1.36	1.25	0.83			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.78	4.13	4.91	5.47	5.47	2.78	2.62	2.83	2.99	5.47	4.91	2.83			ug/L
Chronic Criterion	0.11	0.16	0.19	0.21	0.21	0.11	0.10	0.11	0.12	0.21	0.19	0.11			ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	**0.15**	**0.14**	ND	ND	ND	**0.11**	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	na	**0.13**	**0.12**	na	na	na	**0.09**	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.03	0.05	0.07	0.08	0.08	0.03	0.03	0.03	0.03	0.08	0.07	0.03			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	6	ND	ND	ND	ND	ND	ND	1.1	5	50.00	ug/L
Theoretical dissolved	na	na	na	na	5.87	na	na	na	na	na	na	1.08			ug/L
Acute Criterion	10.96	14.66	16.66	18.06	18.06	10.96	10.50	11.11	11.56	18.06	16.66	11.11			ug/L
Chronic Criterion	11.05	14.78	16.79	18.20	18.20	11.05	10.58	11.20	11.66	18.20	16.79	11.20			ug/L
Hardness (Ca CO3)	6.1	8.6	10	11	11	6.1	5.8	6.2	6.5	11	10	6.2		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J2. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Fall 2002

Station	BA-3	BA-4	BA-5	BA-6	EL-1	EL-3	PI-1	PI-2	PI-3	MDL	PQL	Units
Date Sampled	7/10/2002	7/10/2002	7/10/2002	7/11/2002	7/10/2002	7/10/2002	7/10/2002	7/10/2002	7/10/2002			
Time Sampled	0910	1140	1110	1300	1340	1410	0815	0825	1035			
Copper (Cu)**	0.21	0.45	0.49	0.42	0.98	0.50	0.18	0.14	0.42	0.05	5.0	ug/L
Theoretical dissolved	0.20	0.43	0.47	0.40	0.94	0.48	0.17	0.13	0.40			ug/L
Acute Criterion	0.92	1.24	1.68	1.48	2.81	1.82	1.02	0.96	2.11			ug/L
Chronic Criterion	0.79	1.03	1.36	1.21	2.17	1.46	0.87	0.82	1.67			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.62	3.80	5.47	4.68	10.18	6.04	2.99	2.78	7.20			ug/L
Chronic Criterion	0.10	0.15	0.21	0.18	0.40	0.24	0.12	0.11	0.28			ug/L
Mercury (Hg)	ND	ND	ND	ND	**0.14**	ND	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	**0.12**	na	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.03	0.04	0.08	0.06	0.20	0.09	0.03	0.03	0.12			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	5	9	ND	ND	ND	ND	ND	0.012	5	50	ug/L
Theoretical dissolved	na	4.890	8.802	na	na	na	na	na	0.012			ug/L
Acute Criterion	10.50	13.79	18.06	16.09	28.69	19.44	11.56	10.96	22.15			ug/L
Chronic Criterion	10.58	13.90	18.20	16.22	28.93	19.60	11.66	11.05	22.33			ug/L
Hardness (Ca CO3)	5.8	8.0	11	9.6	19	12	6.5	6.1	14		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J2. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Fall 2002 (continued)

Station	BO-1	BO-2	BO-3	C62-1	C62-2	C62-3	C62-4	CH-1	CH-2	CR-1	CR-2	CR-3	MDL	PQL	Units
Date Sampled	7/2/2002	7/2/2002	7/2/2002	7/2/2002	7/2/2002	7/2/2002	7/2/2002	7/2/2002	7/2/2002	7/11/2002	7/11/2002	7/12/2002			
Time Sampled	1100	1115	0834	1220	1240	1030	0925	1355	1430	1005	1025	0935			
Copper (Cu)**	ND	0.16	0.20	0.07	0.07	0.77	1.0	0.09	0.23	0.09	0.10	0.13	0.05	5.0	ug/L
Theoretical dissolved	na	0.15	0.19	0.07	0.07	0.74	0.96	0.09	0.22	0.09	0.10	0.12			ug/L
Acute Criterion	1.26	1.39	1.43	0.84	0.84	1.19	2.81	0.95	1.16	1.35	2.53	1.42			ug/L
Chronic Criterion	1.05	1.14	1.18	0.73	0.73	0.99	2.17	0.81	0.97	1.11	1.97	1.17			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	**0.47**	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	**0.47**	na	na	na	na	na	na			ug/L
Acute Criterion	3.85	4.35	4.51	2.37	2.37	3.58	10.18	2.73	3.47	4.18	8.98	4.46			ug/L
Chronic Criterion	0.15	0.17	0.18	0.09	0.09	0.14	0.40	0.11	0.14	0.16	0.35	0.17			ug/L
Mercury (Hg)	ND	ND	ND	**0.06**	ND	ND	**0.05**	ND	ND	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	**0.05**	na	na	0.04	na	na	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.05	0.05	0.06	0.02	0.02	0.04	0.20	0.03	0.04	0.05	0.16	0.06			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	13.93	15.23	15.66	9.73	9.73	13.20	28.69	10.80	12.90	14.80	26.11	15.52			ug/L
Chronic Criterion	14.05	15.36	15.79	9.81	9.81	13.31	28.93	10.89	13.01	14.92	26.32	15.65			ug/L
Hardness (Ca CO3)	8.1	9.0	9.3	5.3	5.3	7.6	19	6.0	7.4	8.7	17	9.2		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J2. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Fall 2002 (continued)

Station	HO-1	HO-2	HO-3	NS-1	NS-2	NS-3	SS-1	SS-2	SS-3	TS-1	TS-2	TS-3			
Date Sampled	7/11/2002	7/11/2002	7/12/2002	7/3/2002	7/3/2002	7/3/2002	7/3/2002	7/3/2002	7/3/2002	7/3/2002	7/3/2002	7/3/2002	MDL	PQL	Units
Time Sampled	1230	1240	1040	1015	1010	1045	0930	0945	1035	1040	1050	1145			
Copper (Cu)**	0.08	0.60	0.06	0.59	0.53	0.51	0.49	0.51	0.46	0.62	**2.0**	0.37	0.05	5.0	ug/L
Theoretical dissolved	0.08	0.58	0.06	0.57	0.51	0.49	0.47	0.49	0.44	0.60	**1.9**	0.36			ug/L
Acute Criterion	0.62	0.62	0.62	0.77	0.77	0.77	0.74	0.77	0.74	0.80	0.77	0.77			ug/L
Chronic Criterion	0.55	0.55	0.55	0.67	0.67	0.67	0.64	0.67	0.64	0.69	0.67	0.67			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	1.61	1.61	1.61	2.11	2.11	2.11	2.01	2.11	2.01	2.21	2.11	2.11			ug/L
Chronic Criterion	0.06	0.06	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.08	0.08			ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	**0.06**	**0.10**	**0.09**	ND	**0.09**	**0.14**	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	na	**0.05**	**0.09**	**0.08**	na	**0.08**	**0.12**	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5	50	ug/L
Theoretical dissolved	13.69	na	na	na	na	na	na	na	na	na	na	4.89			ug/L
Acute Criterion	7.34	7.34	7.34	8.94	8.94	8.94	8.63	8.94	8.63	9.26	8.94	8.94			ug/L
Chronic Criterion	7.40	7.40	7.40	9.02	9.02	9.02	8.70	9.02	8.70	9.33	9.02	9.02			ug/L
Hardness (Ca CO3)	3.8	3.8	3.8	4.8	4.8	4.8	4.6	4.8	4.6	5.0	4.8	4.8		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J2. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Fall 2002 (continued)

Station	MO-2	MO-3	NF-1	NF-2	NF-3	RA-1	RA-2	RK-1	RK-2	RK-3	RO-1	RO-2	MDL	PQL	Units
Date Sampled	8/26/2002	8/29/2002	9/5/2002	9/5/2002	8/22/2002	8/29/2002	8/29/2002	7/2/2002	7/2/2002	7/2/2002	6/12/2002	6/12/2002			
Time Sampled	1000	1030	1030	1015	1500	0900	0915	0950	1035	1020	1535	1525			
Copper (Cu)**	ND	ND	ND	ND	0.21	ND	ND	0.28	0.18	0.21	0.70	0.84	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	na	0.20	na	na	0.27	0.17	0.20	0.67	0.81			ug/L
Acute Criterion	0.84	1.10	1.68	0.71	0.81	2.53	0.74	1.82	1.68	1.68	3.09	2.95			ug/L
Chronic Criterion	0.73	0.92	1.36	0.62	0.70	1.97	0.64	1.46	1.36	1.36	2.36	2.26			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.37	3.26	5.47	1.91	2.26	8.98	2.01	6.04	5.47	5.47	11.40	10.79			ug/L
Chronic Criterion	0.09	0.13	0.21	0.07	0.09	0.35	0.08	0.24	0.21	0.21	0.44	0.42			ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.08**	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	**0.07**	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.02	0.04	0.08	0.02	0.02	0.16	0.02	0.09	0.08	0.08	0.24	0.22			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	8	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	7.82	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	9.73	12.31	18.06	8.31	9.41	26.11	8.63	19.44	18.06	18.06	31.23	29.97			ug/L
Chronic Criterion	9.81	12.41	18.20	8.38	9.49	26.32	8.70	19.60	18.20	18.20	31.49	30.21			ug/L
Hardness (Ca CO3)	5.3	7.0	11	4.4	5.1	17	4.6	12	11	11	21	20		1.0	ug/L

ND - Trace Value Not Detected

*Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J2. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Fall 2002 (continued)

Station	**BC-1**	**BC-2**	**BC-3**	**BC-5**	**BC-6**	**BC-7**	**BC-8**	**BC-9**	**BC-10**	**BE-1**	**BE-2**	**BE-3**	**BE-4**	**MDL**	**PQL**	**Units**
Date Sampled	8/29/2002	8/29/2002	8/26/2002	8/26/2002	9/5/2002	8/27/2002	8/27/2002	8/27/2002	8/28/2002	8/27/2002	8/27/2002	8/27/2002	8/27/2002			
Time Sampled	1000	0800	1350	1445	1130	1555	1500	1530	1015	1000	1045	1130	1105			
Copper (Cu)**	ND	ND	ND	ND	ND	ND	ND	ND	**1.09**	ND	ND	ND	ND	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	**1.05**	na	na	na	na			ug/L
Acute Criterion	1.45	0.74	1.07	0.92	0.92	3.64	0.77	0.81	0.84	0.99	0.99	1.04	1.04			ug/L
Chronic Criterion	1.19	0.64	0.90	0.79	0.79	2.74	0.67	0.70	0.73	0.84	0.84	0.88	0.88			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	4.57	2.01	3.15	2.62	2.62	13.88	2.11	2.26	2.37	2.89	2.89	3.05	3.05			ug/L
Chronic Criterion	0.18	0.08	0.12	0.10	0.10	0.54	0.08	0.09	0.09	0.11	0.11	0.12	0.12			ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.06	0.02	0.03	0.03	0.03	0.32	0.02	0.02	0.02	0.03	0.03	0.03	0.03			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	8	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	7.82	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	15.80	8.63	12.01	10.50	10.50	36.20	8.94	9.41	9.73	11.26	11.26	11.71	11.71			ug/L
Chronic Criterion	15.93	8.70	12.11	10.58	10.58	36.50	9.02	9.49	9.81	11.35	11.35	11.81	11.81			ug/L
Hardness (Ca CO3)	9.4	4.6	6.8	5.8	5.8	25	4.8	5.1	5.3	6.3	6.3	6.6	6.6		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J2. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Fall 2002 (continued)

Station	**SJ-1**	**SJ-2**	**SJ-3**	**SJ-4**	**SJ-5**	**SJ-6**	**SJ-7**	**SJ-8**	**SJ-9**	**SJ-10**	**SJ-11**	**SJ-12**			
Date Sampled	8/21/2002	8/21/2002	9/4/2002	8/28/2002	8/28/2002	8/28/2002	8/28/2002	8/28/2002	8/28/2002	9/3/2002	9/3/2002	9/3/2002	**MDL**	**PQL**	**Units**
Time Sampled	1045	1600	1100	1125	1150	1115	1030	1000	0930	0950	1230	1145			
Copper (Cu)**	ND	ND	ND	0.49	ND	ND	ND	ND	ND	ND	ND	ND	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	0.47	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.67	1.08	1.48	1.43	1.51	1.33	0.89	1.05	1.10	1.33	1.40	1.10			ug/L
Chronic Criterion	2.07	0.91	1.21	1.18	1.23	1.10	0.76	0.89	0.92	1.10	1.16	0.92			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	9.58	3.21	4.68	4.51	4.79	4.13	2.52	3.10	3.26	4.13	4.40	3.26			ug/L
Chronic Criterion	0.37	0.12	0.18	0.18	0.19	0.16	0.10	0.12	0.13	0.16	0.17	0.13			ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.40**	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	**0.34**	na	na			ug/L
Acute Criterion	0.18	0.03	0.06	0.06	0.06	0.05	0.02	0.03	0.04	0.05	0.06	0.04			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	27.41	12.16	16.09	15.66	16.37	14.66	10.19	11.86	12.31	14.66	15.38	12.31			ug/L
Chronic Criterion	27.63	12.26	16.22	15.79	16.51	14.78	10.27	11.96	12.41	14.78	15.50	12.41			ug/L
Hardness (Ca CO3)	18	6.9	9.6	9.3	9.8	8.6	5.6	6.7	7.0	8.6	9.1	7.0		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J2. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for Fall 2002 (continued)

Station	SF-1	SF-2	SF-3	SF-4	SF-5	ST-1	ST-2	MDL	PQL	Units
Date Sampled	8/20/2002	8/29/2002	8/29/2002	9/4/2002	8/20/2002	8/22/2002	9/3/2002			
Time Sampled	1630	1215	1045	1530	1100	1530	0930			
Copper (Cu)**	ND	ND	ND	ND	ND	ND	0.05	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	0.05			ug/L
Acute Criterion	0.63	1.26	1.24	1.97	0.83	0.87	1.24			ug/L
Chronic Criterion	0.56	1.05	1.03	1.57	0.72	0.75	1.03			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	1.66	3.85	3.80	6.62	2.31	2.47	3.80			ug/L
Chronic Criterion	0.06	0.15	0.15	0.26	0.09	0.10	0.15			ug/L
Mercury (Hg)	ND	ND	ND	ND	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.01	0.05	0.04	0.10	0.02	0.02	0.04			ug/L
Chronic Criterion	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	7.50	13.93	13.79	20.80	9.57	10.04	13.79			ug/L
Chronic Criterion	7.56	14.05	13.90	20.97	9.65	10.12	13.90			ug/L
Hardness (Ca CO3)	3.9	8.1	8.0	13	5.2	5.5	8.0		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for May 2002 Reservoir Profiles

Station	BA-1	BA-2	BC-4	BC-8	BE-2	MO-1	SJ-8	MDL	PQL	Units
Date Sampled	6/5/2002	6/5/2002	5/20/2002	5/21/2002	6/6/2002	6/6/2002	5/21/2002			
Time Sampled	1220	1330	1030	0805	0950	1145	1130			
Copper (Cu)**	0.20	0.12	0.48	0.44	0.19	0.15	**1.70**	0.05	5.0	ug/L
Theoretical dissolved	0.19	0.12	0.46	0.42	0.18	0.14	**1.63**			ug/L
Acute Criterion	0.81	0.71	0.89	0.96	0.37	1.16	0.98			ug/L
Chronic Criterion	0.70	0.62	0.76	0.82	0.34	0.97	0.83			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.26	1.91	2.52	2.78	0.85	3.47	2.83			ug/L
Chronic Criterion	0.09	0.07	0.10	0.11	0.03	0.14	0.11			ug/L
Mercury (Hg)	**0.07**	**0.08**	ND	ND	**0.07**	**0.36**	ND	0.05	0.4	ug/L
Theoretical dissolved	**0.06**	**0.07**	na	na	**0.06**	**0.31**	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.02	0.02	0.02	0.03	0.00	0.04	0.03			ug/L
Chronic Criterion	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	7	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	6.85	na	na	na	na	na	na			ug/L
Acute Criterion	9.41	8.31	10.19	10.96	4.62	12.90	11.11			ug/L
Chronic Criterion	9.49	8.38	10.27	11.05	4.66	13.01	11.20			ug/L
Hardness (Ca CO3)	5.1	4.4	5.6	6.1	2.2	7.4	6.2		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for May 2002 Reservoir Profiles (continued)

Station	MP-1	MP-2	MP-3	SL-1	SL-2	SL-3A	SL-3B	MDL	PQL	Units
Date Sampled	5/22/2002	5/22/2002	5/22/2002	5/23/2002	5/23/2002	5/23/2002	5/23/2002			
Time Sampled	1115	1215	1330	1200	1100	1020	1000			
Copper (Cu)**	ND	ND	ND	ND	0.29	**2.1**	ND	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	na	0.28	**2.0**	na			ug/L
Acute Criterion	1.04	0.95	0.96	0.92	0.89	0.84	0.84			ug/L
Chronic Criterion	0.88	0.81	0.82	0.79	0.76	0.73	0.73			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	3.05	2.73	2.78	2.62	2.52	2.37	2.37			ug/L
Chronic Criterion	0.12	0.11	0.11	0.10	0.10	0.09	0.09			ug/L
Mercury (Hg)	**0.16**	**0.18**	**0.14**	ND	ND	**0.25**	**0.19**	0.05	0.4	ug/L
Theoretical dissolved	**0.14**	**0.15**	**0.12**	na	na	**0.21**	**0.16**			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.03	0.03	0.03	0.03	0.02	0.02	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	7	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	6.85	na	na	na	na	na			ug/L
Acute Criterion	11.71	10.80	10.96	10.50	10.19	9.73	9.73			ug/L
Chronic Criterion	11.81	10.89	11.05	10.58	10.27	9.81	9.81			ug/L
Hardness (Ca CO3)	6.6	6.0	6.1	5.8	5.6	5.3	5.3		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for May 2002 Reservoir Profiles (continued)

Station	FL-1	FL-2	FL-3	HL-1	HL-2	HL-3A	HL-3B	MDL	PQL	Units
Date Sampled	5/29/2002	5/29/2002	5/29/2002	5/28/2002	5/28/2002	5/28/2002	5/28/2002			
Time Sampled	0930	1025	1230	1035	1140	1230	1240			
Copper (Cu)**	ND	ND	ND	0.47	0.55	0.47	0.42	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	0.45	0.53	0.45	0.40			ug/L
Acute Criterion	0.68	0.63	0.49	0.77	0.81	0.69	0.69			ug/L
Chronic Criterion	0.60	0.56	0.45	0.67	0.70	0.61	0.61			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	1.81	1.66	1.22	2.11	2.26	1.86	1.86			ug/L
Chronic Criterion	0.07	0.06	0.05	0.08	0.09	0.07	0.07			ug/L
Mercury (Hg)	ND	ND	ND	**0.21**	**0.17**	**0.09**	**0.11**	0.05	0.4	ug/L
Theoretical dissolved	na	na	na	**0.18**	**0.14**	**0.08**	**0.09**			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.01	0.01	0.01	0.02	0.02	0.02	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	7.99	7.50	6.01	8.94	9.41	8.15	8.15			ug/L
Chronic Criterion	8.05	7.56	6.05	9.02	9.49	8.21	8.21			ug/L
Hardness (Ca CO3)	4.2	3.9	3.0	4.8	5.1	4.3	4.3		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for June 2002 Reservoir Profiles (continued)

Station	FL-1	FL-2A	FL-2B	FL-3A	FL-3B	HL-1	HL-2	HL-3A	HL-3B	MDL	PQL	Units
Date Sampled	6/26/2002	6/26/2002	6/26/2002	6/26/2002	6/26/2002	6/25/2002	6/25/2002	6/25/2002	6/25/2002			
Time Sampled	1100	1100	1250	1445	1500	1100	1400	1530	1600			
Copper (Cu)**	ND	ND	ND	ND	0.11	0.13	0.13	0.18	0.12	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	na	0.11	0.12	0.12	0.17	0.12			ug/L
Acute Criterion	0.45	0.49	0.49	0.49	0.45	0.59	0.59	0.63	0.59			ug/L
Chronic Criterion	0.41	0.45	0.45	0.45	0.41	0.52	0.52	0.56	0.52			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	1.08	1.22	1.22	1.22	1.08	1.51	1.51	1.66	1.51			ug/L
Chronic Criterion	0.04	0.05	0.05	0.05	0.04	0.06	0.06	0.06	0.06			ug/L
Mercury (Hg)	**0.13**	**0.25**	**0.14**	**0.19**	**0.08**	**0.11**	**0.13**	**0.22**	**0.11**	0.05	0.4	ug/L
Theoretical dissolved	**0.11**	**0.21**	**0.12**	**0.16**	**0.07**	**0.09**	**0.11**	**0.19**	**0.09**			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	5.49	6.01	6.01	6.01	5.49	7.01	7.01	7.50	7.01			ug/L
Chronic Criterion	5.54	6.05	6.05	6.05	5.54	7.07	7.07	7.56	7.07			ug/L
Hardness (Ca CO3)	2.7	3.0	3.0	3.0	2.7	3.6	3.6	3.9	3.6		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for June 2002 Reservoir Profiles (continued)

Station	MP-1 (7M)	MP-1 (10M)	MP-2	MP-3 (4M)	MP-3 (7M)	SL-1	SL-2A	SL-2B	SL-3A	SL-3B	MDL	PQL	Units
Date Sampled	7/2/2002	7/2/2002	7/2/2002	7/2/2002	7/2/2002	6/24/2002	6/24/2002	6/24/2002	6/24/2002	6/24/2002			
Time Sampled	1030	1040	1420	1300	1300	1430	1145	1200	1030	1045			
Copper (Cu)**	0.15	0.19	0.19	0.17	0.20	0.27	0.23	0.26	0.28	0.24	0.05	5.0	ug/L
Theoretical dissolved	0.14	0.18	0.18	0.16	0.19	0.26	0.22	0.25	0.27	0.23			ug/L
Acute Criterion	1.30	1.39	1.33	1.19	1.19	0.89	0.84	0.81	0.84	0.81			ug/L
Chronic Criterion	1.08	1.14	1.10	0.99	0.99	0.76	0.73	0.70	0.73	0.70			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	4.02	4.35	4.13	3.58	3.58	2.52	2.37	2.26	2.37	2.26			ug/L
Chronic Criterion	0.16	0.17	0.16	0.14	0.14	0.10	0.09	0.09	0.09	0.09			ug/L
Mercury (Hg)	**0.10**	**0.05**	**0.15**	**0.14**	**0.09**	**0.20**	**0.49**	**0.30**	**0.28**	**0.10**	0.05	0.4	ug/L
Theoretical dissolved	**0.09**	0.04	**0.13**	**0.12**	**0.08**	**0.17**	**0.42**	**0.26**	**0.24**	**0.09**			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.05	0.05	0.05	0.04	0.04	0.02	0.02	0.02	0.02	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50.00	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	14.37	15.23	14.66	13.20	13.20	10.19	9.73	9.41	9.73	9.41			ug/L
Chronic Criterion	14.49	15.36	14.78	13.31	13.31	10.27	9.81	9.49	9.81	9.49			ug/L
Hardness (Ca CO3)	8.4	9.0	8.6	7.6	7.6	5.6	5.3	5.1	5.3	5.1		1.0	ug/L

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**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for June 2002 Reservoir Profiles (continued)

Station	BA-1	BA-2	BC-4	BC-8	SJ-8	BE-2	MO-1A	MO-1B	MDL	PQL	Units
Date Sampled	6/27/2002	6/27/2002	6/27/2002	6/27/2002	6/27/2002	6/28/2002	6/28/2002	6/28/2002			
Time Sampled	1445	1505	0800	0945	1040	1005	0830	0840			
Copper (Cu)**	ND	ND	ND	ND	ND	ND	ND	ND	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.57	0.63	0.71	0.92	0.84	0.49	1.16	1.16			ug/L
Chronic Criterion	0.51	0.56	0.62	0.79	0.73	0.45	0.97	0.97			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	1.46	1.66	1.91	2.62	2.37	1.22	3.47	3.47			ug/L
Chronic Criterion	0.06	0.06	0.07	0.10	0.09	0.05	0.14	0.14			ug/L
Mercury (Hg)	**0.14**	**0.06**	ND	ND	ND	**0.11**	**0.11**	**0.08**	0.05	0.4	ug/L
Theoretical dissolved	**0.12**	**0.05**	na	na	na	**0.09**	**0.09**	**0.07**			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.01	0.01	0.02	0.03	0.02	0.01	0.04	0.04			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	5	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	4.89	na	na			ug/L
Acute Criterion	6.84	7.50	8.31	10.50	9.73	6.01	12.90	12.90			ug/L
Chronic Criterion	6.90	7.56	8.38	10.58	9.81	6.05	13.01	13.01			ug/L
Hardness (Ca CO3)	3.5	3.9	4.4	5.8	5.3	3.0	7.4	7.4		1.0	ug/L

ND - Trace Value Not Detected

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**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for July 2002 Reservoir Profiles (continued)

Station	MP-1A	MP-1B	MP-2A	MP-2B	MP-3A	MP-3B	SL-1A	SL-1B	SL-2A	SL-2B	SL-3A	SL-3B	MDL	PQL	Units
Date Sampled	7/22/2002	7/22/2002	7/22/2002	7/22/2002	7/22/2002	7/22/2002	7/26/2002	7/26/2002	7/26/2002	7/26/2002	7/26/2002	7/26/2002			
Time Sampled	1330	1345	1200	1215	0915	0925	1100	1115	0945	1000	0900	0915			
Copper (Cu)**	0.10	0.19	0.08	0.11	0.14	0.13	**8.10**	ND	ND	ND	**0.84**	ND	0.05	5.0	ug/L
Theoretical dissolved	0.10	0.18	0.08	0.11	0.13	0.12	**7.78**	na	na	na	**0.81**	na			ug/L
Acute Criterion	1.54	1.46	1.49	1.49	1.49	1.68	0.81	0.92	0.81	0.81	0.81	0.81			ug/L
Chronic Criterion	1.25	1.20	1.22	1.22	1.22	1.36	0.70	0.79	0.70	0.70	0.70	0.70			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	**2.7**	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	**2.7**	na	na	na	na	na			ug/L
Acute Criterion	4.91	4.63	4.74	4.74	4.74	5.47	2.26	2.62	2.26	2.26	2.26	2.26			ug/L
Chronic Criterion	0.19	0.18	0.18	0.18	0.18	0.21	0.09	0.10	0.09	0.09	0.09	0.09			ug/L
Mercury (Hg)	**0.16**	**0.13**	**0.11**	**0.10**	**0.18**	**0.12**	ND	**0.05**	**0.07**	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	**0.14**	**0.11**	**0.09**	**0.09**	**0.15**	**0.10**	na	0.04	**0.06**	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.07	0.06	0.06	0.06	0.06	0.08	0.02	0.03	0.02	0.02	0.02	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	8	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	5	50.00	ug/L
Theoretical dissolved	7.82	na	na	na	na	na	na	1.47	na	na	na	na			ug/L
Acute Criterion	16.66	15.95	16.23	16.23	16.23	18.06	9.41	10.50	9.41	9.41	9.41	9.41			ug/L
Chronic Criterion	16.79	16.08	16.36	16.36	16.36	18.20	9.49	10.58	9.49	9.49	9.49	9.49			ug/L
Hardness (Ca CO3)	10	9.5	9.7	9.7	9.7	11	5.1	5.8	5.1	5.1	5.1	5.1		1.0	ug/L

ND - Trace Value Not Detected

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**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for July 2002 Reservoir Profiles (continued)

Station	FL-1A	FL-1B	FL-2A	FL-2B	FL-3A	FL-3B	HL-1A	HL-1B	HL-2	HL-3A	HL-3B	MDL	PQL	Units
Date Sampled	7/24/2002	7/24/2002	7/24/2002	7/24/2002	7/24/2002	7/24/2002	7/23/2002	7/23/2002	7/23/2002	7/23/2002	7/23/2002			
Time Sampled	1315	1330	1130	1145	1000	1015	1330	1345	1030	1130	1145			
Copper (Cu)**	ND	ND	ND	0.08	ND	0.08	0.12	0.06	0.23	0.11	0.10	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	0.08	na	0.08	0.12	0.06	0.22	0.11	0.10			ug/L
Acute Criterion	0.56	0.56	0.56	0.56	0.56	0.56	0.69	0.63	0.63	0.69	0.59			ug/L
Chronic Criterion	0.50	0.50	0.50	0.50	0.50	0.50	0.61	0.56	0.56	0.61	0.52			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	1.42	1.42	1.42	1.42	1.42	1.42	1.86	1.66	1.66	1.86	1.51			ug/L
Chronic Criterion	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.07	0.06			ug/L
Mercury (Hg)	ND	ND	**0.06**	ND	**0.11**	**0.06**	**0.44**	**0.12**	**0.15**	**0.14**	**0.09**	0.05	0.4	ug/L
Theoretical dissolved	na	na	**0.05**	na	**0.09**	**0.05**	**0.37**	**0.10**	**0.13**	**0.12**	**0.08**			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	6.68	6.68	6.68	6.68	6.68	6.68	8.15	7.50	7.50	8.15	7.01			ug/L
Chronic Criterion	6.73	6.73	6.73	6.73	6.73	6.73	8.21	7.56	7.56	8.21	7.07			ug/L
Hardness (Ca CO3)	3.4	3.4	3.4	3.4	3.4	3.4	4.3	3.9	3.9	4.3	3.6		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for July 2002 Reservoir Profiles (continued)

Station	BA-1A	BA-1B	BA-2	BC-4	BC-8	BE-2	MO-1	SJ-8	MDL	PQL	Units
Date Sampled	7/25/2002	7/25/2002	7/25/2002	7/23/2002	7/23/2002	7/25/2002	7/25/2002	7/25/2002			
Time Sampled	1330	1345	1400	1720	1830	0945	0845	1630			
Copper (Cu)**	ND	ND	ND	0.11	0.14	ND	ND	ND	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	0.11	0.13	na	na	na			ug/L
Acute Criterion	0.74	0.63	0.68	0.69	0.81	0.49	0.56	0.84			ug/L
Chronic Criterion	0.64	0.56	0.60	0.61	0.70	0.45	0.50	0.73			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.01	1.66	1.81	1.86	2.26	1.22	1.42	2.37			ug/L
Chronic Criterion	0.08	0.06	0.07	0.07	0.09	0.05	0.06	0.09			ug/L
Mercury (Hg)	**0.08**	**0.05**	**0.16**	ND	ND	**0.39**	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	**0.07**	0.04	**0.14**	na	na	**0.33**	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	5	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	4.89	na	na	na	na			ug/L
Acute Criterion	8.63	7.50	7.99	8.15	9.41	6.01	6.68	9.73			ug/L
Chronic Criterion	8.70	7.56	8.05	8.21	9.49	6.05	6.73	9.81			ug/L
Hardness (Ca CO3)	4.6	3.9	4.2	4.3	5.1	3.0	3.4	5.3		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for August 2002 Reservoir Profiles (continued)

Station	FL-1	FL-2	FL-3	HL-1A	HL-1B	HL-2A	HL-2B	HL-3A	HL-3B	MDL	PQL	Units
Date Sampled	8/20/2002	8/20/2002	8/20/2002	8/19/2002	8/19/2002	8/19/2002	8/19/2002	8/19/2002	8/19/2002			
Time Sampled	1445	1400	1215	1230	1245	1545	1545	1720	1730			
Copper (Cu)**	ND	ND	ND	0.17	0.06	0.11	0.06	0.12	0.08	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	0.16	0.06	0.11	0.06	0.12	0.08			ug/L
Acute Criterion	0.59	0.52	0.49	0.63	0.63	0.63	0.74	0.68	0.63			ug/L
Chronic Criterion	0.52	0.47	0.45	0.56	0.56	0.56	0.64	0.60	0.56			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	1.51	1.32	1.22	1.66	1.66	1.66	2.01	1.81	1.66			ug/L
Chronic Criterion	0.06	0.05	0.05	0.06	0.06	0.06	0.08	0.07	0.06			ug/L
Mercury (Hg)	**0.08**	**0.11**	**0.18**	**0.10**	**0.13**	**0.17**	**0.07**	**0.21**	ND	0.05	0.4	ug/L
Theoretical dissolved	**0.07**	**0.09**	**0.15**	**0.09**	**0.11**	**0.14**	**0.06**	**0.18**	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	7.01	6.34	6.01	7.50	7.50	7.50	8.63	7.99	7.50			ug/L
Chronic Criterion	7.07	6.39	6.05	7.56	7.56	7.56	8.70	8.05	7.56			ug/L
Hardness (Ca CO3)	3.6	3.2	3.0	3.9	3.9	3.9	4.6	4.2	3.9		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for August 2002 Reservoir Profiles (continued)

Station	MP-1	MP-2	MP-3	SL-1A	SL-1B	SL-2A	SL-2B	SL-3A	SL-3B	MDL	PQL	Units
Date Sampled	8/21/2002	8/21/2002	8/21/2002	8/22/2002	8/22/2002	8/22/2002	8/22/2002	8/22/2002	8/22/2002			
Time Sampled	1430	1230	1130	1310	1320	1040	1050	0930	0940			
Copper (Cu)**	ND	ND	0.06	ND	ND	ND	ND	ND	ND	0.05	5.0	ug/L
Theoretical dissolved	na	na	0.06	na	na	na	na	na	na			ug/L
Acute Criterion	1.68	1.68	1.82	0.84	0.77	0.81	0.81	0.81	0.81			ug/L
Chronic Criterion	1.36	1.36	1.46	0.73	0.67	0.70	0.70	0.70	0.70			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	5.47	5.47	6.04	2.37	2.11	2.26	2.26	2.26	2.26			ug/L
Chronic Criterion	0.21	0.21	0.24	0.09	0.08	0.09	0.09	0.09	0.09			ug/L
Mercury (Hg)	**0.18**	**0.27**	**0.18**	ND	**0.09**	**0.11**	**0.15**	**0.06**	**0.05**	0.05	0.4	ug/L
Theoretical dissolved	**0.15**	**0.23**	**0.15**	na	**0.08**	**0.09**	**0.13**	**0.05**	0.04			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.08	0.08	0.09	0.02	0.02	0.02	0.02	0.02	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na	na	na			ug/L
Acute Criterion	18.06	18.06	19.44	9.73	8.94	9.41	9.41	9.41	9.41			ug/L
Chronic Criterion	18.20	18.20	19.60	9.81	9.02	9.49	9.49	9.49	9.49			ug/L
Hardness (Ca CO3)	11	11	12	5.3	4.8	5.1	5.1	5.1	5.1		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for August 2002 Reservoir Profiles (continued)

Station	BA-1	BA-2	MO-1	BC-4	BE-2	BC-8	SJ-8	MDL	PQL	Units
Date Sampled	8/23/2002	8/23/2002	8/26/2002	8/26/2002	8/27/2002	8/27/2002	8/28/2002			
Time Sampled	1015	0940	1015	1420	1045	1500	1000			
Copper (Cu)**	ND	ND	ND	ND	ND	ND	ND	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.74	0.71	0.84	0.74	0.99	0.77	1.05			ug/L
Chronic Criterion	0.64	0.62	0.73	0.64	0.84	0.67	0.89			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.01	1.91	2.37	2.01	2.89	2.11	3.10			ug/L
Chronic Criterion	0.08	0.07	0.09	0.08	0.11	0.08	0.12			ug/L
Mercury (Hg)	**0.07**	**0.10**	**0.13**	ND	ND	ND	ND	0.05	0.4	ug/L
Theoretical dissolved	**0.06**	**0.09**	**0.11**	na	na	na	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.02	0.02	0.02	0.02	0.03	0.02	0.03			ug/L
Chronic Criterion	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	8.63	8.31	9.73	8.63	11.26	8.94	11.86			ug/L
Chronic Criterion	8.70	8.38	9.81	8.70	11.35	9.02	11.96			ug/L
Hardness (Ca CO3)	4.6	4.4	5.3	4.6	6.3	4.8	6.7		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for September 2002 Reservoir Profiles (continued)

Station	FL-1	FL-2	FL-3	HL-1	HL-2	HL-3	MDL	PQL	Units
Date Sampled	9/24/2002	9/24/2002	9/24/2002	9/23/2002	9/23/2002	9/23/2002			
Time Sampled	1045	1010	0945	0930	1015	1110			
Copper (Cu)**	0.08	ND	0.11	0.23	ND	ND	0.05	5.0	ug/L
Theoretical dissolved	0.08	na	0.11	0.22	na	na			ug/L
Acute Criterion	0.68	0.68	0.71	0.71	0.71	0.71			ug/L
Chronic Criterion	0.60	0.60	0.62	0.62	0.62	0.62			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na			ug/L
Acute Criterion	1.81	1.81	1.91	1.91	1.91	1.91			ug/L
Chronic Criterion	0.07	0.07	0.07	0.07	0.07	0.07			ug/L
Mercury (Hg)	**0.10**	**0.16**	**0.11**	**0.07**	**0.10**	ND	0.05	0.4	ug/L
Theoretical dissolved	**0.09**	**0.14**	**0.09**	**0.06**	**0.09**	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na			ug/L
Acute Criterion	0.01	0.01	0.02	0.02	0.02	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na			ug/L
Acute Criterion	7.99	7.99	8.31	8.31	8.31	8.31			ug/L
Chronic Criterion	8.05	8.05	8.38	8.38	8.38	8.38			ug/L
Hardness (Ca CO3)	4.2	4.2	4.4	4.4	4.4	4.4		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for September 2002 Reservoir Profiles (continued)

Station	MP-1	MP-2	MP-3A	MP-3B	SL-1	SL-2	SL-3	MDL	PQL	Units
Date Sampled	9/25/2002	9/25/2002	9/25/2002	9/25/2002	9/26/2002	9/26/2002	9/26/2002			
Time Sampled	1440	1350	1100	1110	1530	1500	1420			
Copper (Cu)**	ND	ND	0.20	0.36	ND	ND	ND	0.05	5.0	ug/L
Theoretical dissolved	na	na	0.19	0.35	na	na	na			ug/L
Acute Criterion	1.82	1.97	1.82	2.11	0.81	0.81	0.81			ug/L
Chronic Criterion	1.46	1.57	1.46	1.67	0.70	0.70	0.70			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	6.04	6.62	6.04	7.20	2.26	2.26	2.26			ug/L
Chronic Criterion	0.24	0.26	0.24	0.28	0.09	0.09	0.09			ug/L
Mercury (Hg)	**0.12**	**0.23**	**0.22**	**0.14**	**0.15**	**0.09**	**0.08**	0.05	0.4	ug/L
Theoretical dissolved	**0.10**	**0.20**	**0.19**	**0.12**	**0.13**	**0.08**	**0.07**			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.09	0.10	0.09	0.12	0.02	0.02	0.02			ug/L
Chronic Criterion	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	19.44	20.80	19.44	22.15	9.41	9.41	9.41			ug/L
Chronic Criterion	19.60	20.97	19.60	22.33	9.49	9.49	9.49			ug/L
Hardness (Ca CO3)	12	13	12	14	5.1	5.1	5.1		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table CAWG-J3. Trace Values* and Hardness-based Water Quality Criteria for Copper, Lead, Mercury, Silver and Zinc for September 2002 Reservoir Profiles (continued)

Station	BA-1	BA-2	BC-4	BC-8	BE-2	MO-1	SJ-8	MDL	PQL	Units
Date Sampled	9/26/2002	9/26/2002	9/23/2002	9/23/2002	9/24/2002	9/24/2002	9/23/2002			
Time Sampled	1010	0940	1600	1450	1320	1410	1410			
Copper (Cu)**	ND	ND	ND	ND	ND	ND	0.05	0.05	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	0.05			ug/L
Acute Criterion	0.74	0.74	0.71	0.81	1.27	0.81	1.48			ug/L
Chronic Criterion	0.64	0.64	0.62	0.70	1.06	0.70	1.21			ug/L
Lead (Pb)**	ND	ND	ND	ND	ND	ND	ND	0.25	5.0	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	2.01	2.01	1.91	2.26	3.91	2.26	4.68			ug/L
Chronic Criterion	0.08	0.08	0.07	0.09	0.15	0.09	0.18			ug/L
Mercury (Hg)	**0.14**	**0.13**	ND	ND	**0.13**	**0.14**	ND	0.05	0.4	ug/L
Theoretical dissolved	**0.12**	**0.11**	na	na	**0.11**	**0.12**	na			ug/L
Criterion	0.05	0.05	0.05	0.05	0.05	0.05	0.05			ug/L
Silver (Ag)**	ND	ND	ND	ND	ND	ND	ND	0.2	10	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	0.02	0.02	0.02	0.02	0.05	0.02	0.06			ug/L
Chronic Criterion	na	na	na	na	na	na	na			ug/L
Zinc (Zn)**	ND	ND	ND	ND	ND	ND	ND	5	50	ug/L
Theoretical dissolved	na	na	na	na	na	na	na			ug/L
Acute Criterion	8.63	8.63	8.31	9.41	14.08	9.41	16.09			ug/L
Chronic Criterion	8.70	8.70	8.38	9.49	14.19	9.49	16.22			ug/L
Hardness (Ca CO3)	4.6	4.6	4.4	5.1	8.2	5.1	9.6		1.0	ug/L

ND - Trace Value Not Detected

* Trace values were analyzed and reported by the laboratory for these five metals. Trace values are non-quantifiable estimated values between the practical quantitation limit (PQL) and the method detection limit (MDL). They are unknown quality due to baseline noise, calibration curve extrapolation, and method blank detections.

**Hardness-based criteria were calculated for each of these metals as shown. A separate criterion must be calculated for each sample due to varying hardness.

na - Not applicable

Table J-4 Summary of Sample Locations where Mercury J-value/Trace-values Concentrations did not Meet the CTR Hardness Based Criteria (of 0.05 μg/l).

Spring 2002

Date	*Location*	*Description*	*Mercury Result (μg/L)*
5/20/02	BC-6	Big Ck downstream of Dam 4	0.05
5/21/02	SJ-6	Mammoth Powerhouse Tailrace	0.13
5/21/02	SJ-7	San Joaquin River Powerhouse 8 Tailrace	0.12
5/21/02	ST-2	Stevenson Ck upstream of San Joaquin River Confluence	0.05
5/23/02	NF-2	N Fork Stevenson Ck downstream of Outlet	0.05
5/20/02	NF-3	N Fork Stevenson Ck at Shaver Lake	0.13
5/24/02	RA-1	Rancheria Ck upstream of Portal Powerhouse	0.14
5/23/02	SJ-11	San Joaquin River upstream of Powerhouse 3	0.09
6/6/02	MO-1	Mono Diversion Forebay	0.31
6/6/02	MO-2	Mono Ck downstream of Mono Diversion	0.05
6/6/02	BE-2	Bear Diversion Forebay	0.06

Fall 2002

Date	*Location*	*Description*	*Mercury Result (μg/L)*
7/2/02	C62-1	Camp 62 Creek upstream of diversion	0.05
7/2/02	RK-3	Rock Creek upstream of the SFSJR confluence	0.07
7/3/02	NS-3	N Slide Ck upstream of the SFSJR confluence	0.05
7/3/02	SS-1	S Slide Ck upstream of the diversion	0.09
7/3/02	SS-2	S Slide Ck downstream of the diversion	0.08
7/3/02	TS-1	Tombstone Ck upstream of the diversion	0.08
7/3/02	TS-2	Tombstone Ck downstream of the diversion	0.12
7/10/02	EL-1	Ely Creek upstream of the diversion	0.12

May 2002 Monthly Reservoir Profiles

Date	*Location*	*Description*	*Mercury Result (μg/L)*
5/22/02	MP-1	Mammoth Pool near Dam	0.14
5/22/02	MP-2	Mammoth Pool near middle	0.15
5/22/02	MP-3	Mammoth Pool near northeast end	0.12
5/23/02	SL-3A	Shaver Lk nr Stevenson Ck –upper water column	0.21
5/23/02	SL-3B	Shaver Lk nr Stevenson Ck –lower water column	0.16
5/28/02	HL-1	Huntington Lake near Dam	0.18
5/28/02	HL-2	Huntington Lake near middle	0.14
5/28/02	HL-3A	Huntington Lk near NE end-upper water column	0.08
5/28/02	HL-3B	Huntington Lk near NE end-lower water column	0.09
6/5/02	BA-1	Balsam Forebay at Tunnel Inlet	0.06
6/5/02	BA-2	Balsam Forebay at Power Tunnel	0.07
6/6/02	BE-2	Bear Forebay	0.06
6/6/02	MO-1	Mono Forebay	0.31

Table J-4 Summary of Sample Locations where Mercury J-value/Trace-values Concentrations did not Meet the CTR Hardness Based Criteria (of 0.05 μg/l). (continued)

June 2002 Monthly Reservoir Profiles

Date	Location	Description	Mercury Result (μg/L)
6/24/02	SL-1	Shaver Lake near the dam	0.17
6/24/02	SL-2A	Shaver Lk near middle-upper water column	0.42
6/24/02	SL-2B	Shaver Lk near middle-lower water column	0.26
6/24/02	SL-3A	Shaver Lk nr Stevenson Ck-upper water column	0.24
6/24/02	SL-3B	Shaver Lk nr Stevenson Ck –lower water column	0.09
6/25/02	HL-1	Huntington Lake near Dam	0.09
6/25/02	HL-2	Huntington Lake near middle	0.11
6/25/02	HL-3A	Huntington Lk near NE end-upper water column	0.19
6/25/02	HL-3B	Huntington Lk near NE end-lower water column	0.09
6/26/02	FL-1	Florence Lk near Dam	0.11
6/26/02	FL-2A	Florence Lk middle-upper water column	0.21
6/26/02	FL-2B	Florence Lk middle-lower water column	0.12
6/26/02	FL-3A	Florence Lk south-upper water column	0.16
6/26/02	FL-3B	Florence Lk south-lower water column	0.07
6/27/02	BA-1	Balsam Forebay at tunnel inlet	0.12
6/27/02	BA-2	Balsam Forebay at power tunnel	0.05
6/28/02	BE-2	Bear Forebay	0.09
6/28/02	MO-1A	Mono Forebay-upper water column	0.09
6/28/02	MO-1B	Mono Forebay-lower water column	0.07
7/2/02	MP-1A	Mammoth Pool near dam-upper water column	0.09
7/2/02	MP-2	Mammoth Pool near middle	0.13
7/2/02	MP-3A	Mammoth Pool NE-upper water column	0.12
7/2/02	MP-3B	Mammoth Pool NE-lower water column	0.08

July 2002 Monthly Reservoir Profiles

Date	Location	Description	Mercury Result (μg/L)
7/22/02	MP-1A	Mammoth Pool near dam-upper water column	0.14
7/22/02	MP-1B	Mammoth Pool near dam-lower water column	0.11
7/22/02	MP-2A	Mammoth Pool middle-upper water column	0.09
7/22/02	MP-2B	Mammoth Pool middle-lower water column	0.09
7/22/02	MP-3A	Mammoth Pool NE-upper water column	0.15
7/22/02	MP-3B	Mammoth Pool NE-lower water column	0.10
7/23/02	HL-1A	Huntington Lake near dam-upper water column	0.37
7/23/02	HL-1B	Huntington Lake near dam-lower water column	0.10
7/23/02	HL-2	Huntington Lake near middle	0.13
7/23/02	HL-3A	Huntington Lake NE-upper water column	0.12
7/23/02	HL-3B	Huntington Lake NE-lower water column	0.08
7/24/02	FL-2A	Florence Lake middle-upper water column	0.05
7/24/02	FL-3A	Florence Lake south-upper water column	0.09

Table J-4 Summary of Sample Locations where Mercury J-value/Trace-values Concentrations did not Meet the CTR Hardness Based Criteria (of 0.05 μg/l). (continued)

July 2002 Monthly Reservoir Profiles (continued)

Date	Location	Description	Mercury Result (μg/L)
7/24/02	FL-3B	Florence Lake south-lower water column	0.06
7/25/02	BA-1A	Balsam Forebay at inlet-upper water column	0.07
7/25/02	BA-2	Balsam Forebay at power tunnel	0.14
7/25/02	BE-2	Bear Forebay	0.33
7/26/02	SL-2A	Shaver Lake near middle-upper water column	0.06

August 2002 Monthly Reservoir Profiles

Date	Location	Description	Mercury Result (μg/L)
8/19/02	HL-1A	Huntington Lake near dam-upper water column	0.09
8/19/02	HL-1B	Huntington Lake near dam-lower water column	0.11
8/19/02	HL-2A	Huntington Lake middle-upper water column	0.14
8/19/02	HL-2B	Huntington Lake middle-lower water column	0.06
8/19/02	HL-3A	Huntington Lake NE-upper water column	0.18
8/20/02	FL-1	Florence Lake near dam	0.07
8/20/02	FL-2	Florence Lake middle	0.09
8/20/02	FL-3	Florence Lake south	0.15
8/21/02	MP-1	Mammoth Pool near dam	0.15
8/21/02	MP-2	Mammoth Pool middle	0.23
8/21/02	MP-3	Mammoth Pool NE	0.15
8/22/02	SL-1B	Shaver Lake near dam-lower water column	0.08
8/22/02	SL-2A	Shaver Lake middle-upper water column	0.09
8/22/02	SL-2B	Shaver Lake middle-lower water column	0.13
8/22/02	SL-3A	Shaver Lk nr Stevenson Ck-upper water column	0.05
8/23/02	BA-1	Balsam Forebay at inlet	0.06
8/23/02	BA-2	Balsam Forebay at power tunnel	0.09
8/26/02	MO-1	Mono Forebay	0.11

September 2002 Monthly Reservoir Profiles

Date	Location	Description	Mercury Result (μg/L)
9/24/02	FL-1	Florence Lake near dam	0.09
9/24/02	FL-2	Florence Lake middle	0.14
9/24/02	FL-3	Florence Lake south	0.09
9/24/02	BE-2	Bear Forebay	0.11
9/24/02	MO-1	Mono Forebay	0.12
9/23/02	HL-1	Huntington Lake near Dam	0.06
9/23/02	HL-2	Huntington Lake near middle	0.09
9/25/02	MP-1	Mammoth Pool near dam	0.10
9/25/02	MP-2	Mammoth Pool near middle	0.20
9/25/02	MP-3A	Mammoth Pool NE-upper water column	0.19
9/25/02	MP-3B	Mammoth Pool NE-lower water column	0.12

Table J-4 Summary of Sample Locations where Mercury J-value/Trace-values Concentrations did not Meet the CTR Hardness Based Criteria (of 0.05 μg/l). (continued)

September 2002 Monthly Reservoir Profiles (continued)

Date	*Location*	*Description*	*Mercury Result (μg/L)*
9/26/02	SL-1	Shaver Lake near dam	0.13
9/26/02	SL-2	Shaver Lake near middle	0.08
9/26/02	SL-3	Shaver Lake near Stevenson Ck	0.07
9/26/02	BA-1	Balsam Forebay at inlet	0.12
9/26/02	BA-2	Balsam Forebay at power tunnel	0.11