



U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT
ENVIRONMENTAL QUALITY SECTION – WATER QUALITY

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Water Quality Report-Mark Twain Lake

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Executive Summary

The purpose of this report is to provide an annual analysis of the water quality in the lake for the past year. Mark Twain Lake is located in northeastern Missouri in the Salt River Basin on the Salt River. Clarence Cannon Dam and the Reregulation Dam are located in Ralls County at Salt River miles 63.0 and 53.5, respectively. The purpose of this project was to provide flood control, hydroelectric power generation, water supply, fish and wildlife conservation, recreation and water quality enhancement. The Mark Twain watershed comprises 2,318 square miles, with an additional 29 square miles draining into the Reregulation Pool. Major tributaries are the North Fork, Middle Fork, Elk Fork, and South Fork. The watershed consists of a gently rolling plain in the upstream portion and more hilly in the downstream reaches. High rock bluffs border the stream and lake at various locations. Hickory and oak forests are scattered among crop and grazing lands.

The water of Mark Twain Lake and the downstream river channel is generally good. The lake is a medium depth reservoir nestled in the Salt River Basin. The lake tends to stratify during the summer months.

All sampling sites met the appropriate state standards during 2011 except the phosphorous levels. Phosphorous levels have exceeded the state standard on a routine basis. Generally the tailwater levels are lower than the incoming tributary flows, which indicates that the lake is sinking the phosphorous. This is also occurring with nitrogen. The project area has little pollution potentials at present time, no major form of degradation to the lake or streams is apparent. Constant water quality monitoring will continue to check future degradation of the watershed.

WATER QUALITY MONITORING PROGRAM

1.0 GENERAL OVERVIEW

This report summarizes water quality activities of the St. Louis District for Fiscal Year 2011 in accordance with ER 1110-2-8154 Water Quality & Environmental management for Corps Civil Works Projects and ETL 1110-2-362 Environmental Engineering Initiatives for Water Management.

Water quality monitoring remains one of the Sections major responsibilities. The objective is to maintain a reasonable environmental monitoring program for the Mississippi River and the 5 lakes under the St. Louis District's control. The District's reservoirs consist of Mark Twain and Wappapello Lakes in Missouri, and Shelbyville, Carlyle and Rend Lakes in Illinois. Water quality sampling is conducted within the lakes and their tributaries to establish trend analysis and maintain water quality at or above state and federal regulations.

The main objective is to provide technical expertise of an environmental nature to all Corps elements requesting assistance in accordance with ER 1110-2-8154. This would include updating the water quality management priorities for the district's projects to ensure water quality meets the state and federal regulations, for protection of human health and the environment, and for the safety and economic welfare of those at Corps projects. Ongoing goals include ensuring that downstream water quality meets all state and federal regulations, is suitable for aquatic and human life, and continue to evaluate trend analysis in relation to baseline conditions at all projects.

Water quality data is provided to the Missouri Department of Natural Resources (MDNR) to be used as a screening mechanism for the Missouri Water Quality Report which is required every two years by the Clean Water Act Sections 303(d) and 305(b). MDNR does not routinely monitor Mark Twain Lake, however the Lakes of Missouri Volunteer Program (LMVP) through the University of Missouri-Columbia has been taking samples at 3 sites 4 times a year since 1989. The LMVP only analyze for Nutrients and Chlorophyll.

The National Water Quality Inventory Report to Congress (305(b) report) is the primary vehicle for informing Congress and the public about general water quality conditions in the United States. This document characterizes our water quality, identifies widespread water quality problems of national significance, and describes various programs implemented to restore and protect our waters.

Under Section 303(d) of the 1972 Clean Water Act, states, territories and authorized tribes are required to develop a list of water quality limited segments. These waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water on the lists and develop action plans, called as Total Maximum Daily Loads (TMDL), to improve water quality.

The 2010 water quality report compiled by the Missouri Department of Natural Resources has listed the Salt River below the Cannon Dam and Mark Twain Lake as impaired. The Salt River is impaired by low Dissolved Oxygen and Mercury. Mark Twain Lake is impaired by Mercury. Mark Twain Lake is listed as eutrophic. Continued monitoring of the lake and its tributaries is vital in assisting the future assessment of the lake for these and other possible impairments. The water quality monitoring program represents the single metric that encompasses the overall health of the watershed as it is a direct measure of how well the environmental stewardship programs are working.

1.1 INTRODUCTION

Mark Twain Lake is located in northeast Missouri. The land surrounding the lake is used predominately for agriculture. The main agricultural contaminants into the watershed include pesticides and fertilizers. Also a concern is the high sediment loading into the lake and the colloidal characteristic of the sediments as well as low dissolved oxygen levels related to turbine generation. The lake is also susceptible to fish kills due to algal decay in the lake arms.

The operating purposes for Mark Twain Lake are fish/wildlife, hydroelectric power, flood control, recreation, navigation and water supply. The water quality management program for the lake includes monitoring of baseline parameters, ecological trends and investigation of problem areas to keep the lake within state and federal standards.

Water quality monitoring was conducted during 2011 to assure safe conditions for human recreation, wildlife and aquatic life as maintained and managed within the lake system. The 2011 water quality monitoring program was funded to conduct three sampling events. During the sampling event one site was selected for quality control duplication and denoted as MTL-15. The locations of the ten sampling sites are depicted on the lake map in Figure 1.

As mentioned above, LMVP collects samples at Mark Twain Lake. This year they conducted 8 sampling events at 3 sites. Their data is in Appendix D. We have also included data from the United Water Services Clarence Cannon WTP in Appendix E.

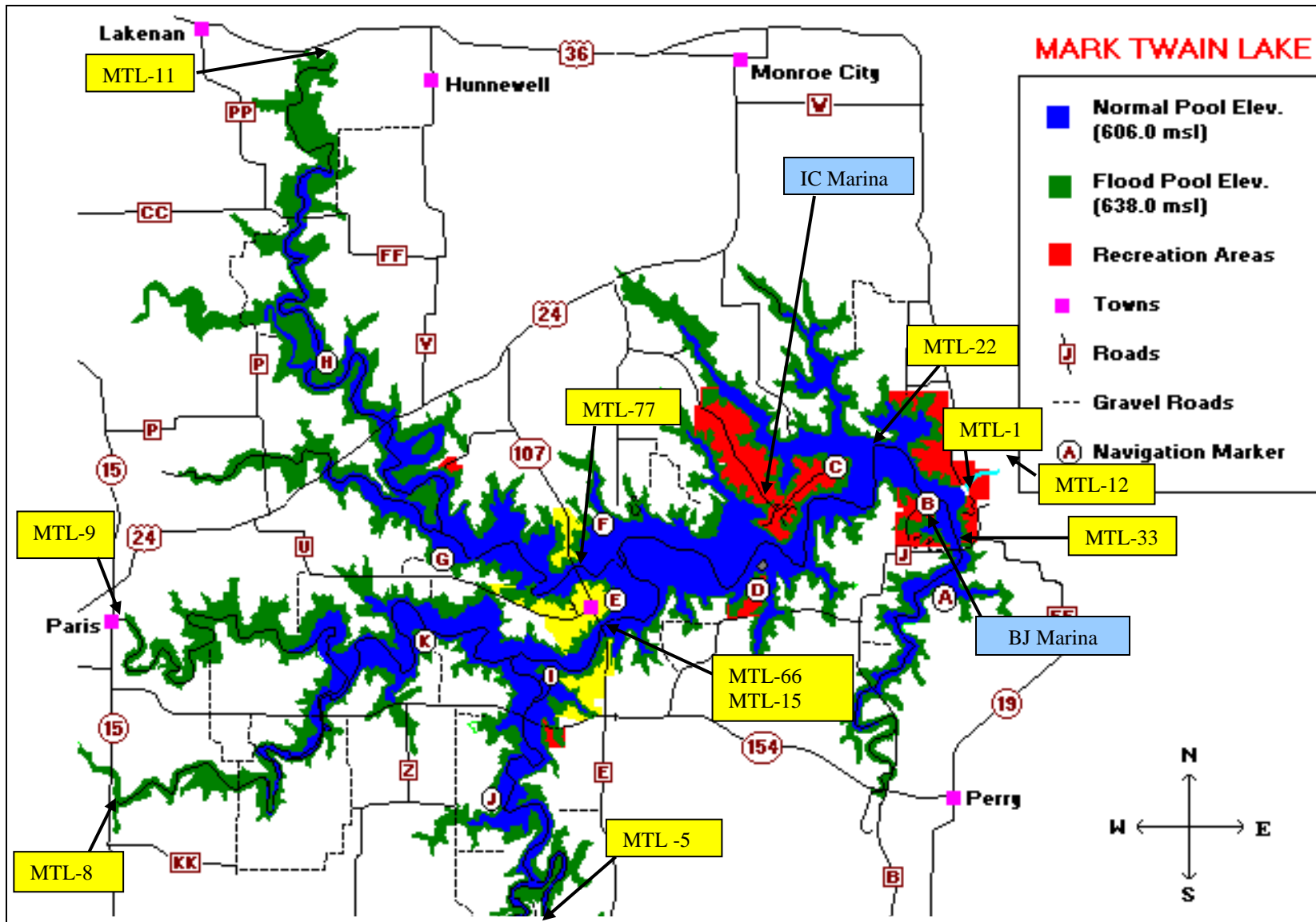


Figure 1
Location of sample sites

2.0 WATER QUALITY ASSESSMENT CRITERIA

2.1 Water Quality

The water quality assessment criteria were based upon the State of Missouri regulatory limits for certain contaminants, which has been generally accepted criteria for sustaining adequate aquatic plant and animal growth. The samplings and analysis which were conducted at the Mark Twain Lake sites reflect the minimal set of parameters needed to analyze the current status of water quality for the Mark Twain Lake system.

The following parameters were analyzed in the Fiscal Year 2011 samplings at Mark Twain Lake: Total Organic Carbon (TOC), iron, manganese, ammonia-nitrogen, nitrate-nitrogen, orthophosphate, total phosphate, Total Suspended Solids (TSS), Total Volatile Suspended Solids (TVSS), fecal coliform, pH, temperature, dissolved oxygen, specific conductance, oxidation-reduction potential (ORP), chlorophyll, pheophytin-a, atrazine and alachlor,

The Missouri Department of Natural Resources, Code of State Regulations, Division 20, Chapter 7 classifies water quality criteria based on designated usage. These standards are used to determine the aquatic water quality of the lake. Table 2.1 provides a listing of the regulatory limits for the parameters analyzed where a limit has been established.

TABLE 2.1 State of Missouri Water Quality Standards	
PARAMETER	LIMIT
Temperature	20.5°C - 33°C (68°F - 90°F)
Ammonia Nitrogen	< 15 mg/L
Nitrate Nitrogen	10 mg/L
Iron	1.0 mg/L (Aquatic Life)
Manganese	0.05 mg/L (Drinking Water & GW)
Phosphorous as Phosphate	0.05 mg/L
E. Coli	Missouri standard is 235 E. coli per 100ml for single sample or 126 for geometric mean
pH	Range: 6.5 to 9.0
DO	> 5.0 mg/L
Atrazine	0.003 mg/L ¹ , 82ug/L ² , 9ug/L ³
Alachlor	0.002 mg/L ¹
Conductivity	1,700 uS/cm≈TDS of 1,000 mg/L
Total Suspended Solids (TSS)	116mg/L (streams); ≥12mg/L Lakes
Cyanazine	370ug/L ² ; 30ug/L ³
Metolachlor	1.7mg/L ²
Simazine	4.0ug/L ¹
Trifluralin	26ug/L ² ; 1.1ug/L ³

¹ Drinking Water ² Acute ³ Chronic

Nitrogen is an essential component of proteins, genetic material, chlorophyll, and other key organic molecules. All organisms require nitrogen in order to survive. Nitrogen exists in several forms. These forms include gaseous nitrogen (N_2), nitrites (NO_2), nitrate (NO_3), ammonia nitrogen (NH_3-N), and ammonium (NH_4). Ammonia can be toxic to fish and other aquatic organisms at certain levels. Unlike ammonia, ammonium (NH_4) is not toxic to aquatic organisms and is readily available for uptake by plankton and macrophytes. Nitrogen levels have increased as human activities have accelerated the rate of fixed nitrogen being put into circulation. High nitrogen levels can cause eutrophication. Eutrophication increases biomass of phytoplankton, decrease water transparency, and causes oxygen depletion. Ammonia nitrogen is monitored so that the effects on fish spawning, hatching, growth rate and pathologic changes in gills, liver and kidney tissue can be related to the detected levels of ammonia nitrogen. Nitrate-nitrogen degrades to nitrite or produces ammonia which has a detrimental effect on aquatic life and, therefore, has been monitored to assure levels are below the regulatory "safe" limit.

Phosphate has been analyzed as phosphorus and has been monitored due to the potential for uptake by nuisance algae. Levels of phosphate can indicate the potential for rapid growth of algae (algae bloom) which can cause serious oxygen depletion during the algae decay process. Phosphorous is typically the limiting nutrient in a water body. Therefore, addition of phosphorous to the ecosystem stimulates the growth of plants and algae. Phosphorous is delivered to lakes and streams by way of storm water runoff from agricultural fields, residential property, and construction sites. Other sources of phosphorous are anaerobic decomposition of organic matter, leaking sewer systems, waterfowl, and point source pollution. The general standard for phosphorous in lake water is 0.05mg/L. Dissolved phosphorous also called ortho-phosphorous is generally found in much smaller concentrations than total phosphorous and is readily available for uptake. For this reason dissolved phosphorous concentrations are variable and difficult to use as an indicator of nutrient availability.

The metals manganese and iron are nutrients for both plants and animals. Living organisms require trace amounts of metals. However, excessive amounts can be harmful to the organism. Heavy metals exist in surface waters in three forms, colloidal, particulate, and dissolved. Water chemistry determines the rate of adsorption and desorption of metals to and from sediment. Metals are desorbed from the sediment if the water experiences increases in salinity, decreases in redox potential, or decreases in pH. Metals in surface waters can be from natural or human sources. Currently human sources contribute more metals than natural sources. Metals levels in surface water may pose a health risk to humans and the environment.

Photosynthetic activity can be hindered by the levels of total suspended solids. Total suspended solids concentrations, which cause the photosynthetic activity to be reduced by more than 10% from the seasonably established norm, can have a detrimental effect on aquatic life. Soil particles, organic material, and other debris comprise suspended solids in the water column. Secchi disk measurements are inverse to suspended solid measurements. As the total suspended solids (TSS) increase, the secchi disk depth or water transparency decreases. Total suspended solids can be an important indicator of the type and degree of turbidity. TSS measurements represent a combination volatile suspended solids (VSS) which is comprised of organic material and nonvolatile suspended solids (NVSS) which is comprised of inorganic mineral particles in the water. In order to more accurately determine the types and amounts of suspended solids,

volatile suspended solids (VSS) are analyzed. VSS concentration represents the organic portion of the total suspended solids. Organic material often includes plankton and additional plant and animal debris that is present in water. Total volatile solids indicate the presence of organics in suspension and, therefore, show additional demand levels of oxygen. Missouri does not currently have a standard for TSS or TVSS. However, literature suggests that NVSS above 15mg/L could highly impair recreational lake use and a NVSS of 3 to 7mg/L might cause slight impairment.

Chlorophyll and pheophytin-a are monitored to provide indicators of algae growth and, therefore, potential oxygen depletion activity. Chlorophyll is measured in lakes to estimate the type and amount of algal productivity in the water column. Chlorophyll a is present in green algae, blue-green algae, and in diatoms. Chlorophyll a is often used to indicate the degree of eutrophication. Chlorophyll b and c are used to estimate the extent of algal diversity and productivity. Chlorophyll b is common in green algae and is used as an auxiliary pigment for photosynthesis. Chlorophyll c is most common in diatom species and serves as an auxiliary pigment. Algal productivity and diversity can be determined by the concentrations of the individual pigments. For example high concentrations of chlorophyll a and b would indicate that green algae is abundant. High concentrations of chlorophyll a would indicate abundance of blue-green algae and concentrations of chlorophyll a and c would indicate diatoms are the dominant species. Chlorophyll production is currently being connected with hypoxia.

Fecal coliform bacteria is monitored for the protection of human health as it relates to full body contact of recreational waters. People can be exposed to disease-causing organisms, such as bacteria, viruses and protozoa in beach and recreational waters mainly through accidental ingestion of contaminated water or through skin contact. These organisms, called pathogens, usually come from the feces of humans and other warm-blooded animals. If taken into the body, pathogens can cause various illnesses and on rare occasions, even death. Waterborne illnesses include diseases resulting from bacteria infection such as cholera, salmonellosis, and gastroenteritis, viral infections such as hepatitis, gastroenteritis, and intestinal diseases, and protozoan infections such as ameobic dysentery and giardiasis. The most commonly monitored recreational water indicator organisms are fecal coliform, Escherichia coli, (E. coli) and enterococci. Fecal coliform are bacteria that live in the intestinal tracts of warm-blooded animals. The Missouri standard for fecal coliform is less than 200 colonies per 100ml of sample water calculated as a geometric mean. Fecal coliform was originally recommended in 1968 by the Federal Water Pollution Control Administration (predecessor to EPA) as an effective water quality indicator organism for recreational waters. Recent studies indicate that fecal coliform show less correlation to illness than other indicator organisms such as E. coli and enterococci. The Environmental Protection Agency (EPA) currently recommends E. coli or enterococci as an indicator organism for fresh waters. Since 2009 the St. Louis District has been using E. coli as the standard indicator.

Atrazine and Alachlor herbicides are commonly used agricultural chemicals which can be readily transported by rainfall runoff. Both compounds are suspected of causing cancer and, therefore, were monitored for the protection of human and aquatic health. Organic compounds include many pesticides. A pesticide can be any substance that is intended to prevent, destroy, repel, or mitigate any pest. This includes insecticides, herbicides, fungicides, fumigants,

algaeicides and other substances. Herbicides which are pesticides used to kill vegetation are the most widely used and sampled. Ten of the most frequently used herbicides and detected in water are Atrazine, Metolachlor, Alachlor, 2,4-D, Trifluralin, Glyphosate, Dicamba, Cyanazine, Simazine, and 2,4,5-T. Two of the most widely used pesticides are Atrazine and Alachlor. Atrazine is a preemergence or postemergence herbicide use to control broadleaf weeds and annual grasses. Atrazine is most commonly detected in ground and surface water due to its wide use, and its ability to persist in soil and move in water. Alachlor is a Restricted Use Pesticide (RUP) due to the potential to contaminate groundwater. The drinking water standard for Atrazine is 0.003mg/L and 0.002 mg/L for Alachlor.

Temperature, dissolved oxygen and pH are monitored for the protection of aquatic life. Temperature is important because it controls several aspects of water quality. Colder water hold more dissolved oxygen which is required by aquatic organisms. Plants grow more rapidly and use more oxygen in warmer water. Decomposition of organic matter which uses oxygen is accelerated in warmer water. Temperature can also determine the availability of toxic compounds such as ammonia. Since aquatic organisms are cold blooded, water temperature regulates their metabolism and ability to survive. The number and kinds of organisms that are found in streams or lakes is directly related to temperature. Certain organisms require a specific temperature range, such as trout, which require water temperatures below 20°C. Most aquatic organisms require a minimum concentration of dissolved oxygen to survive. In spring, surface waters of the lake mix with the water below through wind and thermal action. This mixing diminishes as the upper layer of water becomes warmer and less dense. Solar insulation during the summer months stratifies the lake into three zones. The upper warmer water zone is called the epilimnion and the lower cooler water zone is called the hypolimnion. The epilimnion and the hypolimnion zones are divided by a transition zone known as the metalimnion. The thermocline located within the metalimnion exhibits a rapid change in water temperature. During the summer months the hypolimnion may become anaerobic. In this anaerobic zone, chemical reduction of iron and manganese, or the production of methane and sulfides can occur. Iron rapidly oxidizes in aerobic environments, but manganese oxidizes slowly and can remain in the reduced state for long distances down stream even in aerobic environments. The degree of acidity of water is measured by a logarithmic scale ranging from 0 to 14 and is known as the pH scale. A reading of 7 indicates neutrality and readings below seven are acidic and above are alkaline. Most Illinois lakes range from 6 to 9 on the pH scale. The buffering capacity of water is the ability to neutralize acid better known as alkalinity. A high alkalinity concentration indicates an increased ability to neutralize pH and resist changes, whereas a low alkalinity concentration indicates that a water body is vulnerable to changes in pH.

Conductivity is a measure of a water's ability to conduct an electrical current. The ability to carry a current is often driven by the dissolved materials present in a water column. These materials can include dissolved ions and other materials in the water and thus are directly proportional to the concentration of total dissolved solids (TDS) present in the water column. Typically TDS concentrations represent 50-60% of the conductivity measurements. Conductivity is also affected by water temperature. The warmer the water, the higher the conductivity. Conductivity in streams and rivers is affected by the geology of the area. Streams running through granite areas tend to have lower conductivity due to granite being composed of inert material, materials that do not ionize or dissolve into ionic compounds in water. On the

other hand streams that run through areas of limestone or clay soils tend to have higher conductivity readings because of the presence of materials that ionize. Conductivity is useful as a general measure of water quality. A stream tends to have a relatively constant range of conductivity that once established can be used as a baseline. Significant changes either high or low might indicate a source of pollution has been introduced into the water. The pollution source could be a treatment plant which raises the conductivity or an oil spill which would lower the conductivity.

Redox or Oxidation-Reduction Potential (ORP) is a measure of a water system's capacity to either release or gain electrons. Oxidation involves an exchange of electrons between 2 atoms. The atom that loses an electron is oxidized and the one that gains an electron is reduced. ORP sensors measure the electrochemical potential between the solution and a reference electrode. Readings are expressed in millivolts with positive readings indicating increased oxidizing potential and negative readings being increased reduction. The ORP probe is essentially a millivolt meter, measuring the voltage across 2 electrodes with the water in between. ORP values are used much like pH values to determine water quality. While pH readings characterize the state of a system relative to the receiving or donating hydrogen ions (base or acid), ORP readings characterize the relative state of losing or gaining electrons. The conversion of ammonia (NH_3) requires an oxidizing environment to convert it into nitrites (NO_2) and nitrates (NO_3). Ammonia levels as low as 0.002mg/L can be harmful to fish. Generally ORP readings above 400mV are harmful to aquatic life. However, ORP is a non-specific measurement which is a reflection of a combination of effects of all the dissolved materials in the water. Therefore, the measurement of ORP in relatively clean water has only limited utility unless a predominant redox-active material is known to be present.

Water clarity is intuitively used by the public to judge water quality. Secchi depth has been used for many years as a limnological characterization tool for characterizing water clarity. Secchi depth is a measure of light penetration into a waterbody and is a function of the absorption and scattering of light in the water. There are three characteristics of water which affect the penetration of light. The three factors are the color of water, amount of phytoplankton in the water column, and amount of inorganic material in the water column. Secchi depth integrates the combined impacts of all the factors which influence water clarity. Water transparency was measured using a Secchi disk. Secchi disk readings were taken at all lake sites.

2.2 Sediment

In accordance with EM-1110-2-1201, sediment samples should be taken to monitor and assess potential impacts to aquatic and human health. To assess ecological risk, sample values were compared against toxicity information published in the National Oceanic Atmospheric Administrations (NOAA) Screening Quick Reference Tables (SQRT) or similar references for ecological receptors in freshwater sediment. Without standards or other widely applicable numerical tools, NOAA scientists found it difficult to estimate the possible toxicological significance of chemical concentrations in sediment. Therefore, numerical sediment quality guidelines (SQG's) were developed as informal, interpretive tools. The SQGs were not promulgated as regulatory standards, but rather as informal, non-regulatory guidelines for interpreting chemical data from analyses of sediments. For potential ecological risk from inorganic contaminants, seven metals are typically of "most concern" with regards to fish and

wildlife: Arsenic, Copper, Cadmium, Selenium, Mercury, Lead, and Zinc. Avian species are thought to be particularly sensitive to arsenic, but is also considered a carcinogenic, mutagenic, and teratogenic contaminant in a variety of species in elevated doses over time. Avian species are also known to be particularly sensitive to lead in the environment with effects ranging from mortality, reduced growth and reproductive output, behavior changes, blood chemistry alterations, and lesions of major organs. Finally, the embryo stages in fish and avian species are known to be the most sensitive life stage to selenium effecting reproductive success.

It is recommended that the next round of sediment samples focus on organochlorines in freshwater sediment to assess potential chronic aquatic impacts (e.g. aldrin, chlordane, endrin, endosulfan, DDT, methoxychlor).

For potential human health risk, there are no known values in Missouri for sediments. While not a direct correlation, sample results are compared against Missouri Risk Based Corrective Action (MRBCA) lowest default target levels for all soil types and exposure pathways for soils.

3.0 SUMMARY OF MONITORING RESULTS

3.1 Water Quality Summary

The monitoring program for Mark Twain Lake during Fiscal Year 2011 revealed good water quality when compared to limits established by the Missouri Department of Natural Resources for general use, secondary contact, and indigenous aquatic life. Agricultural nutrient runoffs were primary concerns for the lake's water quality. Better land management practices, erosion control and buffering zones are methods used to reduce such contaminants from entering the lake. The St. Louis District personnel are available to work with lake personnel, area communities, and other agencies in the implementation of educational programs and planning to bring about the use of better management techniques to improve the lake's water quality.

E. coli were sampled at the marinas to ensure that the marina areas are not being contaminated by boats with restroom facilities. Bacteria levels for both marinas were well below the Missouri standard of 235. We currently do not take enough samples in a month to calculate a geometric mean, so we mainly look at a high reading of 235/100ml of sample to trigger additional investigations. E. coli beach sample results for the Corps beaches were received from the project office, and data for the state beach was received from MDNR were incorporated into this report. Beach samples were taken weekly during the recreation season. No samples were above the Missouri standard for beaches.

Total iron and total manganese are sampled above the dam near the bottom of the channel (MTL-22-15), below the re-regulation dam (MTL-12), and in the spillway area (MTL-1). As was previously stated living organisms require trace amounts of metals, however excessive amounts can be harmful to the organism. Iron did exceed the Missouri Water Quality Standard at all 3 sites on 10 May 2011. Manganese exceeded the drinking water and ground water standard of 0.05 mg/L once out of 4 samples at site 1, 3 out of 4 samples at site 12, and 2 out of 3 samples at site 22. Iron cycling is a function of oxidation-reduction processes. This elevated

level of manganese is not detrimental to the overall lake system at this time. Iron oxidizes relatively rapidly (minutes to hours); therefore any iron released through the spillway will normally be oxidized in a short period of time. Manganese oxidizes slower and can persist in the reduced state long distances downstream even in aerobic environments. Missouri's standard for manganese is for drinking water and groundwater. Missouri does not have a manganese standard for aquatic life.

Nitrogen and phosphates are sampled at all sites. All lake sites exceeded the total phosphorous 0.05 mg/l standard on 10 May (site 15 is a duplicate sample to site 66), and at sites 66 & 77 on 1 November. Sites 1 and 12 on 10 May, site 5 on 20 July, and 7 September, and sites 5, 8, 9, and 11 on 1 November exceeded the total phosphorous standard. Because phosphorous in water is not considered directly toxic to humans and animals no drinking water standards have been established for phosphorous. However, phosphorous can cause health threats through the stimulation of toxic algal blooms and the resulting oxygen depletion. Total Phosphate was highest at sites MTL-5 (South Fork) and MTL-11 (North Fork) and lowest at sites MTL-22 (in front of dam) and MTL-33 (Lick Creek). Total Phosphates are used or locked up as water travels down the lake. Nitrates can pose a threat to human and animal health. Nitrate in water is toxic at high levels and has been linked to toxic effects of livestock and to blue baby disease (methemoglobinemia) in infants. The Maximum Contaminant Level (MCL) for nitrate-N in drinking water is 10mg/L to protect babies 3 to 6 months of age. The Missouri Water Quality Standard for ammonia nitrogen (NH₃-N) is 15mg/L. Nitrate-Nitrogen did not exceed the 10mg/L standard at any site. The highest value recorded was 1.6mg/L at any site. Ammonia-Nitrogen tends to be constant throughout the lake. The increased levels of phosphate in combination with nitrogen and other lake conditions, such as temperature, pH and stagnant lake conditions, can lead to increased algae growth. Eutrophication is currently the most widespread water quality problem in the U.S. and many other countries. Restoration of eutrophic waters requires the reduction of nonpoint inputs of phosphorous and nitrogen. The resulting detrimental effects of algae toxins and oxygen depletion could result in health problems for fish and other aquatic species as well as land animals utilizing the water supply. There were no signs of any of these effects during the site visits in 2011.

Chlorophyll *a* was sampled at 4 sites, MTL-22, MTL-33, MTL-66 and MTL-77. MTL-15 is a duplicate sample of MTL-66. Chlorophyll *a* is a green pigment found in plants. Chlorophyll *a* concentrations are an indicator of phytoplankton abundance and biomass. They can be an effective measure of trophic status, and used as a measure of water quality. High levels often indicate poor water quality and low levels suggest good conditions. However, elevated levels are not necessarily bad. It is the long term persistence of elevated levels that is the problem. It is natural for chlorophyll *a* levels to fluctuate over time. Chlorophyll *a* tends to be higher after storm events and during the summer months when water temperatures and light levels are elevated. Chlorophyll can reduce the clarity of the water and the amount of oxygen available to other organisms. Missouri does not currently have a standard for chlorophyll.

Seventy percent of the Mark Twain Lake watershed is used for agriculture and 50% of this is used for cropland. Atrazine and Alachlor are pesticides that were sampled at all sites. These chemicals are herbicides used to control weed growth. All sites were below the Missouri alachlor and atrazine standard. These substances can enter water bodies as a result of drift

during spraying, surface runoff, and leaching through soil. Cyanazine, Metolachlor, Trifluralin and Simazine are also analyzed as part of the pesticide screening. In order to eliminate pesticide contamination of waters it is important for the public to be educated and institute best management practices when using these chemicals.

Total Suspended Solids (TSS) and Total Volatile Suspended Solids (TVSS) samples are collected at all sites. Solids can affect water quality by increasing temperature through the absorption of sunlight by the particles in the water, which also affects the clarity of the water. This can then affect the amount of oxygen in the water. Total Suspended Solids are highest at sites MTL-5 (South Fork), MTL-9 (Middle Fork) and MTL-11 (North Fork), and lowest near sites near the dam. Missouri does not currently have a standard for TSS or TVSS. However, literature suggests that Nonvolatile Suspended Solids (NVSS) which is a subdivision of TSS above 15mg/L could highly impair recreational lake use and a NVSS of 3 to 7mg/L might cause slight impairment.

Total Organic Carbon (TOC) is collected at all sites. TOC is an indicator of the organic character of water. The larger the carbon or organic content, the more oxygen is consumed. TOC tends to be higher in the summer months which may be a result of plant material, which had grown all summer and begins to decay. Missouri does not currently have a standard for TOC.

Temperature and dissolved oxygen levels were taken at all sites. Measurements were taken at 1 meter intervals at the lake sites. During the summer months the lake stratifies and a boundary is formed between the upper warmer water and the lower cooler water. This transition area is known as the thermocline, the area where the temperature drops significantly. Oxygen levels can also change drastically as a function of depth. This area where the oxygen level significantly drops is called the oxycline. The depth of the thermocline and oxycline can have an effect on the aquatic organisms. Occasionally the thermocline and oxycline are at or near the same depth.

pH is taken at all sites and at 1 meter intervals at lake sites. All sites were within the 6 to 9 pH range except site 1 on 7 September. Variances in pH can be caused by a rainfall event. Although, no such event occurred.

Conductivity and redox are taken at all sites and at 1 meter intervals at lake sites. Recommended standard for conductivity is 1,700 μ S/cm. Missouri does not currently have a standard for redox.

Secchi disk readings at sites 22 (above dam) and 33 (Lick Creek Arm near Hwy J) indicate that these sites tend to have better water clarity than the rest of the lake. This would seem to be reasonable since these sites are located closer to the dam which allows solids time to settle out of the water column.

3.2 Sediment Summary

Sediment sampling was not conducted in 2011. Sediment sampling is normally conducted every 5 years if funding is available. Sediment sampling was last conducted in 2007.

4.0 PLANNED 2012 STUDIES

The Mark Twain Lake water quality monitoring will continue in Fiscal Year 2012. Because of budgetary constraints the number of sampling events will remain at 3 for 2012. A restored number of sampling events would provide the ability to better evaluate water quality trends, better defend project operations (lake levels, releases, maintenance projects, construction projects, etc.), to better confirm that we meet state water quality standards, and to better confirm that human health and safety are adequately protected. The sampling events are planned to be conducted between May and August in 2012. Mark Twain Lake provides drinking water to many communities and is a high usage recreational lake. The monitoring of water quality is imperative to assure the water quality is within acceptable limits for the designated usage.

The sampling sites include the following: Site 1 MTL-1 Spillway, Site 5 MTL-5 South Fork at Hwy D, Site 8 Elk Fork at Hwy 15, Site 9 Middle Fork at Hwy 15, Site 11 North Fork at Hwy 36, Site 12 below re-regulation dam, Site 22 MTL-22 old river channel 1 mile up lake from dam, Site 33 Lick Creek at Hwy J, Site 66 South Fork at Hwy 107 bridge, and Site 77 North Fork at Hwy 107 bridge. This combination of sites effectively represents the incoming contaminants and their effects on the lake.

A remote sensor was installed several years ago in the spillway to allow the project as well as water quality personnel to remotely monitor temperature and oxygen readings to avoid fish kills. During low flow, water is discharged through the after bay. This water is low in oxygen and can create a low oxygen area below the dam. The sensor will allow the project to track oxygen levels below the dam and make appropriate adjustments to avoid a possible fish kill. Normally allowing water to spill through the tainter gates will alleviate low oxygen levels below the dam. In 2009 a remote sensor was installed in the re-reg pool near the re-reg dam to monitor the lower portion of the re-reg pool. Water quality personnel will continue to maintain and monitor these probes.

APPENDIX A

DATA

LAB DATA

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-1	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-1	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-1	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-11	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-11	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-11	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-12	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-12	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-12	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-15	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-15	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-15	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-15	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-22	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-22	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-22	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-33	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-33	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-33	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-33	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-5	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-5	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-5	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-66	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-66	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-66	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-77	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-77	7/20/2011	WT	0.620	J	ug/L	Acetochlor
MTL-77	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-8	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-8	7/20/2011	WT	ND		ug/L	Acetochlor
MTL-8	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-9	5/10/2011	WT	ND		ug/L	Acetochlor
MTL-9	7/20/2011	WT	ND		ug/L	Acetochlor

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-9	9/7/2011	WT	ND		ug/L	Acetochlor
MTL-1	5/10/2011	WT	ND		ug/L	Alachlor
MTL-1	7/20/2011	WT	ND		ug/L	Alachlor
MTL-1	9/7/2011	WT	ND		ug/L	Alachlor
MTL-1	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-11	5/10/2011	WT	ND		ug/L	Alachlor
MTL-11	7/20/2011	WT	ND		ug/L	Alachlor
MTL-11	9/7/2011	WT	ND		ug/L	Alachlor
MTL-11	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-12	5/10/2011	WT	ND		ug/L	Alachlor
MTL-12	7/20/2011	WT	ND		ug/L	Alachlor
MTL-12	9/7/2011	WT	ND		ug/L	Alachlor
MTL-12	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-15	5/10/2011	WT	ND		ug/L	Alachlor
MTL-15	7/20/2011	WT	ND		ug/L	Alachlor
MTL-15	9/7/2011	WT	ND		ug/L	Alachlor
MTL-15	9/7/2011	WT	ND		ug/L	Alachlor
MTL-22	5/10/2011	WT	ND		ug/L	Alachlor
MTL-22	7/20/2011	WT	ND		ug/L	Alachlor
MTL-22	9/7/2011	WT	ND		ug/L	Alachlor
MTL-22	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-33	5/10/2011	WT	ND		ug/L	Alachlor
MTL-33	7/20/2011	WT	ND		ug/L	Alachlor
MTL-33	7/20/2011	WT	ND		ug/L	Alachlor
MTL-33	9/7/2011	WT	ND		ug/L	Alachlor
MTL-33	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-5	5/10/2011	WT	ND		ug/L	Alachlor
MTL-5	7/20/2011	WT	ND		ug/L	Alachlor
MTL-5	9/7/2011	WT	ND		ug/L	Alachlor
MTL-5	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-66	5/10/2011	WT	ND		ug/L	Alachlor
MTL-66	7/20/2011	WT	ND		ug/L	Alachlor
MTL-66	9/7/2011	WT	ND		ug/L	Alachlor
MTL-66	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-77	5/10/2011	WT	ND		ug/L	Alachlor
MTL-77	7/20/2011	WT	ND		ug/L	Alachlor
MTL-77	9/7/2011	WT	ND		ug/L	Alachlor

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-77	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-8	5/10/2011	WT	ND		ug/L	Alachlor
MTL-8	7/20/2011	WT	ND		ug/L	Alachlor
MTL-8	9/7/2011	WT	ND		ug/L	Alachlor
MTL-8	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-9	5/10/2011	WT	ND		ug/L	Alachlor
MTL-9	7/20/2011	WT	ND		ug/L	Alachlor
MTL-9	9/7/2011	WT	ND		ug/L	Alachlor
MTL-9	11/1/2011	WT	1	<	ug/L	Alachlor
MTL-1	5/10/2011	WT	0.100		mg/L	Ammonia-N
MTL-1	7/20/2011	WT	0.240		mg/L	Ammonia-N
MTL-1	9/7/2011	WT	ND		mg/L	Ammonia-N
MTL-1	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-11	5/10/2011	WT	0.130		mg/L	Ammonia-N
MTL-11	7/20/2011	WT	ND		mg/L	Ammonia-N
MTL-11	9/7/2011	WT	ND		mg/L	Ammonia-N
MTL-11	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-12	5/10/2011	WT	0.220		mg/L	Ammonia-N
MTL-12	7/20/2011	WT	0.350		mg/L	Ammonia-N
MTL-12	9/7/2011	WT	0.140		mg/L	Ammonia-N
MTL-12	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-15	5/10/2011	WT	0.160		mg/L	Ammonia-N
MTL-15	7/20/2011	WT	ND		mg/L	Ammonia-N
MTL-15	9/7/2011	WT	0.130		mg/L	Ammonia-N
MTL-15	9/7/2011	WT	0.130		mg/L	Ammonia-N
MTL-22	5/10/2011	WT	0.160		mg/L	Ammonia-N
MTL-22	7/20/2011	WT	0.170		mg/L	Ammonia-N
MTL-22	9/7/2011	WT	ND		mg/L	Ammonia-N
MTL-22	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-22-15	5/10/2011	WT	0.110		mg/L	Ammonia-N
MTL-22-15	7/20/2011	WT	ND		mg/L	Ammonia-N
MTL-22-15	9/7/2011	WT	0.180		mg/L	Ammonia-N
MTL-33	5/10/2011	WT	0.200		mg/L	Ammonia-N
MTL-33	7/20/2011	WT	ND		mg/L	Ammonia-N
MTL-33	9/7/2011	WT	ND		mg/L	Ammonia-N
MTL-33	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-5	5/10/2011	WT	0.110		mg/L	Ammonia-N

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-5	7/20/2011	WT	0.200		mg/L	Ammonia-N
MTL-5	9/7/2011	WT	0.170		mg/L	Ammonia-N
MTL-5	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-66	5/10/2011	WT	0.300		mg/L	Ammonia-N
MTL-66	7/20/2011	WT	0.310		mg/L	Ammonia-N
MTL-66	9/7/2011	WT	0.150		mg/L	Ammonia-N
MTL-66	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-77	5/10/2011	WT	0.130		mg/L	Ammonia-N
MTL-77	7/20/2011	WT	ND		mg/L	Ammonia-N
MTL-77	9/7/2011	WT	ND		mg/L	Ammonia-N
MTL-77	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-8	5/10/2011	WT	0.090	J	mg/L	Ammonia-N
MTL-8	7/20/2011	WT	0.170		mg/L	Ammonia-N
MTL-8	9/7/2011	WT	ND		mg/L	Ammonia-N
MTL-8	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-9	5/10/2011	WT	0.100		mg/L	Ammonia-N
MTL-9	7/20/2011	WT	0.190		mg/L	Ammonia-N
MTL-9	9/7/2011	WT	0.140		mg/L	Ammonia-N
MTL-9	11/1/2011	WT	0.03	<	mg/L	Ammonia-N
MTL-1	5/10/2011	WT	ND		ug/L	Atrazine
MTL-1	7/20/2011	WT	ND		ug/L	Atrazine
MTL-1	9/7/2011	WT	0.290	J	ug/L	Atrazine
MTL-1	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-11	5/10/2011	WT	0.610	J	ug/L	Atrazine
MTL-11	7/20/2011	WT	ND		ug/L	Atrazine
MTL-11	9/7/2011	WT	ND		ug/L	Atrazine
MTL-11	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-12	5/10/2011	WT	ND		ug/L	Atrazine
MTL-12	7/20/2011	WT	ND		ug/L	Atrazine
MTL-12	9/7/2011	WT	0.240	J	ug/L	Atrazine
MTL-12	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-15	5/10/2011	WT	0.950	J	ug/L	Atrazine
MTL-15	7/20/2011	WT	0.910	J	ug/L	Atrazine
MTL-15	9/7/2011	WT	0.410	J	ug/L	Atrazine
MTL-15	9/7/2011	WT	0.410	J	ug/L	Atrazine
MTL-22	5/10/2011	WT	0.240	J	ug/L	Atrazine
MTL-22	7/20/2011	WT	ND		ug/L	Atrazine

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-22	9/7/2011	WT	0.270	J	ug/L	Atrazine
MTL-22	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-33	5/10/2011	WT	1.100		ug/L	Atrazine
MTL-33	7/20/2011	WT	ND		ug/L	Atrazine
MTL-33	7/20/2011	WT	0.520	J	ug/L	Atrazine
MTL-33	9/7/2011	WT	0.310	J	ug/L	Atrazine
MTL-33	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-5	5/10/2011	WT	0.970	J	ug/L	Atrazine
MTL-5	7/20/2011	WT	0.410	J	ug/L	Atrazine
MTL-5	9/7/2011	WT	0.160	J	ug/L	Atrazine
MTL-5	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-66	5/10/2011	WT	0.750	J	ug/L	Atrazine
MTL-66	7/20/2011	WT	0.520	J	ug/L	Atrazine
MTL-66	9/7/2011	WT	0.440	J	ug/L	Atrazine
MTL-66	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-77	5/10/2011	WT	0.280	J	ug/L	Atrazine
MTL-77	7/20/2011	WT	ND		ug/L	Atrazine
MTL-77	9/7/2011	WT	0.390	J	ug/L	Atrazine
MTL-77	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-8	5/10/2011	WT	0.280	J	ug/L	Atrazine
MTL-8	7/20/2011	WT	ND		ug/L	Atrazine
MTL-8	9/7/2011	WT	0.150	J	ug/L	Atrazine
MTL-8	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-9	5/10/2011	WT	0.480	J	ug/L	Atrazine
MTL-9	7/20/2011	WT	0.470	J	ug/L	Atrazine
MTL-9	9/7/2011	WT	0.160	J	ug/L	Atrazine
MTL-9	11/1/2011	WT	1	<	ug/L	Atrazine
MTL-1	5/10/2011	WT	ND		ug/L	Bromacil
MTL-1	7/20/2011	WT	ND		ug/L	Bromacil
MTL-1	9/7/2011	WT	ND		ug/L	Bromacil
MTL-11	5/10/2011	WT	ND		ug/L	Bromacil
MTL-11	7/20/2011	WT	ND		ug/L	Bromacil
MTL-11	9/7/2011	WT	ND		ug/L	Bromacil
MTL-12	5/10/2011	WT	ND		ug/L	Bromacil
MTL-12	7/20/2011	WT	ND		ug/L	Bromacil
MTL-12	9/7/2011	WT	ND		ug/L	Bromacil
MTL-15	5/10/2011	WT	ND		ug/L	Bromacil

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-15	7/20/2011	WT	ND		ug/L	Bromacil
MTL-15	9/7/2011	WT	ND		ug/L	Bromacil
MTL-15	9/7/2011	WT	ND		ug/L	Bromacil
MTL-22	5/10/2011	WT	ND		ug/L	Bromacil
MTL-22	7/20/2011	WT	ND		ug/L	Bromacil
MTL-22	9/7/2011	WT	ND		ug/L	Bromacil
MTL-33	5/10/2011	WT	ND		ug/L	Bromacil
MTL-33	7/20/2011	WT	ND		ug/L	Bromacil
MTL-33	7/20/2011	WT	ND		ug/L	Bromacil
MTL-33	9/7/2011	WT	0.300	J	ug/L	Bromacil
MTL-5	5/10/2011	WT	ND		ug/L	Bromacil
MTL-5	7/20/2011	WT	ND		ug/L	Bromacil
MTL-5	9/7/2011	WT	ND		ug/L	Bromacil
MTL-66	5/10/2011	WT	ND		ug/L	Bromacil
MTL-66	7/20/2011	WT	ND		ug/L	Bromacil
MTL-66	9/7/2011	WT	ND		ug/L	Bromacil
MTL-77	5/10/2011	WT	ND		ug/L	Bromacil
MTL-77	7/20/2011	WT	ND		ug/L	Bromacil
MTL-77	9/7/2011	WT	ND		ug/L	Bromacil
MTL-8	5/10/2011	WT	ND		ug/L	Bromacil
MTL-8	7/20/2011	WT	ND		ug/L	Bromacil
MTL-8	9/7/2011	WT	ND		ug/L	Bromacil
MTL-9	5/10/2011	WT	ND		ug/L	Bromacil
MTL-9	7/20/2011	WT	ND		ug/L	Bromacil
MTL-9	9/7/2011	WT	ND		ug/L	Bromacil
MTL-1	5/10/2011	WT	ND		ug/L	Butachlor
MTL-1	7/20/2011	WT	ND		ug/L	Butachlor
MTL-1	9/7/2011	WT	ND		ug/L	Butachlor
MTL-11	5/10/2011	WT	ND		ug/L	Butachlor
MTL-11	7/20/2011	WT	ND		ug/L	Butachlor
MTL-11	9/7/2011	WT	ND		ug/L	Butachlor
MTL-12	5/10/2011	WT	ND		ug/L	Butachlor
MTL-12	7/20/2011	WT	ND		ug/L	Butachlor
MTL-12	9/7/2011	WT	ND		ug/L	Butachlor
MTL-15	5/10/2011	WT	ND		ug/L	Butachlor
MTL-15	7/20/2011	WT	ND		ug/L	Butachlor
MTL-15	9/7/2011	WT	ND		ug/L	Butachlor

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-15	9/7/2011	WT	ND		ug/L	Butachlor
MTL-22	5/10/2011	WT	ND		ug/L	Butachlor
MTL-22	7/20/2011	WT	ND		ug/L	Butachlor
MTL-22	9/7/2011	WT	ND		ug/L	Butachlor
MTL-33	5/10/2011	WT	ND		ug/L	Butachlor
MTL-33	7/20/2011	WT	ND		ug/L	Butachlor
MTL-33	7/20/2011	WT	ND		ug/L	Butachlor
MTL-33	9/7/2011	WT	ND		ug/L	Butachlor
MTL-5	5/10/2011	WT	ND		ug/L	Butachlor
MTL-5	7/20/2011	WT	ND		ug/L	Butachlor
MTL-5	9/7/2011	WT	ND		ug/L	Butachlor
MTL-66	5/10/2011	WT	ND		ug/L	Butachlor
MTL-66	7/20/2011	WT	ND		ug/L	Butachlor
MTL-66	9/7/2011	WT	ND		ug/L	Butachlor
MTL-77	5/10/2011	WT	ND		ug/L	Butachlor
MTL-77	7/20/2011	WT	ND		ug/L	Butachlor
MTL-77	9/7/2011	WT	ND		ug/L	Butachlor
MTL-8	5/10/2011	WT	ND		ug/L	Butachlor
MTL-8	7/20/2011	WT	ND		ug/L	Butachlor
MTL-8	9/7/2011	WT	ND		ug/L	Butachlor
MTL-9	5/10/2011	WT	ND		ug/L	Butachlor
MTL-9	7/20/2011	WT	ND		ug/L	Butachlor
MTL-9	9/7/2011	WT	ND	J	ug/L	Butachlor
MTL-1	11/1/2011	WT	3		mg/m3	Chlorophyll a
MTL-11	7/20/2011	WT	23.496		mg/m3	Chlorophyll a
MTL-12	7/20/2011	WT	8.544		mg/m3	Chlorophyll a
MTL-12	11/1/2011	WT	2	<	mg/m3	Chlorophyll a
MTL-15	5/10/2011	WT	17.088		mg/m3	Chlorophyll a
MTL-15	7/20/2011	WT	14.952		mg/m3	Chlorophyll a
MTL-15	9/7/2011	WT	17.088		mg/m3	Chlorophyll a
MTL-22	5/10/2011	WT	0.000		mg/m3	Chlorophyll a
MTL-22	7/20/2011	WT	2.136		mg/m3	Chlorophyll a
MTL-22	9/7/2011	WT	0.000		mg/m3	Chlorophyll a
MTL-22	11/1/2011	WT	20		mg/m3	Chlorophyll a
MTL-33	5/10/2011	WT	10.680		mg/m3	Chlorophyll a
MTL-33	7/20/2011	WT	2.136		mg/m3	Chlorophyll a
MTL-33	7/20/2011	WT	17.088		mg/m3	Chlorophyll a

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-33	9/7/2011	WT	6.400		mg/m3	Chlorophyll a
MTL-33	11/1/2011	WT	3		mg/m3	Chlorophyll a
MTL-66	5/10/2011	WT	25.632		mg/m3	Chlorophyll a
MTL-66	7/20/2011	WT	17.088		mg/m3	Chlorophyll a
MTL-66	9/7/2011	WT	19.224		mg/m3	Chlorophyll a
MTL-66	11/1/2011	WT	2	<	mg/m3	Chlorophyll a
MTL-77	5/10/2011	WT	8.544		mg/m3	Chlorophyll a
MTL-77	7/20/2011	WT	8.544		mg/m3	Chlorophyll a
MTL-77	9/7/2011	WT	8.544		mg/m3	Chlorophyll a
MTL-77	11/1/2011	WT	19.5		mg/m3	Chlorophyll a
MTL-1	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-11	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-12	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-22	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-33	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-5	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-66	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-77	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-8	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-9	11/1/2011	WT	1	<	ug/L	Chlorpyrifos
MTL-1	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-1	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-1	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-11	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-11	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-11	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-12	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-12	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-12	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-15	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-15	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-15	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-15	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-22	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-22	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-22	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-33	5/10/2011	WT	ND		ug/L	Chlorpyrifos

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-33	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-33	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-33	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-5	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-5	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-66	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-66	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-66	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-77	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-77	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-77	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-8	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-8	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-8	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-9	5/10/2011	WT	ND		ug/L	Chlorpyrifos
MTL-9	7/20/2011	WT	ND		ug/L	Chlorpyrifos
MTL-9	9/7/2011	WT	ND		ug/L	Chlorpyrifos
MTL-1	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-1	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-1	9/7/2011	WT	0.340	J	ug/L	Cyanizine
MTL-1	11/1/2011	WT	1	<	ug/L	Cyanizine
MTL-11	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-11	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-11	9/7/2011	WT	ND		ug/L	Cyanizine
MTL-11	11/1/2011	WT	1	<	ug/L	Cyanizine
MTL-12	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-12	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-12	9/7/2011	WT	ND		ug/L	Cyanizine
MTL-12	11/1/2011	WT	1	<	ug/L	Cyanizine
MTL-15	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-15	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-15	9/7/2011	WT	ND		ug/L	Cyanizine
MTL-15	9/7/2011	WT	ND		ug/L	Cyanizine
MTL-22	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-22	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-22	9/7/2011	WT	ND		ug/L	Cyanizine
MTL-22	11/1/2011	WT	1	<	ug/L	Cyanizine

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-33	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-33	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-33	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-33	9/7/2011	WT	0.320	J	ug/L	Cyanizine
MTL-33	11/1/2011	WT	1	<	ug/L	Cyanizine
MTL-5	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-5	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-5	11/1/2011	WT	1	<	ug/L	Cyanizine
MTL-66	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-66	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-66	9/7/2011	WT	ND		ug/L	Cyanizine
MTL-66	11/1/2011	WT	1	<	ug/L	Cyanizine
MTL-77	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-77	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-77	9/7/2011	WT	ND		ug/L	Cyanizine
MTL-77	11/1/2011	WT	1	<	ug/L	Cyanizine
MTL-8	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-8	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-8	9/7/2011	WT	ND		ug/L	Cyanizine
MTL-8	11/1/2011	WT	1	<	ug/L	Cyanizine
MTL-9	5/10/2011	WT	ND		ug/L	Cyanizine
MTL-9	7/20/2011	WT	ND		ug/L	Cyanizine
MTL-9	9/7/2011	WT	ND	J	ug/L	Cyanizine
MTL-9	11/1/2011	WT	1	<	ug/L	Cyanizine
MTL-1	5/10/2011	WT	1.500		mg/L	Iron, Total
MTL-1	7/20/2011	WT	0.160		mg/L	Iron, Total
MTL-1	9/7/2011	WT	0.085		mg/L	Iron, Total
MTL-1	11/1/2011	WT	0.24		mg/L	Iron, Total
MTL-12	5/10/2011	WT	1.700		mg/L	Iron, Total
MTL-12	7/20/2011	WT	0.440		mg/L	Iron, Total
MTL-12	9/7/2011	WT	0.370		mg/L	Iron, Total
MTL-12	11/1/2011	WT	0.23		mg/L	Iron, Total
MTL-22-15	5/10/2011	WT	1.600		mg/L	Iron, Total
MTL-22-15	7/20/2011	WT	0.590		mg/L	Iron, Total
MTL-22-15	9/7/2011	WT	0.100		mg/L	Iron, Total
MTL-1	5/10/2011	WT	0.027		mg/L	Manganese, Total
MTL-1	7/20/2011	WT	0.017		mg/L	Manganese, Total

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-1	9/7/2011	WT	0.049		mg/L	Manganese, Total
MTL-1	11/1/2011	WT	0.12		mg/L	Manganese, Total
MTL-12	5/10/2011	WT	0.063		mg/L	Manganese, Total
MTL-12	7/20/2011	WT	0.044		mg/L	Manganese, Total
MTL-12	9/7/2011	WT	0.140		mg/L	Manganese, Total
MTL-12	11/1/2011	WT	0.1		mg/L	Manganese, Total
MTL-22-15	5/10/2011	WT	0.025		mg/L	Manganese, Total
MTL-22-15	7/20/2011	WT	0.064		mg/L	Manganese, Total
MTL-22-15	9/7/2011	WT	0.600		mg/L	Manganese, Total
MTL-1	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-1	7/20/2011	WT	1.300		ug/L	Metolachlor
MTL-1	9/7/2011	WT	0.500	J	ug/L	Metolachlor
MTL-1	11/1/2011	WT	1	<	UG/L	Metolachlor
MTL-11	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-11	7/20/2011	WT	1.000	J	ug/L	Metolachlor
MTL-11	9/7/2011	WT	ND		ug/L	Metolachlor
MTL-11	11/1/2011	WT	1	<	ug/L	Metolachlor
MTL-12	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-12	7/20/2011	WT	1.000	J	ug/L	Metolachlor
MTL-12	9/7/2011	WT	0.470	J	ug/L	Metolachlor
MTL-12	11/1/2011	WT	1	<	ug/L	Metolachlor
MTL-15	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-15	7/20/2011	WT	1.200		ug/L	Metolachlor
MTL-15	9/7/2011	WT	0.630	J	ug/L	Metolachlor
MTL-15	9/7/2011	WT	0.630	J	ug/L	Metolachlor
MTL-22	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-22	7/20/2011	WT	1.200		ug/L	Metolachlor
MTL-22	9/7/2011	WT	0.750	J	ug/L	Metolachlor
MTL-22	11/1/2011	WT	1	<	ug/L	Metolachlor
MTL-33	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-33	7/20/2011	WT	0.830	J	ug/L	Metolachlor
MTL-33	7/20/2011	WT	1.200		ug/L	Metolachlor
MTL-33	9/7/2011	WT	0.310	J	ug/L	Metolachlor
MTL-33	11/1/2011	WT	1	<	ug/L	Metolachlor
MTL-5	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-5	7/20/2011	WT	ND		ug/L	Metolachlor
MTL-5	11/1/2011	WT	1	<	ug/L	Metolachlor

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-66	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-66	7/20/2011	WT	1.200		ug/L	Metolachlor
MTL-66	9/7/2011	WT	0.840	J	ug/L	Metolachlor
MTL-66	11/1/2011	WT	1	<	ug/L	Metolachlor
MTL-77	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-77	7/20/2011	WT	1.100		ug/L	Metolachlor
MTL-77	9/7/2011	WT	0.710	J	ug/L	Metolachlor
MTL-77	11/1/2011	WT	1	<	ug/L	Metolachlor
MTL-8	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-8	7/20/2011	WT	0.730	J	ug/L	Metolachlor
MTL-8	9/7/2011	WT	ND		ug/L	Metolachlor
MTL-8	11/1/2011	WT	1	<	ug/L	Metolachlor
MTL-9	5/10/2011	WT	ND		ug/L	Metolachlor
MTL-9	7/20/2011	WT	0.410	J	ug/L	Metolachlor
MTL-9	9/7/2011	WT	ND		ug/L	Metolachlor
MTL-9	11/1/2011	WT	1	<	ug/L	Metolachlor
MTL-1	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-1	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-1	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-1	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-11	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-11	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-11	9/7/2011	WT	ND	J	ug/L	Metribuzin
MTL-11	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-12	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-12	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-12	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-12	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-15	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-15	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-15	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-15	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-22	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-22	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-22	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-22	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-33	5/10/2011	WT	ND		ug/L	Metribuzin

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-33	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-33	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-33	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-33	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-5	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-5	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-5	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-66	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-66	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-66	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-66	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-77	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-77	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-77	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-77	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-8	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-8	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-8	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-8	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-9	5/10/2011	WT	ND		ug/L	Metribuzin
MTL-9	7/20/2011	WT	ND		ug/L	Metribuzin
MTL-9	9/7/2011	WT	ND		ug/L	Metribuzin
MTL-9	11/1/2011	WT	1	<	ug/L	Metribuzin
MTL-1	5/10/2011	WT	ND		ug/L	Molinate
MTL-1	7/20/2011	WT	ND		ug/L	Molinate
MTL-1	9/7/2011	WT	ND		ug/L	Molinate
MTL-11	5/10/2011	WT	ND		ug/L	Molinate
MTL-11	7/20/2011	WT	ND		ug/L	Molinate
MTL-11	9/7/2011	WT	ND	J	ug/L	Molinate
MTL-12	5/10/2011	WT	ND		ug/L	Molinate
MTL-12	7/20/2011	WT	ND		ug/L	Molinate
MTL-12	9/7/2011	WT	ND		ug/L	Molinate
MTL-15	5/10/2011	WT	ND		ug/L	Molinate
MTL-15	7/20/2011	WT	ND		ug/L	Molinate
MTL-15	9/7/2011	WT	ND		ug/L	Molinate
MTL-15	9/7/2011	WT	ND		ug/L	Molinate
MTL-22	5/10/2011	WT	ND		ug/L	Molinate

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-22	7/20/2011	WT	ND		ug/L	Molinate
MTL-22	9/7/2011	WT	ND		ug/L	Molinate
MTL-33	5/10/2011	WT	ND		ug/L	Molinate
MTL-33	7/20/2011	WT	ND		ug/L	Molinate
MTL-33	7/20/2011	WT	ND		ug/L	Molinate
MTL-33	9/7/2011	WT	ND		ug/L	Molinate
MTL-5	5/10/2011	WT	ND		ug/L	Molinate
MTL-5	7/20/2011	WT	ND		ug/L	Molinate
MTL-5	9/7/2011	WT	ND		ug/L	Molinate
MTL-66	5/10/2011	WT	ND		ug/L	Molinate
MTL-66	7/20/2011	WT	ND		ug/L	Molinate
MTL-66	9/7/2011	WT	ND		ug/L	Molinate
MTL-77	5/10/2011	WT	ND		ug/L	Molinate
MTL-77	7/20/2011	WT	ND		ug/L	Molinate
MTL-77	9/7/2011	WT	ND		ug/L	Molinate
MTL-8	5/10/2011	WT	ND		ug/L	Molinate
MTL-8	7/20/2011	WT	ND		ug/L	Molinate
MTL-8	9/7/2011	WT	ND		ug/L	Molinate
MTL-9	5/10/2011	WT	ND		ug/L	Molinate
MTL-9	7/20/2011	WT	ND		ug/L	Molinate
MTL-9	9/7/2011	WT	ND		ug/L	Molinate
MTL-1	5/10/2011	WT	1.600		mg/L	Nitrate-N
MTL-1	7/20/2011	WT	1.300		mg/L	Nitrate-N
MTL-1	9/7/2011	WT	0.180	J	mg/L	Nitrate-N
MTL-1	11/1/2011	WT	0.27		mg/L	Nitrate-N
MTL-11	5/10/2011	WT	ND		mg/L	Nitrate-N
MTL-11	7/20/2011	WT	0.360		mg/L	Nitrate-N
MTL-11	9/7/2011	WT	ND		mg/L	Nitrate-N
MTL-11	11/1/2011	WT	0.05	<	mg/L	Nitrate-N
MTL-12	5/10/2011	WT	1.600		mg/L	Nitrate-N
MTL-12	7/20/2011	WT	1.400		mg/L	Nitrate-N
MTL-12	9/7/2011	WT	0.080	J	mg/L	Nitrate-N
MTL-12	11/1/2011	WT	0.27		mg/L	Nitrate-N
MTL-15	5/10/2011	WT	1.200		mg/L	Nitrate-N
MTL-15	7/20/2011	WT	ND		mg/L	Nitrate-N
MTL-15	9/7/2011	WT	ND		mg/L	Nitrate-N
MTL-15	9/7/2011	WT	ND		mg/L	Nitrate-N

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-22	5/10/2011	WT	1.600		mg/L	Nitrate-N
MTL-22	7/20/2011	WT	1.200		mg/L	Nitrate-N
MTL-22	9/7/2011	WT	0.340		mg/L	Nitrate-N
MTL-22	11/1/2011	WT	0.26		mg/L	Nitrate-N
MTL-22-15	5/10/2011	WT	1.600		mg/L	Nitrate-N
MTL-22-15	7/20/2011	WT	1.300		mg/L	Nitrate-N
MTL-22-15	9/7/2011	WT	1.100		mg/L	Nitrate-N
MTL-33	5/10/2011	WT	1.500		mg/L	Nitrate-N
MTL-33	7/20/2011	WT	1.100		mg/L	Nitrate-N
MTL-33	9/7/2011	WT	0.260		mg/L	Nitrate-N
MTL-33	11/1/2011	WT	0.29		mg/L	Nitrate-N
MTL-5	5/10/2011	WT	ND		mg/L	Nitrate-N
MTL-5	7/20/2011	WT	ND		mg/L	Nitrate-N
MTL-5	9/7/2011	WT	ND	1	mg/L	Nitrate-N
MTL-5	11/1/2011	WT	0.05	<	mg/L	Nitrate-N
MTL-66	5/10/2011	WT	1.200		mg/L	Nitrate-N
MTL-66	7/20/2011	WT	0.820		mg/L	Nitrate-N
MTL-66	9/7/2011	WT	ND		mg/L	Nitrate-N
MTL-66	11/1/2011	WT	0.42		mg/L	Nitrate-N
MTL-77	5/10/2011	WT	1.500		mg/L	Nitrate-N
MTL-77	7/20/2011	WT	0.820		mg/L	Nitrate-N
MTL-77	9/7/2011	WT	ND		mg/L	Nitrate-N
MTL-77	11/1/2011	WT	0.31		mg/L	Nitrate-N
MTL-8	5/10/2011	WT	ND		mg/L	Nitrate-N
MTL-8	7/20/2011	WT	ND		mg/L	Nitrate-N
MTL-8	9/7/2011	WT	ND		mg/L	Nitrate-N
MTL-8	11/1/2011	WT	0.05	<	mg/L	Nitrate-N
MTL-9	5/10/2011	WT	ND		mg/L	Nitrate-N
MTL-9	7/20/2011	WT	ND		mg/L	Nitrate-N
MTL-9	9/7/2011	WT	ND		mg/L	Nitrate-N
MTL-9	11/1/2011	WT	0.05	<	mg/L	Nitrate-N
MTL-1	5/10/2011	WT	0.003	J	mg/L	Orthophosphate
MTL-1	7/20/2011	WT	0.006	J	mg/L	Orthophosphate
MTL-1	9/7/2011	WT	0.014	J	mg/L	Orthophosphate
MTL-1	11/1/2011	WT	0.01	<	mg/L	Orthophosphate
MTL-11	5/10/2011	WT	0.011	J	mg/L	Orthophosphate
MTL-11	7/20/2011	WT	0.005	J	mg/L	Orthophosphate

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-11	9/7/2011	WT	0.011	J	mg/L	Orthophosphate
MTL-11	11/1/2011	WT	0.013		mg/L	Orthophosphate
MTL-12	5/10/2011	WT	0.009	J	mg/L	Orthophosphate
MTL-12	7/20/2011	WT	0.006	J	mg/L	Orthophosphate
MTL-12	9/7/2011	WT	0.016	J	mg/L	Orthophosphate
MTL-12	11/1/2011	WT	0.01	<	mg/L	Orthophosphate
MTL-15	5/10/2011	WT	0.003	J	mg/L	Orthophosphate
MTL-15	7/20/2011	WT	0.001	J	mg/L	Orthophosphate
MTL-15	9/7/2011	WT	0.017	J	mg/L	Orthophosphate
MTL-15	9/7/2011	WT	0.017	J	mg/L	Orthophosphate
MTL-22	5/10/2011	WT	0.008	J	mg/L	Orthophosphate
MTL-22	7/20/2011	WT	ND		mg/L	Orthophosphate
MTL-22	9/7/2011	WT	0.013	J	mg/L	Orthophosphate
MTL-22	11/1/2011	WT	0.01		mg/L	Orthophosphate
MTL-22-15	5/10/2011	WT	0.009	J	mg/L	Orthophosphate
MTL-22-15	7/20/2011	WT	0.003	J	mg/L	Orthophosphate
MTL-22-15	9/7/2011	WT	0.011	J	mg/L	Orthophosphate
MTL-33	5/10/2011	WT	0.008	J	mg/L	Orthophosphate
MTL-33	7/20/2011	WT	0.005	J	mg/L	Orthophosphate
MTL-33	9/7/2011	WT	0.011	J	mg/L	Orthophosphate
MTL-33	11/1/2011	WT	0.01	<	mg/L	Orthophosphate
MTL-5	5/10/2011	WT	ND		mg/L	Orthophosphate
MTL-5	7/20/2011	WT	0.005	J	mg/L	Orthophosphate
MTL-5	9/7/2011	WT	ND		mg/L	Orthophosphate
MTL-5	9/7/2011	WT	0.047	1	mg/L	Orthophosphate
MTL-5	11/1/2011	WT	0.054		mg/L	Orthophosphate
MTL-66	5/10/2011	WT	ND	J	mg/L	Orthophosphate
MTL-66	7/20/2011	WT	0.005	J	mg/L	Orthophosphate
MTL-66	9/7/2011	WT	0.014	J	mg/L	Orthophosphate
MTL-66	11/1/2011	WT	0.029		mg/L	Orthophosphate
MTL-77	5/10/2011	WT	0.005	J	mg/L	Orthophosphate
MTL-77	7/20/2011	WT	ND		mg/L	Orthophosphate
MTL-77	9/7/2011	WT	0.013	J	mg/L	Orthophosphate
MTL-77	11/1/2011	WT	0.023		mg/L	Orthophosphate
MTL-8	5/10/2011	WT	0.013	J	mg/L	Orthophosphate
MTL-8	7/20/2011	WT	ND		mg/L	Orthophosphate
MTL-8	9/7/2011	WT	0.014	J	mg/L	Orthophosphate

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-8	11/1/2011	WT	0.047		mg/L	Orthophosphate
MTL-9	5/10/2011	WT	0.010	J	mg/L	Orthophosphate
MTL-9	7/20/2011	WT	0.001	J	mg/L	Orthophosphate
MTL-9	9/7/2011	WT	0.028		mg/L	Orthophosphate
MTL-9	11/1/2011	WT	0.036		mg/L	Orthophosphate
MTL-1	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-11	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-12	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-22	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-33	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-5	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-66	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-77	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-8	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-9	11/1/2011	WT	1	<	ug/L	Pendimethalin
MTL-1	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-1	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-1	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-11	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-11	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-11	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-12	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-12	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-12	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-15	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-15	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-15	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-15	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-22	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-22	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-22	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-33	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-33	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-33	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-33	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-5	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-5	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-5	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-5	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-66	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-66	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-66	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-77	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-77	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-77	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-8	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-8	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-8	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-9	5/10/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-9	7/20/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-9	9/7/2011	WT	ND		ug/L	Pendimethalin(Prowl)
MTL-1	11/1/2011	WT	2	<	mg/m3	Pheophytin
MTL-11	7/20/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-12	7/20/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-12	11/1/2011	WT	2	<	mg/m3	Pheophytin
MTL-15	5/10/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-15	7/20/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-15	9/7/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-22	5/10/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-22	7/20/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-22	9/7/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-22	11/1/2011	WT	3.8		mg/m3	Pheophytin
MTL-33	5/10/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-33	7/20/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-33	7/20/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-33	9/7/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-33	11/1/2011	WT	2	<	mg/m3	Pheophytin
MTL-5	7/20/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-66	5/10/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-66	7/20/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-66	9/7/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-66	11/1/2011	WT	2	<	mg/m3	Pheophytin
MTL-77	5/10/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-77	7/20/2011	WT	1.000	<	mg/m3	Pheophytin

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-77	9/7/2011	WT	1.000	<	mg/m3	Pheophytin
MTL-77	11/1/2011	WT	2	<	mg/m3	Pheophytin
MTL-1	5/10/2011	WT	0.064	J	mg/L	Phosphorus, Total
MTL-1	7/20/2011	WT	ND		mg/L	Phosphorus, Total
MTL-1	9/7/2011	WT	0.038	J	mg/L	Phosphorus, Total
MTL-1	11/1/2011	WT	0.034		mg/L	Phosphorus, Total
MTL-11	5/10/2011	WT	0.036	J	mg/L	Phosphorus, Total
MTL-11	7/20/2011	WT	0.033	J	mg/L	Phosphorus, Total
MTL-11	9/7/2011	WT	0.031	J	mg/L	Phosphorus, Total
MTL-11	11/1/2011	WT	0.072		mg/L	Phosphorus, Total
MTL-12	5/10/2011	WT	0.089	J	mg/L	Phosphorus, Total
MTL-12	7/20/2011	WT	ND		mg/L	Phosphorus, Total
MTL-12	9/7/2011	WT	ND		mg/L	Phosphorus, Total
MTL-12	11/1/2011	WT	0.029		mg/L	Phosphorus, Total
MTL-15	5/10/2011	WT	0.054	J	mg/L	Phosphorus, Total
MTL-15	7/20/2011	WT	ND		mg/L	Phosphorus, Total
MTL-15	9/7/2011	WT	0.037	J	mg/L	Phosphorus, Total
MTL-15	9/7/2011	WT	0.037	J	mg/L	Phosphorus, Total
MTL-22	5/10/2011	WT	0.082	J	mg/L	Phosphorus, Total
MTL-22	7/20/2011	WT	ND		mg/L	Phosphorus, Total
MTL-22	9/7/2011	WT	ND		mg/L	Phosphorus, Total
MTL-22	11/1/2011	WT	0.034		mg/L	Phosphorus, Total
MTL-22-15	5/10/2011	WT	0.066	J	mg/L	Phosphorus, Total
MTL-22-15	7/20/2011	WT	ND		mg/L	Phosphorus, Total
MTL-22-15	9/7/2011	WT	0.034	J	mg/L	Phosphorus, Total
MTL-33	5/10/2011	WT	0.061	J	mg/L	Phosphorus, Total
MTL-33	7/20/2011	WT	ND		mg/L	Phosphorus, Total
MTL-33	7/20/2011	WT	ND		mg/L	Phosphorus, Total
MTL-33	9/7/2011	WT	ND		mg/L	Phosphorus, Total
MTL-33	11/1/2011	WT	0.046		mg/L	Phosphorus, Total
MTL-5	5/10/2011	WT	ND		mg/L	Phosphorus, Total
MTL-5	7/20/2011	WT	0.065	J	mg/L	Phosphorus, Total
MTL-5	9/7/2011	WT	0.170		mg/L	Phosphorus, Total
MTL-5	9/7/2011	WT	ND		mg/L	Phosphorus, Total
MTL-5	11/1/2011	WT	0.11		mg/L	Phosphorus, Total
MTL-66	5/10/2011	WT	0.049	J	mg/L	Phosphorus, Total
MTL-66	7/20/2011	WT	ND	J	mg/L	Phosphorus, Total

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-66	9/7/2011	WT	0.029	J	mg/L	Phosphorus, Total
MTL-66	11/1/2011	WT	0.068		mg/L	Phosphorus, Total
MTL-77	5/10/2011	WT	0.066	J	mg/L	Phosphorus, Total
MTL-77	7/20/2011	WT	ND		mg/L	Phosphorus, Total
MTL-77	9/7/2011	WT	0.026	J	mg/L	Phosphorus, Total
MTL-77	11/1/2011	WT	0.068		mg/L	Phosphorus, Total
MTL-8	5/10/2011	WT	ND		mg/L	Phosphorus, Total
MTL-8	7/20/2011	WT	0.031	J	mg/L	Phosphorus, Total
MTL-8	9/7/2011	WT	ND		mg/L	Phosphorus, Total
MTL-8	11/1/2011	WT	0.085		mg/L	Phosphorus, Total
MTL-9	5/10/2011	WT	0.037	J	mg/L	Phosphorus, Total
MTL-9	7/20/2011	WT	ND		mg/L	Phosphorus, Total
MTL-9	9/7/2011	WT	0.037	J	mg/L	Phosphorus, Total
MTL-9	11/1/2011	WT	0.094		mg/L	Phosphorus, Total
MTL-1	5/10/2011	WT	ND		ug/L	Prometon
MTL-1	7/20/2011	WT	ND		ug/L	Prometon
MTL-1	9/7/2011	WT	ND		ug/L	Prometon
MTL-11	5/10/2011	WT	ND		ug/L	Prometon
MTL-11	7/20/2011	WT	ND		ug/L	Prometon
MTL-11	9/7/2011	WT	ND		ug/L	Prometon
MTL-12	5/10/2011	WT	ND		ug/L	Prometon
MTL-12	7/20/2011	WT	ND		ug/L	Prometon
MTL-12	9/7/2011	WT	ND		ug/L	Prometon
MTL-15	5/10/2011	WT	ND		ug/L	Prometon
MTL-15	7/20/2011	WT	ND		ug/L	Prometon
MTL-15	9/7/2011	WT	ND		ug/L	Prometon
MTL-15	9/7/2011	WT	ND		ug/L	Prometon
MTL-22	5/10/2011	WT	ND		ug/L	Prometon
MTL-22	7/20/2011	WT	ND		ug/L	Prometon
MTL-22	9/7/2011	WT	ND		ug/L	Prometon
MTL-33	5/10/2011	WT	ND		ug/L	Prometon
MTL-33	7/20/2011	WT	ND		ug/L	Prometon
MTL-33	7/20/2011	WT	ND		ug/L	Prometon
MTL-33	9/7/2011	WT	ND		ug/L	Prometon
MTL-5	5/10/2011	WT	ND		ug/L	Prometon
MTL-5	7/20/2011	WT	ND		ug/L	Prometon
MTL-5	9/7/2011	WT	0.160	J	ug/L	Prometon

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-5	9/7/2011	WT	ND		ug/L	Prometon
MTL-66	5/10/2011	WT	ND		ug/L	Prometon
MTL-66	7/20/2011	WT	ND		ug/L	Prometon
MTL-66	9/7/2011	WT	ND		ug/L	Prometon
MTL-77	5/10/2011	WT	ND		ug/L	Prometon
MTL-77	7/20/2011	WT	ND		ug/L	Prometon
MTL-77	9/7/2011	WT	ND		ug/L	Prometon
MTL-8	5/10/2011	WT	ND		ug/L	Prometon
MTL-8	7/20/2011	WT	ND		ug/L	Prometon
MTL-8	9/7/2011	WT	ND		ug/L	Prometon
MTL-9	5/10/2011	WT	ND		ug/L	Prometon
MTL-9	7/20/2011	WT	ND		ug/L	Prometon
MTL-9	9/7/2011	WT	ND		ug/L	Prometon
MTL-1	5/10/2011	WT	ND		ug/L	Propachlor
MTL-1	7/20/2011	WT	ND		ug/L	Propachlor
MTL-1	9/7/2011	WT	ND		ug/L	Propachlor
MTL-11	5/10/2011	WT	ND		ug/L	Propachlor
MTL-11	7/20/2011	WT	ND		ug/L	Propachlor
MTL-11	9/7/2011	WT	ND		ug/L	Propachlor
MTL-12	5/10/2011	WT	ND		ug/L	Propachlor
MTL-12	7/20/2011	WT	ND		ug/L	Propachlor
MTL-12	9/7/2011	WT	ND		ug/L	Propachlor
MTL-15	5/10/2011	WT	ND		ug/L	Propachlor
MTL-15	7/20/2011	WT	ND		ug/L	Propachlor
MTL-15	9/7/2011	WT	ND		ug/L	Propachlor
MTL-15	9/7/2011	WT	ND		ug/L	Propachlor
MTL-22	5/10/2011	WT	ND		ug/L	Propachlor
MTL-22	7/20/2011	WT	ND		ug/L	Propachlor
MTL-22	9/7/2011	WT	ND		ug/L	Propachlor
MTL-33	5/10/2011	WT	ND		ug/L	Propachlor
MTL-33	7/20/2011	WT	ND		ug/L	Propachlor
MTL-33	7/20/2011	WT	ND		ug/L	Propachlor
MTL-33	9/7/2011	WT	ND		ug/L	Propachlor
MTL-5	5/10/2011	WT	ND		ug/L	Propachlor
MTL-5	7/20/2011	WT	ND		ug/L	Propachlor
MTL-5	9/7/2011	WT	ND		ug/L	Propachlor
MTL-5	9/7/2011	WT	ND		ug/L	Propachlor

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-66	5/10/2011	WT	ND		ug/L	Propachlor
MTL-66	7/20/2011	WT	ND		ug/L	Propachlor
MTL-66	9/7/2011	WT	ND		ug/L	Propachlor
MTL-77	5/10/2011	WT	ND		ug/L	Propachlor
MTL-77	7/20/2011	WT	ND		ug/L	Propachlor
MTL-77	9/7/2011	WT	ND		ug/L	Propachlor
MTL-8	5/10/2011	WT	ND		ug/L	Propachlor
MTL-8	7/20/2011	WT	ND		ug/L	Propachlor
MTL-8	9/7/2011	WT	ND		ug/L	Propachlor
MTL-9	5/10/2011	WT	ND		ug/L	Propachlor
MTL-9	7/20/2011	WT	ND		ug/L	Propachlor
MTL-9	9/7/2011	WT	ND	<	ug/L	Propachlor
MTL-1	5/10/2011	WT	ND		ug/L	Simazine
MTL-1	7/20/2011	WT	ND		ug/L	Simazine
MTL-1	9/7/2011	WT	ND		ug/L	Simazine
MTL-11	5/10/2011	WT	ND		ug/L	Simazine
MTL-11	7/20/2011	WT	ND		ug/L	Simazine
MTL-11	9/7/2011	WT	ND		ug/L	Simazine
MTL-12	5/10/2011	WT	ND		ug/L	Simazine
MTL-12	7/20/2011	WT	ND		ug/L	Simazine
MTL-12	9/7/2011	WT	ND		ug/L	Simazine
MTL-15	5/10/2011	WT	ND		ug/L	Simazine
MTL-15	7/20/2011	WT	ND		ug/L	Simazine
MTL-15	9/7/2011	WT	ND		ug/L	Simazine
MTL-15	9/7/2011	WT	ND		ug/L	Simazine
MTL-22	5/10/2011	WT	ND		ug/L	Simazine
MTL-22	7/20/2011	WT	ND		ug/L	Simazine
MTL-22	9/7/2011	WT	ND		ug/L	Simazine
MTL-33	5/10/2011	WT	ND		ug/L	Simazine
MTL-33	7/20/2011	WT	ND		ug/L	Simazine
MTL-33	7/20/2011	WT	ND		ug/L	Simazine
MTL-33	9/7/2011	WT	ND		ug/L	Simazine
MTL-5	5/10/2011	WT	ND		ug/L	Simazine
MTL-5	7/20/2011	WT	ND		ug/L	Simazine
MTL-5	9/7/2011	WT	ND		ug/L	Simazine
MTL-5	9/7/2011	WT	ND		ug/L	Simazine
MTL-66	5/10/2011	WT	ND		ug/L	Simazine

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-66	7/20/2011	WT	ND		ug/L	Simazine
MTL-66	9/7/2011	WT	ND		ug/L	Simazine
MTL-77	5/10/2011	WT	ND		ug/L	Simazine
MTL-77	7/20/2011	WT	ND		ug/L	Simazine
MTL-77	9/7/2011	WT	ND		ug/L	Simazine
MTL-8	5/10/2011	WT	ND		ug/L	Simazine
MTL-8	7/20/2011	WT	ND		ug/L	Simazine
MTL-8	9/7/2011	WT	ND		ug/L	Simazine
MTL-9	5/10/2011	WT	ND		ug/L	Simazine
MTL-9	7/20/2011	WT	ND		ug/L	Simazine
MTL-9	9/7/2011	WT	ND		ug/L	Simazine
MTL-1	11/1/2011	WT	0.2	<	mg/L	Total Kjeldahl Nitrogen
MTL-12	11/1/2011	WT	0.2	<	mg/L	Total Kjeldahl Nitrogen
MTL-22	11/1/2011	WT	0.2	<	mg/L	Total Kjeldahl Nitrogen
MTL-33	11/1/2011	WT	0.27		mg/L	Total Kjeldahl Nitrogen
MTL-66	11/1/2011	WT	0.33		mg/L	Total Kjeldahl Nitrogen
MTL-77	11/1/2011	WT	0.37		mg/L	Total Kjeldahl Nitrogen
MTL-1	5/10/2011	WT	3.000		mg/L	Total Organic Carbon (TOC)
MTL-1	7/20/2011	WT	14.600		mg/L	Total Organic Carbon (TOC)
MTL-1	9/7/2011	WT	7.700		mg/L	Total Organic Carbon (TOC)
MTL-1	11/1/2011	WT	7.1		mg/L	Total Organic Carbon (TOC)
MTL-11	5/10/2011	WT	5.500		mg/L	Total Organic Carbon (TOC)
MTL-11	7/20/2011	WT	7.700		mg/L	Total Organic Carbon (TOC)
MTL-11	9/7/2011	WT	7.400		mg/L	Total Organic Carbon (TOC)
MTL-11	11/1/2011	WT	7.1		mg/L	Total Organic Carbon (TOC)
MTL-12	5/10/2011	WT	5.800		mg/L	Total Organic Carbon (TOC)
MTL-12	7/20/2011	WT	7.500		mg/L	Total Organic Carbon (TOC)
MTL-12	9/7/2011	WT	7.300		mg/L	Total Organic Carbon (TOC)
MTL-12	11/1/2011	WT	5.5		mg/L	Total Organic Carbon (TOC)
MTL-15	5/10/2011	WT	8.600		mg/L	Total Organic Carbon (TOC)
MTL-15	7/20/2011	WT	6.600		mg/L	Total Organic Carbon (TOC)
MTL-15	9/7/2011	WT	7.600		mg/L	Total Organic Carbon (TOC)
MTL-15	9/7/2011	WT	7.600		mg/L	Total Organic Carbon (TOC)
MTL-22	5/10/2011	WT	6.500		mg/L	Total Organic Carbon (TOC)
MTL-22	7/20/2011	WT	8.600		mg/L	Total Organic Carbon (TOC)
MTL-22	9/7/2011	WT	6.900		mg/L	Total Organic Carbon (TOC)
MTL-22	11/1/2011	WT	6.6		mg/L	Total Organic Carbon (TOC)

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-22-15	5/10/2011	WT	6.600		mg/L	Total Organic Carbon (TOC)
MTL-22-15	7/20/2011	WT	7.500		mg/L	Total Organic Carbon (TOC)
MTL-22-15	9/7/2011	WT	7.800		mg/L	Total Organic Carbon (TOC)
MTL-33	5/10/2011	WT	6.800		mg/L	Total Organic Carbon (TOC)
MTL-33	7/20/2011	WT	6.900		mg/L	Total Organic Carbon (TOC)
MTL-33	7/20/2011	WT	9.200		mg/L	Total Organic Carbon (TOC)
MTL-33	9/7/2011	WT	6.800		mg/L	Total Organic Carbon (TOC)
MTL-33	11/1/2011	WT	6.9		mg/L	Total Organic Carbon (TOC)
MTL-5	5/10/2011	WT	7.000		mg/L	Total Organic Carbon (TOC)
MTL-5	7/20/2011	WT	8.400		mg/L	Total Organic Carbon (TOC)
MTL-5	9/7/2011	WT	ND		mg/L	Total Organic Carbon (TOC)
MTL-5	9/7/2011	WT	6.900		mg/L	Total Organic Carbon (TOC)
MTL-5	11/1/2011	WT	6.4		mg/L	Total Organic Carbon (TOC)
MTL-66	5/10/2011	WT	8.000		mg/L	Total Organic Carbon (TOC)
MTL-66	7/20/2011	WT	9.200		mg/L	Total Organic Carbon (TOC)
MTL-66	9/7/2011	WT	8.400		mg/L	Total Organic Carbon (TOC)
MTL-66	11/1/2011	WT	7.1		mg/L	Total Organic Carbon (TOC)
MTL-77	5/10/2011	WT	8.500		mg/L	Total Organic Carbon (TOC)
MTL-77	7/20/2011	WT	6.600		mg/L	Total Organic Carbon (TOC)
MTL-77	9/7/2011	WT	8.000		mg/L	Total Organic Carbon (TOC)
MTL-77	11/1/2011	WT	6.8		mg/L	Total Organic Carbon (TOC)
MTL-8	5/10/2011	WT	6.300		mg/L	Total Organic Carbon (TOC)
MTL-8	7/20/2011	WT	7.800		mg/L	Total Organic Carbon (TOC)
MTL-8	9/7/2011	WT	7.300		mg/L	Total Organic Carbon (TOC)
MTL-8	11/1/2011	WT	9.2		mg/L	Total Organic Carbon (TOC)
MTL-9	5/10/2011	WT	5.700		mg/L	Total Organic Carbon (TOC)
MTL-9	7/20/2011	WT	8.300		mg/L	Total Organic Carbon (TOC)
MTL-9	9/7/2011	WT	8.600		mg/L	Total Organic Carbon (TOC)
MTL-9	11/1/2011	WT	8.3		mg/L	Total Organic Carbon (TOC)
MTL-1	5/10/2011	WT	11.000		mg/L	Total Suspended Solids
MTL-1	7/20/2011	WT	31.000		mg/L	Total Suspended Solids
MTL-1	9/7/2011	WT	10.000		mg/L	Total Suspended Solids
MTL-1	11/1/2011	WT	4.5		mg/L	Total Suspended Solids
MTL-11	5/10/2011	WT	21.000		mg/L	Total Suspended Solids
MTL-11	7/20/2011	WT	36.000		mg/L	Total Suspended Solids
MTL-11	9/7/2011	WT	31.000		mg/L	Total Suspended Solids
MTL-11	11/1/2011	WT	11		mg/L	Total Suspended Solids

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-12	5/10/2011	WT	21.000		mg/L	Total Suspended Solids
MTL-12	7/20/2011	WT	7.000		mg/L	Total Suspended Solids
MTL-12	9/7/2011	WT	15.000		mg/L	Total Suspended Solids
MTL-12	11/1/2011	WT	2.5	<	mg/L	Total Suspended Solids
MTL-15	5/10/2011	WT	19.000		mg/L	Total Suspended Solids
MTL-15	7/20/2011	WT	9.000		mg/L	Total Suspended Solids
MTL-15	9/7/2011	WT	14.000		mg/L	Total Suspended Solids
MTL-15	9/7/2011	WT	14.000		mg/L	Total Suspended Solids
MTL-22	5/10/2011	WT	11.000		mg/L	Total Suspended Solids
MTL-22	7/20/2011	WT	ND		mg/L	Total Suspended Solids
MTL-22	9/7/2011	WT	8.000		mg/L	Total Suspended Solids
MTL-22	11/1/2011	WT	5		mg/L	Total Suspended Solids
MTL-22-15	5/10/2011	WT	14.000		mg/L	Total Suspended Solids
MTL-22-15	7/20/2011	WT	7.000		mg/L	Total Suspended Solids
MTL-22-15	9/7/2011	WT	25.000		mg/L	Total Suspended Solids
MTL-33	5/10/2011	WT	14.000		mg/L	Total Suspended Solids
MTL-33	7/20/2011	WT	7.000		mg/L	Total Suspended Solids
MTL-33	9/7/2011	WT	6.000		mg/L	Total Suspended Solids
MTL-33	11/1/2011	WT	5.8		mg/L	Total Suspended Solids
MTL-5	5/10/2011	WT	42.000		mg/L	Total Suspended Solids
MTL-5	7/20/2011	WT	31.000		mg/L	Total Suspended Solids
MTL-5	9/7/2011	WT	19.000		mg/L	Total Suspended Solids
MTL-5	11/1/2011	WT	7.5		mg/L	Total Suspended Solids
MTL-66	5/10/2011	WT	18.000		mg/L	Total Suspended Solids
MTL-66	7/20/2011	WT	11.000		mg/L	Total Suspended Solids
MTL-66	9/7/2011	WT	14.000		mg/L	Total Suspended Solids
MTL-66	11/1/2011	WT	10.5		mg/L	Total Suspended Solids
MTL-77	5/10/2011	WT	20.000		mg/L	Total Suspended Solids
MTL-77	7/20/2011	WT	7.000		mg/L	Total Suspended Solids
MTL-77	9/7/2011	WT	18.000		mg/L	Total Suspended Solids
MTL-77	11/1/2011	WT	12		mg/L	Total Suspended Solids
MTL-8	5/10/2011	WT	5.000		mg/L	Total Suspended Solids
MTL-8	7/20/2011	WT	20.000		mg/L	Total Suspended Solids
MTL-8	9/7/2011	WT	15.000		mg/L	Total Suspended Solids
MTL-8	11/1/2011	WT	2.5		mg/L	Total Suspended Solids
MTL-9	5/10/2011	WT	20.000		mg/L	Total Suspended Solids
MTL-9	7/20/2011	WT	29.000		mg/L	Total Suspended Solids

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-9	9/7/2011	WT	22.000		mg/L	Total Suspended Solids
MTL-9	11/1/2011	WT	9.2		mg/L	Total Suspended Solids
MTL-1	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-1	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-1	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-1	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-11	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-11	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-11	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-11	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-12	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-12	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-12	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-12	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-15	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-15	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-15	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-15	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-22	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-22	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-22	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-22	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-33	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-33	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-33	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-33	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-33	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-5	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-5	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-5	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-5	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-5	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-66	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-66	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-66	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-66	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-77	5/10/2011	WT	ND		ug/L	Trifluralin

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-77	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-77	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-77	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-8	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-8	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-8	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-8	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-9	5/10/2011	WT	ND		ug/L	Trifluralin
MTL-9	7/20/2011	WT	ND		ug/L	Trifluralin
MTL-9	9/7/2011	WT	ND		ug/L	Trifluralin
MTL-9	11/1/2011	WT	1	<	ug/L	Trifluralin
MTL-1	5/10/2011	WT	7.000		mg/L	Volatile Suspended Solids
MTL-1	7/20/2011	WT	6.000		mg/L	Volatile Suspended Solids
MTL-1	9/7/2011	WT	11.000		mg/L	Volatile Suspended Solids
MTL-1	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids
MTL-11	5/10/2011	WT	7.000		mg/L	Volatile Suspended Solids
MTL-11	7/20/2011	WT	19.000		mg/L	Volatile Suspended Solids
MTL-11	9/7/2011	WT	13.000		mg/L	Volatile Suspended Solids
MTL-11	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids
MTL-12	5/10/2011	WT	8.000		mg/L	Volatile Suspended Solids
MTL-12	7/20/2011	WT	6.000		mg/L	Volatile Suspended Solids
MTL-12	9/7/2011	WT	10.000		mg/L	Volatile Suspended Solids
MTL-12	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids
MTL-15	5/10/2011	WT	9.000		mg/L	Volatile Suspended Solids
MTL-15	7/20/2011	WT	7.000		mg/L	Volatile Suspended Solids
MTL-15	9/7/2011	WT	5.000		mg/L	Volatile Suspended Solids
MTL-15	9/7/2011	WT	5.000		mg/L	Volatile Suspended Solids
MTL-22	5/10/2011	WT	7.000		mg/L	Volatile Suspended Solids
MTL-22	7/20/2011	WT	ND		mg/L	Volatile Suspended Solids
MTL-22	9/7/2011	WT	9.000		mg/L	Volatile Suspended Solids
MTL-22	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids
MTL-22-15	5/10/2011	WT	7.000		mg/L	Volatile Suspended Solids
MTL-22-15	7/20/2011	WT	ND		mg/L	Volatile Suspended Solids
MTL-22-15	9/7/2011	WT	9.000		mg/L	Volatile Suspended Solids
MTL-33	5/10/2011	WT	7.000		mg/L	Volatile Suspended Solids
MTL-33	7/20/2011	WT	6.000		mg/L	Volatile Suspended Solids
MTL-33	9/7/2011	WT	7.000		mg/L	Volatile Suspended Solids

Site	Date Collected	Matrix	Result	Qualifier	Unit	Analyte Name
MTL-33	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids
MTL-5	5/10/2011	WT	9.000		mg/L	Volatile Suspended Solids
MTL-5	7/20/2011	WT	ND		mg/L	Volatile Suspended Solids
MTL-5	9/7/2011	WT	11.000		mg/L	Volatile Suspended Solids
MTL-5	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids
MTL-66	5/10/2011	WT	8.000		mg/L	Volatile Suspended Solids
MTL-66	7/20/2011	WT	8.000		mg/L	Volatile Suspended Solids
MTL-66	9/7/2011	WT	14.000		mg/L	Volatile Suspended Solids
MTL-66	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids
MTL-77	5/10/2011	WT	9.000		mg/L	Volatile Suspended Solids
MTL-77	7/20/2011	WT	ND		mg/L	Volatile Suspended Solids
MTL-77	9/7/2011	WT	11.000		mg/L	Volatile Suspended Solids
MTL-77	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids
MTL-8	5/10/2011	WT	ND		mg/L	Volatile Suspended Solids
MTL-8	7/20/2011	WT	ND		mg/L	Volatile Suspended Solids
MTL-8	9/7/2011	WT	8.000		mg/L	Volatile Suspended Solids
MTL-8	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids
MTL-9	5/10/2011	WT	8.000		mg/L	Volatile Suspended Solids
MTL-9	7/20/2011	WT	6.000		mg/L	Volatile Suspended Solids
MTL-9	9/7/2011	WT	12.000		mg/L	Volatile Suspended Solids
MTL-9	11/1/2011	WT	2.5	<	mg/L	Volatile Suspended Solids

U Analyte was not detected

J Estimated value between Method Detection Limit (MDL) and Practical Quantitation Limit (PQL)

FIELD DATA

Site	Date	Depth	H2OTemp (oC)	Redox	Cond	D.O.%	D.O.(mg/L)	pH	Time	Seechi (in.)
1	5/10/11	0.4	18.26	418	202.0	91.6	8.56	8.14	902	
1	7/20/11	1.4	30.67	307	232.0	102.1	7.60	8.84	851	
1	9/7/11	0.5	23.68	357.00	219.0	114.2	9.57	9.27	958	
1	11/1/11	0.2	14.57	205.00	222.8	76.2	7.61	8.11		
5	5/10/11	0.2	24.7	365.00	445	159.5	13.2	8.67	1240	
5	7/20/11	0.3	33.65	300	377.0	150.0	10.53	8.66	1245	
5	9/7/11	0.2	21.06	192.00	293.0	113.3	10.00	8.17	1307	
8	5/10/11	0.5	23.7	391.00	474.5	122.7	10.3	8.28	1210	
8	7/20/11	0.5	32.17	327	437.5	96.3	7.13	8.21	1150	
8	9/7/11	0.2	20.72	382.00	499.0	99.3	8.81	8.30	1221	
9	5/10/11	0.1	23.2	383.00	441	119.0	10.2	8.32	1140	
9	7/20/11	0.2	30.40	336	424.0	71.8	5.29	8.01	1128	
9	9/7/11	0.2	20.89	389.00	536.0	88.1	7.79	8.09	1158	
11	5/10/11	0.3	22.8	447.00	406	101.8	8.7	7.92	1055	
11	7/20/11	0.3	31.91	181	297.0	93.4	6.77	7.95	1045	
11	9/7/11	0.3	21.27	399.00	484.0	85.5	7.52	8.08	1116	
12	5/10/11	0.5	17.8	483.00	197.3	95.4	9.1	8.04	1000	
12	7/20/11	1.1	28.33	344	233.7	70.9	5.51	8.04	1011	
12	9/7/11	0.4	23.17	389.00	3.0	67.7	5.71	8.09	1035	
12	11/1/11	0.2	14.32	282.00	217.4	76.9	7.80	7.49		
22	5/10/11	0.5	16.32	455	200.0	95.8	9.20	7.98	1042	
22	5/10/11	1.0	16.75	453	200.0	95.6	9.19	7.94		
22	5/10/11	2.0	16.60	454	199.0	94.8	9.16	7.94		
22	5/10/11	3.0	16.38	454	198.0	94.1	9.12	7.91		
22	5/10/11	4.0	16.26	455	198.0	93.6	9.10	7.89		
22	5/10/11	5.0	16.37	446	198.0	93.4	9.09	7.90		
22	5/10/11	6.0	14.86	448	199.9	88.9	8.76	7.88		
22	7/20/11	0.5	31.00	240	231.4	121.3	9.00	8.88	1025	66
22	7/20/11	1.0	30.99	241	231.0	121.1	9.00	8.88	1026	
22	7/20/11	2.0	30.94	244	231.0	119.6	8.89	8.87	1028	
22	7/20/11	3.0	30.79	246	231.0	115.0	8.56	8.83	1029	
22	7/20/11	4.0	30.59	250	232.0	103.9	7.84	8.59	1030	
22	7/20/11	5.0	28.11	285	235.0	40.1	3.14	7.63	1031	
22	7/20/11	6.0	25.40	299	228.0	6.1	0.45	7.21	1032	
22	7/20/11	7.0	22.77	302	228.0	3.5	0.30	7.00	1034	

Site	Date	Depth	H2OTemp (oC)	Redox	Cond	D.O.%	D.O.(mg/L)	pH	Time	Secchi (in.)
22	7/20/11	8.0	19.47	304	229.0	1.7	0.16	6.90	1034	
22	7/20/11	9.0	16.44	303	225.0	2.0	0.18	6.74	1036	
22	9/7/11	0.0	24.12	215.00	221.6	93.8	7.80	7.80	1025	33.00
22	9/7/11	1.0	24.17	223.00	221.5	93.4	7.78	8.57		
22	9/7/11	2.0	23.96	227.00	221.4	90.3	7.55	8.56		
22	9/7/11	3.0	23.91	232.00	221.9	87.0	7.27	8.51		
22	9/7/11	4.0	23.88	237.00	221.5	84.4	7.06	8.47		
22	9/7/11	5.0	23.85	241.00	222.0	82.8	6.93	8.44		
22	9/7/11	6.0	22.64	263.00	222.9	39.4	3.30	7.57		
22	9/7/11	7.0	21.17	266.00	223.1	4.6	0.40	7.29		
22	9/7/11	8.0	17.32	261.00	219.8	3.0	0.29	7.17		
22	9/7/11	9.0	15.21	256.00	218.0	2.5	0.24	7.05		
22	9/7/11	10.0	13.97	254.00	213.9	2.1	0.22	6.95		
22	9/7/11	15.0	10.75	254.00	213.0	1.9	0.20	6.76		
22	9/7/11	17.0	10.34	177.00	218.8	1.8	0.20	6.79	1037	
22	11/1/11	0.2	14.46	270.00	218.8	72.9	7.15	7.57		
22	11/1/11	0.5	14.45	280.00	218.9	67.1	6.83	7.47		
22	11/1/11	0.8	14.44	282.00	219.4	66.6	6.78	7.46		
22	11/1/11	1.0	14.43	282.00	219.7	66.1	6.74	7.44		
22	11/1/11	1.4	14.43	283.00	219.4	65.9	6.71	7.42		
22	11/1/11	1.7	14.43	285.00	220.0	65.8	6.71	7.42		
22	11/1/11	2.0	14.43	285.00	219.2	65.7	6.70	7.41		
22	11/1/11	2.3	14.43	282.00	219.9	65.8	6.72	7.41		
33	5/10/11	0.3	17.46	447	208.7	98.1	9.32	8.02	936	16
33	5/10/11	1.0	17.24	447	208.0	97.5	9.28	8.00		
33	5/10/11	2.0	17.22	446	208.0	96.9	9.20	7.98		
33	5/10/11	3.0	16.50	446	204.0	94.1	9.08	7.95		
33	5/10/11	4.0	13.80	449	194.0	86.3	8.80	7.83		
33	5/10/11	5.0	13.65	450	194.0	85.0	8.74	7.80		
33	5/10/11	6.0	13.46	450	192.0	84.1	8.71	7.78		
33	5/10/11	7.0	12.97	451	192.7	82.5	8.63	7.76		
33	5/10/11	8.0	12.68	452	191.8	81.1	8.54	7.73		
33	5/10/11	9.0	12.65	452	191.8	80.6	8.45	7.73		
33	5/10/11	10.0	12.40	453	192.0	78.0	8.26	7.70		
33	5/10/11	11.0	12.17	454	192.0	76.3	8.10	7.67		
33	5/10/11	12.0	11.87	454	193.0	73.3	7.82	7.64		
33	7/20/11	0.5	31.69	222	232.0	134.6	9.90	9.01	944	60
33	7/20/11	1.0	31.44	222	232.0	135.4	9.99	9.02	945	

Site	Date	Depth	H2OTemp (oC)	Redox	Cond	D.O.%	D.O.(mg/L)	pH	Time	Seechi (in.)
33	7/20/11	2.0	31.26	226	232.0	131.2	9.71	8.95	946	
33	7/20/11	3.0	30.30	232	232.0	116.0	8.55	8.81	947	
33	7/20/11	4.0	28.61	256	234.0	73.5	5.64	8.15	948	
33	7/20/11	5.0	26.46	283	232.0	25.1	1.75	7.45	950	
33	7/20/11	6.0	23.36	272	228.0	4.9	0.40	7.09	951	
33	7/20/11	7.0	22.05	254	225.0	3.8	0.33	6.98	952	
33	7/20/11	8.0	20.04	252	226.0	2.3	0.20	6.92	953	
33	7/20/11	22.4	10.61	163	430.0	2.3	0.25	6.54	956	
33	9/7/11	0.0	24.48	324.00	221.6	95.8	7.92	8.60	1000	35.00
33	9/7/11	1.0	24.49	316.00	222.4	95.6	7.90	8.63		
33	9/7/11	2.0	24.45	315.00	221.8	94.1	7.78	8.64		
33	9/7/11	3.0	24.40	314.00	221.6	92.9	7.69	8.64		
33	9/7/11	4.0	24.41	313.00	222.0	92.5	7.66	8.64		
33	9/7/11	5.0	24.40	313.00	221.9	92.0	7.61	8.64		
33	9/7/11	6.0	24.36	314.00	222.7	87.6	7.27	8.57		
33	9/7/11	7.0	19.19	336.00	220.5	5.7	0.51	7.50		
33	9/7/11	8.0	16.37	327.00	217.6	3.2	0.31	7.27		
33	9/7/11	9.0	15.06	324.00	214.7	2.6	0.26	7.15		
33	9/7/11	10.0	14.26	326.00	211.1	2.5	0.25	7.08		
33	9/7/11	15.0	10.68	327.00	215.4	2.1	0.23	6.91		
33	9/7/11	20.0	10.25	179.00	225.2	2.0	0.22	6.77	1018	
33	11/1/11	0.2	14.69	270.00	220.1	66.6	6.67	7.90		
33	11/1/11	0.5	14.66	274.00	220.0	64.5	6.56	7.80		
33	11/1/11	0.8	14.60	278.00	219.0	63.8	6.48	7.70		
33	11/1/11	1.0	14.64	277.00	219.0	63.7	6.47	7.74		
33	11/1/11	1.4	14.63	279.00	220.6	63.4	6.44	7.73		
33	11/1/11	1.7	14.64	280.00	219.7	63.3	6.42	7.72		
33	11/1/11	2.0	14.64	281.00	219.8	63.2	6.42	7.80		
33	11/1/11	2.3	14.64	282.00	220.0	63.2	6.40	7.65		
66	5/10/11	0.5	17.78	429	245.0	97.4	9.18	8.10	1152	12
66	5/10/11	1.0	17.76	429	244.9	97.2	9.17	8.06		
66	5/10/11	2.0	17.20	429	242.0	94.3	9.01	8.01		
66	5/10/11	3.0	16.30	431	231.0	90.1	8.77	7.95		
66	5/10/11	4.0	15.88	432	226.6	87.7	8.58	7.89		
66	5/10/11	5.0	15.22	434	223.5	84.7	8.42	7.84		
66	5/10/11	6.0	14.58	435	221.5	81.1	8.17	7.78		
66	5/10/11	7.0	13.82	436	223.0	78.7	8.06	7.75		
66	5/10/11	8.0	13.21	438	217.8	74.4	7.70	7.65		

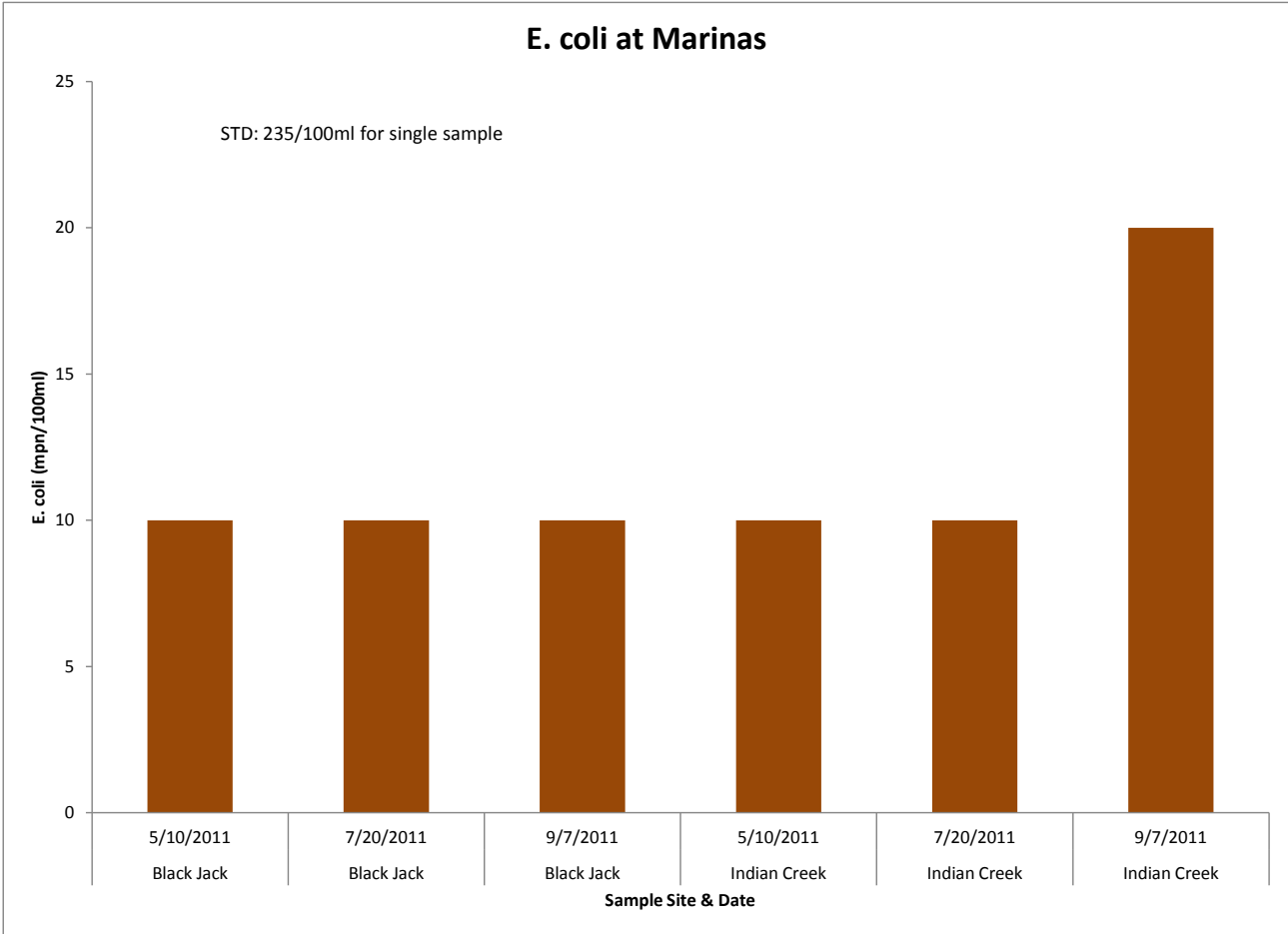
Site	Date	Depth	H2OTemp (oC)	Redox	Cond	D.O.%	D.O.(mg/L)	pH	Time	Seechi (in.)
66	5/10/11	9.0	12.94	439	217.9	71.1	7.38	7.63		
66	5/10/11	10.0	12.55	441	212.3	65.1	6.83	7.57		
66	5/10/11	11.0	12.29	443	210.8	58.1	6.13	7.50		
66	5/10/11	12.0	11.50	445	201.0	51.4	5.30	7.42		
66	7/20/11	0.5	31.08	220	239.6	137.6	10.23	9.06	1201	36
66	7/20/11	1.0	31.00	225	239.9	136.4	10.14	9.04	1203	
66	7/20/11	2.0	30.69	234	238.0	115.9	8.86	8.92	1204	
66	7/20/11	3.0	28.94	260	233.0	72.2	5.38	8.25	1206	
66	7/20/11	4.0	27.00	264	226.0	14.7	1.15	7.44	1207	
66	7/20/11	5.0	24.76	246	219.5	3.5	0.26	7.20	1208	
66	7/20/11	6.0	22.81	227	224.1	2.3	0.20	7.10	1208	
66	7/20/11	7.0	21.14	210	242.2	2.0	0.18	7.04	1209	
66	7/20/11	8.0	19.42	203	251.3	1.9	0.18	6.98	1210	
66	7/20/11	9.0	17.31	203	254.5	1.8	0.17	6.94	1211	
66	7/20/11	10.0	15.70	205	252.6	1.8	0.18	6.91	1211	
66	7/20/11	11.3	14.06	-36	608.3	1.9	0.20	6.71	1212	
66	9/7/11	0.0	24.26	163.00	229.5	88.1	7.31	8.23	1140	25
66	9/7/11	1.0	24.30	166.00	230.0	87.9	7.29	8.24		
66	9/7/11	2.0	24.29	171.00	230.4	84.0	6.97	8.18		
66	9/7/11	3.0	24.23	175.00	231.4	77.7	6.46	8.05		
66	9/7/11	4.0	24.19	178.00	231.1	75.6	6.29	8.01		
66	9/7/11	5.0	24.16	177.00	229.9	79.1	6.58	8.10		
66	9/7/11	6.0	24.07	178.00	229.4	80.0	6.67	8.13		
66	9/7/11	7.0	24.04	180.00	228.4	79.6	6.64	8.15		
66	9/7/11	8.0	23.15	192.00	245.1	37.6	3.18	7.55		
66	9/7/11	9.0	18.84	-19.00	279.5	3.5	0.32	7.10		
66	9/7/11	9.6	16.63	-47.00	284.4	2.5	0.24	7.05	1153	
66	11/1/11	0.2	13.95	285.00	230.2	71.0	7.24	7.90		
66	11/1/11	0.5	13.92	286.00	231.0	66.8	6.86	7.78		
66	11/1/11	0.8	13.94	286.00	230.8	66.2	6.83	7.79		
66	11/1/11	1.0	13.90	286.00	231.2	65.6	6.76	7.81		
66	11/1/11	1.4	13.89	286.00	230.4	65.5	6.75	7.75		
66	11/1/11	1.7	13.90	287.00	230.7	65.1	6.72	7.74		
66	11/1/11	2.0	13.89	288.00	230.6	64.9	6.69	7.77		
66	11/1/11	2.3	13.87	289.00	230.4	64.5	6.65	7.73		
77	5/10/11	0.5	17.84	432	220.6	96.0	9.04	8.01	1126	10
77	5/10/11	1.0	17.73	432	220.6	95.2	8.98	8.00		
77	5/10/11	2.0	17.59	433	220.7	94.2	8.93	7.97		

Site	Date	Depth	H2OTemp (oC)	Redox	Cond	D.O.%	D.O.(mg/L)	pH	Time	Seechi (in.)
77	5/10/11	3.0	16.70	433	220.0	92.3	8.86	7.95		
77	5/10/11	4.0	16.12	435	220.0	90.1	8.80	7.93		
77	5/10/11	5.0	15.74	436	220.0	88.3	8.69	7.89		
77	5/10/11	6.0	15.59	437	219.2	86.8	8.53	7.86		
77	5/10/11	7.0	15.16	439	215.8	79.0	7.88	7.78		
77	5/10/11	8.0	14.25	441	208.0	68.3	6.91	7.66		
77	5/10/11	9.0	12.88	445	205.0	57.2	5.88	7.55		
77	5/10/11	10.0	12.78	447	204.8	53.4	5.58	7.49		
77	5/10/11	11.0	12.53	448	204.7	52.1	5.48	7.48		
77	5/10/11	12.0	12.02	449	202.8	48.7	5.17	7.45		
77	7/20/11	0.5	30.45	271	224.5	111.7	8.39	8.76	1131	48
77	7/20/11	1.0	30.39	268	225.0	111.8	8.41	8.77	1132	
77	7/20/11	2.0	29.98	269	227.0	102.9	7.73	8.66	1133	
77	7/20/11	3.0	28.61	290	230.3	67.7	4.98	8.00	1135	
77	7/20/11	4.0	27.31	310	228.3	24.4	1.85	7.45	1136	
77	7/20/11	5.0	24.91	314	211.8	5.0	0.35	7.16	1137	
77	7/20/11	6.0	22.39	296	215.0	2.4	0.21	7.01	1138	
77	7/20/11	7.0	21.43	269	194.8	2.0	0.80	6.96	1138	
77	7/20/11	11.8	14.72	-28	481.5	1.9	0.20	6.69	1141	
77	9/7/11	0.0	24.19	234.00	223.7	90.9	7.56	8.42	1117	46
77	9/7/11	1.0	24.18	236.00	223.3	90.9	7.56	8.43		
77	9/7/11	2.0	24.15	240.00	223.7	89.4	7.42	8.37		
77	9/7/11	3.0	24.14	242.00	223.8	88.1	7.32	8.40		
77	9/7/11	4.0	24.10	243.00	224.0	86.2	7.18	8.38		
77	9/7/11	5.0	24.03	243.00	223.4	86.2	7.19	8.45		
77	9/7/11	6.0	24.00	244.00	223.5	86.1	7.18	8.42		
77	9/7/11	7.0	23.95	245.00	223.5	86.1	7.18	8.44		
77	9/7/11	8.0	22.31	193.00	232.7	10.7	0.92	7.47		
77	9/7/11	9.0	17.31	-6.00	256.4	3.1	0.29	7.11		
77	9/7/11	10.0	15.83	-25.00	256.1	2.4	0.24	7.01		
77	9/7/11	15.0	12.75	-34.00	260.4	2.1	0.22	6.94	1130	
77	11/1/11	0.2	14.10	285.00	226.7	69.2	7.10	7.67		
77	11/1/11	0.5	14.10	288.00	227.4	68.6	7.04	7.64		
77	11/1/11	0.8	14.11	290.00	227.1	68.4	7.02	7.58		
77	11/1/11	1.0	14.10	291.00	227.0	68.1	7.00	7.54		
77	11/1/11	1.4	14.10	292.00	226.6	68.1	7.00	7.51		
77	11/1/11	1.7	14.09	294.00	227.2	68.1	7.00	7.55		
77	11/1/11	2.0	14.10	294.00	226.5	67.9	6.97	7.54		

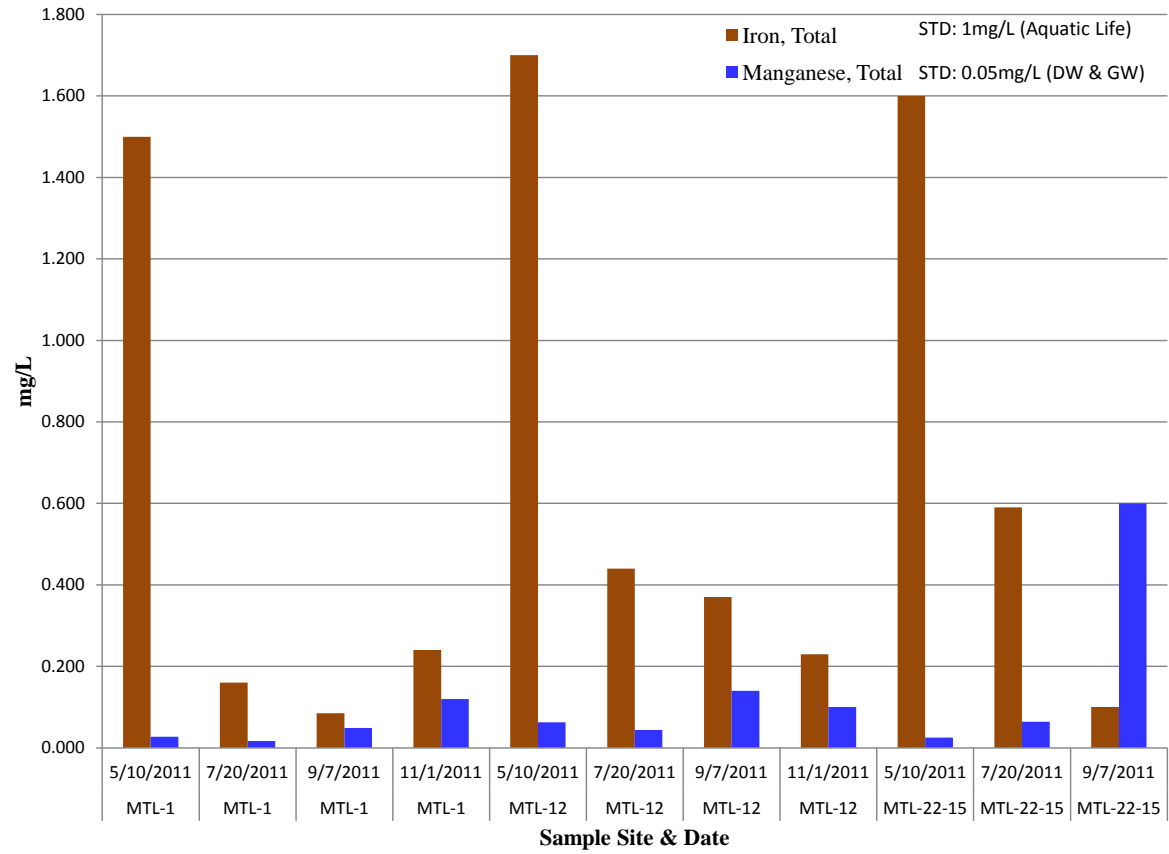
Site	Date	Depth	H2OTemp (oC)	Redox	Cond	D.O.%	D.O.(mg/L)	pH	Time	Seechi (in.)
77	11/1/11	2.3	14.10	294.00	226.5	67.8	6.97	7.49		

APPENDIX B

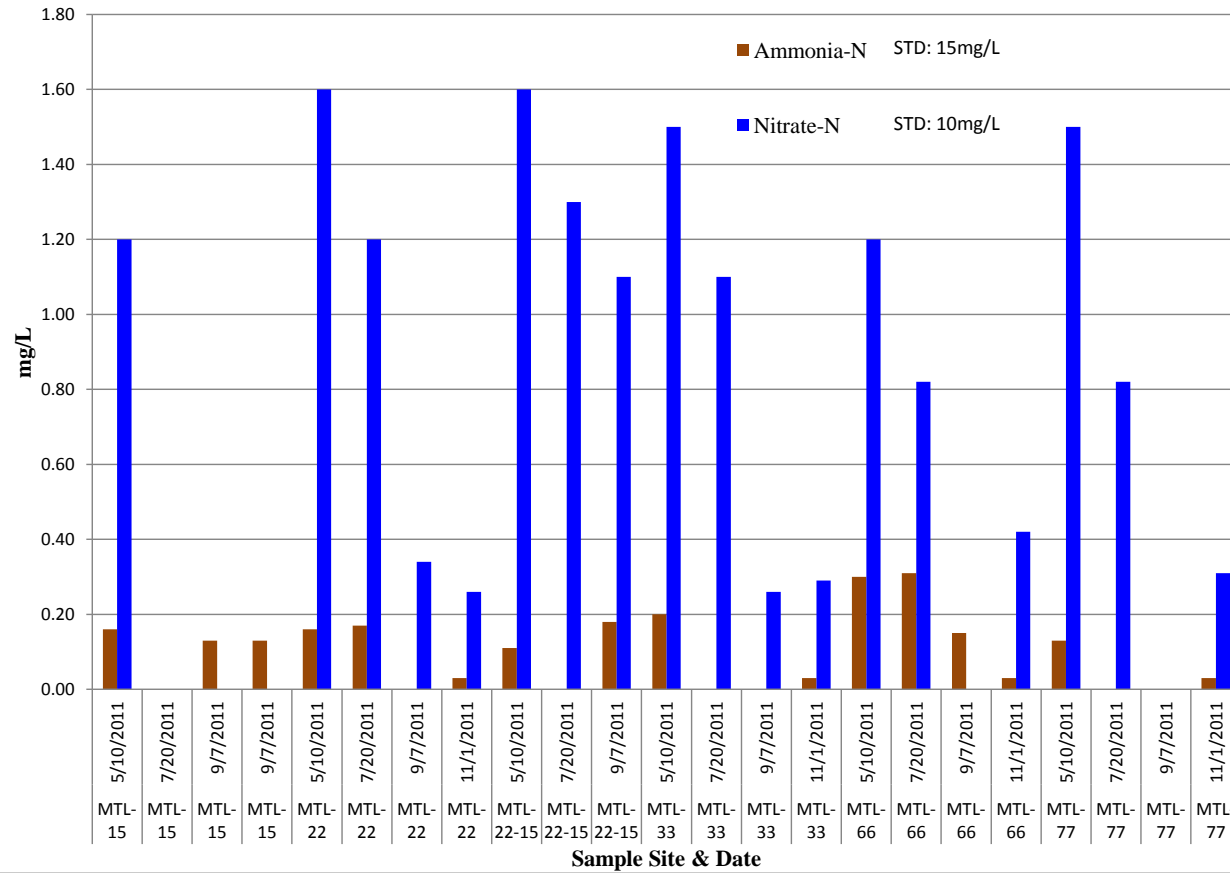
LAB DATA GRAPHS



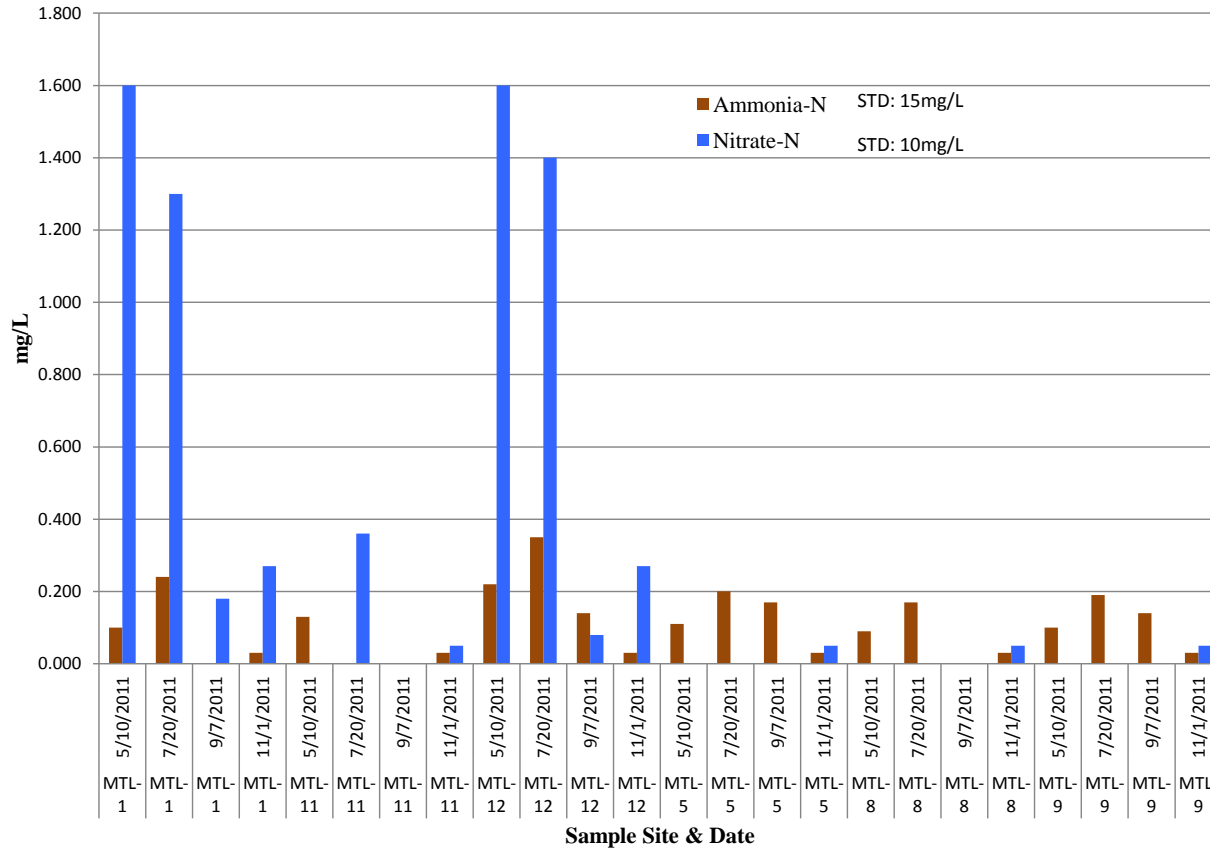
Total Iron & Total Manganese



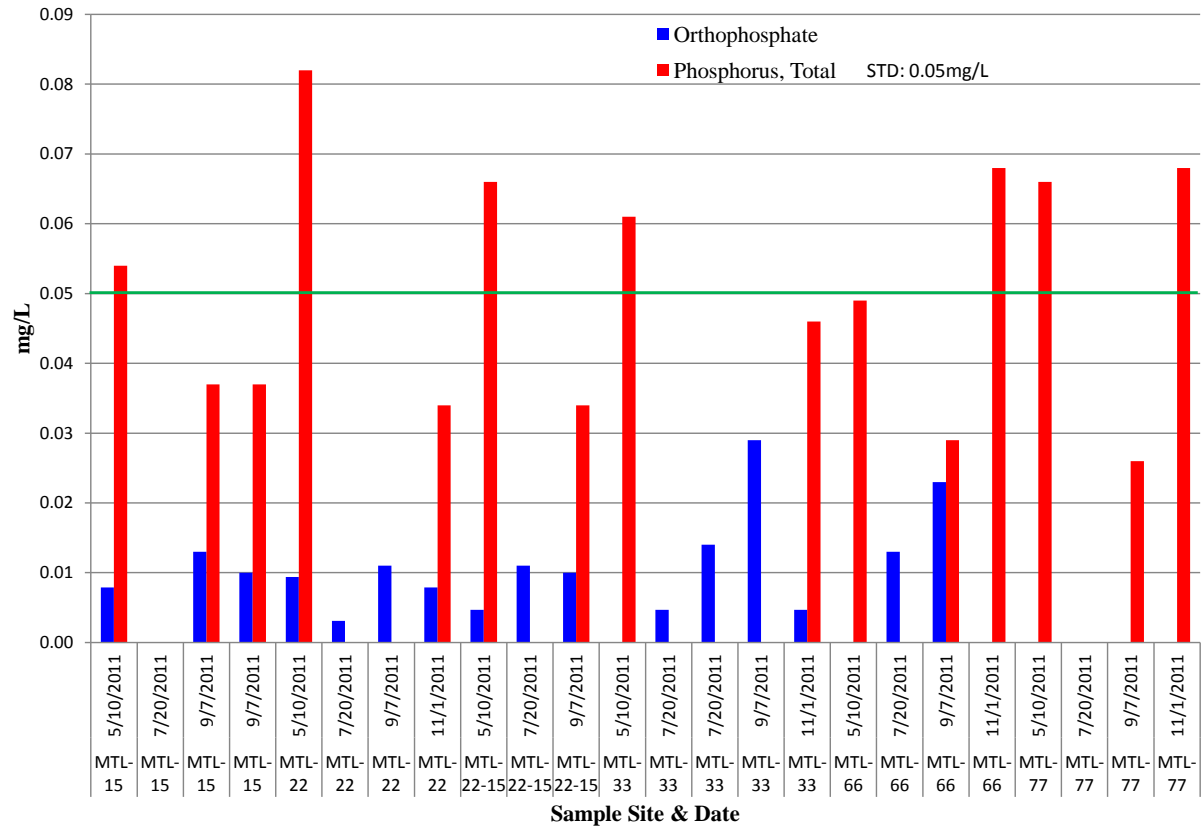
Lake Ammonia-Nitrogen & Nitrate-Nitrogen



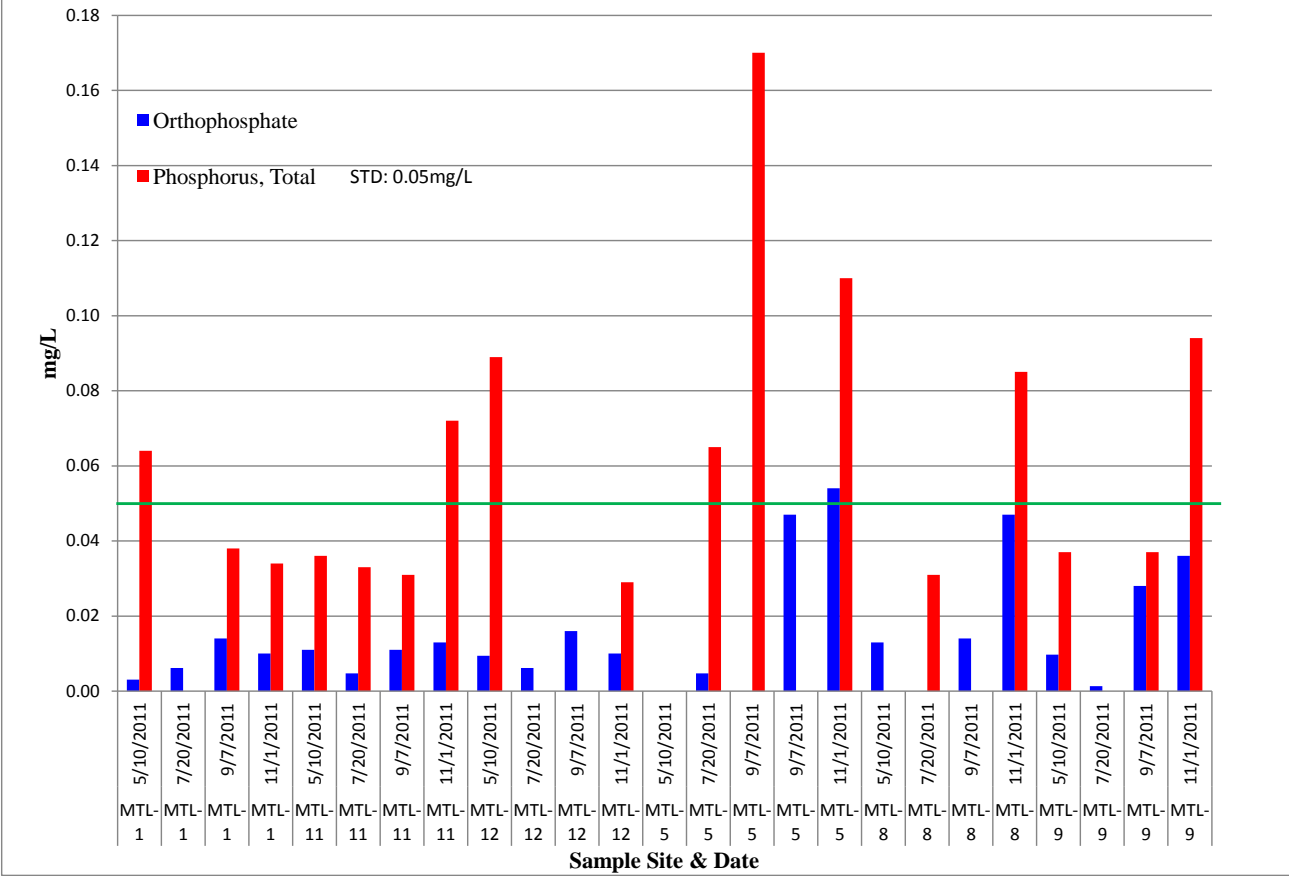
Tributary Ammonia-Nitrogen & Nitrate-Nitrogen



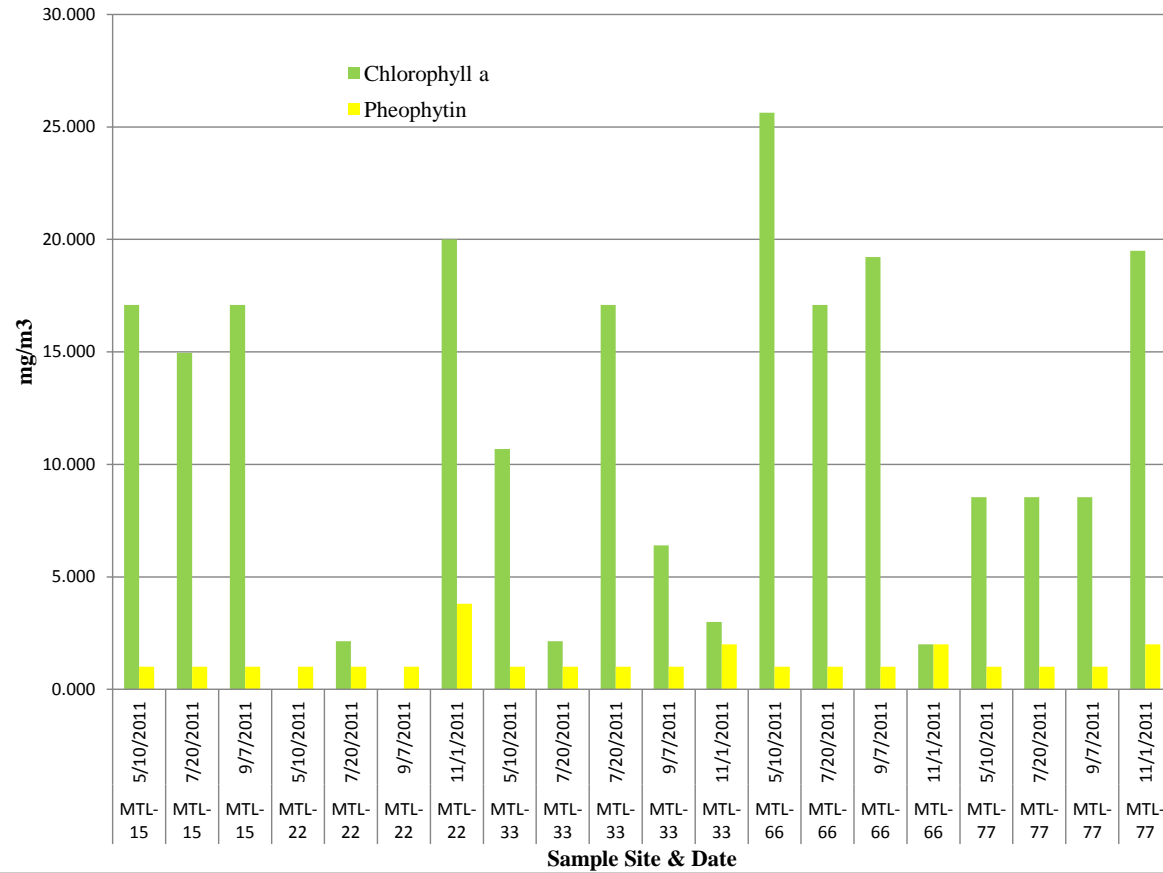
Lake Phosphorous



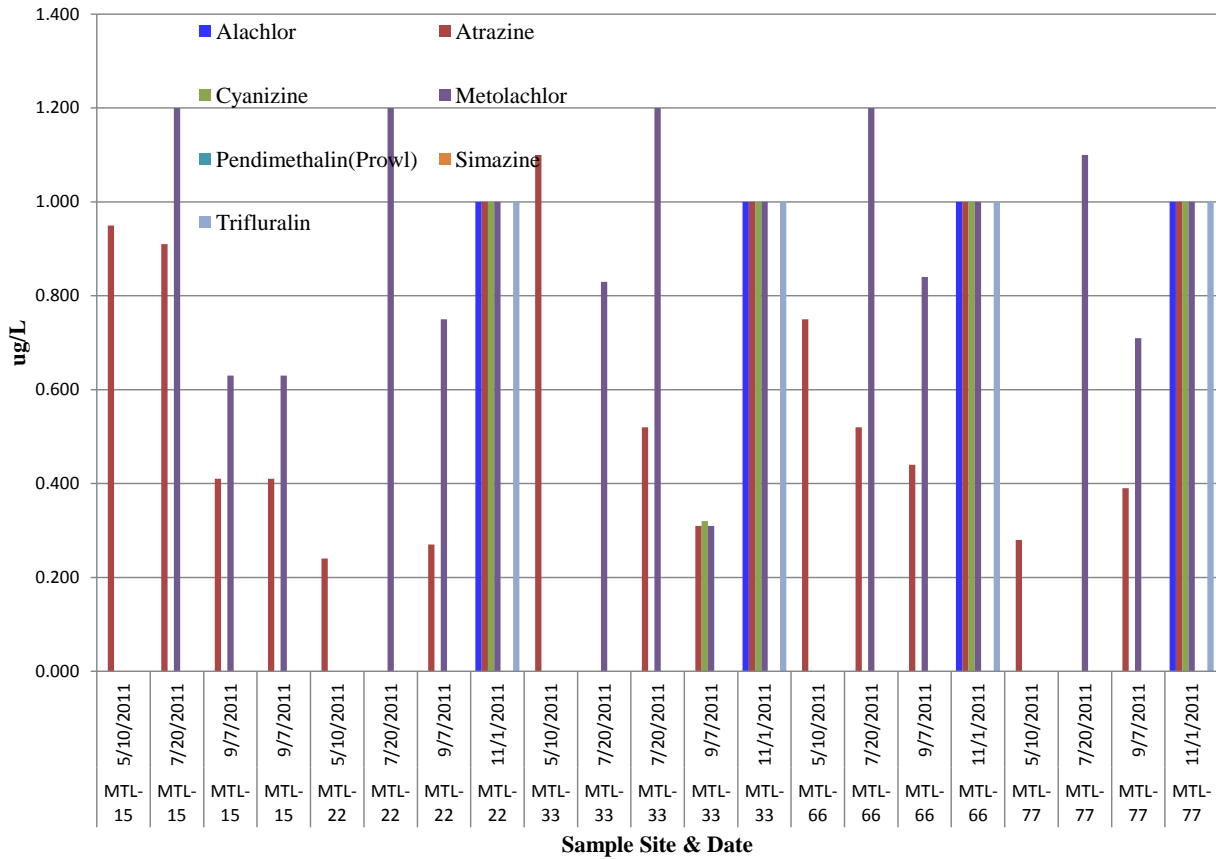
Tributary Phosphorous



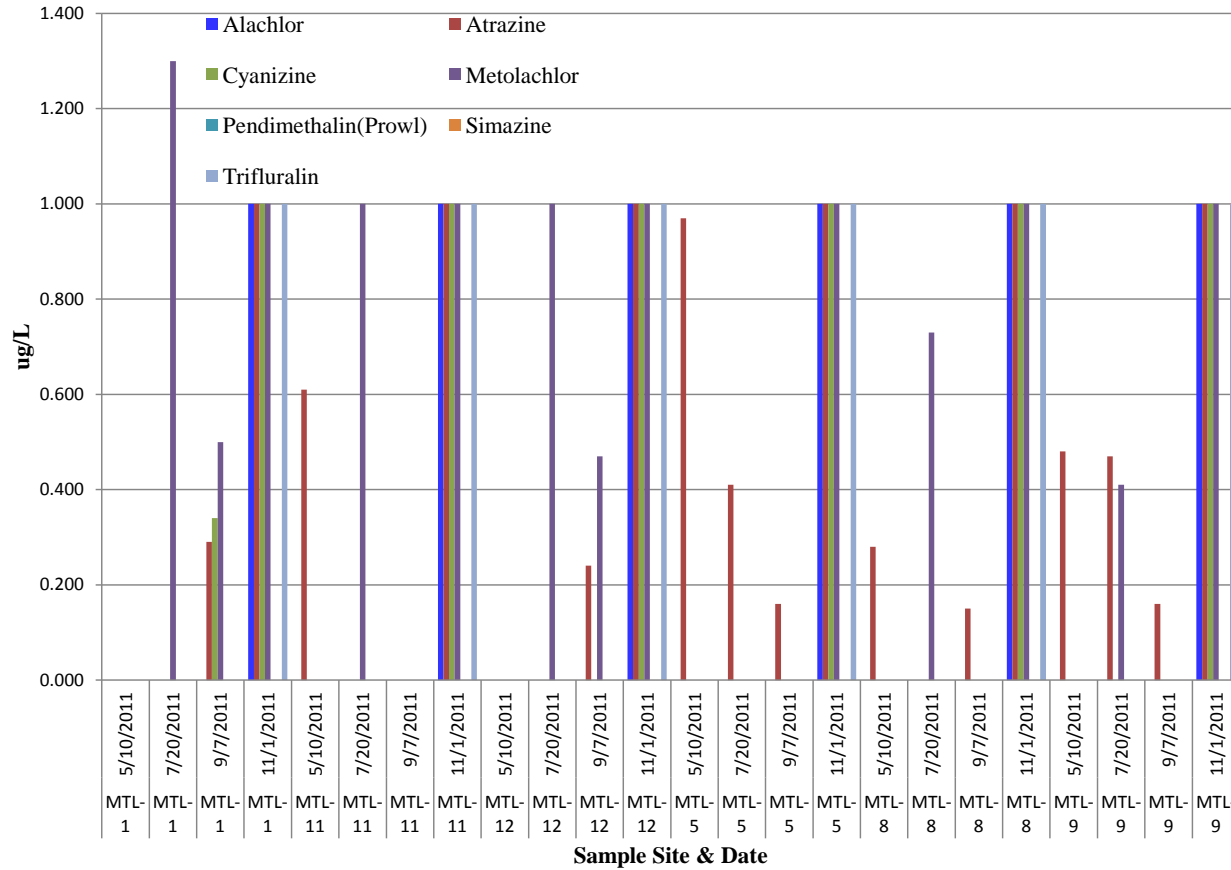
Chlorophyll & Pheophytin

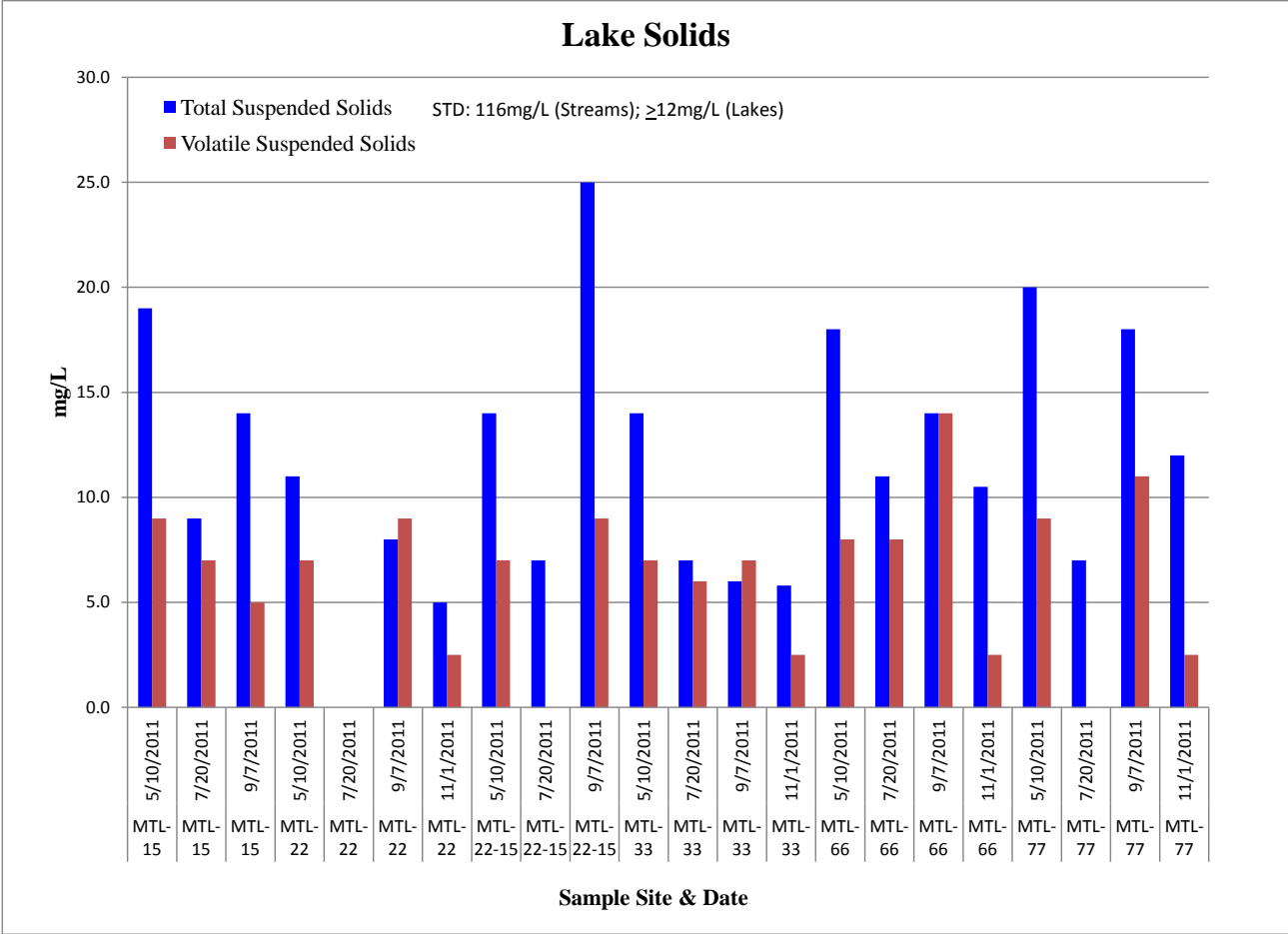


Lake Pesticides

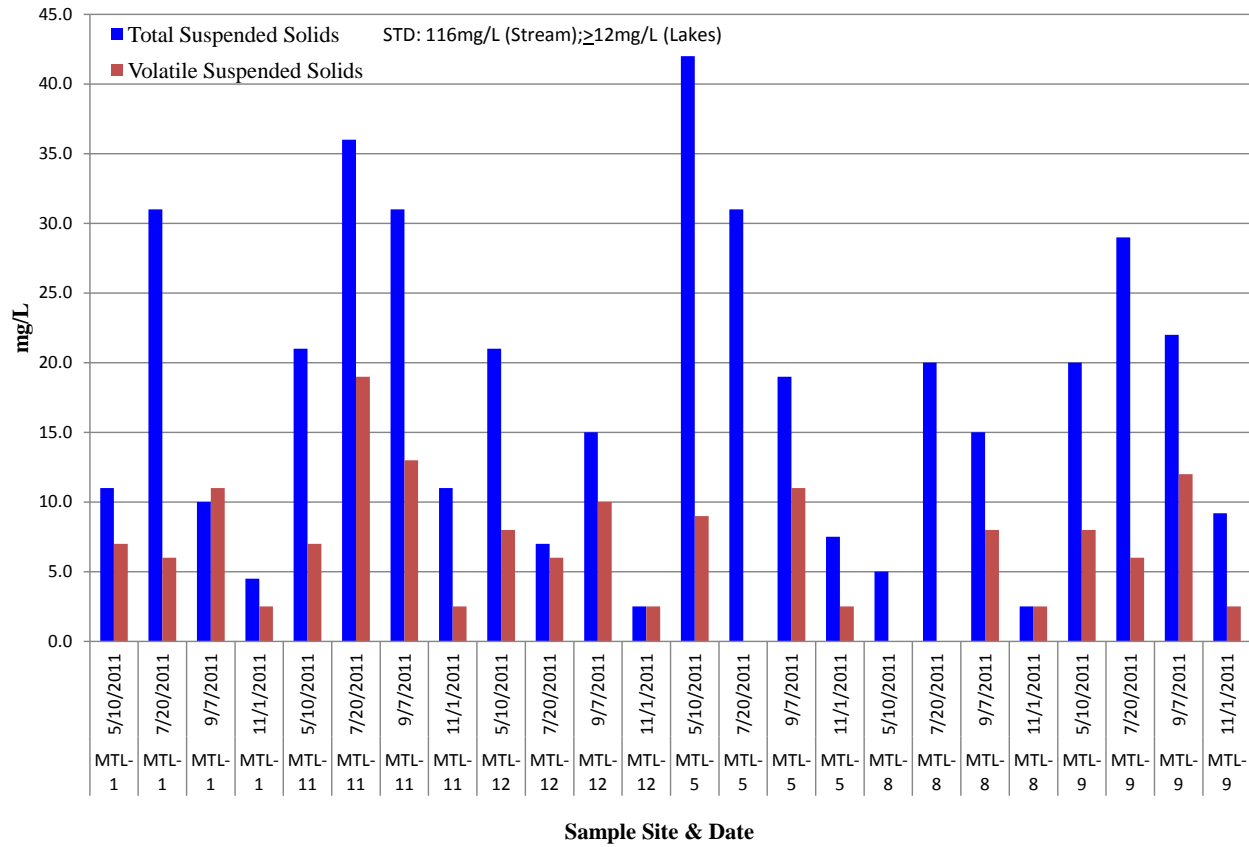


Tributary Pesticides

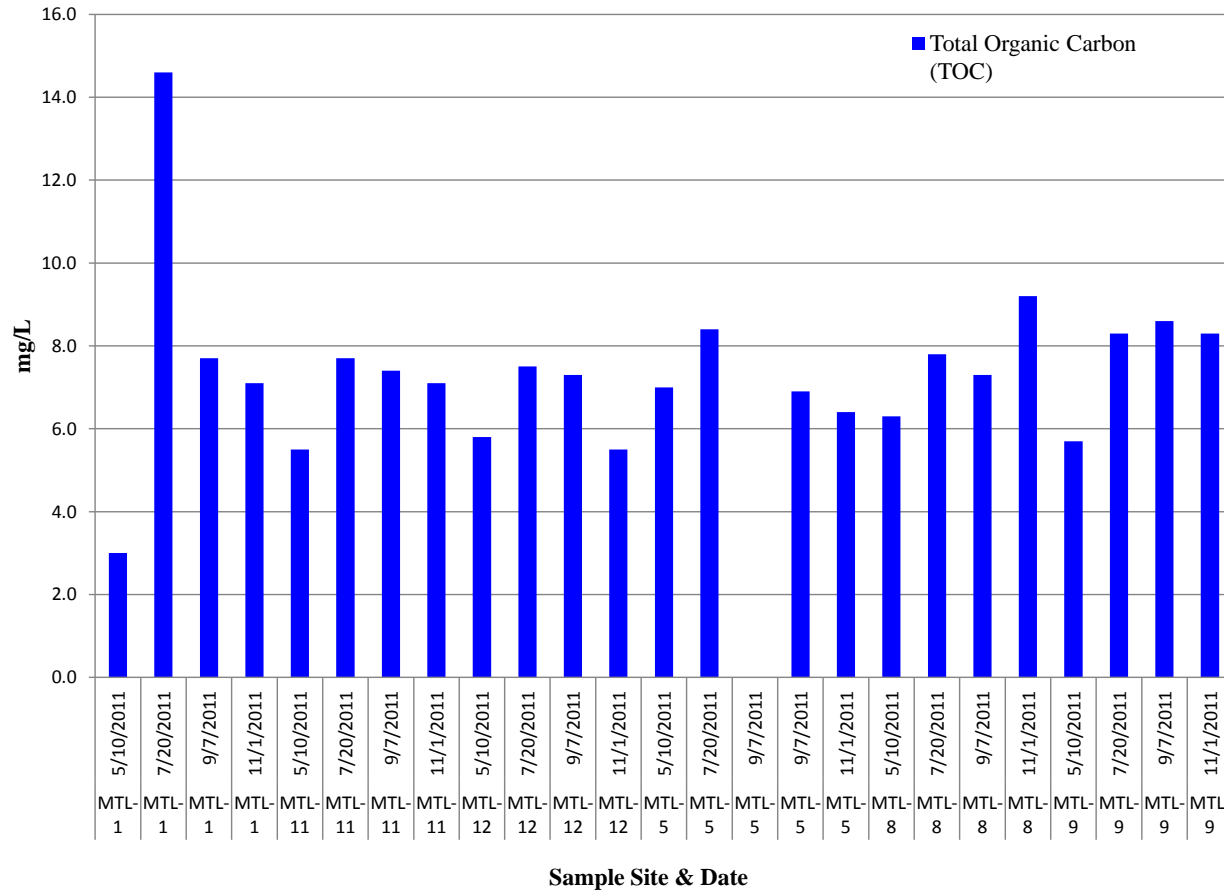




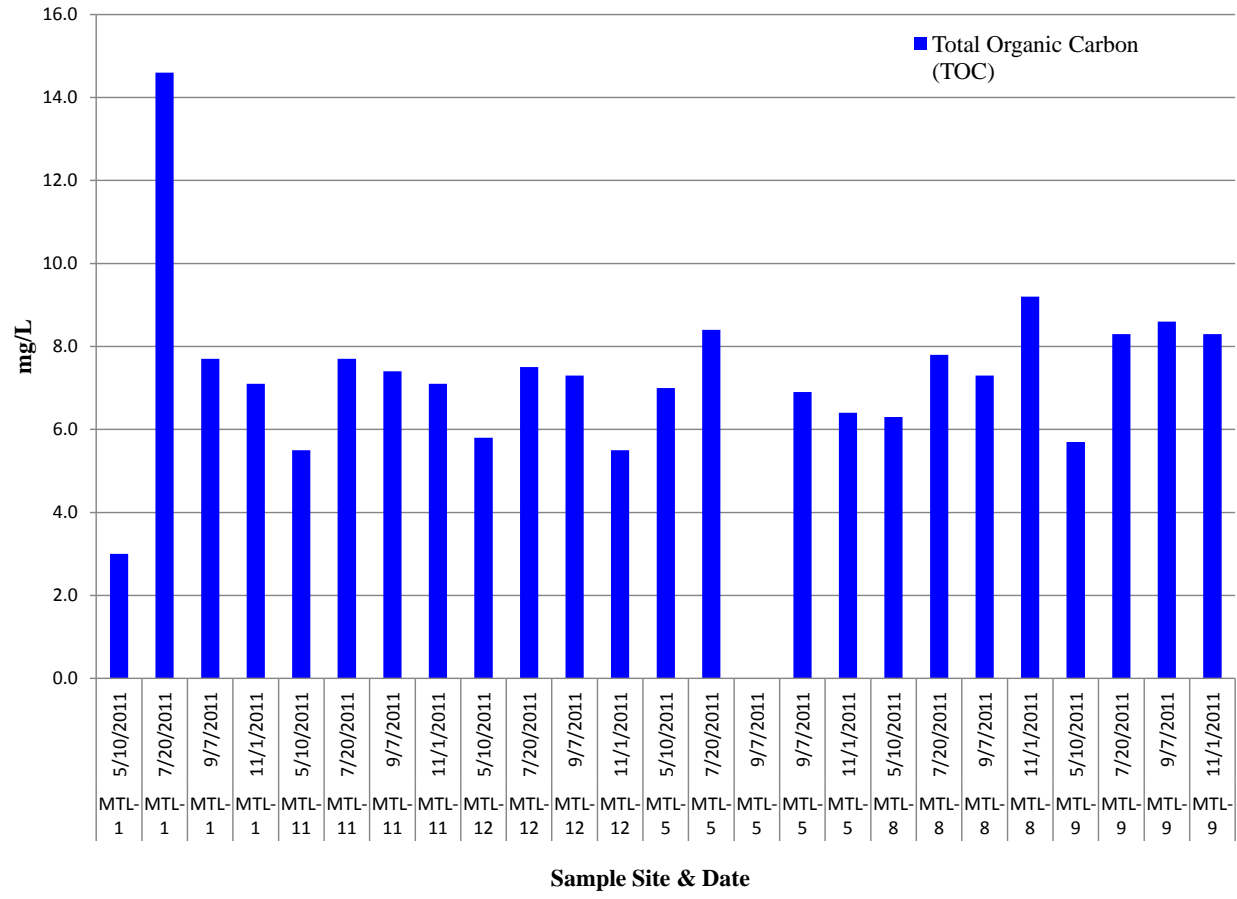
Tributary Solids



Tributary Total Organic Carbon



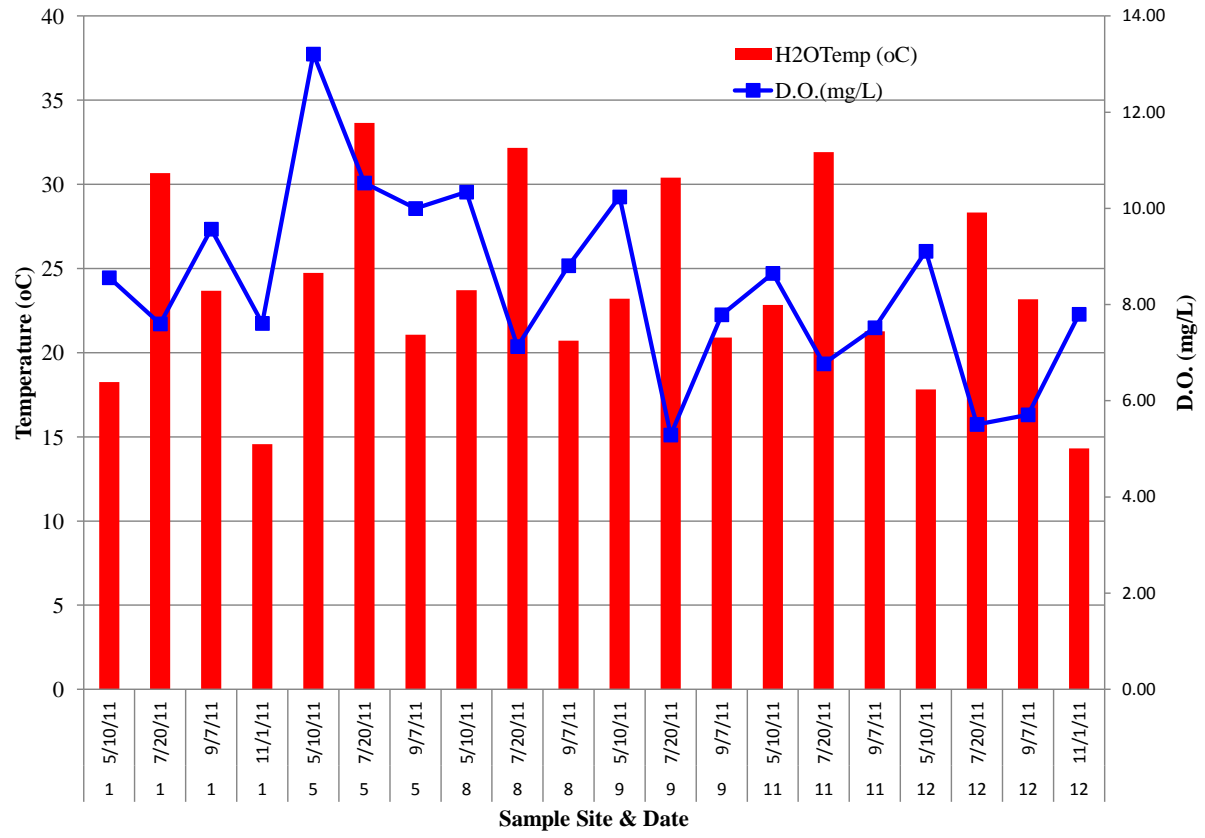
Tributary Total Organic Carbon



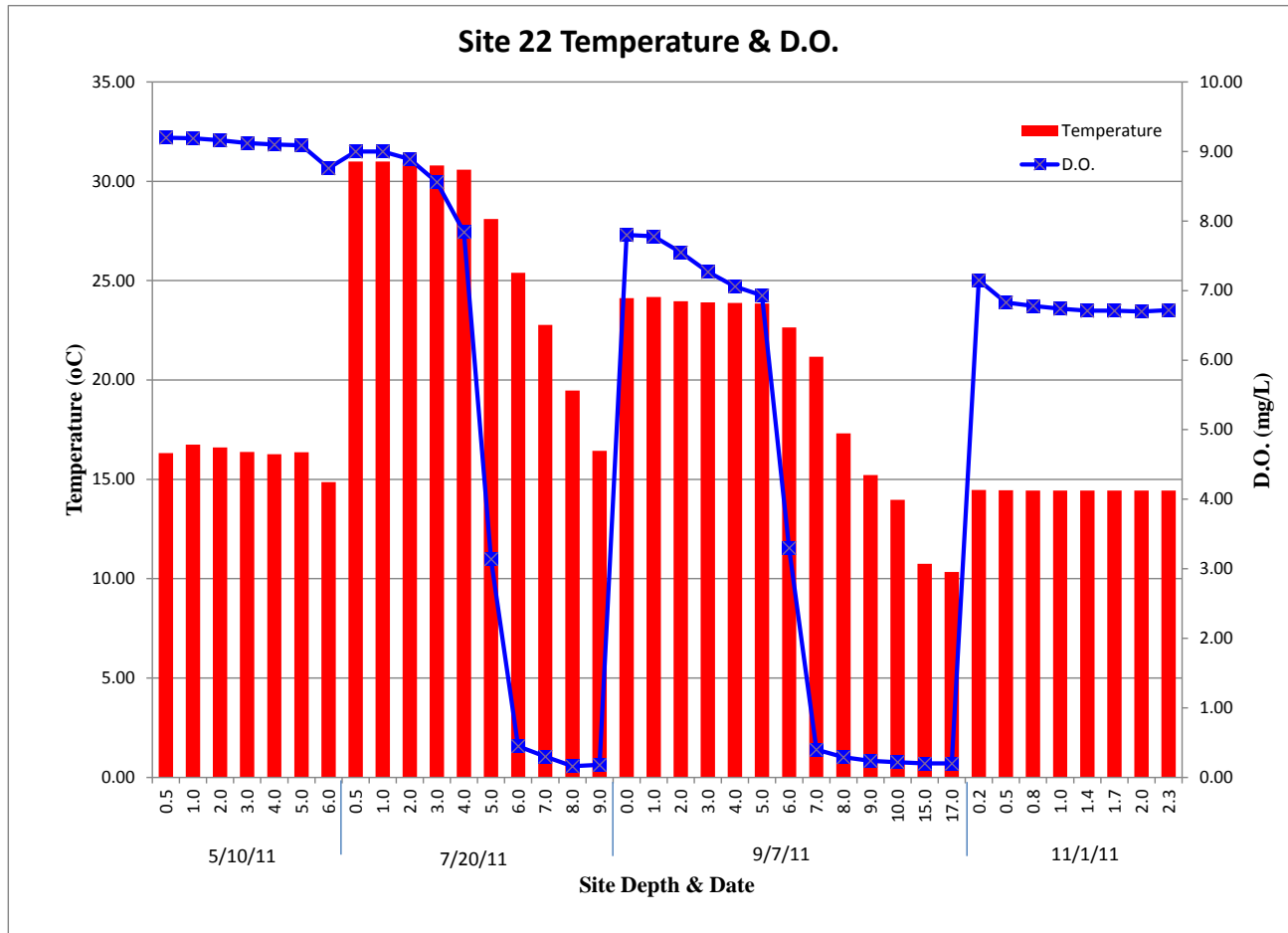
APPENDIX C

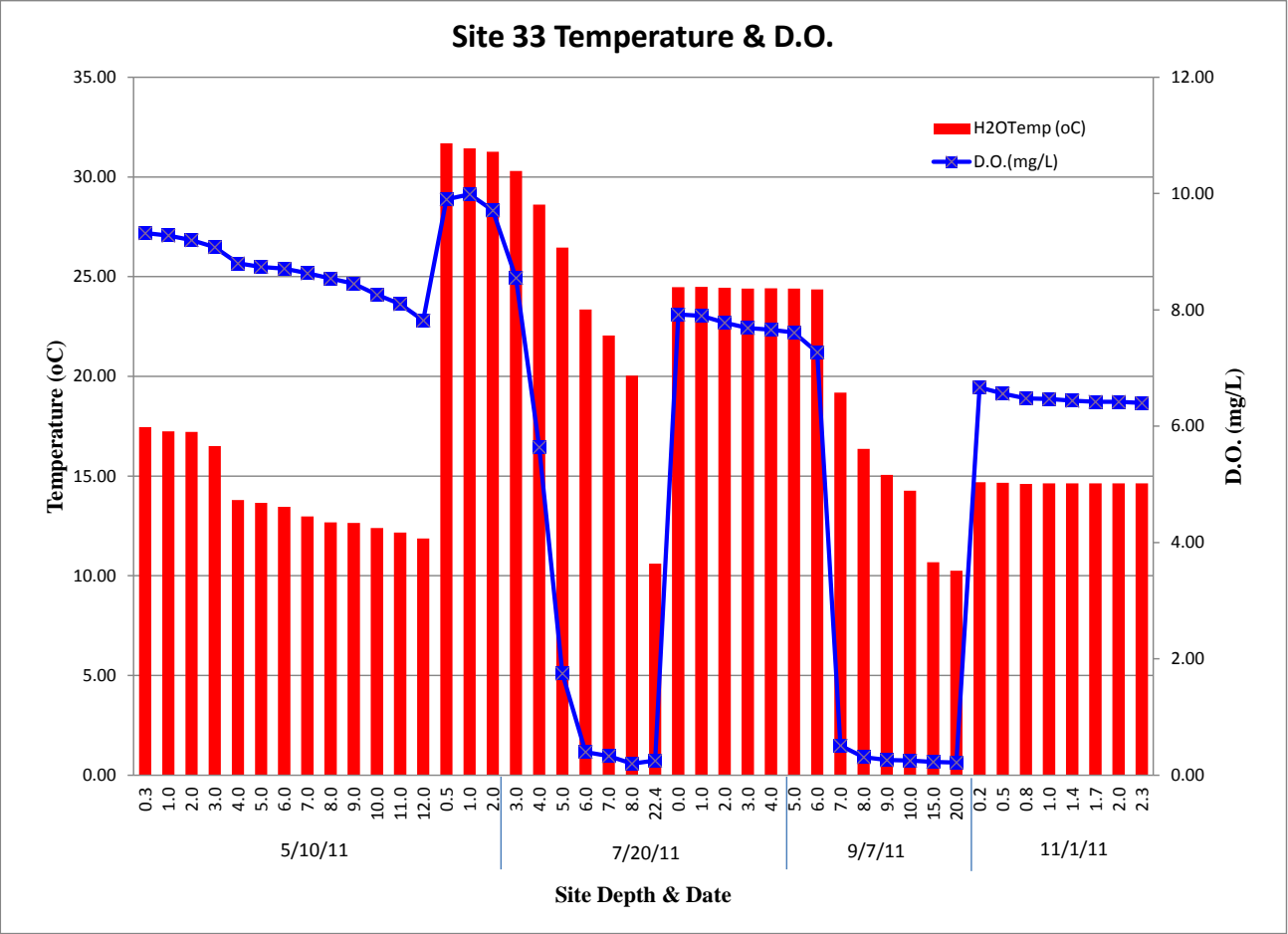
FIELD DATA GRAPHS

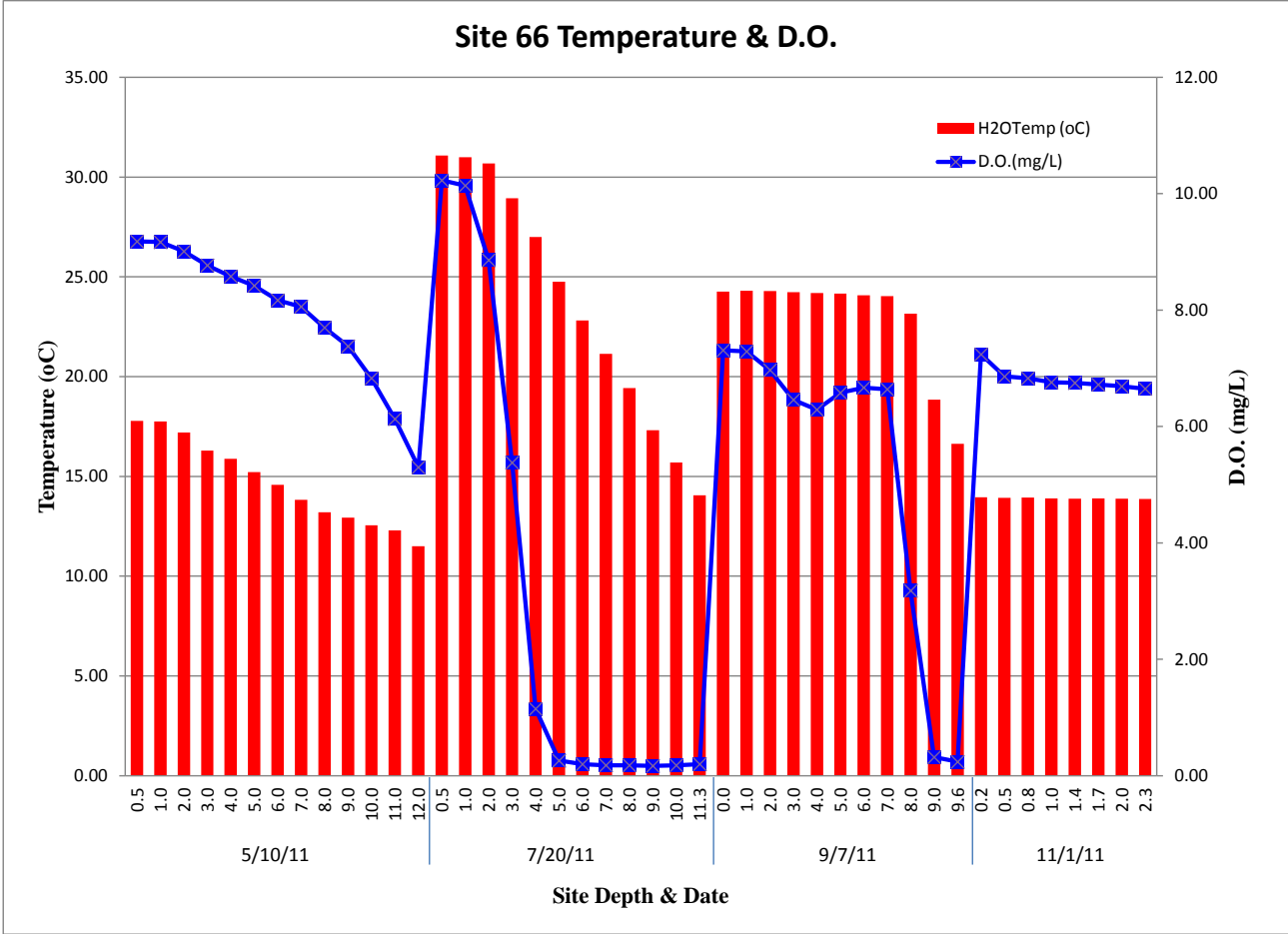
Temperature & D.O. Tributary Sites

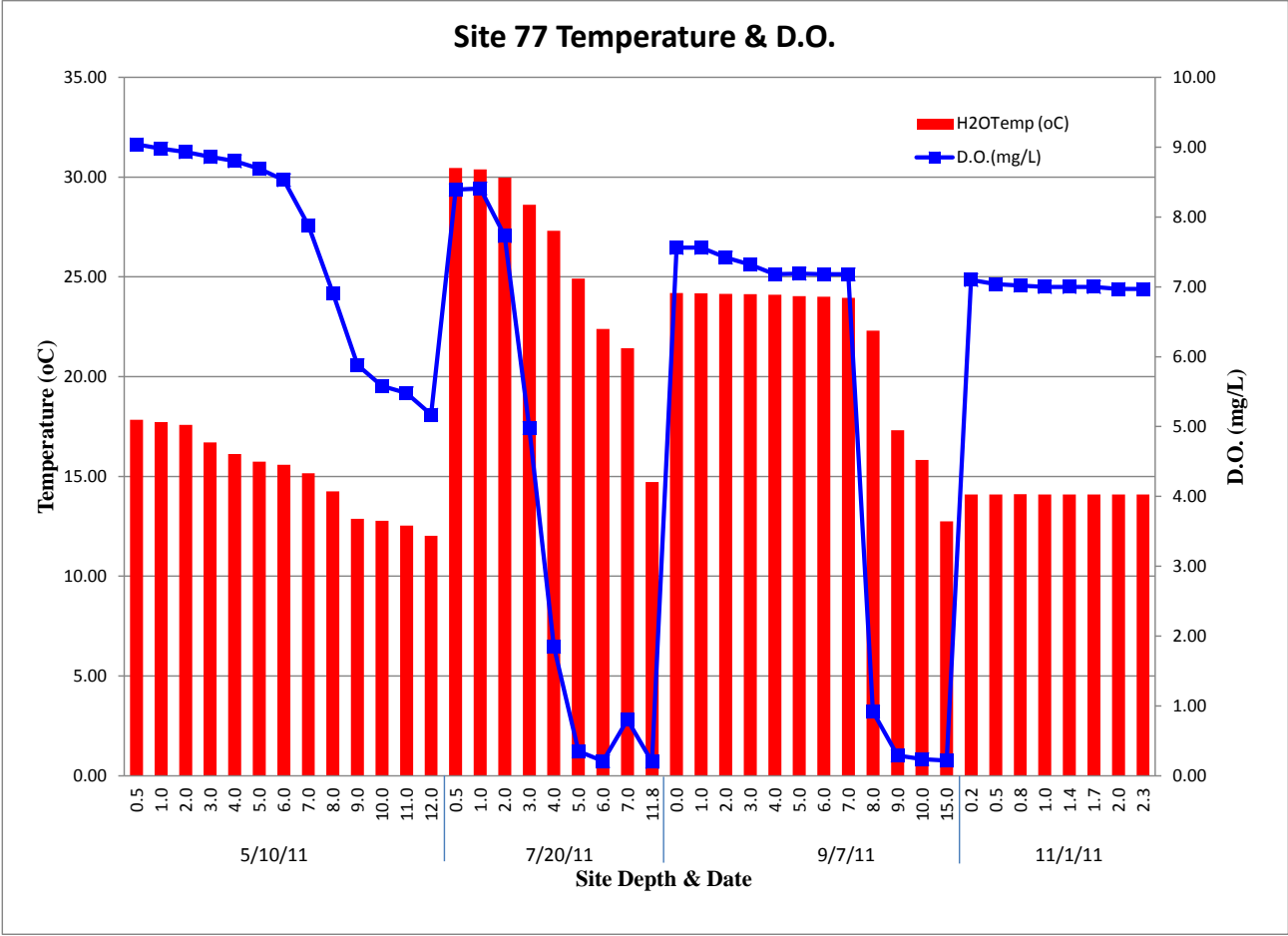


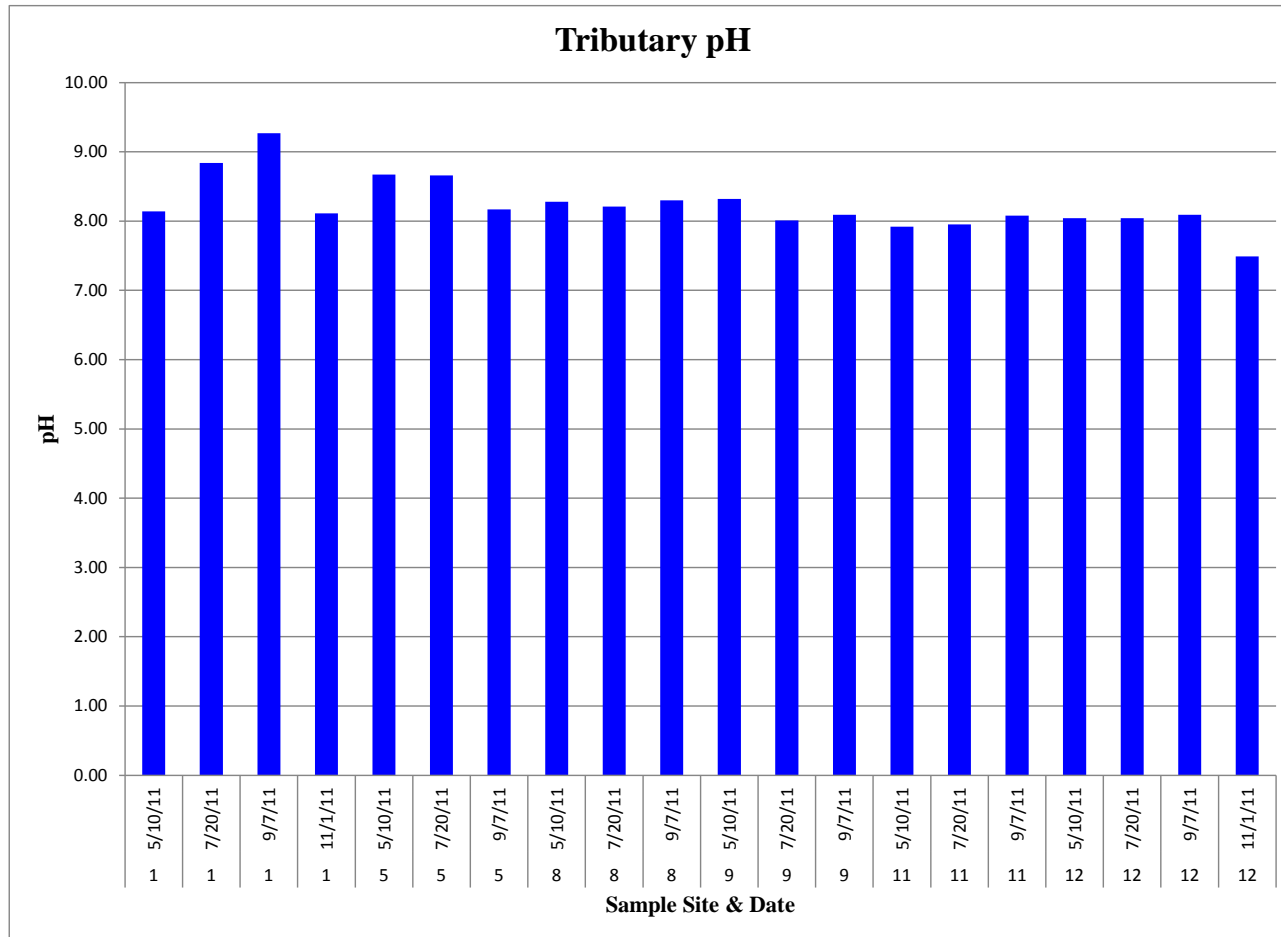
Site 22 Temperature & D.O.

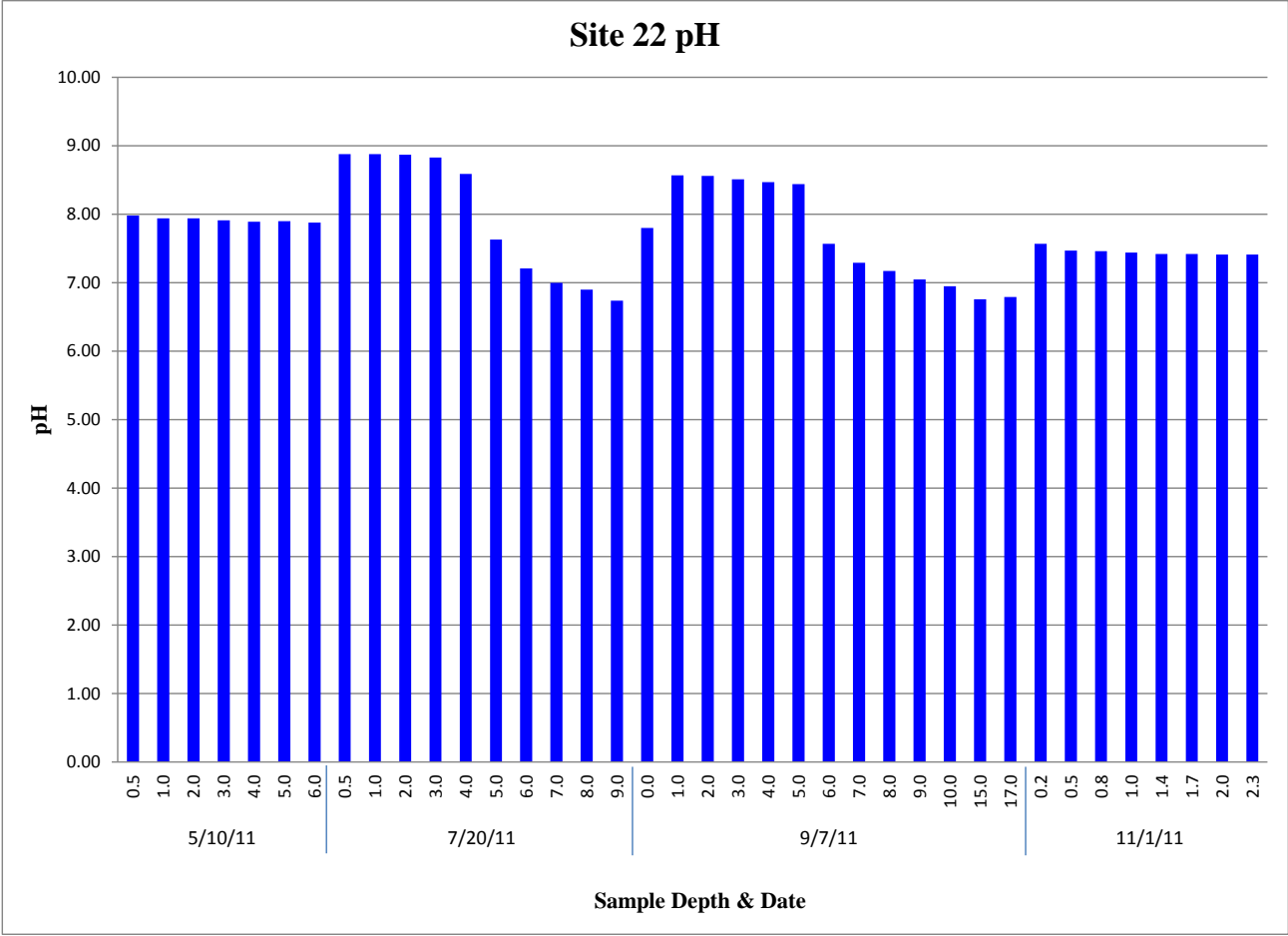


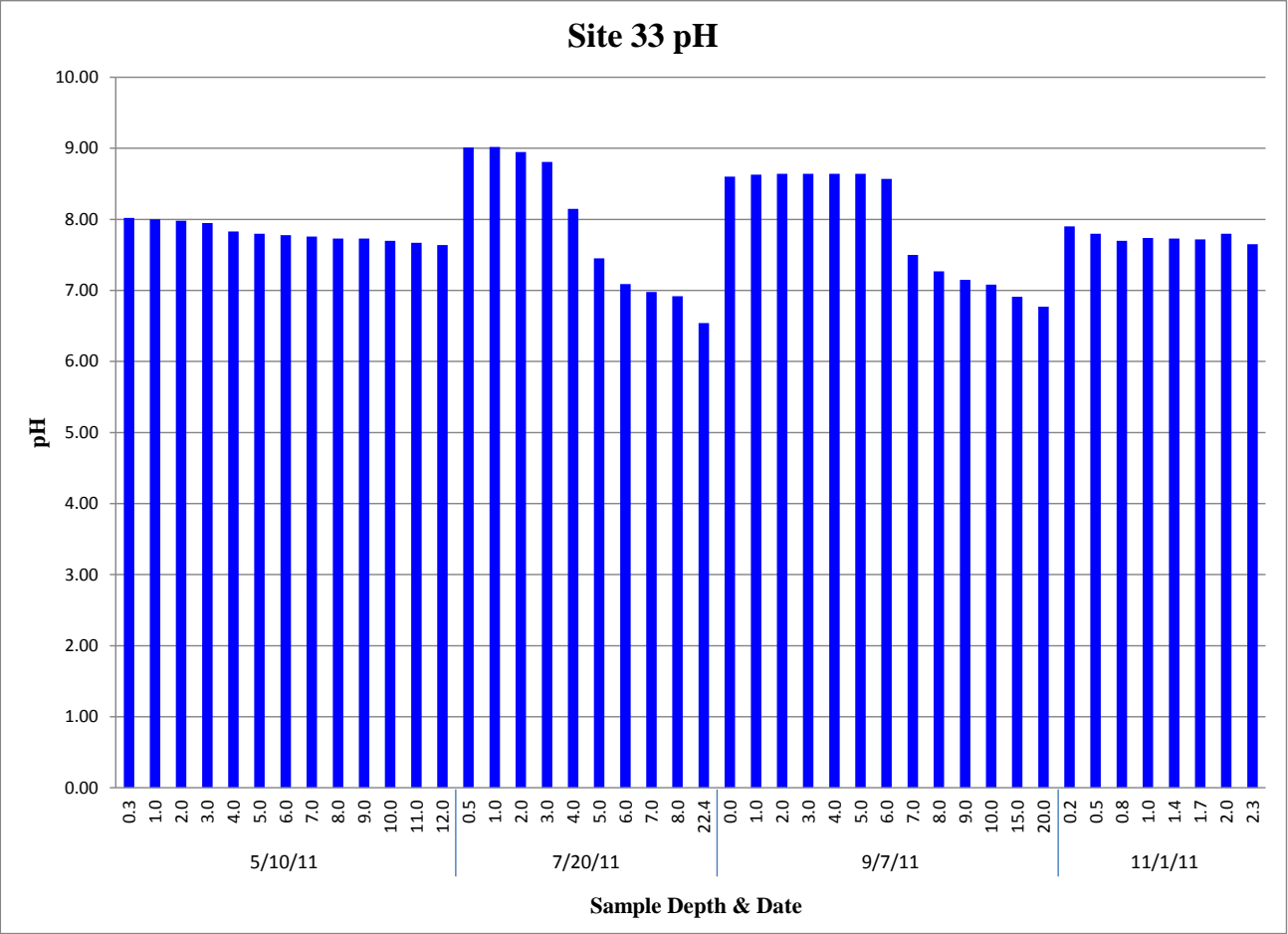


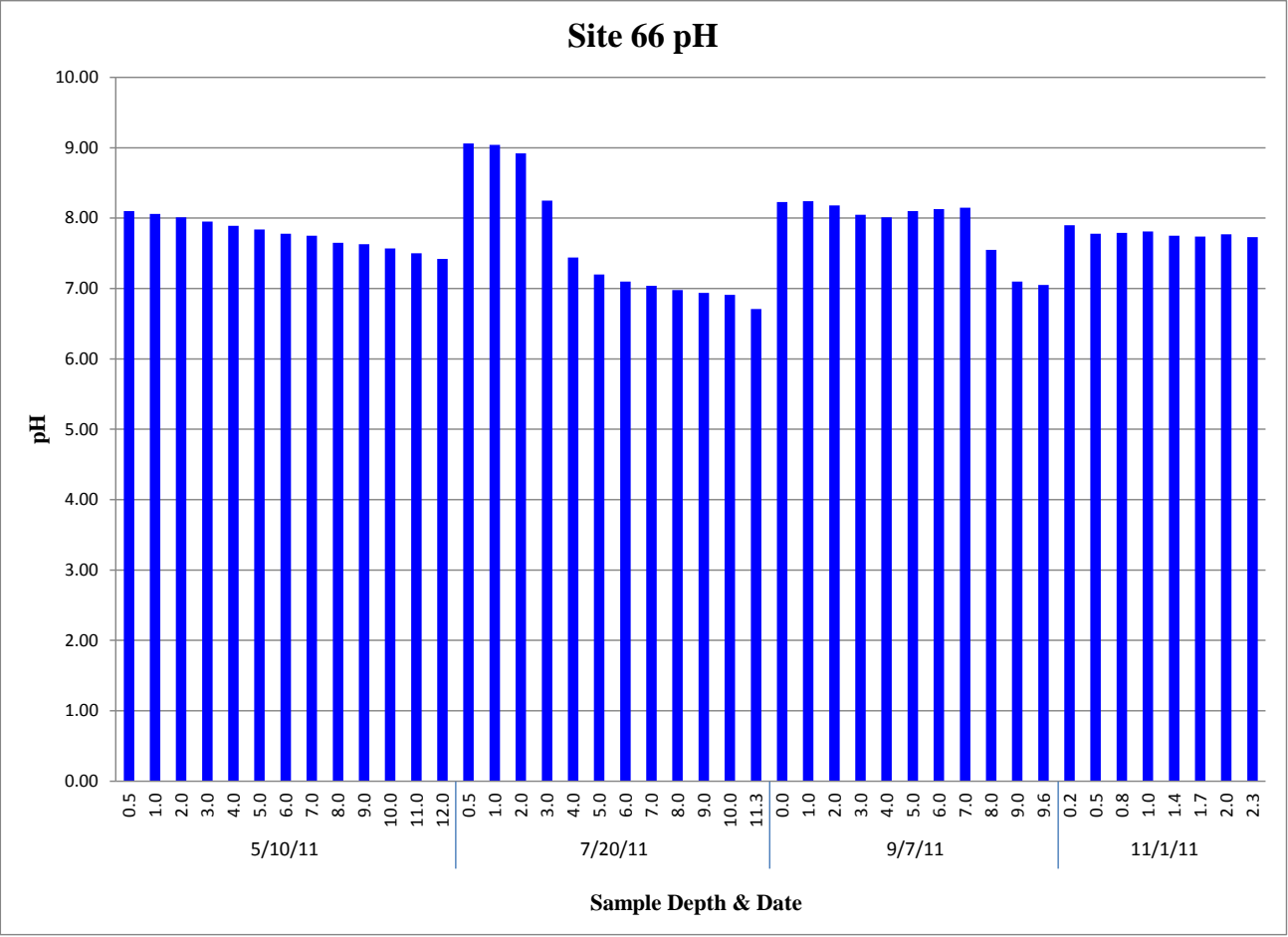


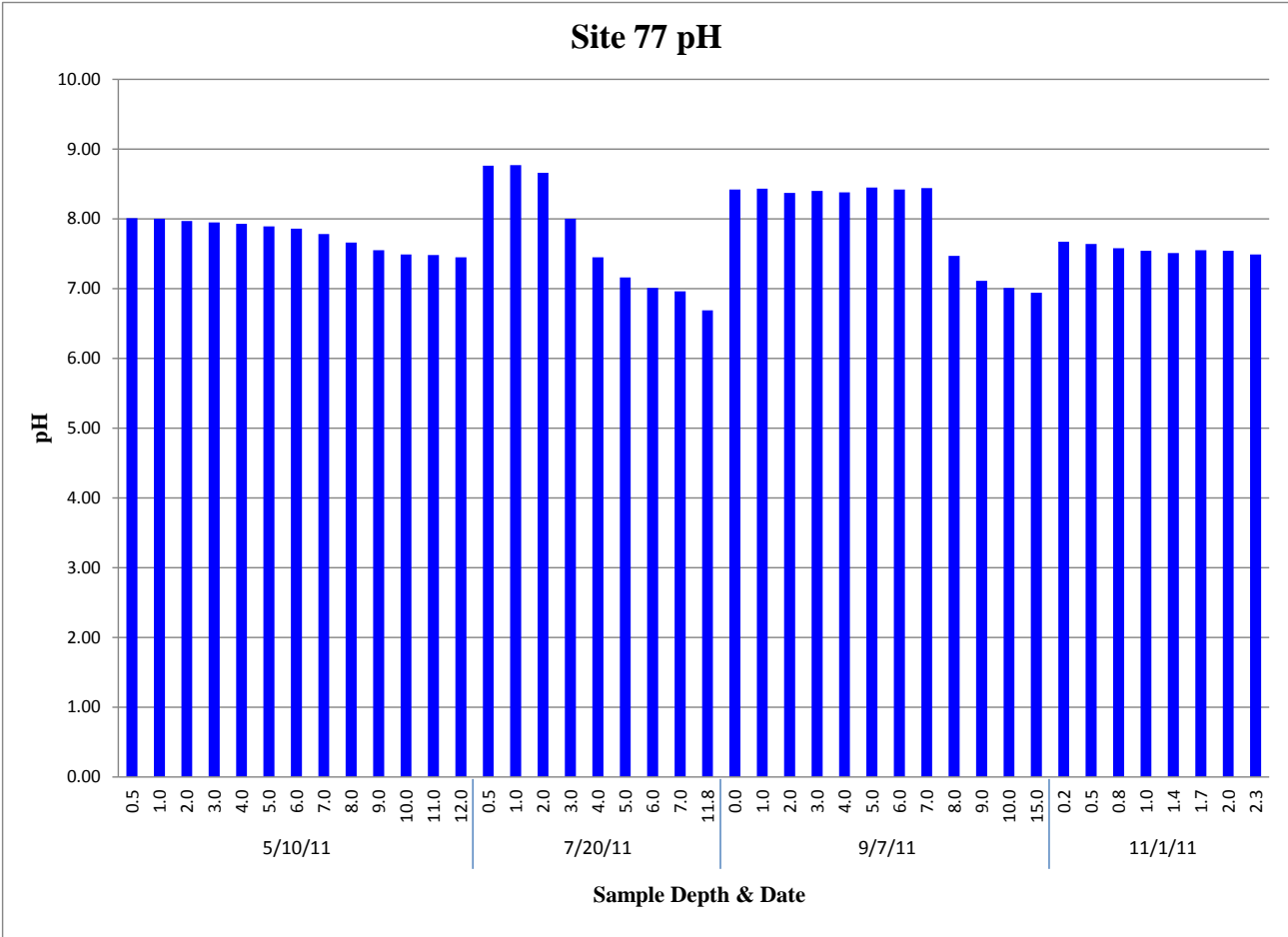


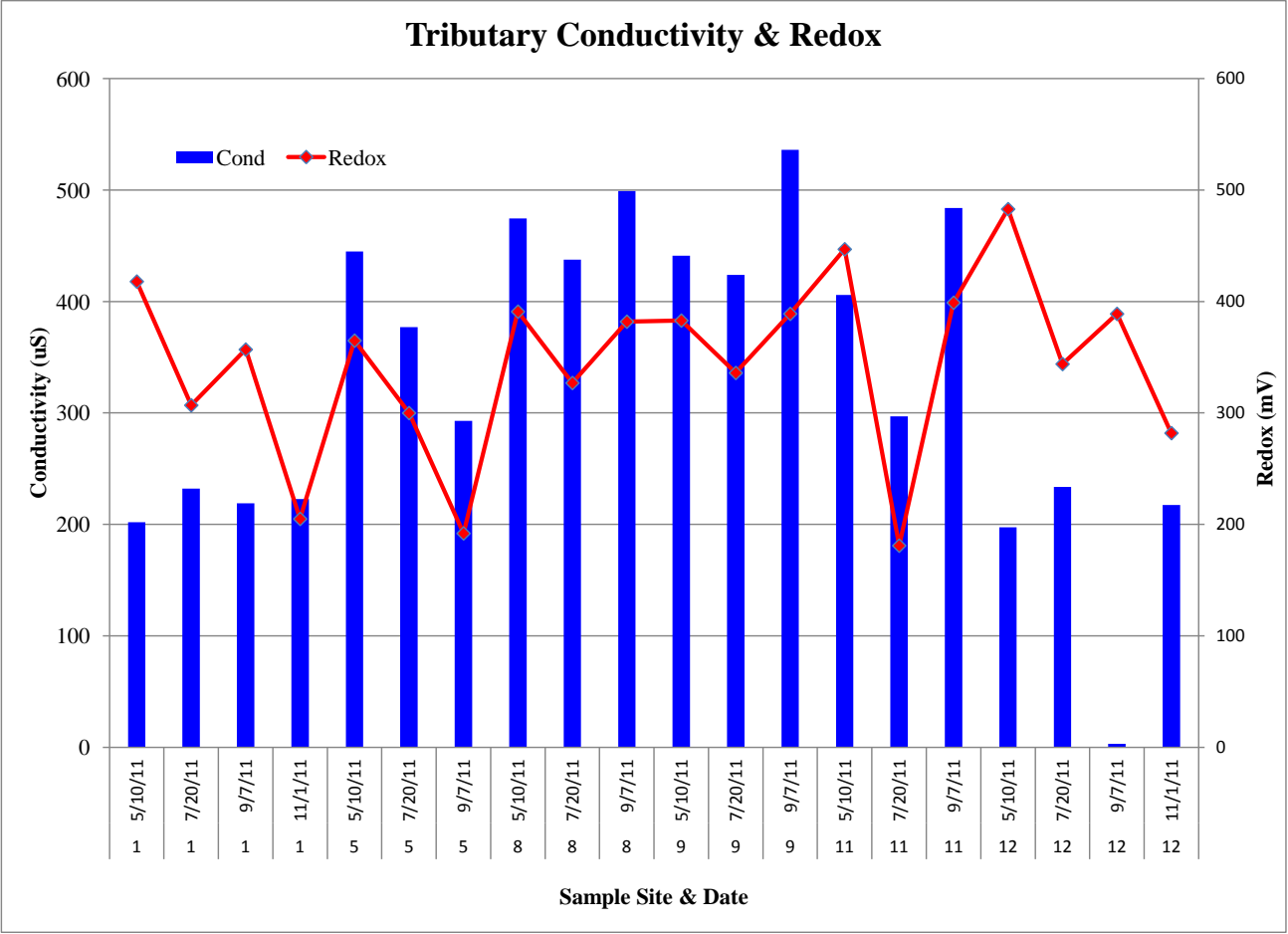


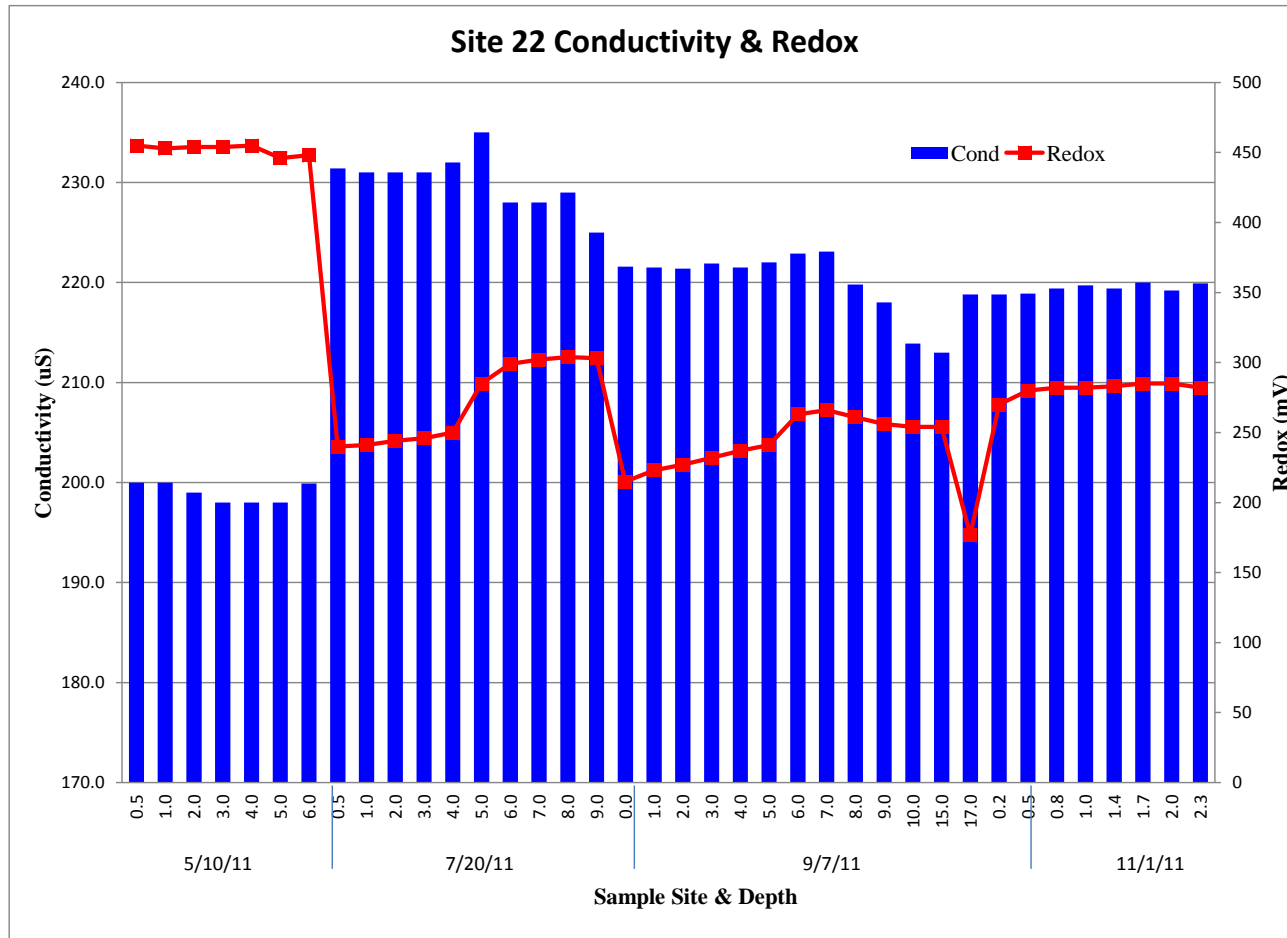


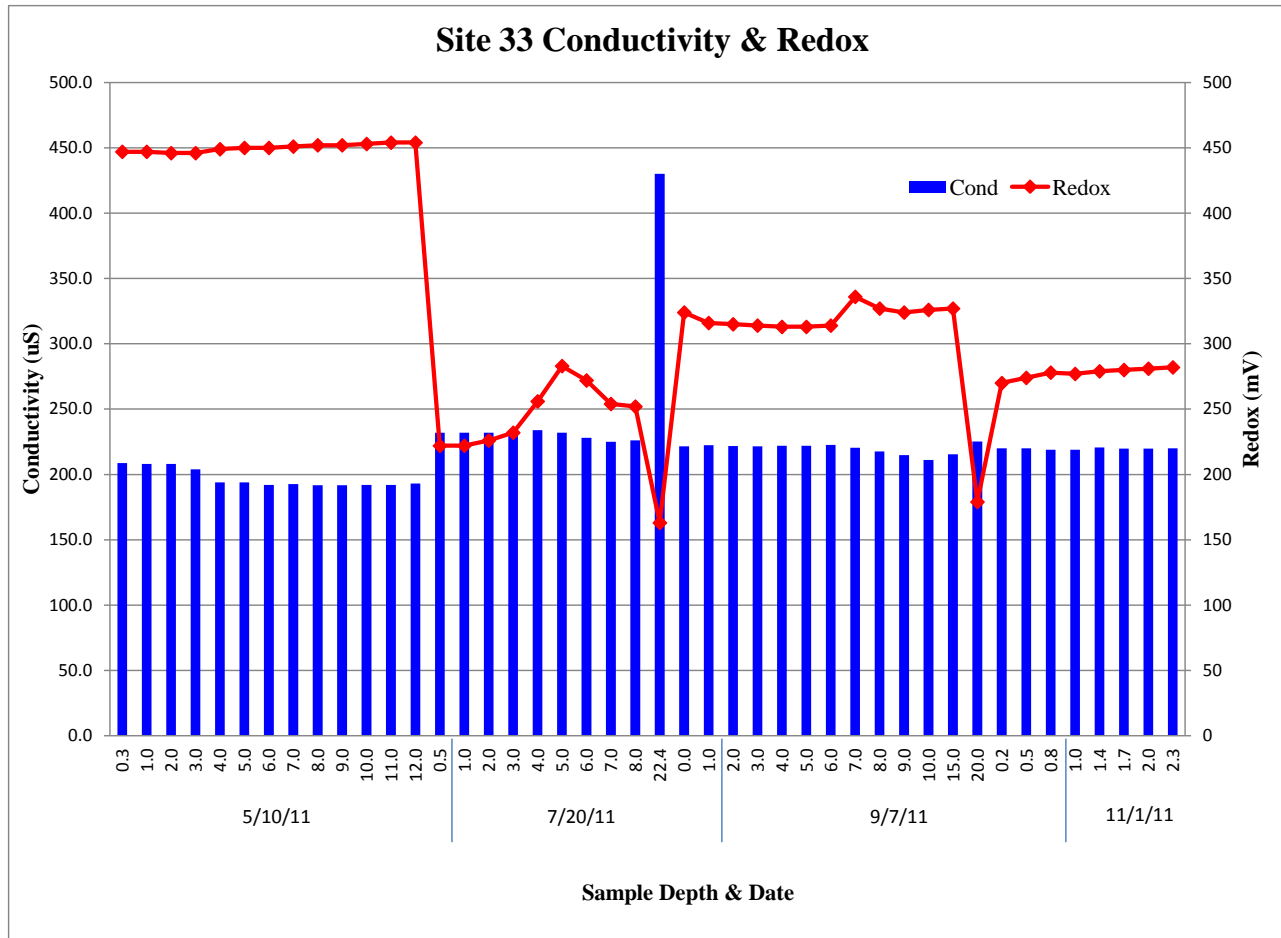


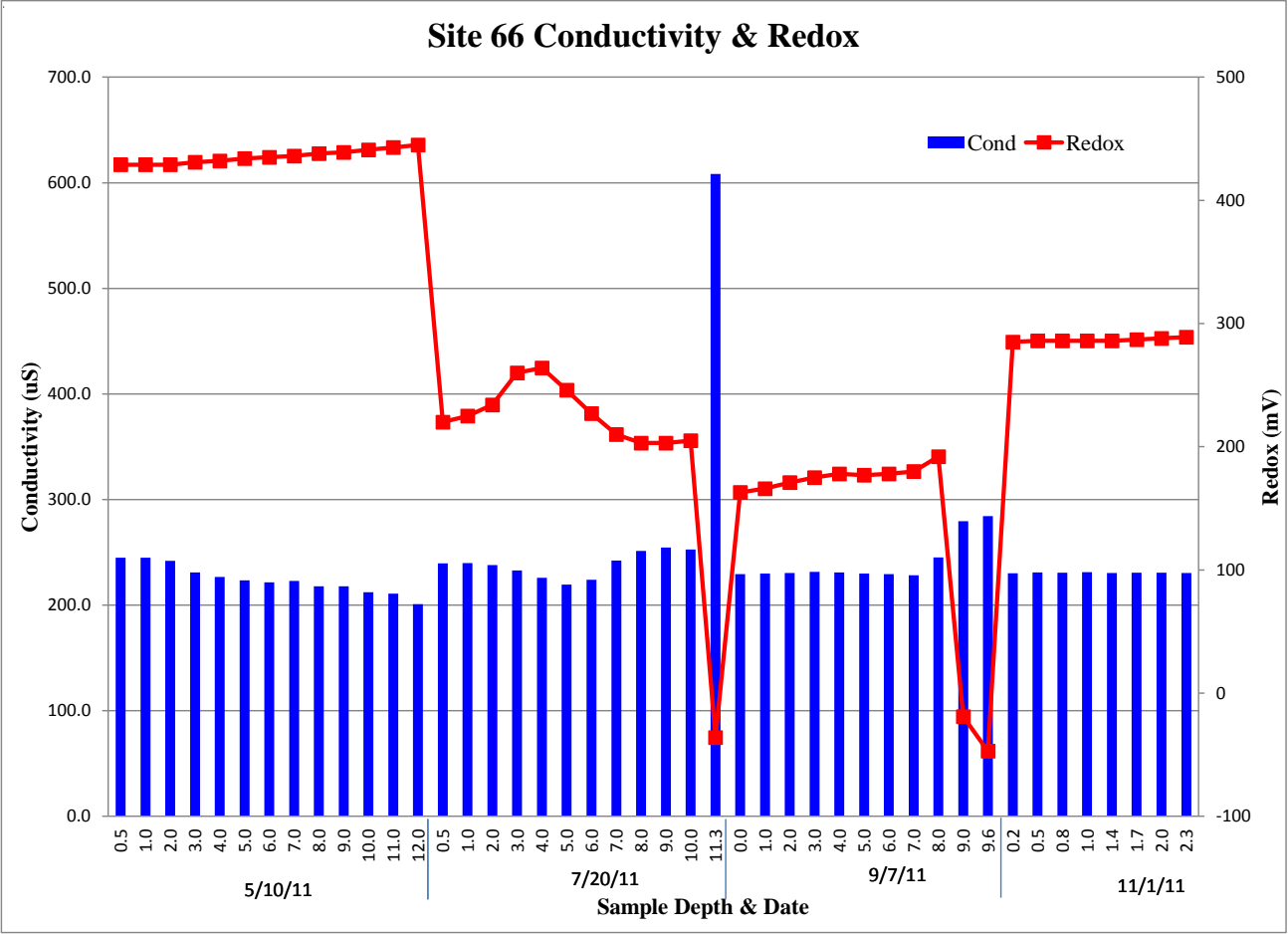


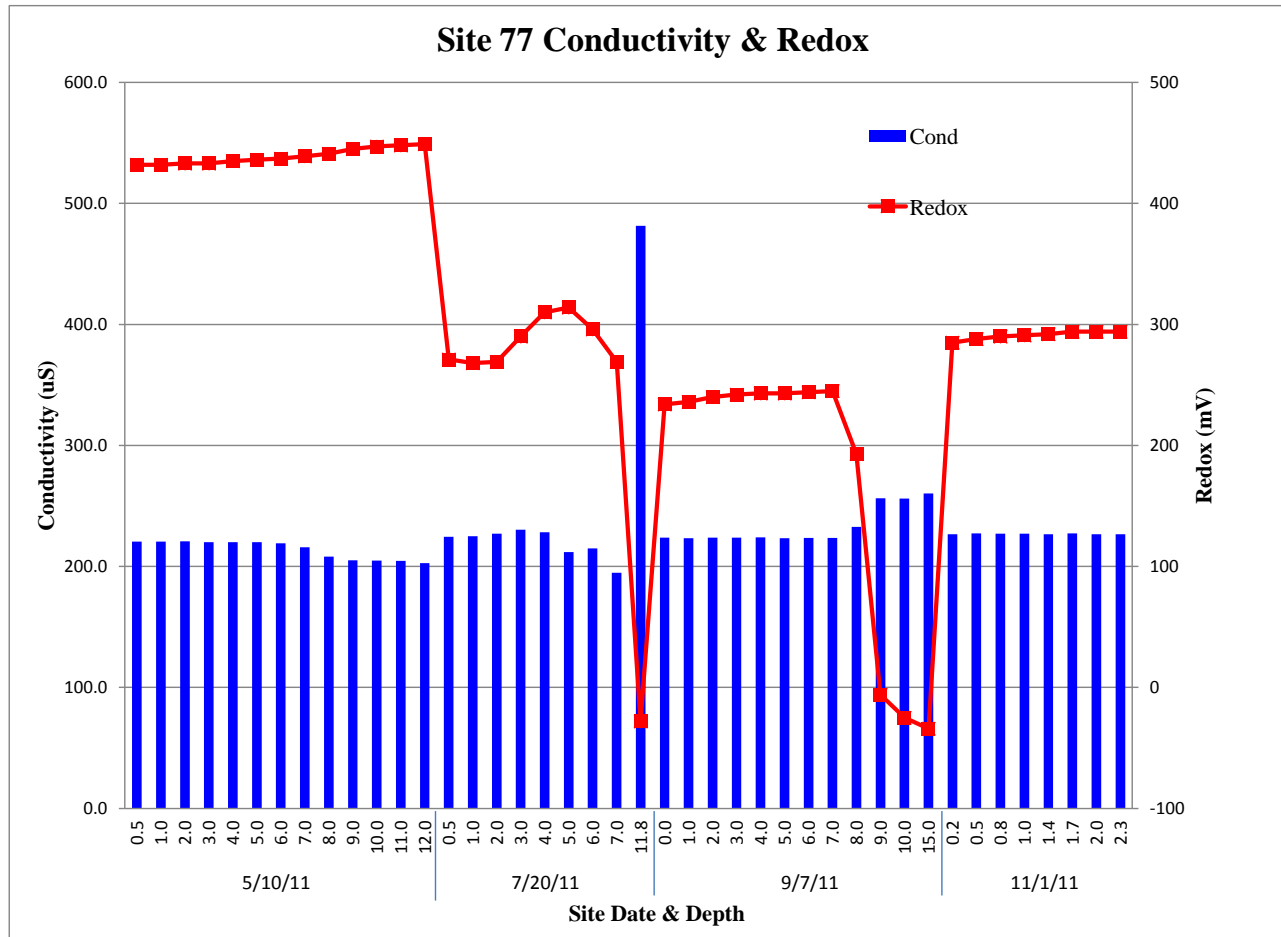


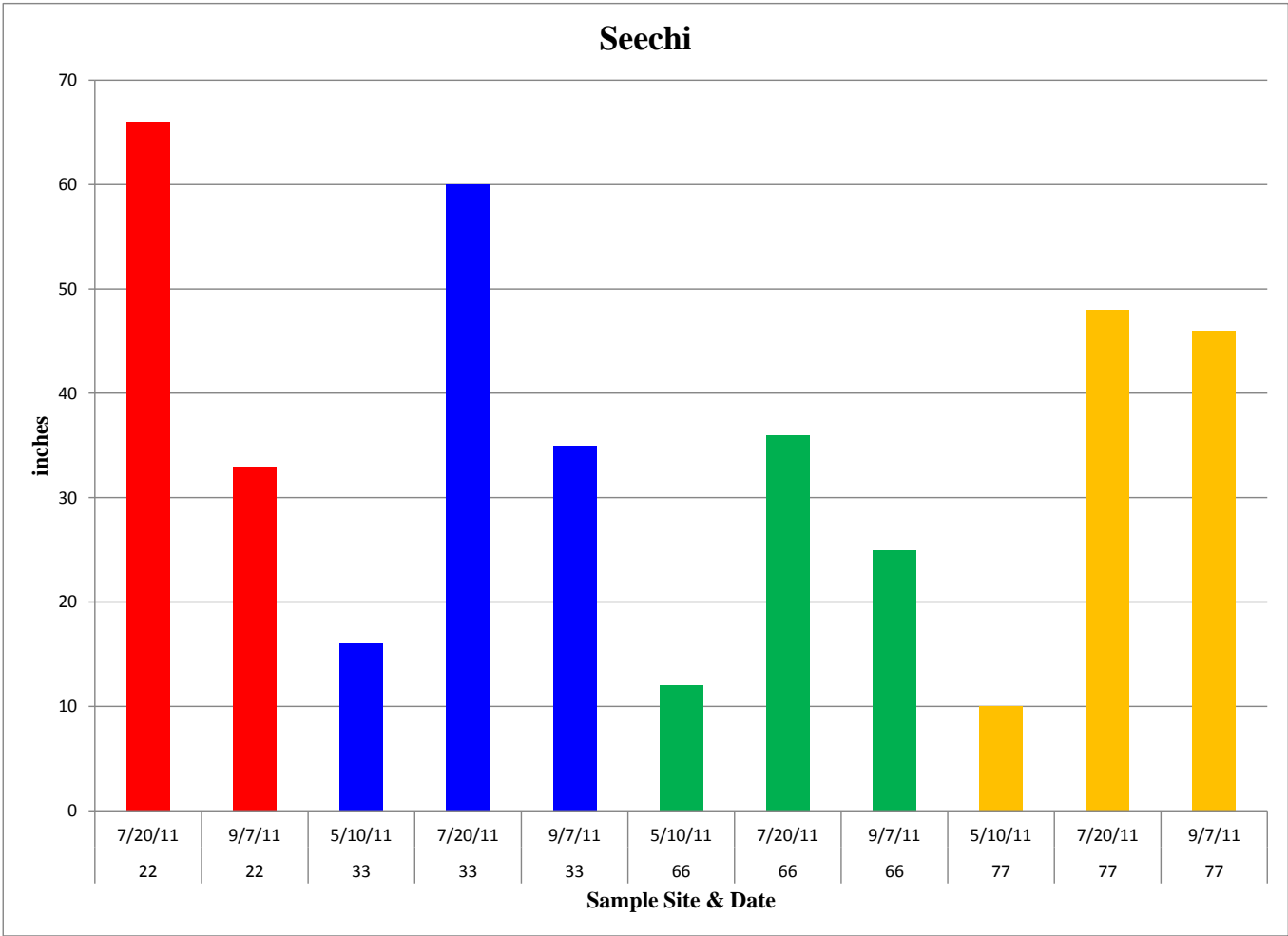


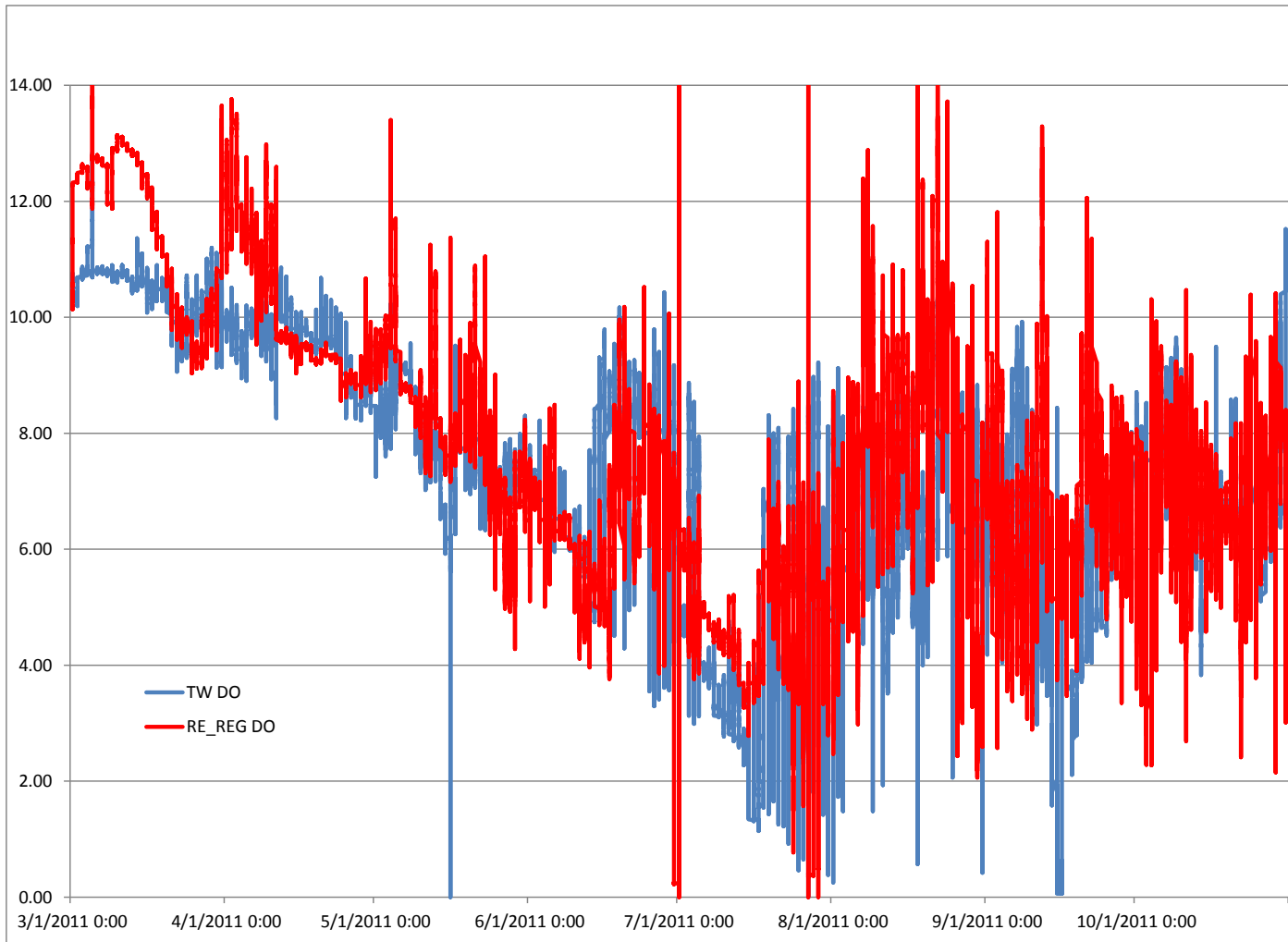












APPENDIX D

Lakes of Missouri Volunteer Program (LMVP) Data

Lakes of Missouri Volunteer Program (LMVP) Data

Site	Date	Temp	Secchi	TP	TN	CHL	ISS
1	4/23/2011	52	18	132	2290	8.2	7.6
1	5/14/2011	54	18	109	2160	6.4	6.3
1	6/5/2011	68	16	84	2130	14.6	6
1	6/26/2011	64	34	62	2290	20.2	3.5
1	7/16/2011	82	37	41	2000	19	2.4
1	8/6/2011	82	47	27	1510	18.7	0.6
1	8/28/2011	77	33	21	990	31.8	1.3
1	9/17/2011	66	40	20	740	27.3	0.7
2	4/23/2011	52	16	119	1930	12.6	7.5
2	5/14/2011	52	18	104	2080	11.9	8.2
2	6/5/2011	68	20	85	1780	17.2	6.8
2	6/26/2011	64	36	58	1930	23.7	4.7
2	7/16/2011	84	36	37	2080	12.2	2.8
2	8/6/2011	82	44	25	1430	22	0.7
2	8/28/2011	78	33	25	900	32.9	1.7
2	9/17/2011	66	39	20	840	26.5	1.7
5	4/23/2011	52	12	142	2530	3.8	11.5
5	5/14/2011	54	14	116	1870	9.6	7.6
5	6/5/2011	68	16	100	2130	21.6	7.2
5	6/26/2011	64	32	64	2280	23.1	4.1
5	7/16/2011	82	31	36	1900	24.2	3.1
5	8/6/2011	82	46	25	1230	25.5	0.6
5	8/28/2011	78	31	25	970	35.3	1.3
5	9/17/2011	66	39	21	710	27.5	1.7

Site 1 - near dam

Site 2 - Indian Creek

Site 5 - Confluence of North Fork & South Fork

Parameter	Abbreviation	Unit of Measure
Water Clarity (using Secchi disk)	Secchi	Inches (“)
Total Phosphorus	TP	Micrograms per liter (ug/L) or parts per billion (ppb)
Total Nitrogen	TN	Micrograms per liter (ug/L) or parts per billion (ppb)
Chlorophyll	CHL	Micrograms per liter (ug/L) or parts per billion (ppb)
Inorganic Suspended Sediments	ISS	Milligrams per liter (mg/L), or parts per million (ppm) 1mg = 1000 ug
Total Suspended Sediments	TSS	Milligrams per liter (mg/L), or parts per million (ppm) 1mg = 1000 ug

Full report for all lakes in the LMVP can be found at <http://www.lmvp.org/lakes.htm>.

APPENDIX E

United Water Services Clarence Cannon WTP Data

HIGH SERVICE

April	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (ntu)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH3 (mg/l)	Fluoride (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	3.68	7.80	93	0.08	0.06	3.21	155	0.018		0.25	0.73	151	0.0	9	A
2	3.81	7.81	97	0.08	0.10	3.36	169	0.001		0.25	0.71	153	0.0	10	
3	3.47	7.89	97	0.07	0.11	3.32	165	0.009		0.28	0.70	157	0.0	12	
4	3.85	7.88	94	0.07	0.09	3.24	157	0.008		0.22	0.71	166	0.0	12	A
5	3.29	7.85	93	0.07	0.08	3.33	154	0.002		0.33	0.71	160	0.0	11	
6	3.78	7.97	99	0.08	0.10	3.28	164	0.004	0.005	0.22	0.66		0.0	14	A
7	3.57	7.89	98	0.07	0.08	3.46	163	0.003		0.22	0.67	152	0.0	13	
8	3.81	7.76	102	0.07	0.10	3.75	164	0.004		0.26	0.69	153	0.0	13	A
9	3.36	7.77	99	0.08	0.08	3.64	160	0.005		0.24	0.68	156	0.0	13	
10	4.05	7.86	98	0.08	0.08	3.41	162	0.004		0.24	0.69	155	0.0	14	
11	3.81	7.82	101	0.08	0.10	3.36	164	0.009		0.35	0.71	153	0.0	14	A
12	3.68	7.84	111	0.08	0.10	3.42	180	0.002		0.28	0.70	152	0.0	15	
13	3.62	7.89	116	0.09	0.08	3.27	170	0.007		0.32	0.61	163	0.0	15	A
14	3.98	7.85	116	0.09	0.08	3.23	180	0.008		0.32	0.64	174	0.0	15	
15	3.23	7.92	112	0.09	0.08	3.20	171	0.011		0.32	0.79	174	0.0	15	A
16	3.72	7.99	105	0.08	0.07	3.34	168	0.014		0.27	0.74	167	0.0	14	
17	3.50	8.04	105	0.08	0.07	3.24	167	0.007		0.30	0.77	166	0.0	14	
18	3.65	8.02	107	0.09	0.09	3.17	172	0.008		0.29	0.78	168	0.0	15	A
19	3.73	7.98	110	0.10	0.07	3.10	171	0.004		0.24	0.78	183	0.0	15	
20	3.20	7.92	109	0.10	0.08	3.30	172	0.006	0.006	0.26	0.76	171	0.0	15	A
21	3.71	7.81	109	0.08	0.09	3.36	171	0.007		0.30	0.76	166	0.0	15	
22	3.36	7.76	108	0.09	0.08	3.38	169	0.009		0.36	0.73	157	0.0	15	A
23	3.74	7.85	107	0.10	0.08	3.12	166	0.009		0.26	0.63	164	0.0	15	
24	3.36	7.93	110	0.09	0.08	2.99	167	0.007		0.26	0.71	164	0.0	15	
25	4.13	8.02	112	0.10	0.08	3.07	177	0.007		0.27	0.79	158	0.0	15	A
26	3.34	8.08	112	0.10	0.08	3.13	172	0.004			0.64			15	
27	4.28	8.04	108	0.09	0.08	3.21	170	0.006			0.73	163	0.0	15	A
28	2.93	7.89	107	0.09	0.09	3.18	166	0.007	0.002		0.54	174	0.0	16	
29	3.66	8.01	107	0.10	0.09	3.05	159	0.014			0.63	158	0.0	15	A
30	3.55	8.21	106	0.09	0.09	3.06	165	0.006		0.27		170	0.0	16	
AVG	3.63	7.91	105	0.08	0.08	3.27	167	0.007	0.004	0.28	0.70	162	0.0	14	
TOTAL	108.85														

HIGH SERVICE

MAY	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (ntu)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH3 (mg/l)	Fluoride (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	3.46	8.12	103	0.09	0.08	3.07	167	0.006		0.28	0.39	166	0.0	15	
2	3.77	7.91	102	0.10	0.10	3.22	155	0.005				173	0.0	16	A
3	3.99	7.90	103	0.10	0.07	3.12	158	0.011		0.20		161	0.0	16	
4	3.36	7.90	104	0.08	0.09	3.25	159	0.013		0.28	0.20	162	0.0	16	A
5	3.50	7.93	104	0.09	0.09	3.14	154	0.007	0.003	0.19		148	0.0	15	
6	3.94	7.91	105	0.09	0.09	3.18	164	0.008		0.19		145	0.0	16	A
7	3.80	8.01	105	0.09	0.08	3.22	160	0.014		0.23		140	0.0	16	
8	3.76	8.08	104	0.09	0.07	3.21	159	0.008		0.23		148	0.0	16	
9	4.31	7.92	106	0.09	0.09	3.14	163	0.005		0.24		159	0.0	17	A
10	4.40	8.06	106	0.09	0.09	3.12	163	0.004		0.22		153	0.0	19	
11	3.74	7.99	104	0.09	0.15	3.15	160	0.005	0.009	0.22		158	0.0	19	A
12	4.51	7.95	104	0.09	0.09	3.14	160	0.003				157	0.0	19	
13	3.58	7.98	103	0.09	0.07	3.12	158	0.009		0.23		155	0.0	19	A
14	4.18	8.01	105	0.09	0.08	2.96	163	0.006		0.27		161	0.0	19	
15	3.27	7.92	106	0.11	0.08	2.96	161	0.010		0.23		160	0.0	18	
16	3.94	7.83	104	0.11	0.07	3.01	159	0.007				168	0.0	17	A
17	3.80	7.88	104	0.11	0.07	3.05	158	0.009				166	0.0	18	
18	3.37	7.86	112	0.09	0.08	3.23	160	0.006	0.003	0.24	0.21	165	0.0	18	A
19	4.29	7.93	112	0.07	0.07	3.28	167	0.005		0.24	0.20	164	0.0	18	
20	3.56	7.94	113	0.08	0.08	3.26	167	0.003		0.23		162	0.0	18	A
21	3.83	8.00	107	0.09	0.08	3.03	160	0.006		0.21		165	0.0	18	
22	3.86	8.03	108	0.09	0.08	3.13	161	0.006		0.21		164	0.0	18	
23	4.09	8.03	106	0.09	0.06	3.16	162	0.008		0.19		163	0.0	19	A
24	4.06	7.99	107	0.08	0.06	3.18	166	0.003		0.16		167	0.0	19	
25	2.98	7.89	107	0.09	0.08	3.18	160	0.003		0.21		165	0.0	19	A
26	3.65	7.90	108	0.08	0.08	3.13	160	0.004		0.21		175	0.0	19	
27	3.42	7.92	107	0.09	0.07	3.09	165	0.004		0.15		179	0.0	20	A
28	4.09	7.89	108	0.09	0.07	3.22	168	0.008		0.11		173	0.0	19	
29	3.30	7.75	111	0.09	0.08	3.18	169	0.011		0.32	0.15	174	0.0	21	
30	4.63	7.85	111	0.10	0.07	3.25	166	0.004		0.32		170	0.0	21	A
31	4.23	7.93	108	0.10	0.08	3.11	165	0.010		0.35		171	0.0	21	
AVG	3.83	7.94	106	0.09	0.08	3.14	162	0.007	0.005	0.23	0.23	162	0.0	18	
TOTAL	118.67														

HIGH SERVICE

June		PLANT EFFLUENT													
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (ntu)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH3 (mg/l)	Fluoride (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	4.12	7.85	108	0.10	0.09	3.25	166	0.006	0.004	0.31		164	0.0	21	A
2	3.93	7.82	107	0.09	0.09	3.14	166	0.006		0.38	0.27	173	0.0	21	
3	4.23	7.84	110	0.10	0.11	3.19	168	0.007		0.36		172	0.0	24	A
4	4.48	7.91	109	0.10	0.09	3.13	164	0.007		0.34		170	0.0	23	
5	4.15	7.78	109	0.10	0.08	3.11	162	0.008		0.34		170	0.0	23	
6	4.47	7.74	108	0.09	0.09	3.12	162	0.004		0.28	0.14	169	0.0	23	A
7	5.05	7.76	108	0.10	0.09	3.17	162	0.006		0.33		158	0.0	24	
8	4.22	7.87	108	0.10	0.08	3.19	160	0.010		0.31		169	0.0	23	A
9	4.42	7.90	108	0.10	0.08	3.24	160	0.009		0.31		167	0.0	23	
10	4.21	7.92	108	0.09	0.07	3.22	165	0.014		0.26		165	0.0	23	A
11	3.65	7.93	111	0.10	0.08	3.11	167	0.002		0.27		166	0.0	22	
12	3.99	8.00	110	0.09	0.07	3.28	169	0.006		0.28		166	0.0	22	
13	3.75	8.00	107	0.09	0.06	3.09	165	0.006		0.22		176	0.0	22	A
14	4.00	8.12	107	0.09	0.07	2.59	162	0.009		0.30		168	0.0	22	
15	3.76	8.04	107	0.09	0.07	2.55	162	0.005	0.012	0.27		163	0.0	24	A
16	4.15	7.79	104	0.09	0.07	2.82	158	0.008		0.24		160	0.0	24	
17	3.81	7.81	106	0.18	0.07	3.05	168	0.004		0.22		160	0.0	25	A
18	3.85	7.78	105	0.09	0.07	3.15	160	0.004		0.18		168	0.0	25	
19	3.46	7.77	103	0.20	0.08	3.10	161	0.009		0.22		168	0.0	25	
20	4.20	7.85	102	0.09	0.07	3.12	166	0.005		0.22		167	0.0	25	A
21	4.00	7.83	104	0.09	0.06	3.13	164	0.004		0.38		168	0.0	26	
22	4.13	7.76	105	0.09	0.07	3.01	157	0.004		0.18		164	0.0	25	A
23	3.76	7.77	105	0.09	0.05	3.11	157	0.005		0.18		164	0.0	25	
24	4.03	7.85	108	0.09	0.05	3.19	160	0.005				168	0.0	24	A
25	4.13	7.82	107	0.09	0.07	3.25	158	0.006		0.18		170	0.0	23	
26	3.68	7.97	103	0.08	0.06	3.08	156	0.015		0.21		162	0.0	23	
27	3.55	8.02	109	0.10	0.06	3.17	158	0.005		0.22		160	0.0	22	A
28	4.88	7.99	106	0.10	0.06	3.13	159	0.009		0.22		168	0.0	23	
29	4.22	7.91	101	0.10	0.07	3.08	160	0.010		0.22		160	0.0	24	A
30	4.84	7.77	98	0.09	0.07	3.04	150	0.017		0.20		86	0.0	25	
AVG	4.10	7.87	106	0.10	0.07	3.09	162	0.007	0.008	0.26	0.21	163	0.0	23	
TOTAL	123.12														

HIGH SERVICE

July		PLANT EFFLUENT													
DATE	Flow (mgd)	pH	Alkalinity (mg/l)	Turbidity (ntu)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH3 (mg/l)	Fluoride (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	5.09	7.83	99	0.08	0.07	3.10	152	0.006		0.18		167	0.0	25	A
2	5.87	7.92	95	0.08	0.07	3.12	147	0.008		0.14		162	0.0	25	
3	4.94	7.78	95	0.08	0.06	3.11	145	0.007				160	0.0	25	
4	5.46	7.95	100	0.07	0.08	3.14	151	0.004		0.12		155	0.0	24	A
5	4.20	7.96	104	0.07	0.07	3.31	154	0.009		0.22		156	0.0	26	
6	4.79	7.96	100	0.08	0.06	3.26	151	0.006	0.008	0.06		157	0.0	25	A
7	4.49	7.99	98	0.09	0.07	3.24	156	0.004		0.20		170	0.0	25	
8	4.43	8.00	98	0.08	0.06	3.22	155	0.009		0.24		163	0.0	25	A
9	4.64	8.00	103	0.08	0.07	3.08	152	0.004		0.15		144	0.0	26	
10	4.44	7.96	104	0.09	0.08	3.02	147	0.003		0.12		152	0.0	27	
11	4.59	7.90	99	0.09	0.07	3.14	146	0.006		0.17		160	0.0	25	A
12	5.19	7.81	99	0.09	0.07	3.31	153	0.013		0.05		165	0.0	25	
13	4.46	7.80	104	0.09	0.07	3.17	149	0.004	0.013	0.09		147	0.0	26	A
14	4.23	7.84	104	0.08	0.08	3.11	147	0.005		0.05		158	0.0	26	
15	4.72	8.05	107	0.09	0.08	3.15	158	0.002				160	0.0	28	A
16	4.36	7.95	106	0.10	0.07	3.16	156	0.002		0.05		164	0.0	28	
17	4.49	7.89	104	0.10	0.08	3.15	152	0.006		0.06		161	0.0	29	
18	5.07	7.90	107	0.10	0.08	3.12	155	0.006		0.26		167	0.0	30	A
19	4.70	7.77	108	0.10	0.08	3.03	158	0.004		0.21		164	0.0	30	
20	5.37	7.81	107	0.10	0.08	3.21	156	0.005		0.21		162	0.0	29	A
21	4.77	7.96	109	0.10	0.07	3.20	156	0.005		0.19		164	0.0	29	
22	4.61	8.02	109	0.09	0.06	3.28	156	0.004		0.19		162	0.0	29	A
23	5.24	8.02	112	0.08	0.07	3.34	167	0.006		0.18		164	0.0	30	
24	4.97	7.91	111	0.09	0.08	3.25	165	0.003		0.21		173	0.0	29	
25	4.90	7.84	108	0.10	0.07	3.24	156	0.004		0.15		170	0.0	29	A
26	4.87	7.91	107	0.09	0.08	3.28	160	0.005		0.19		175	0.0	29	
27	4.65	7.76	111	0.10	0.09	3.11	162	0.007	0.005	0.23		175	0.0	31	A
28	5.06	7.76	111	0.10	0.08	2.95	162	0.011		0.21		184	0.0	31	
29	5.11	7.96	113	0.09	0.07	3.05	169	0.009		0.21		175	0.0	30	A
30	5.02	8.00	110	0.10	0.07	3.11	160	0.007		0.16		177	0.0	30	
31	4.12	7.96	110	0.10	0.07	3.27	158	0.006		0.16		177	0.0	30	
AVG	4.80	7.91	105	0.09	0.07	3.17	155	0.006	0.009	0.16		164	0.0	27	
TOTAL	148.85														

HIGH SERVICE

AUG		PLANT EFFLUENT													
DATE	Flow (mgd)	pH	Alkalinity (mg/l)	Turbidity (ntu)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH3 (mg/l)	Fluoride (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	5.06	7.96	113	0.09	0.07	3.27	164	0.005		0.16		156		31	A
2	4.92	7.98	114	0.08	0.08	3.31	163	0.007		0.19		170	0.0	32	
3	4.80	7.98	110	0.11	0.09	3.27	156	0.008		0.19		164	0.0	31	A
4	5.00	7.91	109	0.12	0.07	3.23	154	0.006		0.19		178	0.0	32	
5	4.18	7.85	107	0.11	0.07	3.23	158	0.006		0.19		175	0.0	31	A
6	4.51	7.94	111	0.10	0.08	3.18	163	0.008		0.19		174	0.0	30	
7	4.43	7.88	108	0.09	0.09	3.14	161	0.009		0.18		179	0.0	30	
8	5.17	8.02	108	0.10	0.08	3.17	158	0.008		0.12		182	0.0	30	A
9	4.61	8.01	107	0.11	0.07	3.19	160	0.010		0.23		171	0.0	30	
10	4.65	7.97	109	0.13	0.08	3.13	161	0.018	0.014	0.15		166	0.0	28	A
11	4.55	7.89	108	0.13	0.07	3.05	159	0.015		0.13		173	0.0	28	
12	4.15	7.91	110	0.11	0.08	3.25	164	0.020		0.18		166		27	A
13	4.06	7.94	111	0.09	0.06	3.28	166	0.007		0.18		170	0.0	28	
14	4.65	8.07	111	0.09	0.06	3.25	167			0.08		169	0.0	28	
15	4.68	8.09	112	0.09	0.08	3.29	170	0.003		0.12		174	0.0	27	A
16	4.35	7.96	111	0.09	0.07	3.20	169	0.007				170		26	
17	4.23	7.83	110	0.10	0.07	3.16	165	0.006		0.13		170	0.0	27	A
18	4.48	7.59	106	0.10	0.07	3.12	164	0.006			0.13	168	0.0	27	
19	4.23	7.70	108	0.09	0.07	3.13	167	0.015		0.17		173	0.0	27	A
20	4.36	7.86	113	0.10	0.08	3.00	166	0.014		0.15		171	0.0	27	
21	3.99	7.94	110	0.10	0.08	2.89	167	0.011		0.12		181	0.0	28	
22	4.93	7.90	106	0.11	0.08	3.00	160	0.009				180	0.0	27	A
23	4.43	7.68	105	0.11	0.08	3.06	158	0.009		0.10		176		28	
24	4.68	7.89	110	0.10	0.08	3.08	165	0.011	0.009	0.04		178		29	A
25	4.64	8.13	108	0.11	0.08	3.00	161	0.014		0.09		176		28	
26	4.20	8.03	111	0.10	0.07	3.10	170	0.007		0.11				28	A
27	4.96	8.01	108	0.10	0.07	3.33	165	0.007		0.09		171	0.0	27	
28	3.67	8.03	105	0.10	0.08	3.31	160	0.007		0.11		176	0.0	27	
29	5.00	7.97	109	0.10	0.08	3.16	166	0.007		0.18		174	0.0	27	A
30	4.90	7.99	109	0.10	0.08	3.05	161	0.009		0.09				27	
31	4.10	17.15	106	0.10	0.17	3.10	161	0.007		0.09		162	0.0	27	A
AVG	4.53	8.23	109	0.10	0.08	3.16	163	0.009	0.012	0.14	0.13	172	0.0	28	
TOTAL	140.57														

HIGH SERVICE

SEP	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (ntu)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH3 (mg/l)	Fluoride (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	4.60	7.93	106	0.09	0.08	3.12	160	0.007				168	0.0	27	
2	4.76	7.90	107	0.10	0.08	3.10	166	0.006		0.09		175	0.0	27	A
3	4.79	7.98	111	0.09	0.09	2.98	168	0.002		0.07		181		29	
4	4.34	7.90	110	0.09	0.09	3.04	165	0.004		0.05		175		27	
5	4.39	7.97	106	0.09	0.07	3.13	160	0.006		0.05		172	0.0	26	A
6	4.37	7.87	104	0.09	0.08	3.22	164	0.010		0.05		170	0.0	26	
7	3.89	7.88	107	0.09	0.09	3.09	160	0.011	0.013	0.04		175		26	A
8	4.44	7.93	108	0.09	0.09	3.13	165	0.004		0.13		173		25	
9	4.02	7.92	108	0.08	0.08	3.21	166	0.011				170	0.0	24	A
10	4.48	7.98	108	0.08	0.08	3.24	165	0.006				177	0.0	24	
11	3.60	7.88	109	0.08	0.07	3.19	165	0.002				180	0.0	23	
12	5.21	7.78	112	0.08	0.10	3.13	168	0.007		0.25		184		25	A
13	4.30	7.90	115	0.07	0.08	3.11	178	0.007		0.25		166	0.0	25	
14	4.20	8.04	114	0.08	0.07	3.43	167	0.005		0.25		170	0.0	25	A
15	3.79	8.07	110	0.09	0.07	3.38	168	0.005		0.16		171	0.0	24	
16	4.38	8.07	109	0.09	0.06	3.25	170	0.014		0.20		173	0.0	23	A
17	3.88	7.90	110	0.08	0.08	3.14	169	0.006		0.24		183		22	
18	4.14	7.88	113	0.08	0.08	3.12	172	0.009		0.25		181	0.0	22	
19	4.12	7.85	109	0.09	0.07	3.08	170	0.007		0.16		180	0.0	21	A
20	4.05	7.81	110	0.08	0.06	3.17	167	0.004		0.18		176	0.0	21	
21	4.10	7.78	114	0.07	0.07	3.12	171	0.005	0.013	0.23		171		22	A
22	4.15	7.89	114	0.07	0.08	3.14	171	0.010		0.25		181	0.0	22	
23	3.85	7.89	114	0.07	0.07	3.21	180	0.001		0.19		171		22	A
24	3.98	7.91	115	0.08	0.06	3.26	171	0.007		0.19		177	0.0	22	
25	4.57	7.97	113	0.07	0.06	3.31	169	0.005		0.19		177	0.0	21	
26	4.26	7.97	113	0.08	0.08	3.27	170	0.005		0.19		182	0.0	21	A
27	4.05	8.02	112	0.08	0.08	3.37	174	0.003		0.21		177	0.0	21	
28	4.18	7.94	112	0.08	0.06	3.47	168	0.009	0.009	0.19		170	0.0	21	A
29	4.37	7.96	114	0.08	0.06	3.41	168	0.007		0.19		180	0.0	20	
30	3.84	7.91	112	0.08	0.06	3.40	171	0.012		0.23		180	0.0	20	A
AVG	4.24	7.92	111	0.08	0.07	3.21	168	0.006	0.012	0.17		175	0.0	23	
TOTAL	127.10														

HIGH SERVICE

NOV	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (ntu)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH3 (mg/l)	Fluoride (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	5.23	7.67	107	0.07	2.59	3.21	174	0.023				188	0.0	15	
2	3.88	7.78	112	0.07	2.61	3.16		0.003	0.015			172	0.0	15	A
3	4.39	7.75	110	0.07	1.48	2.23	139	0.004		0.00		182		15	
4	4.13	8.01	115	0.07	0.06	2.98	180	0.003		0.07		185		15	A
5	4.36	8.02	110	0.08	0.05	3.16	170	0.004				186	0.0	15	
6	4.05	7.91	111	0.08	0.05	3.23	168	0.004				185	0.0	15	
7	4.10	7.81	114	0.07	0.07	3.26	177	0.011		0.08		192		14	A
8	4.27	7.87	114	0.07	0.06	3.16	184	0.001						14	
9	3.81	7.87	111	0.08	0.05	3.16	170	0.004	0.009	0.15		177	0.0	14	A
10	4.48	7.97	111	0.07	0.05	3.15	170	0.003		0.07		178	0.0	14	
11	3.85	8.02	110	0.07	0.06	3.16	172	0.004		0.08		178	0.0	14	A
12	4.12	8.08	116	0.07	0.07	3.03	174	0.012		0.07		190		14	
13	4.53	7.99	115	0.07	0.06	2.95	178	0.003		0.05		185		14	
14	4.20	7.96	109	0.07	0.07	2.98	174	0.005		0.01		168	0.0	13	A
15	4.36	7.90	108	0.07	0.07	3.12	171	0.001		0.04		178	0.0	15	
16	3.95	7.97	112	0.06	0.07	3.38	178	0.001	0.012	0.14		172	0.0	12	A
17	4.10	8.02	114	0.07	0.09	3.52	175	0.006		0.07		192	0.0	13	
18	3.73	7.98	114	0.07	0.06	3.13	180	0.002		0.02		184		14	A
19	4.54	7.91	108	0.07	0.06	3.31	176	0.001		0.04		178	0.0	12	
20	4.14	7.91	107	0.08	0.07	3.22	170	0.006		0.04		174		15	
21	3.81	7.95	113	0.07	0.07	3.06	173	0.005		0.23		186		13	A
22	4.18	8.01	114	0.07	0.09	3.11	182	0.001		0.15		178		12	
23	4.15	7.82	109	0.06	0.06	3.53	172	0.006	0.006	0.11		174	0.0	15	A
24	3.57	7.73	108	0.09	0.06	3.53	170	0.004				176	0.0		
25	4.14	7.82	107	0.07	0.06	3.35	169	0.007		0.15		176	0.0	12	A
26	4.13	7.87	110	0.06	0.06	3.31	173	0.003		0.16		186	0.0	12	
27	3.53	7.88	112	0.07	0.06	3.33	173	0.004		0.22		185		11	
28	4.11	7.88	109	0.07	0.07	3.41	175	0.003	0.200			186	0.0	12	A
29	3.99	7.87	108	0.08	0.07	3.61	168	0.007		0.14		182	1.0	13	
30	3.80	7.92	113	0.07	0.07	3.48	178	0.003	0.011	0.13		182		12	A
AVG	4.12	7.90	111	0.07	0.28	3.21	173	0.005	0.042	0.10	#DIV/0!	181	0.1	13	
TOTAL	123.63														

HIGH SERVICE

DEC	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (ntu)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH3 (mg/l)	Fluoride (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	3.84	7.92	114	0.07	0.06	3.38	176	0.010		0.13		178	0.0	11	
2	4.15	7.91	114	0.07	0.06	3.53	177	0.009		0.04		179	0.0	10	A
3	4.42	7.87	108	0.07	0.08	3.55	174	0.004		0.07		182	0.0	11	
4	4.06	7.85	109	0.08	0.07	3.49									
5	4.09	7.91	113	0.09	0.07	3.28	173	0.009		0.21		186		10	A
6	3.82	7.99	113	0.08	0.07	3.32	184	0.001		0.14		182	0.0	10	
7	3.69	8.01	107	0.09	0.08	3.52	166		0.008	0.14		174	0.0	9	A
8	4.38	8.02	110	0.11	0.06	3.46		0.004		0.17		174	0.0	8	
9	4.09	8.00	109	0.08	0.06	3.41	167	0.002		0.18		183	0.0	8	A
10	3.78	8.04	114	0.07	0.07	3.25	179	0.003						8	
11	4.17	8.08	116	0.07	0.08	3.38	186	0.003		0.16		180		10	
12	4.29	8.04	112	0.09	0.07	3.39	176	0.004	0.210	0.16		172	0.0	9	A
13	3.77	8.00	108	0.09	0.07	3.36	182	0.009		0.20		177	0.0	8	
14	4.07	7.98	115	0.06	0.07	3.20	186	0.010	0.009	0.18		181		10	A
15	3.83	8.01	115	0.06	0.06	3.07	170	0.007		0.22		193		8	
16	4.02	8.01	116	0.06	0.07	3.20	182	0.007		0.08				8	A
17	4.26	7.98	110	0.08	0.07	3.35	180	0.007		0.08		186	0.0	8	
18	3.93	7.93	111	0.09	0.09	3.47	175	0.006				185	0.0	5	
19	4.01	7.89	116	0.08	0.09	3.28	184	0.002		0.09				9	A
20	3.81	7.95	116	0.07	0.09	3.37	177	0.003		0.19				7	
21	4.11	7.98	112	0.07	0.08	3.47	174	0.004	0.005	0.19		168	0.0	6	A
22	4.50	7.99	112	0.07	0.07	3.39	172	0.004		0.19		176	0.0	8	
23	4.53	7.97	112	0.05	0.07	3.23	176	0.002		0.20		189	0.0	8	A
24	4.39	7.93	116	0.04	0.07	3.09	180	0.008		0.24		189		8	
25	3.88	7.86	112	0.05	0.08	3.15	177	0.010		0.24		189	0.0	8	
26	4.09	7.92	115	0.04	0.07	3.15	184	0.001		0.25		190		8	A
27	4.36	7.95	104	0.06	0.06	3.10	172	0.005		0.27		187	0.0	7	
28	3.82	7.97	110	0.05	0.07	3.13		0.001	0.015	0.21		176	0.0	6	A
29	4.70	8.01	112	0.05	0.09	3.25	177	0.005		0.20		196		6	
30	3.56	8.06	114	0.04	0.07	3.27	178	0.007		0.10		192	0.0	8	A
31	3.87	8.05	108	0.07	0.07	3.56	166	0.008		0.14		190	0.0	8	
AVG	4.07	7.97	112	0.07	0.07	3.32	177	0.005	0.049	0.17	#DIV/0!	183	0.0	8	
TOTAL	126.29														

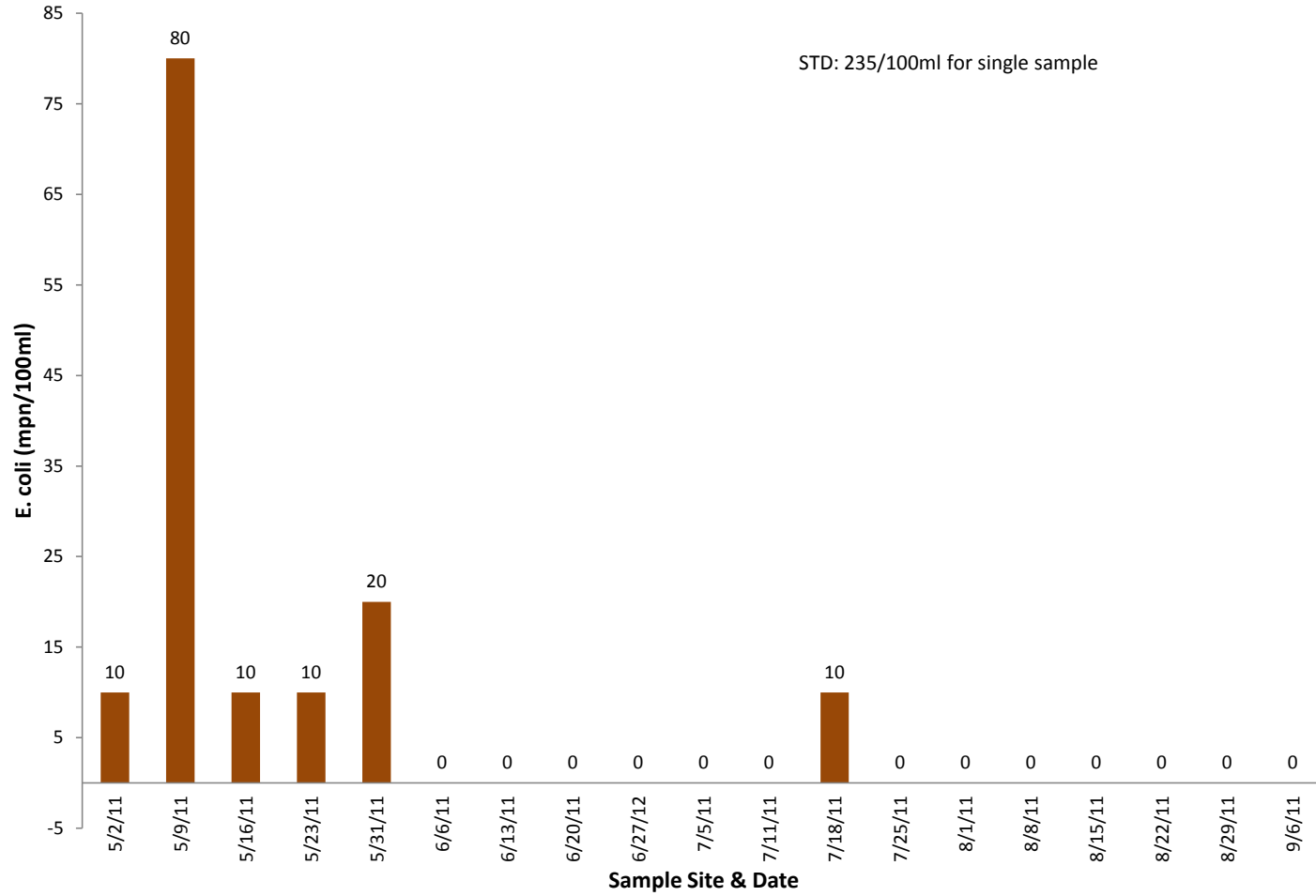
APPENDIX F

Beach Data & Graphs

<u>Date</u>	<u>Spalding East (E. Coli / 100 ml)</u>	<u>Spalding West (E. Coli / 100 ml)</u>	<u>Indian Creek (E. Coli / 100 ml)</u>
5/2/2011	10	10	10
5/9/2011	80	30	40
5/16/2011	10	10	10
5/23/2011	10	20	10
5/31/2011	20	10	0
6/6/2011	0	10	0
6/13/2011	0	0	0
6/20/2011	0	5	5
6/27/2012	0	20	30
7/5/2011	0	0	0
7/11/2011	0	0	110
7/18/2011	10	0	20
7/25/2011	0	0	10
8/1/2011	0	10	40
8/8/2011	0	20	0
8/15/2011	0	0	0
8/22/2011	0	10	0
8/29/2011	0	0	10
9/6/2011	0	0	0

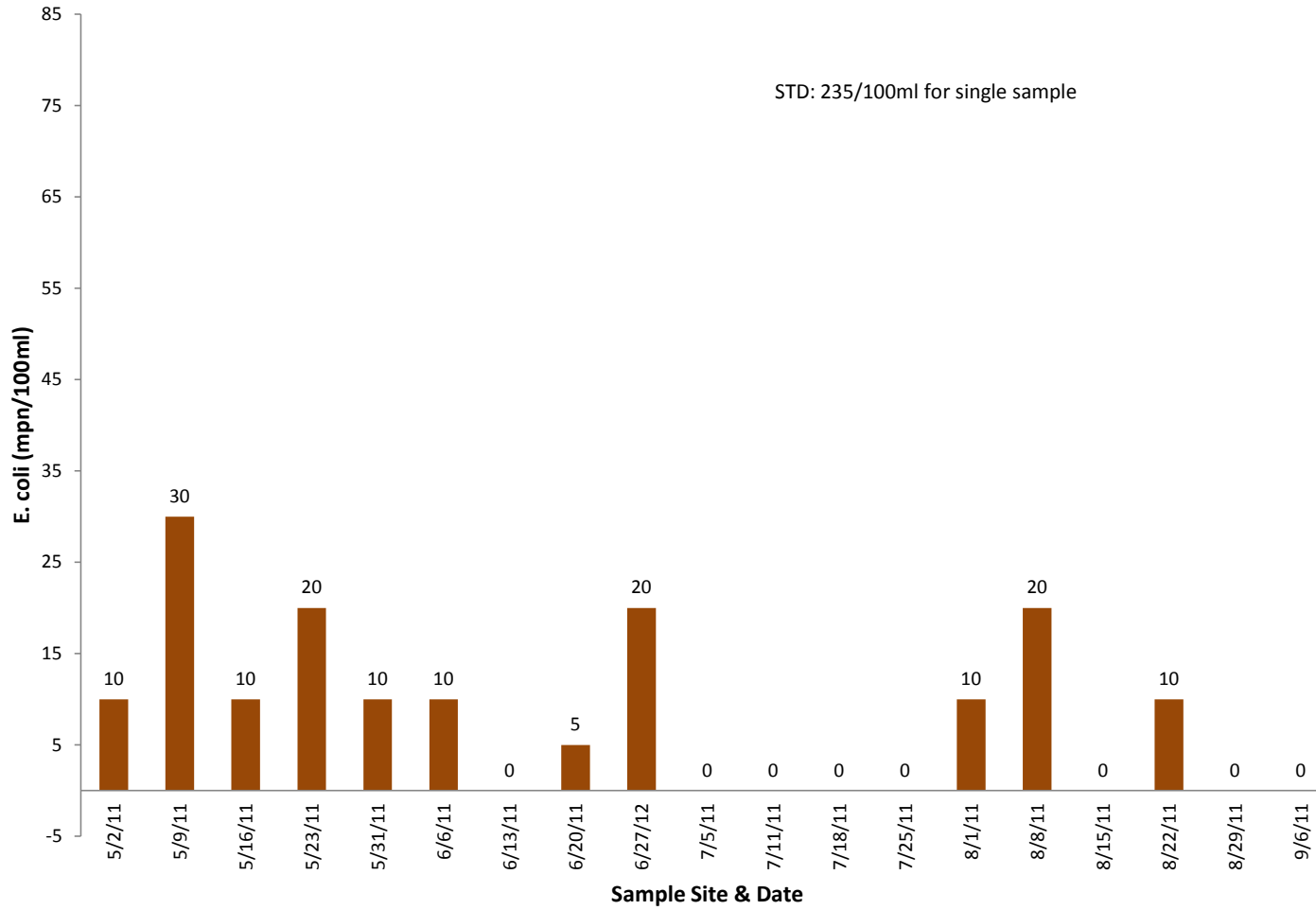
Spalding East

STD: 235/100ml for single sample

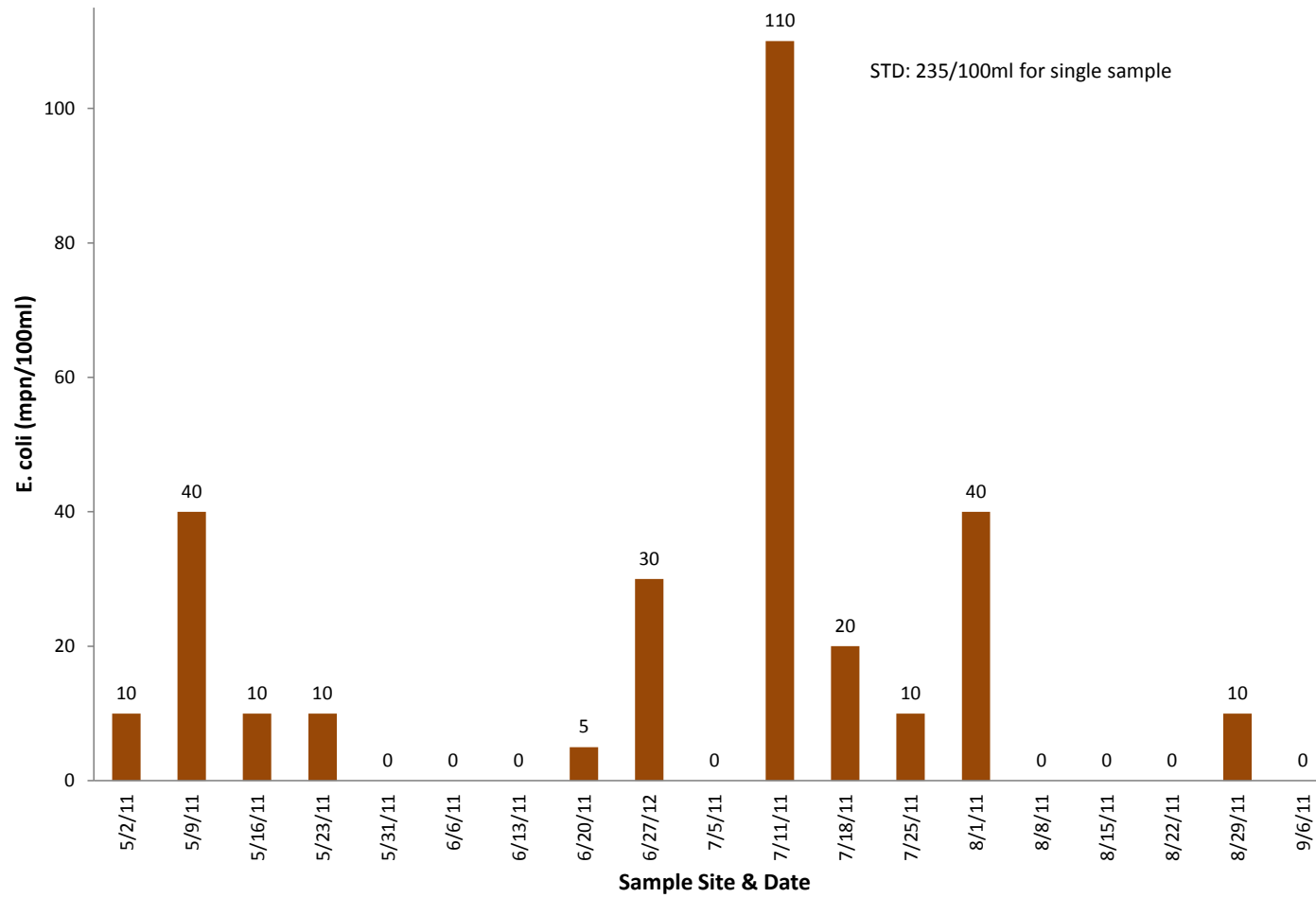


Spalding West

STD: 235/100ml for single sample



Indian Creek



Mark Twain State Park MDNR Data

STD: 235/100ml for single sample

